Tue, 12 December 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #833

Editorial

2024 Is Already On The Books At DVN

Last Wednesday, we published our last DVN Report of 2023. It is a long—80 pages!—presentation of the Shanghai DVN Workshop, showing you what's happening in China with lighting and ADAS technology, marketing, and regulation; especially for EVs. DVN members can **download it** for free, for all DVN members have free access to all DVN Reports; that's just one of the benefits of DVN membership, along with your weekly DVNewsletter, free attendance at DVN Workshops, and more.

In 2023, we brought you 11 reports:
- CES
- TU Darmstadt Lighting Institute
- Paris DVN Workshop
- Universities and Lighting

• MLA Technology
• Models launched in H1-2023
• Tokyo DVN Workshop
• ISAL
• US DVN Workshop
• Osram company profile
• Shanghai DVN Workshop

We have already planned a list of reports—14 of them—for 2024, including:
• CES
• New cars of the semester
• Munich DVN Workshop
• OLED technology and technique
• Test houses
• Detroit DVN Workshop
• India's vehicle lighting ecosystem
• Lumileds company profile
• Nichia company profile
• Interior lighting market
• India DVN Workshop
• VISION Congress
• Shanghai DVN Workshop
• Brazil's vehicle lighting ecosystem

Please **speak up** if you'd like particular questions addressed in any of these, or if you have a topic idea you don't see on this list. We've already received a request for a report about laser technology in vehicle lighting manufacturing—laser engraving in tools, for example, and laser welding—and we're pursuing that. So please share your thoughts with us so we can bring you the content you'd like to have.

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

In Depth Lighting Technology

Car Design News People Awards '23

DVN COO and Lighting General Editor Paul-Henri Matha attended the Car Design News People Awards in London last Thursday, 7 December. This event celebrates the people behind the designs we see on the road. Around 500 designers gathered at the Londoner Hotel, in Leicester Square, London.

14 awards were bestowed: best clay modeller; CMF team; collaboration; digital modelling team; exterior design team; interior design team; UX design team; lighting design team, sketcher; undiscovered talent; most supportive design leader; most sustainable design team, as well as awards for 'beyond automotive design' and 'challenging the industry'.

The jury comprised 20 renowned designers: Massimo Frascella (JLR); Lisa Reeves (Volvo Cars); Gorden Wagener (Mercedes-Benz); Amko Leenarts (Ford Europe); Carl Gotham (SAIC); Ben Payne and Russel Carr (Lotus); Karim Antoine Habib (Kia); Pontus Fontæus (GAC); Martin Uhlarik (Tata); Simon Loasby (Hyundai); Martin Groschwald (Konzepthaus); Matt Weaver (Nissan Europe); Kripa Anathan (Ola Electric); Pierre Leclercq (Citroën); Pratap Bose (Mahindra); Dale Harrow (Royal College of Art); Julien Montousse (Archer); Olver Samson (Changan), and Robin Page (Bentley).

The event started with a cocktail reception; the award event occurred during dinner.

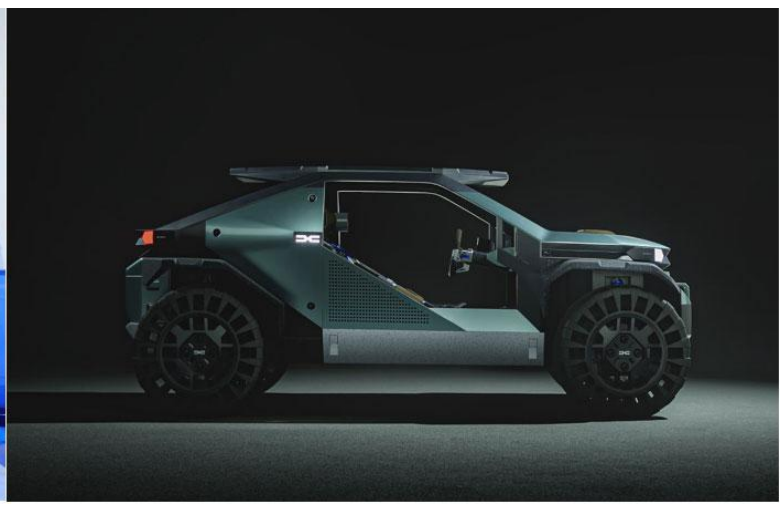
There were six candidates for Best Lighting Team: Lynk & Co; Changan; Hyundai (Namyang); Volvo Cars, Range Rover, and SEAT-Cupra.

The winner was Volvo Cars, with a special focus on the EX90 exterior and interior lighting.

Volvo Cars got two more awards, for best CMF team and best UX team.

Citroën got also three awards: best sustainable, exterior, and interior design teams.

Two vehicle-specific awards were also bestowed; the Dacia Manifesto won best concept car design, and the Polestar 4 was declared the best car design of the year.



Polestar 4 is well known for DVN members. We had the chance to welcome Christophe Ferreira, Design lighting Manager, during DVN Shanghai event this year who presented the lighting roadmap and especially Polestar 4 design (you can find the video on demand on our website).

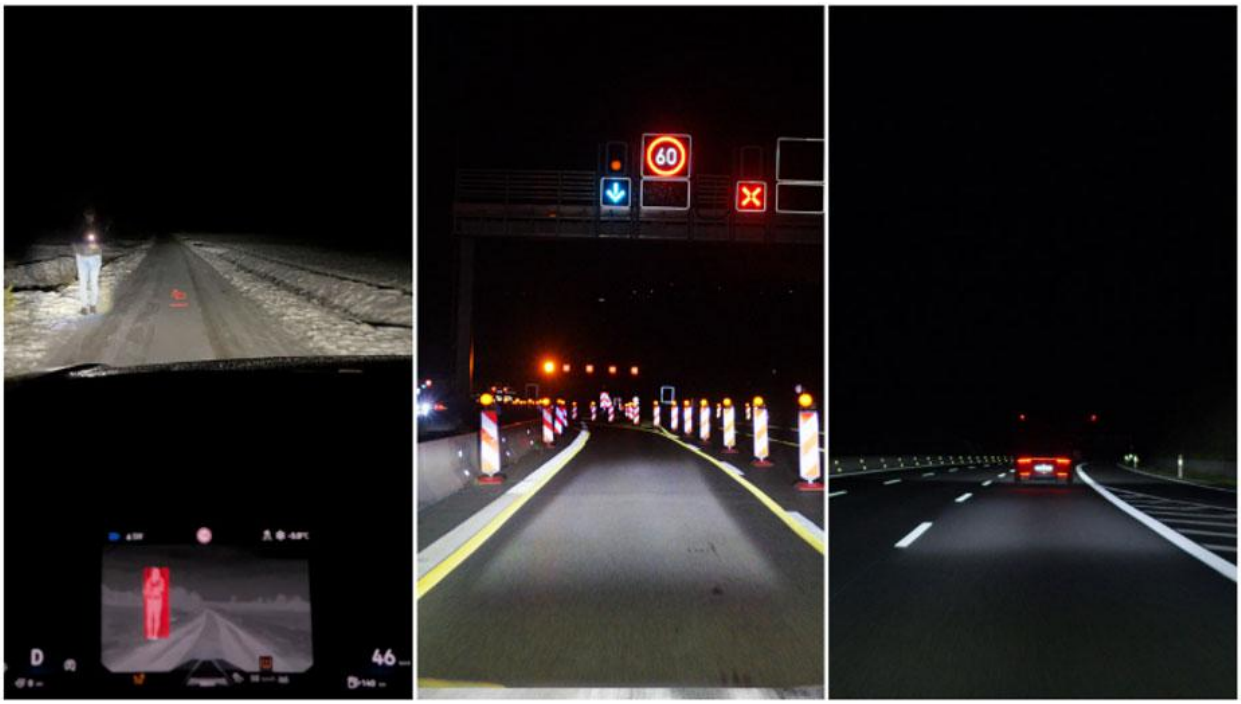
Paul-Henri Matha's key takeaways:

"The design community can be compared to lighting community: very friendly, with a lot of connection among designers even when they are competitors. Everybody is talking to everybody. There are also tier-1 and -2 suppliers and universities in the ecosystem; it's a very rich environment. I worked with many of these designers when I worked for Renault, Dacia, Volvo, and Polestar. Some of them have changed companies. I am sure many DVN readers have worked or are still working with some of them. All of them have this great passion for automotive and for lighting!"

Lighting News

German Motor Mag Tests VW Touareg Headlights

LIGHTING NEWS



German online auto magazine motoreport.de just tested the new Marelli AL headlighting system on the new Touareg. Here's what they found:

Successful Functions & Projections

The "IQ.Light Additional Functions" are a real eye-catcher. They can be activated in the infotainment system. The "Lane Light" carpets your own lane on the motorway with brighter light—seems like a gimmick, but the function of the "Lane Light" in construction zones makes much more sense. Here, the width of the vehicle is projected between yellow construction site markings, with an exact representation of the steering angle. If you signal and go to change lanes while another vehicle is in the blind spot, a warning is also projected onto the road. These light animations are not disturbing, and they're hardly noticeable to other road users. If pedestrians or animals come dangerously close to the road, they are marked with a spot of light for the driver and displayed in the digital cockpit, if the car has the optional night vision system.

Test on Country Roads

On the country road, they always drive their light tests on the same route in the Bamberg area and the same drivers with them, albeit in changing vehicles. The result of their test drive was that the Touareg takes 2nd place overall in their internal ranking, after the Digital

Light from Mercedes. The Touareg always perfectly shadows out oncoming road users, and usually does a very good job of shadowing leading vehicles.

Is IQ.Light With HD-Matrix Headlights a Worthy Option?

HD matrix light would definitely be worth the extra charge. The animations are especially helpful in motorway construction sites. Other road users are even less dazzled than with the standard-equipment system.

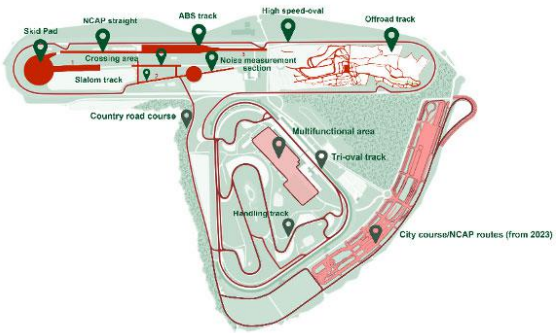
You can find complete article **here**, and the video of the test **here**—it's a full 15 minutes long, which shows the large amount of thought-space given to vehicle lighting in German culture. That's quite a contrast with cultures where the matter is given **no** thought **at all**.

DEKRA is testing ADB according American requirements

LIGHTING NEWS

By Wilfried van Laarhoven - DEKRA Certification B.V.

DEKRA is now dynamically testing complete vehicles concerning Adaptive Driving Beam (ADB) Headlamps according to the FMVSS108 requirements applicable to the North-American market. Specially developed test equipment is used to test the glare levels of vehicles equipped with ADB according the prescribed scenario's. These night tests take place on a large multifunction area available on the DEKRA Lausitzring, not far from Dresden, Germany.



Homologation through DEKRA

Already for many decades DEKRA is testing automotive lighting and light-signaling equipment for homologation in several markets. This includes the testing according to UN Regulations for approval in Europe, Japan and many other countries, in total more than sixty. The testing also can be performed for several other markets, such as India, Taiwan, Korea and so on.

DEKRA's testing according to the Federal Motor Vehicle Safety Standard No. 108 (FMVSS108) for the United States market is unique. In the DEKRA Arnhem laboratories photometric, color and all critical mechanical and environmental tests take place. Based on the test results DEKRA issues their test report but also the American Calcoast-ITL test report, which is an essential basis for the required self-certification.

Dynamic ADB testing on the DEKRA Lausitzring test track

New final rule

On the 22nd February 2022 the American National Highway Traffic Safety Administration (NHTSA) published their "Final Rule" as part of the FMVSS108 for "Lamps, Reflective Devices, and Associated Equipment, Adaptive Driving Beam Headlamps". This Final Rule contained the requirements for ADB headlamps and for vehicles equipped with such system.

Altering high beam patterns

The FMVSS108 now allows to automatically alter the high beam pattern, provided that the glare to oncoming and preceding vehicle drivers is limited to low beam level. This is done by creating dimmed areas in the high beam pattern. The vehicle's hard- and software computes the best available high beam pattern for the actual dynamic traffic situation (scenario) to limit the dazzling of road users.

FMVSS108 ADB testing in the DEKRA photometric laboratories

Photometry testing of the ADB beam patterns is performed with dedicated gonio-photometers. The ADB beams contain dimmed area(s) which shall meet the low beam requirements. The rest of the beam shall meet the high beam requirements except a 1 degree transition zone. There are two approaches to test. By using manufacturer defined angular coordinates of the dimmed area resulting in a limited number of point and line measurements. Or by searching the angular coordinates of the dimmed area by performing photometric line scans resulting in a somehow complex analysis. A limited number of selected critical ADB beam patterns should be tested.

Dynamic ADB FMVSS108 testing on the DEKRA Lausitzring test track

FMVSS108 is giving the maximum glare levels of oncoming and preceding road users, i.e. car, truck and motorcycle defined in the ADB System Test Matrix. On its Lausitzring area DEKRA is using its own test rack equipped with photosensors and prescribed stimulus lamps to simulate the mentioned road users. The illuminances (glare level) created by test vehicle's ADB is measured dynamically. The test vehicle is subjected to test drives, with prescribed vehicle speeds, orientations, curvature radii, driving directions and distance range. For improved speed and driving accuracy and reproducibility a programmable driving robot can be installed into the test vehicle. The illuminances from the sensors, along with the distance and pitch of the test vehicle, are recorded with a speed of 100 times per second. The data is used to determine the compliance with the requirements.

Fig. 2 Measurements on the DEKRA test track.

As can be seen in the images the stimulus lamps are actual lamps. The FMVSS108 prescribes the use of specific Ford F-150, Toyota Camry headlamps and rear combination lamps. The Harley Davidson Sportster headlamps and Roadster rear combination lamps shall be used as motor cycle stimulus lamps.

The independent DEKRA test reports are used for development, comparison, marketing and certification purposes.

Automotive interiors Expo Europe, Stuttgart December 5,6 & 7, 2023

LIGHTING NEWS

Last week took the Automotive Interiors Expo Europe 2023 place in Stuttgart. This event was an opportunity for about 150 exhibitors to present their products and services. Materials, fabrics, components, electronics and lighting were among the strongest themes of this expo.

With four companies, the Lighting community was well represented: Covestro, Luxor Lighting, Oshino Lamps and The Lighting Consultants were there with their latest innovations.

Here the testimony of Jérôme Génoist, Sales & Development Manager at Luxor Lighting: “Our presence at this Show aroused the interest of many actors from the automotive interior, OEMs and Tiers 1. They appreciated our solutions for interior lighting and our latest developments, especially on dynamic lighting or surface illumination. We also presented the very compact ambient lighting solution we just developed for Aston Martin and the complete interior lighting of the new VF8 and VF9 SUVs from Vinfast.”

HELLA wins Lingxuan Award for its Digital FlatLight in China

LIGHTING NEWS

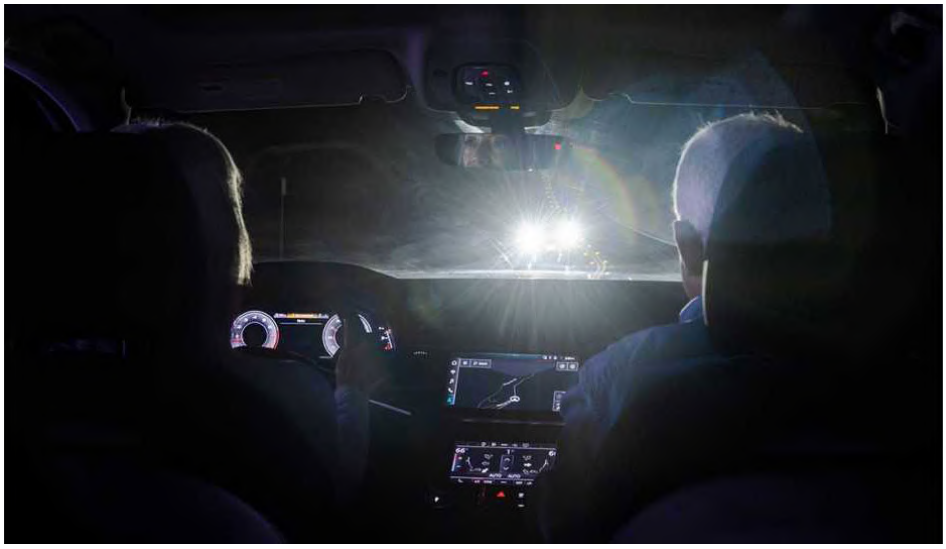
HELLA, the automotive supplier operating under the FORVIA umbrella brand, has received the Lingxuan Award in China for its Digital FlatLight technology. The Lingxuan Award is a prestigious award with significant influence and recognition in the Chinese automotive industry initiated by leading local media Auto Business Review in 2016. A panel of experts from the automotive industry and its supply chain evaluated and discussed 195 technical and product cases for the Lingxuan Award 2023. HELLA's cutting-edge lighting technology, Digital FlatLight, surpassed numerous competitors with its groundbreaking innovation and technological leadership.

"We are pleased to receive this prestigious award. It fully demonstrates HELLA's innovative strength and industry influence in the field of lighting. With the continuous development of major market trends towards electrification and autonomous driving, rear lamps have not only become important design elements enhancing vehicle brand identity but are also communication tools between vehicles and other road users" says Ivan Wang, Vice President Sales of HELLA Lighting in China. "With our Digital FlatLight technology, we are able to not only provide high-efficient, unique and sophisticated lighting solutions for vehicles, but also give the rear lamp superior looking and more functionality."

HELLA's Digital FlatLight utilizes 80% less energy consumption compared to a taillight function, enabling customized styling opportunities with a Smart Glass cover with switchable segments that brings digitalization into rear lighting. Only 8 millimeters thick, Digital FlatLight gives automakers increased design flexibility to create unique, signature styling designs for their vehicles and offer opportunities for changing light pattern or dynamic animations including upgradability via soft-ware updates.

ADB could give drivers about 60 extra meters of Visibility

LIGHTING NEWS



Synthesis of several US papers

Half of all fatal car crashes happen after dark because big problem of vision.
While our vision in daylight may be just fine, our night vision becomes less acute.
The good news is that headlights are, in some cases, getting better at lighting the road ahead us. A testing initiative by IIHS has found that vehicles equipped with top-rated headlights have 19% fewer nighttime crashes than do cars with lower-rated lights. As opposed to older headlights, which use a halogen bulb backed by a reflective surface, the best new headlights use LED bulbs with a so-called projector lens, explains Matt Brumbelow, a senior research engineer with the IIHS. “Now you can have a much better beam pattern that gets enough light onto the road,” he says.

Fortunately, a solution for both visibility and glare may soon be at hand. “Adaptive driving beam” headlights, already common in other parts of the world, have recently been approved by regulators for use in the U.S. Adaptive headlights feature a camera that helps direct LED bulbs away from oncoming cars, “while your side of the road would still be fully lit by the high beams,” Brumbelow says.
Adaptive lights could give drivers about 165 to 195 extra feet of visibility, which, at 65 mph, translates into a couple of seconds of additional reaction time. This could be a boon for older drivers, Bullough suggests. “It almost brings you back to what you could see with low beams in your 20s.”

To maximize your vision:

1. Use your high beams at night in almost all cases, except when there are oncoming cars. Drivers often don’t see as well at night as they think they do, and high beams give them the best chance of reacting fast enough to an unexpected hazard.
2. Don’t economize. When buying a new or used car, look for models with top-rated headlights. When given a choice, opt for the best headlights available.
3. If your car is old, consider getting your headlights and casings replaced.
4. Keep your windshield and headlights cleaned, for obvious reasons.
5. Reset the illumination levels of your dashboard lights and any in-car screens to low. Bright light inside makes it harder to see outside.

General News

Marelli at CES 2024: Discover the Journey to Design-Led Innovation

GENERAL NEWS

Marelli, a leading mobility technology supplier to the automotive sector, will showcase its latest innovations at **CES 2024** in Las Vegas, NV, January 9-11, 2024, at the Wynn Hotel. The invitation-only, curated experience will introduce guests to Marelli's approach to **Design-Led Innovation**.

Those visiting Marelli's hospitality suite at CES will be treated to a customized journey stepping through the phases of the vehicle co-creation process. As a first step, guests will enter the **Digital Twin Studio**, where they will answer a few preference-driven questions that will result in a persona that best reflects them. Their feature-based selections will be activated in a demo car later in the journey. Visitors will also be introduced to Marelli's Digital Twin technology.

In the **Co-Creation @Speed** area, visitors will learn more about Marelli's software-defined vehicle value proposition, and interact with technologies powered by Amazon Web Services (AWS), QNX, and Qualcomm Technologies. They will see how the company helps support architecture scalability, software portability, zone control standardization, and cloud virtualization. Visitors will interact with the company's Digital Twin demonstrator, which can replicate a vehicle cockpit in the cloud.

After visiting the **Digital Twin Studio** and **Co-Creation @Speed** areas, visitors can sit in the driver's seat in the first of two demo cars in the booth. It's here that the persona-based features from the **Digital Twin Studio** will be activated. Guests can interact with their personalized 3D avatar, and experience Marelli's award-winning pillar-to-pillar display, ambient lighting, smart surfaces, driver monitoring, and multifunctional HMI

technology. Thin light modules and light bar technology are integrated into the vehicle front.

Marelli will showcase lighting and display technologies in the **Design for Affordability** area. These solutions boast a simplified hardware and software design resulting in fewer parts, reduced weight, reduced CO_2 emissions, and cost less than traditional lighting and display products. These lean design concepts are achieved through technology optimization, a design for manufacturing approach, and supply chain localization.

Technologies designed to impact vehicle performance will be on display in the **Design for Performance** area, including Marelli's fully-active electromechanical suspension system, zone control unit, integrated thermal management module, and wireless battery management system powered by Artificial Intelligence (AI).

The future of mobility will be revealed in the private, **Design for What's Next** space, which will offer a sneak peek at what Marelli is designing next – an AI-powered in-vehicle experience - including advanced audio and sound zoning, motorized hidden displays and interior components, in-console projection, eco-materials, multi-functional interfaces, high-definition headlamps with ground projection, multi-color, illuminated front panels and grilles, external message displays, rear window projection, and more.

Geely's LEVC L380 electric MPV revealed in China

GENERAL NEWS

L380 is a new all-electric MPV from the Geely-owned LEVC (London Electric Vehicle Company) brand. Geely applied for a sales license in China, revealing the pictures and some key specifications.

LEVC L380 is a large MPV (multi-purpose vehicle) over 5.3 meters long with a 6 or 8-seat layout. The dimensions are (L/W/H) 5316/1998/1940 mm and the wheelbase is 3185 mm. The 8-seater versions have a layout of 2+2+2+2. The curb weight is 2805 kg.

LEVC L380 has a single 200 kW motor supplied by Viridi E-Mobility Technology (Ningbo) Co. (VREMT), and the top speed is 170 km/h. The battery is a ternary NMC pack manufactured by the CATL – Geely joint venture. The capacity to be revealed later.

L380 will sit on LEVC's SOA (Space Oriented Architecture) platform, unveiled in May. It is a slightly adjusted Geely's SEA platform dedicated to electric commercial vehicles.

LEVC is a British company founded in 1919. In 2012, it was acquired by Geely. It currently produces only one car – a LEVC TX cab.

It is unclear if the Xpsace will be produced only for the British market or if it will also be sold in China, but as Geely just applied for a Chinese sales license, it gives us a hint. Also, the car in the pictures has a steering wheel on the left side, so it is dedicated to the right-hand traffic market.

Unlike in Europe, MPVs are very hot in China. However, L380 would compete with dozens of electric minivans, such as Li Mega, Denza D9, Xpeng X9, Maxus Mifa 9, and Zeekr 009

Stellantis EVs are profitable in U.S., Europe, Tavares says

GENERAL NEWS

Tavares said automakers have to be "super sharp on cost" to achieve good profits on EVs. To attract middle-class consumers, Tavares said EVs will need affordable but profitable pricing at the core of the market. "This is an equation you can only solve if you reduce cost, and this is what we are reasonably good at," he said.
Tavares said Stellantis is "fighting head-on" with Tesla for sales in Europe. CFO Natalie Knight said Stellantis has overtaken Tesla as Europe's No. 2 EV seller.
Tavares pointed to the upcoming Citroen e-C3, priced at €23,300, saying it will be a profitable vehicle. The small EV is built on Stellantis' low-cost "smart car" platform.

Stellantis aims to have more than 75 battery-electric models globally by 2030, including more than 25 in the U.S. The automaker's EV push in the U.S. begins with models such as the Ram ProMaster van, Ram 1500 REV and the Jeep Recon.

"The fact that we try continuously to levelize the margins between BEVs and ICE is not new. We have been working on that for several years now, and I would say that we are achieving results," Tavares said. He added: "The first thing is that we are in the black, both in the U.S. and in Europe. Our margins on electrified vehicles are in the black. That's a good thing. We are closing the gap against ICE faster in Europe than in U.S. because we started sooner, but we are achieving results and we see that all of this is going to be exciting."

Tavares said the deal recently done with Chinese EV maker Leapmotor will deliver profitable electric models to European consumers. Stellantis was investing $1.5 billion for a 20% stake in Leapmotor. The deal calls for the formation of Leapmotor International, a Stellantis-led joint venture that has exclusive rights for the sale of Leapmotor products outside China.