

Editorial

50 Years Of Lightstyling

From 1970 to 2020, automotive styling has been highly influenced by lighting innovations, with reciprocal propulsion from the fields of optics, materials, thermics, electronics, simulation, testing, light sources, and regulations. The ongoing results: brand and model family design identity, with automakers using light shapes and signature to stand out from their competitors and create coherence in their product ranges.

Lighting innovations are often devised achieve a new differentiation in appearance—think of projector optics and complex-reflector/clear-lens headlamps, plastic rather than glass headlight lenses, LEDs and light guides, dynamic turn signals, CHMSLs, 3D signal lights, light bar optics, OLEDs, new digital lights and displays; the list goes on and on.

We are entering another great period of new lighting innovation, with dynamics and digital lights to communicate to the equipped driver, to other drivers, to VRUs, and to the environment.

Lighting will be a central focus at both ends of the car: with ADB and communication up front, and in the rear with communication and displays.

This month's DVN Report, the 150th report of DVN, [published today](#), showcases lightstyle evolution from the the last five decades and looks at trends toward the future and the challenges to succeed with new lighting functions.

And we're hard at work on a very important new study to be published soon. Six great experts have been making tens of interviews for it, and we're sure it will be of great use to all DVN members, so stay tuned.

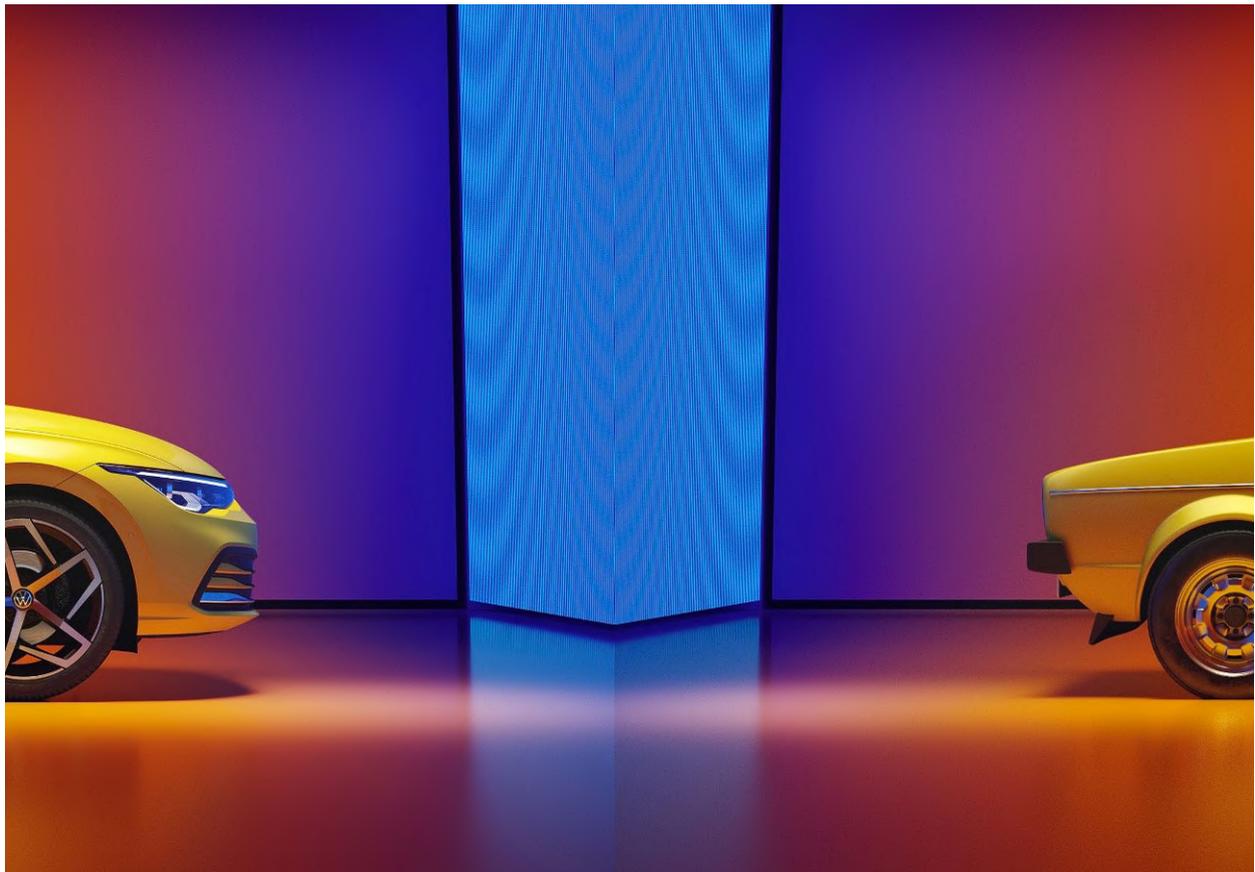
Keep well,



DVN PRESIDENT

In Depth Lighting Technology

Innovations which Summarize Relation Lighting/Styling



Headlamps and Rear lamps played a big part in the evolution of the car: slope of the front, shape and contour of the headlamps and rear lamps, show case effect, and perceived quality.

After presenting the 10 innovation in front and the 10 innovation in the rear which were the most significant in styling evolution, the report shows in detail the involved fields as optics, thermics, electronics, testing, materials, regulations and the light sources which were often in the center of the styling evolution.

Ten models, premium and generalist, in Europe, America and Asia are analyzed, decade after decade, emphasizing what lighting components then lighting systems bring model after model.

Premium: Audi



Before 1985



1990-2005



After 2010

Premium: BMW



Before 1985



1990-2005



2005-2010

Generalist: Peugeot



Before 1985



1990-2005



2015-2020

Generalist: Volkswagen



Before 1985



1990-2005



2015-2020

In the story of vehicle lightstyling, two periods stand out as particularly important: The **1985–'93** timeframe starts just after the American mandate for standard-size-and-shape sealed-beam headlamps was finally dropped after over four decades, and ends just after ECE Regulations began permitting plastic headlight lenses. And the **2005–'10** timeframe saw LEDs break out from their former confinement to minor functions (CHMSL, dashboard indicators), first to DRLs and then to the main headlamp functions, allowing vast new design possibilities to radically change the appearance of cars.

We are now at the start of what surely looks like another significant timeframe in this arena. New lighting functions like Welcome and Farewell displays, dynamic signal lights, digital headlamps, OLED lamps, and light-based displays will once again take a lead role in unprecedented changes to car design.

During this review of five decades' worth of lightstyles, we have seen many remarkable technical evolutions marrying astonishing style novelties. From simple vertical striated lenses with steel reflectors to LED ADB systems with slim headlamps treated as jewels, from simple rectangular rear lamps with bulbs to LEDs or OLEDs in stylish designs incorporating audacious light guides or very homogeneous 3D appearance, the way was always paved with more safety and more style attractiveness.

Now we are in a period with a huge challenge for the automotive community to succeed in the electrification of vehicles and to overcome the economic shock of the coronavirus crisis. Surely lighting will continue to be a crucial focal point for creative and important design and style innovations. We foresee its evolution flowing in these directions:

- Endless appearance differentiation
- Communication
- Decoration and Welcome/Farewell
- Dynamics from lights

All these different new functions will propose a styling innovation. For instance, new projections signs will have to be both clearly understandable and nice; the new signals functions that will better welcome the drivers or communicate with pedestrians will certainly be the opportunity to find new styling differentiation as well as displays will need to be as attractive for the eyes as readable.

These marvelous technologies currently so expensive at the beginning will find their economic way to be installed intensively on cars, as always, decreasing with the quantities produced. For instance, LEDs that are now the standard equipment for all new cars were at their beginning in 2007 many times more expensive than a standard Xenon system. In fact, every technology bringing safety through better performance, better information to other and perhaps above all bringing styling novelty has a chance to succeed. The cost decrease is naturally the other important condition. And for the new technologies explained before, a lot of them are using microprocessors techniques or are incorporating in their cost a lot of software, both being very sensitive to cost decrease with quantities.

The lighting world of tomorrow will be as thrilling as it was in the past after a consolidation period. And as it was in the past, these new functions mainly studied and justified for safety reasons will have a strong styling content. With six senior lighting experts through the best worldwide experts, DVN is working in a study analysing the evolutions to come and particularly the new functions that will be the future of lighting. This study will be published soon.

Lighting News

The new OLED technology of the Audi Q5

LIGHTING NEWS



The next generation of OLED lighting technology is available for the first time in the facelift Q5.

OLEDs are particularly efficient in the emission of a homogeneous area light. The optional OLED rear light is divided into three tiles, each with six segments. This enables Audi designers and developers to display different lighting designs and signatures with a single piece of hardware.

For years, the Audi Q5 has been one of the best-selling SUVs in the European markets in its premium mid-range segment. Audi has now made it even better and more attractive. The optimized Q5 combines sporty character with high suitability for everyday use and offers a wide range of infotainment and assistance options. The sharpened exterior design of the successful model emphasizes the Q identity and offers the rear lights in digital OLED technology as a world first.

See from the below links to :

- a video presented by Stephan Berlitz, head of innovation light and vision, and Dr. Werner Thomas, responsible of the project OLED Technology

<https://www.audi-mediacyber.com/en/audi-mediacyber/video/the-digital-oled-technology-in-the-rear-lights-of-the-audi-q5-5059>

- a video of front and rear lights



<https://www.audi-mediacenter.com/de/audimediavideo/video/animation-digitale-oled-lichttechnologie-im-audi-q5-5061>

New Opel Mokka's New LED Lamps

LIGHTING NEWS



Opel have revealed the second generation of their brisk-selling compact Mokka.

The new Mokka arrives in the B-segment with top innovations that until recently have only been available in the luxury class. All Mokka variants are equipped with latest generation LED lamps, including DRLs in brand-typical wing signature, front fog lamps, and just about everything else. A notable highlight is the adaptive IntelliLux matrix headlamps with a total of 14 elements.



In the rear, the choice for LED-only technology has allowed designers to specify and realise very thin, stretched lights enhancing the car's perceived precision and quality. All Mokka model variants come standard with LED lamps at the front and rear, and traffic sign recognition. A 180° panoramic rear-view camera is also available.

Innovative Lighting on the Nio ES8

LIGHTING NEWS



Nio say their new ES8 brings more than 180 product improvements including their Nio Pilot ADAS and their NOMI in-car AI.



The new ES8 has sweeping turn signals, upgraded LED tail lights, and a CHMSL just under 8 cm shy of a full metre wide.



Materion to Buy Balzers

LIGHTING NEWS



US-based Materion will buy Optics Balzers in an all-cash transaction. Optics Balzers, with headquarters in Liechtenstein and sites in Germany and Malaysia, have been generating revenue of around USD \$67m annually in recent years. They're a privately-held industry partner for the development and production of coated optical components and subassemblies, and a provider of optical thin film coatings.

The firm's shareholders decided, in accord with the company's growth strategy, to sell to Materion. Balzer CEO Detlev Haeusler says "We are serving one of the most attractive growth markets and the key factor of success is growth. Thanks to the new shareholder, Optics Balzers will be able to implement the global expansion strategy more quickly, and better exploit opportunities".

Materion supply specialty materials including alloys, beryllium products, composite/clad metals, thin film deposition materials, and precision optics; 2019 sales totalled around \$1.2bn. Optics Balzers expect to benefit from Materion's sales strength in North America, and Materion from Balzers' market position in Europe. The current market development made clear that Optics Balzers could achieve its growth targets with an additional location in the USA, while the Optics Balzers plant in Malaysia fits into Materion's road ma.

Hella, Minth Build New China JV

LIGHTING NEWS



Hella and the Minth Group have agreed to establish a joint venture, to be called Hella Minth Jiaxing Automotive Parts. The new company will work on development, production, and marketing of radomes and illuminated logos.

Radomes are permeable covers for radar systems, which can be produced in special designs according to customer requirements. Both companies are already active in this field. The JV will be funded by both partners in equal shares, with a production facility (one of Minth's existing ones in Jiaxing), and will have an international scope with an initial focus on the Chinese market. The joint venture is scheduled to start operations this Autumn.

Hella Lighting Divisional Managing Director Dr. Frank Huber says "With the increasing market penetration of radar-based driver assistance systems, the demand for radomes will also continue to rise. Radomes offer vehicle manufacturers a wide range of possibilities for differentiation, since they can be staged in different ways, just like logos. We have been active in this field for many years, being a technology leader. By cooperating with Minth, we want to further expand our business internationally".

Minth will contribute their own production capacities to the JV, including existing series productions). Initially, the JV employ around 80 people; production capacities will be continuously expanded within the next year to meet expected growth of the radome business and the increasing demands of globally operating carmakers.

Osram Foresee Recovery After Q3-20

LIGHTING NEWS



The pandemic has caused numerous companies—including Osram—to withdraw or reduce their business outlook and guidance. Now Osram have an updated business guidance for their fiscal year 2020 (October 2019 to September 2020).

Osram are expecting a year-on-year revenue decline of 15 to 19 per cent, versus their previous prediction of about 3 per cent growth. For the ongoing third quarter of the fiscal year (1 April to 30 June 2020) the current forecast provides for a comparable revenue decline of as much as 35 per cent.

After an expected decline of business development in the third quarter, the managing board now expect a slight demand recovery in the upcoming months. The profound weakness of the global automotive business as well as a demand weakness in Osram's core markets in Europe and North America will burden the development also in the fourth quarter. This is countered by increasing revenues in China and the early measures taken by the company which helped to moderate the impact of the COVID-19 pandemic on liquidity and financial results. These measures will continue to be consistently implemented.

U.S. investigates Kia headlight failures

LIGHTING NEWS



The U.S. National Highway Traffic Safety Administration is investigating reports of headlight failures in nearly 400,000 Kia Sorento SUVs.

NHTSA say they received 74 reports of sudden, unexpected loss of headlights in model year 2011-2013 Sorentos, including some while drivers were making a turn or traveling on the highway.

Reports say the headlamps sometimes remain dark for some time until they come back on by themselves or the driver turns the vehicle off and then on again; some owners say they have taken vehicles to dealerships for service several times without a permanent fix.

Driver Assistance News

VW Strengthens New Software Org

DRIVER ASSISTANCE NEWS



Volkswagen are bolstering their Car.Software organisation, and setting it up to operate as an independent business unit. As a Group company, Car.Software will centralise the associates and subsidiaries within the Group that develop car software and software for the digital ecosystem.

Initially, around 3,000 digital experts from software-related associates and subsidiaries will be grouped together in this unit. Car.Software will be based at Audi Electronics Venture, and will also operate at other German and international sites.

In addition to integrating the associates and subsidiaries, the goal is to win skilled professionals from the Volkswagen Passenger Cars, Audi and Porsche brands for a transfer to the Car.Software organisation. Over time, the number of experts will be sustainably increased through new hires, strategic acquisitions, and further partnerships. By 2025, more than 10,000 digital experts at Car.Software will develop software for vehicles and related digital ecosystems, as well as for customer-centric functions at dealers. In the long term, further development of Car.Software will be pursued, using the target vision of a software brand within the Group with its own brand design.

Car.Software is being positioned to play a key role in achieving Volkswagen's aim to boost the in-house share of car software development from the current figure of less than 10% to at least 60% by 2025. The organisation will develop cross-brand software in five domains: Connected Car & Device Platform, Intelligent Body & Cockpit, Automated Driving, Vehicle Motion & Energy, and Digital Business & Mobility Services. The objective is to establish one uniform software architecture in the Group and bring

together parallel development paths in the brands.

The domains will cover the development work on a groupwide vehicle operating system—vw.os—for all Group vehicles and their connection to the Volkswagen Automotive Cloud; a standardised infotainment platform; all assistance systems including highly automated driving functions such as a motorway or parking garage pilot in cars for end customers; software functions for connecting the drive system; chassis and charging technology, and ecosystems for all of the brands' mobility services and digital business models.

Having a uniform software architecture will enable Volkswagen to generate sizable economies of scale in the Group, substantially reducing per-vehicle software costs across all brands, and Car.Software will invest over €7bn by 2025.

Audi ADAS R&D Office Opens in Silicon Valley

DRIVER ASSISTANCE NEWS



Audi have opened their new Audi Automated Driving Development (A2D2) R&D office in San Jose, California, to create ADAS specifically for the North American markets. Located in the heart of Silicon Valley, A2D2 will have the flexibility to quickly develop new software and to collaborate with nearby startups for production-intent applications.

While Audi maintain R&D offices in various locations throughout the U.S., A2D2 is the first office dedicated to developing ADAS hardware and software specifically for North American roads and driving behaviours.

To start, they've outfitted several Audi Q7 development vehicles with roof-mounted sensor kits to collect data and help software engineers develop ways to enhance the driving experience in an Audi. The A2D2 development vehicles are wrapped in a QR code that links to a webpage with the latest Audi automated driving breakthroughs and developments. Designers working in the Audi Design Loft in Malibu, California, created the unique graphics and logo specifically for A2D2.

Audi are focused on the further development of automated driving

Volvo, Waymo partner to build self-driving vehicles

DRIVER ASSISTANCE NEWS



Waymo and Volvo Cars have agreed to develop a self-driving electric vehicle designed for ride-hailing use, as part of a new global partnership, the companies said Thursday.

Waymo, a unit of Silicon Valley's Alphabet, said it will be the exclusive global partner for Volvo Cars for developing self-driving vehicles capable of operating safely without routine driver intervention.

- Waymo will focus on the artificial intelligence and certain hardware, including cameras, lidar and radar, for the automated "driver."
- Volvo will design and manufacture the vehicles.

Volvo, owned by China's Zhejiang Geely, has a separate agreement to deliver vehicles to ride-hailing company Uber that Uber will equip to operate as self-driving vehicles. Volvo Cars is continuing to deliver vehicles to Uber..

The Waymo-Volvo deal marks a return by Waymo to its early goal of rethinking how cars that can pilot themselves should look. Since retiring its Firefly self-driving car in 2017, Waymo has retrofitted its software and sensors into conventional vehicles such as Chrysler Pacifica minivans. Waymo earlier this year raised \$3 billion in its first external investment round.

Waymo said it will continue working with Fiat Chrysler, Jaguar Land Rover, and Renault-Nissan-Mitsubishi alliance.

Ford to Field Hands-Off Drive Tech Before '22

DRIVER ASSISTANCE NEWS



Ford's are adding new ADAS offerings including Active Drive Assist, which allows hands-free driving on more than 160,000 km of divided highways mapped in all 50 U.S. states and Canada.

Active Drive Assist is the next evolution of Ford's Intelligent Adaptive Cruise Control with Lane Centring, adding Ford's first no-hands mode with the potential for more enhancements in the future.

The hands-free mode allows drivers on certain sections of pre-mapped, divided highways to drive with their hands off the steering wheel—if they keep their attention on the road—granting them an additional level of comfort during long drives. An advanced infrared driver-facing camera will track eye gaze and head position to ensure drivers are paying attention to the road while in hands-free mode as well as hands-on lane centring mode, which works on any road with lane lines. Drivers will be notified by visual prompts on their instrument cluster when they need to return their attention to the road or resume control of the vehicle. Active Drive Assist will be available on certain 2021 model year Ford vehicles and will be available across the Mustang Mach-E lineup.

The updated lanekeeping system joins Automatic headlight high/low beam selection (ADB is still not allowed in the United States) in Ford's Copilot 360 2.0 package on the Mustang Mach-E, along with Blind Spot Information System with Cross-Traffic Alert, Pre-Collision Assist with Automatic Emergency Braking, Post-Collision Braking, and Rear View Camera.

AEye Lidar Proves Rugged

DRIVER ASSISTANCE NEWS



AEye say their new 4Sight™ M sensor sets a new standard for reliability. In testing completed at an independent test facility, the 4Sight M scan block surpassed automotive qualification for both shock and vibration. The test results showed a 4Sight sensor can sustain mechanical shock of over 50G, random vibration of over 12G_{rms} (5–2000 Hz), and sustained vibration of over 3G.

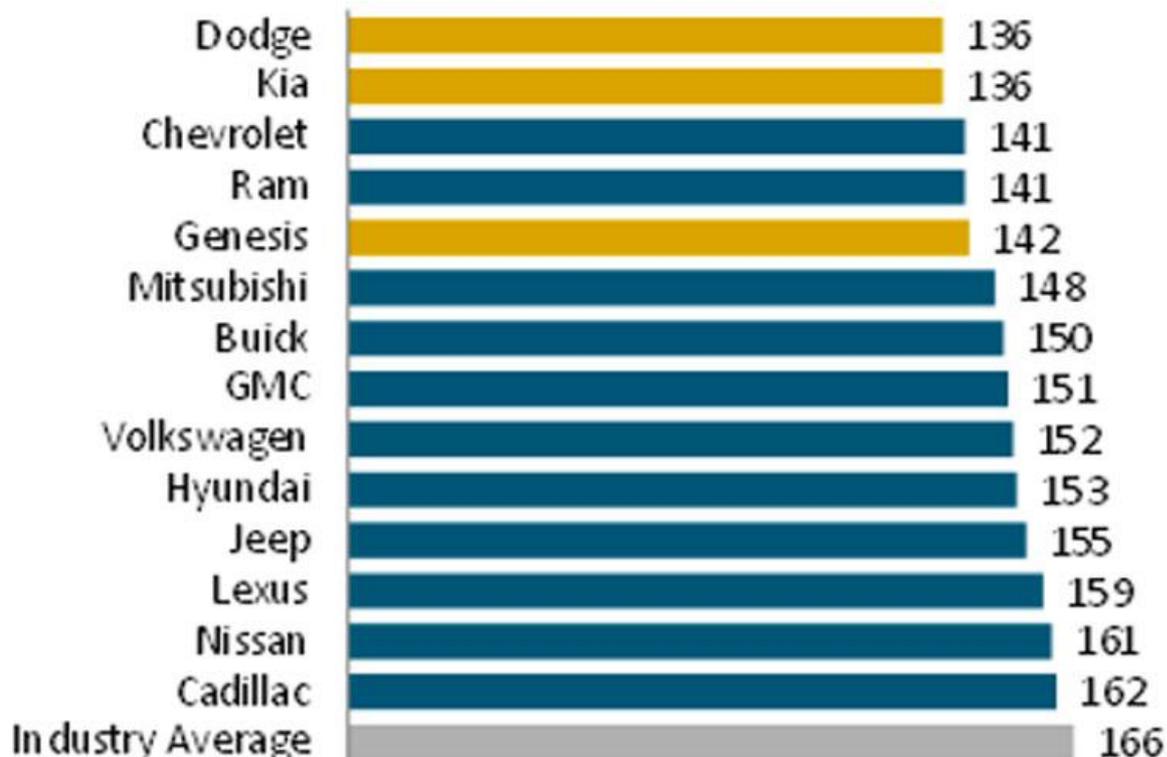
AEye cofounder and CEO Luis Dussan says "The lidar industry has struggled with attaining solid-state performance, especially when trying to achieve sufficiently high resolution at long range. MEMS-based systems were seen as a potential solution, but the inability of FMCW or other TOF systems to effectively reduce the size of or harden their MEMS continues to be a stumbling block."

AEye have also announced the availability of 4Sight, a new range of 1550-nm lidar vision systems which are the fifth-generation sensor from AEye, and it's based on their iDAR™ platform with one laser, one MEMS arrangement, one receiver, and one SOC. AEye's MEMS has a mirror less than 1 mm across. Combined with a 1550-nm amplifiable laser and sophisticated receiver, the small mirrors are produced in volume using standard processes. The size of the mirror in a MEMS largely determines its reliability. Larger mirrors also have larger inertia, generating up to 600 times greater torque from shock and vibration events. And AEye say larger mirrors preclude fast, quasi-static movement for agile scanning, which is key to intelligent and reliable artificial perception.

General News

JD Power Initial Quality Study Brings Interesting Results

GENERAL NEWS



This year's J.D. Power Initial Quality Study has been released. It looks at problems experienced by owners of new 2020 model-year vehicles during the first 90 days of ownership. Initial quality is determined by the number of problems experienced per 100 vehicles (PP100), with a lower score reflecting higher quality.

Redesigned this year, the study measures components that fail and features that are difficult to use, hard to understand or don't work the way owners want. J.D. Power VP of Automotive Quality Dave Sargent says "Year after year, automakers apply the insights they learn from [IQS respondents] to make positive changes. The higher problem levels we see in this year's study don't mean vehicle quality has worsened; rather, the redesigned study asks additional questions that allow owners to cite more of the problems that they are experiencing". Key takeaways from this year's IQS:

Most American brands are above average: Seven domestic brands—Dodge (136 PP100); Chevrolet (141 PP100); Ram (141 PP100); Buick (150 PP100); GMC (151 PP100); Jeep (155 PP100); and Cadillac (162 PP100)—perform better than the overall industry average of 166 PP100. Collectively, this is the best-ever performance by the American automakers—when compared with the import brands—in the history of the study.

Most premium brands are below average: For most of the past decade, mass market brands have improved relative to premium brands, and this trend continues in 2020. Premium brands generally equip their vehicles with more complex technology, which can cause problems for some owners. Genesis (142 PP100), Lexus (159 PP100) and Cadillac (162 PP100) are the only premium brands that perform better than the industry average.

Japanese brands fail to regain footing: Once regarded as the gold standard in quality, most Japanese brands have not improved as fast as competitors have and they continue to trail most Korean and American brands. Mitsubishi (148 PP100), Lexus (159 PP100) and Nissan (161 PP100) are the only Japanese brands to better than average.

Tesla profiled for first time: Tesla receives an initial quality score of 250 PP100. The automaker is not officially ranked among other brands in the study as it doesn't meet ranking criteria. "Unlike other manufacturers, Tesla doesn't grant us permission to survey its owners in 15 states where it is required", said J.D. Power Automotive Divisional President Doug Betts. "However, we were able to collect a large enough sample of surveys from owners in the other 35 states and, from that base, we calculated Tesla's score."

Infotainment is most problematic category: Almost one-fourth of all problems cited by new-vehicle owners relate to infotainment. Top complaints include built-in voice recognition; Android Auto/Apple CarPlay connectivity; touchscreens; built-in navigation systems; and Bluetooth connectivity.

Problems With ADAS: Driver assistance systems brought fiery wrath from respondents. "Consumers say many of them don't work well and warning alarms go off way too often," Sargent says.

Jaguar receives first-ever model-level award: The Jaguar E-Pace is the first Jaguar model to earn an IQS award, with a score of 159 PP100.

Renault's new CEO de Meo : High Expectations

GENERAL NEWS



De Meo, credited with revitalizing Seat brand, has been sidelined for nearly six months by a noncompete clause. In his absence, interim CEO Clotilde Delbos and Chairman Jean-Dominique Senard delivered a €2b cost cutting plan, leaving an overall strategy review to de Meo, who starts officially to-morrow.

De Meo addressed Renault's employees and directors for the first time last week, delivering a talk in fluid French.

"I've enjoyed moving toward a challenge, whenever there's been a brand to rebuild, a financial situation that needed to be put back on its feet and talented people to bring together," he said. "This is a challenge that we will face as a team."

"The Renault Group is where I got my first job after my diploma. This is the company that made it possible to fulfill my childhood dream: to work in the auto industry and to start on an international career."

"When a customer buys a Clio or a Zoe or an Alpine, they're actually buying French know-how and French culture," he said. "This is an ace that we have. These French roots are at the heart of our group, and they are at the heart of the pride of our colleagues as well as the desires of our customers."

De Meo is expected to deliver a revised strategic plan by the end of this year.

"I have already seen some wonderful products in the current range and some fantastic projects for the future, and this makes the heart of a car enthusiast like me very happy," de Meo said.

He said he believed that Renault employees were up to dual challenge of a restructuring while coping with the pandemic. "I'm completely aware of the difficult situation that the company finds itself in today," he said. "We need to have everyone mobilized."

European Sales Will Skid This Year: ACEA

GENERAL NEWS



SALES IN EUROPE, EXCLUDING UK

ACEA, the association representing 16 car, bus, truck and van makers with operations in Europe, has radically revised downward their 2020 forecast for passenger car sales after the coronavirus pandemic led to a collapse in demand.

Sales are forecast to fall by 25% to 9.6 million in the EU from 12.8 million in 2019, ACEA said last week. That would be the lowest number of cars sold in the EU since 2013 after Europe emerged from the 2008-09 financial crisis. The decline this year will halt a six-year run of gains starting in 2014.

Europe's auto industry has been hit hard by the coronavirus pandemic, with factories and showrooms closed for all or parts of March, April and May. IHS Markit expects that sales will fall by 25% in all of Europe, while LMC Automotive forecasts that western Europe sales will fall by 26%. AlixPartners is forecasting that European sales will fall even further, by 32%, and Moody's is predicting a 30% decline.

ACEA expects sales to slightly recover in the coming months as lockdowns end and business slowly returns to normal. Countries including France and Germany are rolling out incentives and scrapping programs to boost the market, with an emphasis on electrified and fuel-efficient vehicles