DVN-I
Automotive Interior

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Editorial

Incremental Disruption—That's What It's All About

Here we are, already at the top of DVN-I's second newsletter! We've got news and views this week from the WardsAuto Interior Conference recently held near Detroit. And our in-depth article looks at the takeaways of the recent Shanghai auto show, as a preview of our full auto shows DVN-I Report to be released next month.

The panoply of relevant events DVN-I covers present a wide array of products from production cars that can be bought today, through to exotic previews of what transportation might look like in the near (or far) future. All of this is in context of rapidly changing topography in the world of automotive transportation: established automakers feel increasingly urgent pressure to prove they are relevant, leading runners in the race for new mobility. New participants in the field, including digital outfits, want to be recognized for the innovative products and services they offer, while meanwhile the popular perception, perhaps fuelled by popular media, is that fully autonomous, self-driving cars are just around the corner, coming soon—of course, the reality is very different.

Most of the SUVs presented at the Shanghai auto show, as well as the WardsAuto 10 Best Interior award winners, are reflecting an industry incrementally integrating technologies and design elements of the future. With interiors adding amenities, features, and capabilities but mostly not yet containing new-generation HMIs, life for the vehicle occupant isn't getting simpler—it's getting more complicated, and sleeker and more elegant designs aren't enough to foster real ease and peace of mind.

So our long way to disruption is slow and incremental for the time being and the foreseeable future, and industry must take care not to overload and overwhelm consumers, or there could be a general backlash that would slow down acceptance and demand for new equipment. For that reason, this issue of DVN-I also looks at how interior design can better respond to consumer demand, such as by enhanced audio and personal-technology integration, easier mobility, and new alliances and services.

We'll continue our globetrotting tour with the Stuttgart interior event, and you'll be able to read about it here in DVN-I.

Happy Reading. We're glad you're here with us. Onward and upward!

Philippe Aumont

General Editor, DVN-Interior

In Depth Automotive Interior

Interiors and Innovations at the Shanghai Motor Show


The Shanghai motor show is massive in scale. It certainly the best auto show to attend on the planet to get a global view of the auto market, with most of the world's brands—including some little-known outside of China—and a mix of global models with some China-specific designs; long gone are the days when Shanghai was an exhibition of copycat cars.


Electric cars are very visible, but combustion engines remain numerous. Concept cars are providing previews of the future, which—if the preview comes to fruition—looks likely to belong to autonomous, connected, and electric vehicles and their optimized interiors. Here's our DVN-I summary of what we retain from our time at the show:

Interiors will transform slowly, with steadily more adept technology. Smarter lighting for ambient, communication and safety uses, for example—several concepts showed innovative materials that are chameleon-like; they illuminate when needed. And touch-sensitive technologies will become central to controls and displays. For acknowledgement to the vehicle that the occupant is aware of

an emerging condition requiring a response, for instance. Perhaps one of the earliest production iterations of a kind of touch-sensitive technology is the driver-engagement safety control on vehicles with advanced cruise control, lanekeeping, and other driver assistants that can almost drive the car in easy conditions, like long highway trips: if the driver's touch isn't detected on the steering wheel for longer than a few seconds, warnings are given and then the drive-assistants are deactivated. A wide variety of other touch-sensitive interface elements surely isn't far off.

Interior size is increasing, as autonomous vehicles will grow in size to respond to customer demand for more space and to accommodate the free movement of people. That includes a higher ceiling, but that invokes the constraint of aerodynamic drag. Nevertheless, new models from Lexus, VW, and Leap, among others, are moving in that direction.

This new set of priorities will also surely drive changes to seating and consoles. Incorporating movement and flexibility will offer more space for the occupants, and this will require new design and new thinking for ergonomics. Consequently, interiors are getting simplified as automakers pare away excessively cluttered designs to create a minimalistic space that can take full advantage of flexibility and movement, while supporting occupants' peace of mind.

Audi AI:ME Concept

Infiniti QX Inspiration Concept

Concept cars showed that automakers are paying more attention to rear occupants, too. Cars like Audi's AI:ME and Infiniti's QX Inspiration forecast a future of living-room comfort, including flat floors and ample space for sofa-like bench seats. Architecture opportunities come from space freed up by the removal of the tunnel—transmission linkages, exhaust pipes, and other such items don't exist on EVs, and neither does a fuel tank, and the battery is generally laid under the floor. The deletion of the tunnel opens up valuable central seating space at the same comfort level as the traditionally roomier, cushier outboard positions.

Karim Habib, the design chief for Nissan's premium Infiniti brand, described the interior experience offered by the QX Inspiration concept car: "You can kind of comfortably sit into it…you can cross your legs, stretch your legs out". Another example: Audi's AI:ME. Its compact exterior design combined with maximum interior space leads to a flexible premium urban mobility car, with and without a steering wheel.

New Chinese vehicles made a strong showing, with an increasing number of Chinese models being prepared for European launches. Examples include Jiangling's Landwind E315 5-seater (called the Rongyao in China), or Lynk & Company's "05" SUV coupe, seemingly targeting BMW's X6 and positioned as "Simpler, Smarter, Sharable".

Global manufacturers like Volkswagen are putting a lot of attention and resources into models that will be specifically adapted for sales in China, like the new Jetta VS5 inspired by Škoda's Kamiq, and the VS7 7-seater that draws heavily on the new Seat Tarraco, targeting family-oriented buyers between 25 and 35 years old; first-time buyers looking for practicality with a bit of emotional fulfillment. Or Renault with their K-ZE, first shown last year in Paris as a cnocept; now it's an production-ready electric city vehicle based on the Kwid SUV already selling in India.


New EV sedans were on display, too, including Nio's ET (left) and the Xpeng P7 (right), the Enovate ME-S, and Qoros Mile II reminding that there's still a market for people who value being comfortably anchored to the road and don't require cavernous interiors. China's established car makers are creating their own EV brands, such as BAIC's Arcfox, GAC's Aion and Geely's Geometry (not to mention Geely-owned Volvo's Polestar).

INTERIOR NEWS

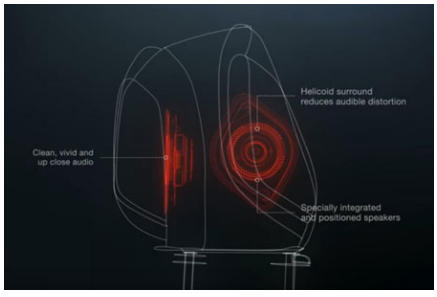
Design, Texture, and Sound at NY Motor Show

Among the top 10 vehicle interiors selected by WardsAuto at the New York auto show, we can identify the concern of car manufacturers not only for the quality of sound but also for the appearance of sound amplifiers and this even for the intermediate segments.

Some manufacturers choose to highlight the speakers while others choose to hide them. The chosen materials are getting fancier, sometimes with aluminum. Texture is also leveraged to reinforce design motifs. The Bentley Continental GT, for example, has drilled brushed aluminum speaker grates, while the Hyundai Santa Fe finesses their design with very textural, mocha-brown door speaker grilles. For the Kicks, Nissan has chosen a complex audio system that wants to get closer to the quality and auditory perception of portable audio headsets that are incompatible with driving. With the Bose Personal Plus System, two speakers are invisibly integrated in the driver's head restraint, near the ears. The helicoid surround makes for less distortion of the sound. Six other speakers are positioned in the cockpit and the touch screen allows adjustment and customization.

Hyundai Santa Fe

In New York, incremental efforts on sound design and quality are being made, still using existing audio technologies as breakthroughs remain pending, such as those introduced by Yanfeng through its alliance with Noveto to market audio systems featuring "dynamic focused sound" based on sound sensors, transducers, and software that can locate and track the passenger's position and deliver high-quality sound straight to their ears, without disturbing others.



Nissan Kicks

Genesis' Mint 2-Seater EV Concept

At the New York auto show, Hyundai's premium Genesis brand fielded an electric concept car with a strong and aesthetic style.

It's called the Mint. Inside it, designers chose to use traditional materials such as leather but the floor shows a key original design element: a diamond shape pattern called "G-Matrix". It's on the pedals, the dashboard, and elsewhere in and around the car—even on the wheels.
The front seat is a bench in which the retractable central armrest houses a spherical control knob. When the car is turned on, the sphere rotates around to become the control for the driving modes. That way the driver always knows when the car is on, something that isn't always apparent with electric cars.

In addition to six GUI (graphical user interface) information screens that call attention when needed, the instrumentation consists of a screen located at the center of the steering wheel, which Genesis says permits the driver to focus on the road. Will it do that? Maybe, but how is the driver to seek and use the information on a small, turning screen located outside their axis of vision?

Unusually, access to cargo space is not possible from the back of the Mint. In consideration of access to the trunk of any vehicle parked in a big citiy is just about always problematic, the Mint proposes a new solution: a lateral opening which pivotes upwards like wings so passengers can reach their bags or suitcases from the parcel shelf.

Like most concept cars, this one is unlikely to see production in its displayed form, but the design is really neat.

See Vehicle Occupants as Living: Ford's Sartorello

Dennis Sartorello (photo), Ford's Global Strategic Design chief, has spent the past five years driving a cultural revolution inside the automaker's design studio. It's targeted at creating more user-friendly vehicles that better connect emotionally with buyers. Ford is turning its Global Strategic Design Studio into a playground, Sartorello says; he believes that's the best way to create interiors that meet customers' quickly-evolving mobility needs.

Speaking at the WardsAuto Interiors Conference in Novi, Michigan, Sartorello said the goal is to stop regarding drivers and passengers as two-dimensional data points and see them more as living beings. To that end, Sartorello and his team have been looking beyond traditional assumptions in interior design to look at how to promote free thinking, experimental play, and better communication with outside world. "We're doing things that are driving us to be better human-centric designers," he says.

The team is encouraged to find inspiration from interactions throughout their daily lives and share those impressions with others when they enter the studio. "There are no filters; look for clues everywhere," Sartorello says. The goal isn't to discover the next innovation, he suggests, but to develop designs that work better for the customer. "We're not necessarily looking for new features to add, but to create new choreographies with existing elements", he says.

This reboot on designers' thinking has them creating more immersive three-dimensional prototypes and computer-generated, virtual-reality-type drawings. Designers are getting out in the field to see how consumers act in Ford vehicles or to test concepts themselves; they're encouraged, Sartorello says, to "break the spaces and redraw on the fly", adding "We watch what people do and then work backward." Ford also is bringing customers into the studio, observing them as they play with vehicle simulators and react to futuristic concepts and sketches.

WardsAuto Interior: Virtually Enhancing Interior Reality

Technologies such as immersive environments, virtual reality, computer design, and Industry 4.0 are transforming the way designers and engineers create the latest automotive interiors. Innovative technologies and digitalization are quickly improving the development of automotive interiors, affecting every part of the process from design to manufacturing.

L-R: Stewart (Tachi), Collins (Lectra), Baron (Immersionary Enterprises)

Using physical knobs, switches, touchscreens, and other controls, engineers can provide touchpoints needed to make interacting with computer-generated models as close as possible to reality, says Elizabeth Baron, founder of Immersionary Enterprises: "The goal is to interact in immersive environments, being able to cheat the natural world to study any potential reality, seeing data in context and being as free and natural in your interactions as you can". Baron spoke on a panel called "Advanced Design and Manufacturing" at the 2019 WardsAuto Interior Conference in Michigan. She was joined by Jim Collins, Automotive VP at Lectra, and Graeme Stewart, Senior Engineering Director at Tachi-S NA.

Pressure-sensing mats in a seat prototype, for example, allows engineers to scientifically measure seat comfort by identifying pressure points. CAD, virtual reality, artificial intelligence, and interconnections made possible by Industry 4.0 will enhance those design efforts in the future.

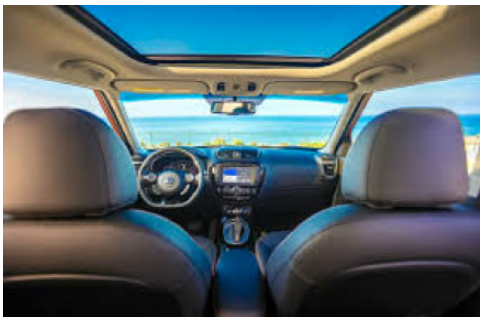
Lectra, which manufactures machines used to razor-cut leather for automobiles, already is applying Industry 4.0 connectivity and troubleshooting technologies to the operation of its equipment, Collins says. Industry 4.0 technology prevents downtime due to machine breakdowns, permits quick response to changes in production needs, Collins says. The system also allows maximum optimization of raw materials, using some 85% of each leather hide while cutting up to 20 hides per hour.

Iconiq/W Muse is Packed with Interior Innovation

Dubai-based W Motors and ICONIQ Motors teamed up to unveil the Muse, a fully-electric self-driving car, at the Shanghai auto show. Development partners included Akka Technologies, Magna Steyr, and Microsoft. A fleet of Muses cars is being manufactured for use during the Dubai Expo 2020, with commercialization of production vehicles set for 2023.

The interior of the Muse features an advanced infotainment system and smart onboard services, innovative wide-screen user interfaces, and advanced cloud-computing connectivity. Two large screens and four personal tablets enable individual connectivity through what the makers call "CEO.UX", which stands for Comfort, Entertainment, and Office User eXperience—a designation probably targeting Chief Executive Officers. The car has three-meter-wide gullwing doors, along with two front seats that can revolve and a small movable console, so the car can be reconfigured into a mobile meeting room.

Kia e-Soul's Sound & Mood System

The new Kia e-Soul serves up technical innovation with classic style in its interior. The upper door panels use an aesthetic 3D-patterned surface included in the mass of the panel material and reminiscent of fish scales. When the vehicle is running, the fish scales light

up at the same time as a stripe all around the lower part of the door panel. The music played in the car is visualized on the panel doors; Kia calls it their Sound Mood Ambient System.

We note that despite the presence of a touch screen, the interior bristles with buttons: pushbuttons and shift paddles and knobs on the armrests, on the center console, on and under the steering wheel. The screen is mainly used for infotainment rather than control. The customizable touch screen provides connected information including the live charging stations.


The display included Kia's UVO connect application, new in Europe but already in use in the United States. This telematics system allows a real exchange with the driver's smartphone. The driver can

retrieve information from the vehicle: battery state of charge, geolocation, status report including tire pressure and any other detected issues. They can also program and transmit remote instructions to the vehicle—not only a destination for its navigation but also HVAC settings, windshield defogging and the like, right from their smartphone. Seat heaters aren't much use when the trip is too short to let them heat up, but now this remote system could change that for the better by allowing preheating.

Faurecia, Accenture in Connected-Car Lab Pact

Faurecia and Accenture will combine their innovation expertise and co-invest to develop products and services for connected and autonomous vehicles. They will focus initially on two areas: cognitive technologies to reinvent the on-board user experience, and services to enhance health and wellness. They also intend to leverage digital technologies such as artificial intelligence, advanced analytics, augmented and virtual reality, blockchain and quantum computing.
Their expertise for these initiatives will be organized within what they're calling a "digital services factory".

At the recent Hannover Messe 2019, they presented the Connected Car Lab. It's an in-car development lab, equipped with many sensors and actuators where you can design, measure, test and improve features with real occupants into static and even driving conditions.
This tool aims at reducing driver distraction and drowsiness by providing feedback to the driver—as by vibration in the seat, for example.

This collaboration illustrates what Accenture refers to as Industry X.0, the profound shift of industrial manufacturing to digital products and services that will increasingly require new methods and processes to produce and deliver them as well as support them in the field.

Valeo's IAQ Solutions at Shanghai Show

At the Shanghai auto show, Valeo showed a variety of IAQ (interior air quality) solutions to reduce the impact of ambient pollution on a vehicle's occupants. The EV revolution is well under way in China, but for now urban areas are often still heavily polluted, so improving air quality is a major concern in Chinese cities; 65% of respondents to a recent local study by Sigma use personal protection against pollution while in their cars. Moreover, IAQ is often worse than outdoor air

quality because the airflow into a car comes from the lowest layers of city areas.

Valeo's Shanghai demo car offered a number of solutions to detect and neutralize harmful pollutants inside a vehicle. One of them is a high-efficiency cabin air filter system, which Valeo says stops 98% of PM2.5 (particles smaller than 2.5 nm) and virtually 100% of VOCs (toxic volatile organic compounds). The Valeo IAQ technology suite also allows for dynamic digital monitoring of cabin air quality that can measure pollution levels, to take preventive measures and anticipate maintenance. A sensor automatically activates the air-recirculation mode when PM2.5 particle concentrations are too high, for instance. There's also a Valeo in-cabin purification system with an ionizer diffusing negative ions to clean the cabin as well as cabin fragrances customized to the passengers' tastes.

New Driving Scenarios Require New Safety Architecture

A big challenge arising from expected new driving scenarios is that vehicle occupants will be in a much wider variety of positions than they have traditionally, as they relax, work, sleep, and do other non-driving activities. Traditional safety architecture is based on the assumption, usually valid up to now, of a rather narrow range of seat, occupant, and belt positions. Now new and varied seating positions will require a new approach to protect occupants wherever they are, and whatever they are occupied with.

For example, a dashboard-mounted airbag could land like a vicious punch to the back of the head if an occupant has swiveled their chair around to talk to rear-seat passengers. It's fun to imagine lounging in our cars once they start driving themselves, but safety engineers are worried about how to make sure we'll still be protected if there's a crash. Autoliv, a major supplier of interior safety systems, has developed a new "life cell" airbag, which provides protection regardless of how a driver or passenger is seated. A comparable approach is found in a new "dual lobe" passenger

airbag which envelopes passenger in a range of positions.
These cocoonlike safety solutions could help shield the passenger from free-flying objects, including unbuckled backseat occupants or loose items in the vehicle.
Other systems are in development by a variety of suppliers, and there's intense interest and development in seat-integral belts and airbags to assure optimally need-responsive protection no matter the position of the seat or its occupant.

NEWS MOBILITY

WeRide Accelerating Robo-Taxi Debut

The Chinese startup company WeRide has announced a launch, slated for this coming July, of its first commercial autonomous taxis in Guangzhou. A driver will be still present during the experimentation to deal with particular driving situations such as a severe weather conditions, but booking and payment will be made by users via the smartphone app. WeRide has therefore focused on level 4 autonomous vehicles, planning to boot out the driver progressively in 2020, progressively to secure consumer acceptance.

Since 2018, WeRide has done multiple road tests in an effort to catch up with Waymo and Uber and others by collecting road driving data generated by 500 taxis already in operation; WeRide President Lu Qing said, "In China you can afford to get data quickly, because due to government support vehicles can drive practically anywhere. Costs are also lower. To hire a driver in Guangzhou is less than a tenth of the cost in San Francisco".

Meanwhile, the Renault-Nissan-Mitsubishi Alliance Venture Capital Fund and Hong Kong-based AI company SenseTime have invested in WeRide. They use SenseTime surveillance system combined with Nvidia graphics processing units. Using its very favorable legal and economic environment, China is leading autonomous car introductions, with many heavyweights like Baidu (in agreement with Volvo), Tencent and Pony.ai , among others, heavily investing in the segment.

Two Car-Share Leaders Merge

Getaround has just spent USD $300m buying Drivy, France's leading car-sharing company in Europe. The purchase makes Getaround the world's leading car-sharing platform, covering more than 300 cities in the United States and Europe with 5 million users.

Getaround was the first to engage in connected car-sharing using technology to locate and unlock vehicles through phones without physical vehicle keys transfer between owner and renter. Their system is based on the provision of private vehicles not in immediate use by their owner, and rented for an hour or a day—sort of like Airbnb for cars. In some cases, the app can also give access to professional fleets.

Getaround and Drivy share the same strategies for extending the car-sharing network through connected technology, related services such as insurance, and roadside assistance. The two companies complement each other geographically, with 170 cities in the United States for Getarount and 140 European cities for Drivy and for the pooling of their estimated fleet of 62,000 vehicles which according to Transportation Sustainability Research Center in California, could equate to 620,000 fewer vehicles on the roads.

Lyft Ramps Up AV Rides

Last month Lyft signed an agreement with Waymo to operate ten autonomous vehicles on the Lyft booking platform. All will drive on the roads of Phoenix, Arizona. The robo-taxi offer will be identified as an option when app users go to book a ride.

Since 2018, the ride-hail company has also been cooperating with Aptiv, a Delphi subsidiary

focused on mobility solutions, for the use of self-driving vehicles in Las Vegas. The use was massive last January during CES with more than 40,000 paid trips in autonomous BMW sedans. For now, there is still a driver in the taxi who takes control only in case of problems and on private properties such as hotels and casinos.

In addition, Lyft is also cooperating with Magna and the team has achieved several milestones including public-roads testing which included a public autonomous ride-sharing pilot with Level 5 vehicles for Lyft employees.

In addition to these cooperations, Lyft has invested in its own in-house autonomous-driving program, with a research and development office in Palo Alto, California working on hardware and software and the acquisition of a British company, Blue Vision Labs, a London-based startup that uses computer vision to process street-level imagery.

GENERAL NEWS

Rivian, Ford in Electric-Trucks Pact

Rivian, a Michigan-based EV startup, has benefited from two very important investments recently. After a contribution of USD $700m following fundraising led by Amazon this past February, Ford swooped in this past April to pour $500m into Rivian.
Rivian is preparing to launch two EVs and two Level-3 semi-autonomous vehicles optimized for ride-sharing next year. The planned rollout includes the R1T pickup truck and 7-seat R1S SUV shown at the last several major auto shows.

Rivian has positioned its facilities to respect the specificities and historical advantages of the different US states: the head office, design and engineering, are located in Plymouth, Michigan, near the traditional automotive sector while its development center in San Jose, California taps into Silicon Valley's research on self-driving technology and data. The company's battery research and development center is in Irvine, California. The R1T and R1S will be produced at the Normal, Illinois plant Rivian bought from Mitsubishi in 2017.

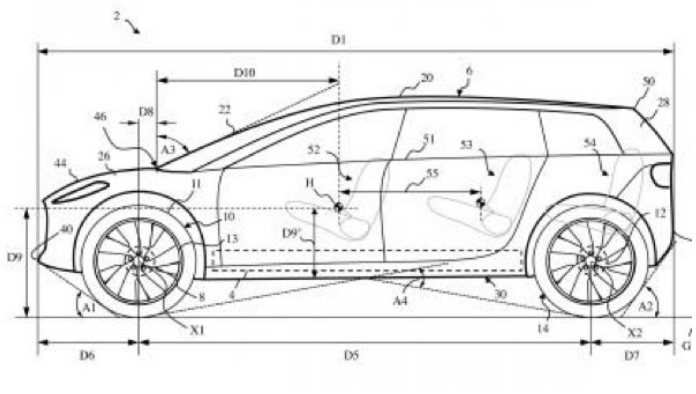
The deal with Ford provides for the delivery by Rivian of the unique battery architecture included

in the Skateboard platform that Ford will use for its own EV models, Ford emphasizing that the platform that will be common to them, was also quite "flexible" to allow to respect the specificities of both brands and there's no doubt that with its strong design, Rivian vehicles will remain recognizable. As part of the deal, Rivian could, for its part, take advantage of the logistics of Ford.

Dyson Branch Out Into EVs

Dyson, well known for their vacuum cleaners and public-washroom hand dryers, is now sniffing around the EV market. James Dyson says his company has been "researching motors, batteries, aerodynamics, vision systems and robotics for 22 years.

Now the time is right to bring all our knowledge and experience together into one big project—an electric car".



The British entrepreneur announced at the end of 2017 his automotive projects but it is the publication of its first patents which reveal some information on the characteristics of the vehicle announced as a large 7-seater SUV by its elevation and saloon by its center of low inertia. The vehicle would be scheduled for launch in 2021.

We can surely see connections between the manufacture of vacuum cleaners or other home appliances and the production of electric vehicles: both are mass-production products using a mix of similar technologies (plastic moldings, electric motors, electronics, consumer oriented design, etc). The target demographic would match up with Dyson's existing products (their vacuums are positioned as high-end items). But there is probably a great deal of differences to cover between the engineering and manufacturing stages of the two types of products. To counter this, Dyson has hired former Infiniti President Roland Krueger and Aston Martin's Ian Minards to lead the engineering. The production site will be in Singapore, where the production of Dyson digital motors is already based. It's not a low-cost country, but is considered as a gateway to the Chinese electric market with more than a million vehicles sold in 2018, and a high-skill labor pool. The development and testing center remain based in Wiltshire, UK.

Magneti Marelli: New Owner, New Brand, New Logo

Earlier this month, Fiat Chrysler Automobiles sold diversified parts-making subsidiary Magneti Marelli to CK Holdings (parent company of Calsonic Kansei) for USD $6.5 billions. Now the two companies' meld is beginning to take shape.
The companies' combined activities

will face automaker customers and the public under one brand: Marelli.

Marelli CEO Beda Bolzenius says "We selected Marelli after a great deal of analysis. Though Calsonic Kansei has a strong presence in Asia and Japan, when we looked at total brand value and awareness among customers around the world, the 'Magneti Marelli' brand is more widespread. It is important to hold onto the existing brand equity that comes from Magneti Marelli, but do it in a way that is fresh, recognisable to global customers, represents the same high quality and innovation for which we are known, as well as creating a sense of unity through a single brand name with a new image. Our priority now is to ensure operational continuity for the benefit of all of our customers, and make sure all stakeholders feel part of the transition so they can maximise the opportunities that will arise as a result of these changes."

Marelli says the new logo pays tribute to both companies' extensive history of innovation and excellence by incorporating the corporate colors from Calsonic Kansei (light blue) and Magneti Marelli (dark blue). The logo is formed of two upward-pointing arrows which symbolise the company's engineering precision and technological expertise while conveying a sense of progress toward the future, while their union signifies the combination of two powerful companies coming together as partners in a collaborative spirit.