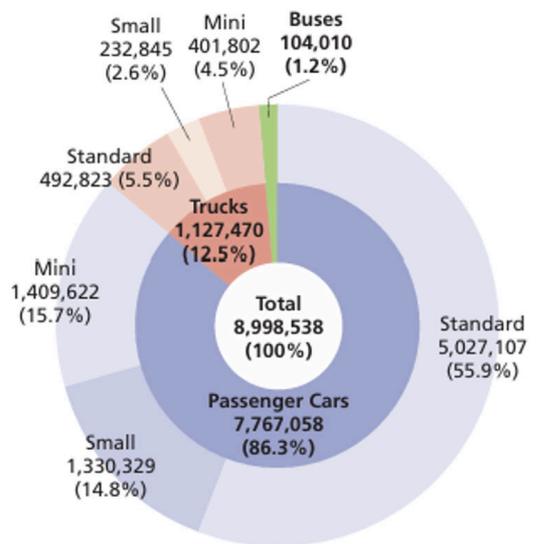


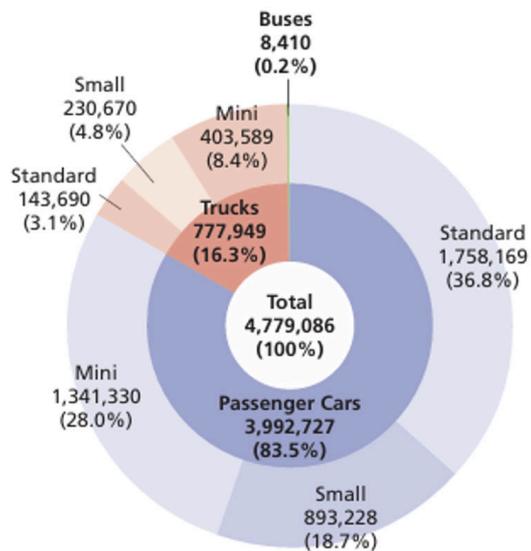
## Editorial

# Focusing On The Japanese Market

● **MOTOR VEHICLE PRODUCTION BY TYPE IN 2023**  
In vehicle units



● **NEW MOTOR VEHICLE REGISTRATIONS BY TYPE IN 2023**  
In vehicle units



Data from JAMA, Japan Automobile Manufacturers Association, 2023

DVN is back in Tokyo this 11-12 June for our lighting workshop. The first Tokyo workshop was 13 years ago in 2012; this will be the fifth. I was travelling often to Japan in my previous role, when I was visiting my former colleagues at Nissan.

Japan is a great country for the automotive industry, ranked № 3 for motor vehicle manufacturing (around 9 million a year) and № 4 for motor vehicle selling (just behind India with 4.8 million vehicles selling in 2023). Auto-related employment in Japan at present totals 5.58 million people, of whom 883,000 are in auto production.

This year, the market has decreased a bit to 4.421 million units. That includes a strong motorbike market with 682,000 units including famous Japanese brands. Export market is very strong at 4.4 million vehicles, while imports are very low at just 311,000 vehicles in 2023.

If we zoom out to a more global vision, Japanese automakers' overseas production in 2023 totalled 17.51 million automobiles and 25.19 million motorcycles. Japanese makers own around 30 per cent of the worldwide motor vehicle market!

The vehicle lighting market in Japan is mainly shared among the big three: Koito, Stanley, and Ichikoh-Valeo. In 2023, I estimated the Japanese vehicle lighting market at around €3bn, with Koito's market share above 50 per cent, followed by Stanley and

Ichikoh with estimated market shares between 15 and 25 per cent. There's an average basket for lighting around €300 per car.

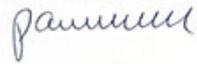
During the DVN event in June, you will be able to learn more about this, the world's № 3 lighting market, with participation from main Japanese automakers and tier-1 and -2 suppliers. We will have some really interesting sessions about technology (ADB, microLED, laser), sustainability, interior lighting, and another of DVN's famous regulatory sessions, with key official attendees from the Japanese GRE delegation and GTB. 18 exhibitors and 25 speakers are already confirmed.

We have just published a [first draft agenda](#), and updated the [event summary and registration page](#) with additional information, so have a look, reserve your place, and book your trip!

We have also just released [DVN Munich Videos](#) for people who missed the event or would like to see again some sessions.

**Paul-Henri Matha**

DVN Chief Executive Officer and Lighting General Editor

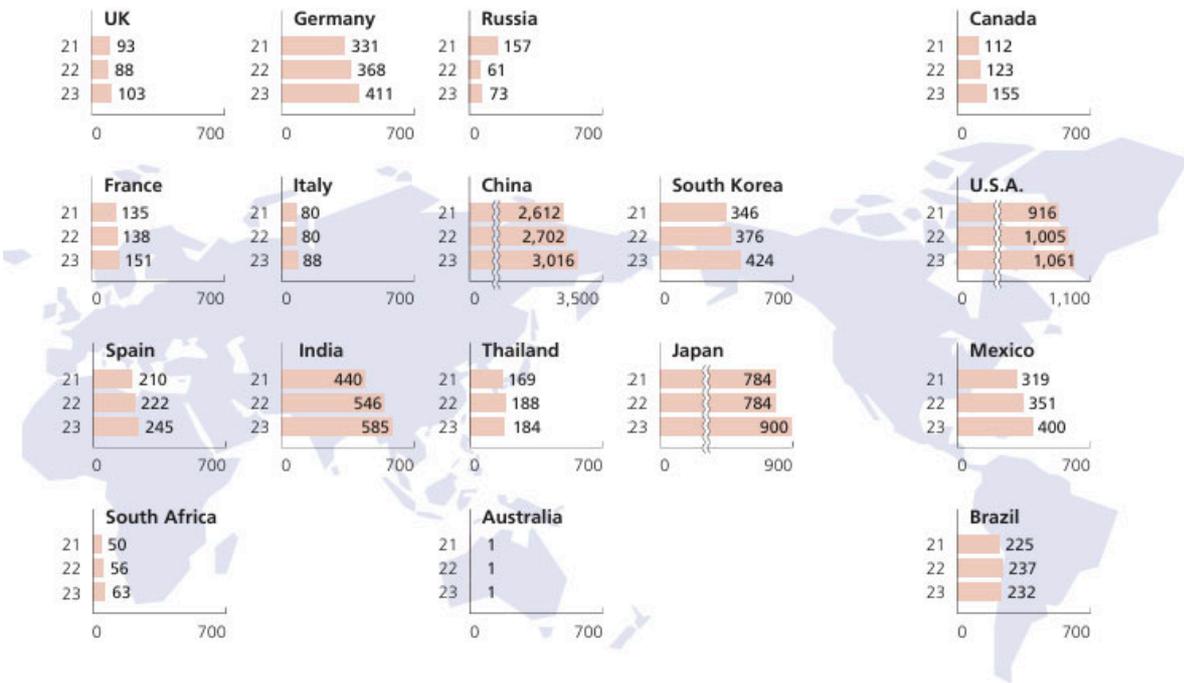


# In Depth Lighting Technology

## Japan's Vehicle Lighting Market

### MOTOR VEHICLE PRODUCTION EXCLUDING MOTORCYCLES (MAJOR PRODUCING COUNTRIES)

x 10,000 units

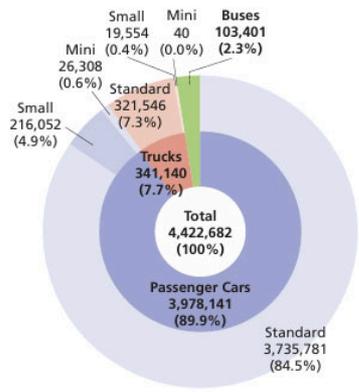


Data from JAMA, Japan Automobile Manufacturers Association, 2023

In order to prepare for the upcoming DVN Tokyo event, I took time to analyse in detail the Japanese automotive market. For that I used the data from JAMA (Japan Automobile Manufacturers Association), JADA (Japan Automobile Dealer association) and Marklines database. This in-depth is aimed at those who are not experts on the Japanese market. With a total production of 9 million vehicles—the world's № 3 vehicle producer—passenger cars represent 86 per cent of the total.

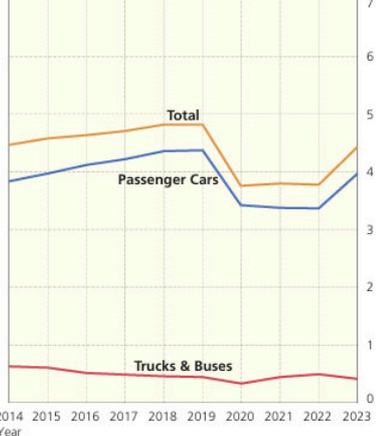
### MOTOR VEHICLE EXPORTS BY TYPE IN 2023

In vehicle units



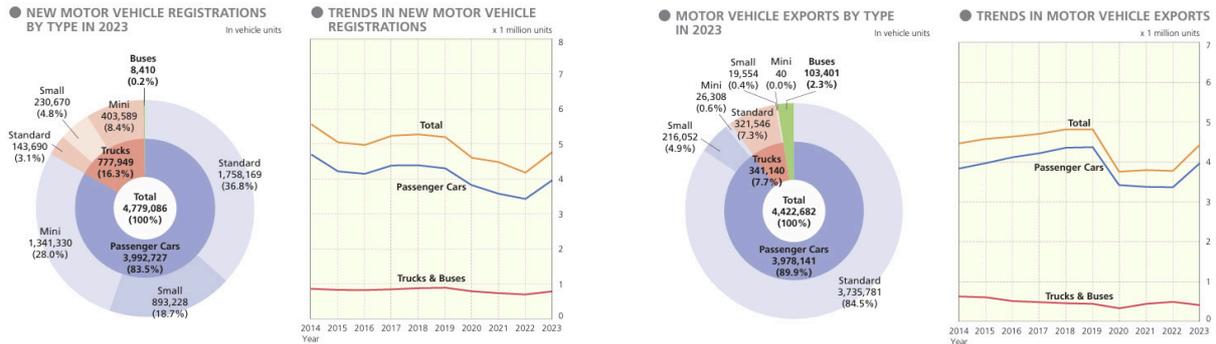
### TRENDS IN MOTOR VEHICLE EXPORTS

x 1 million units



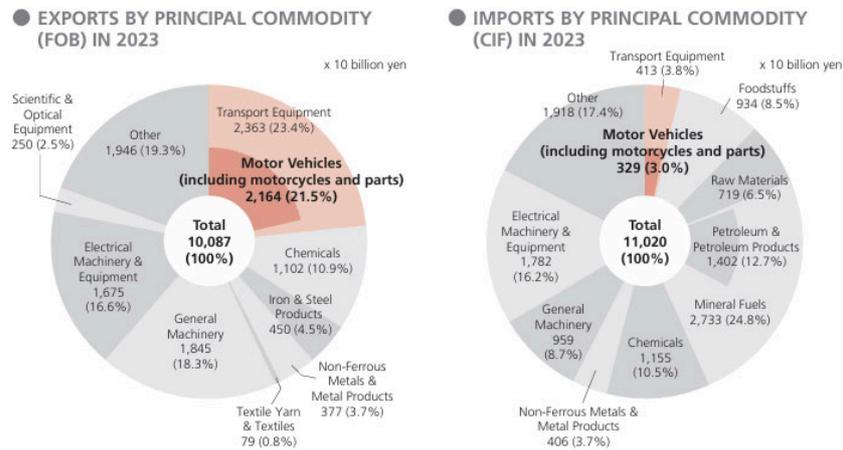
Data from JAMA, Japan Automobile Manufacturers Association, 2023

Vehicle registrations (proxy for sales) represent only 50 per cent of the production value, with a 2023 market about 4.8 million vehicles. 83 per cent were also passenger cars. What is really important in Japan is the export rate, which is quite unique: 4.4 million exported vehicles in 2023, 90 per cent of which were passenger cars.

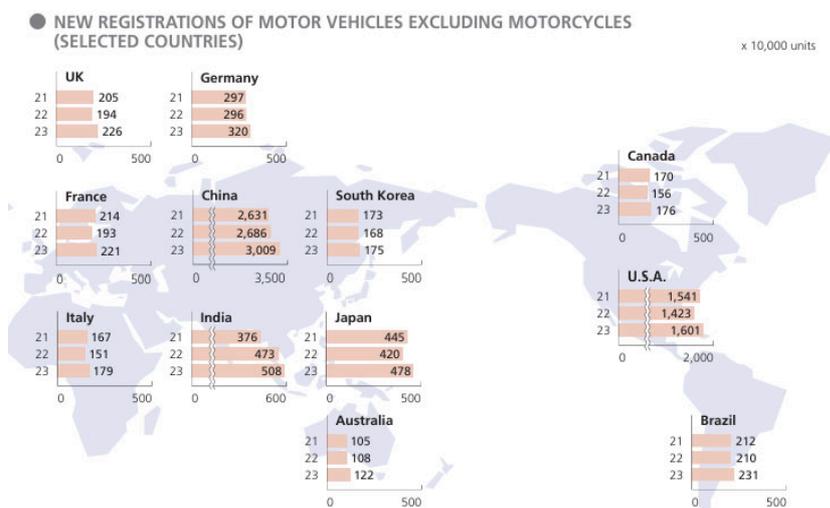


Data from JAMA, Japan Automobile Manufacturers Association, 2023

Motor vehicle export represents 21.5 per cent of all global exports from Japan!



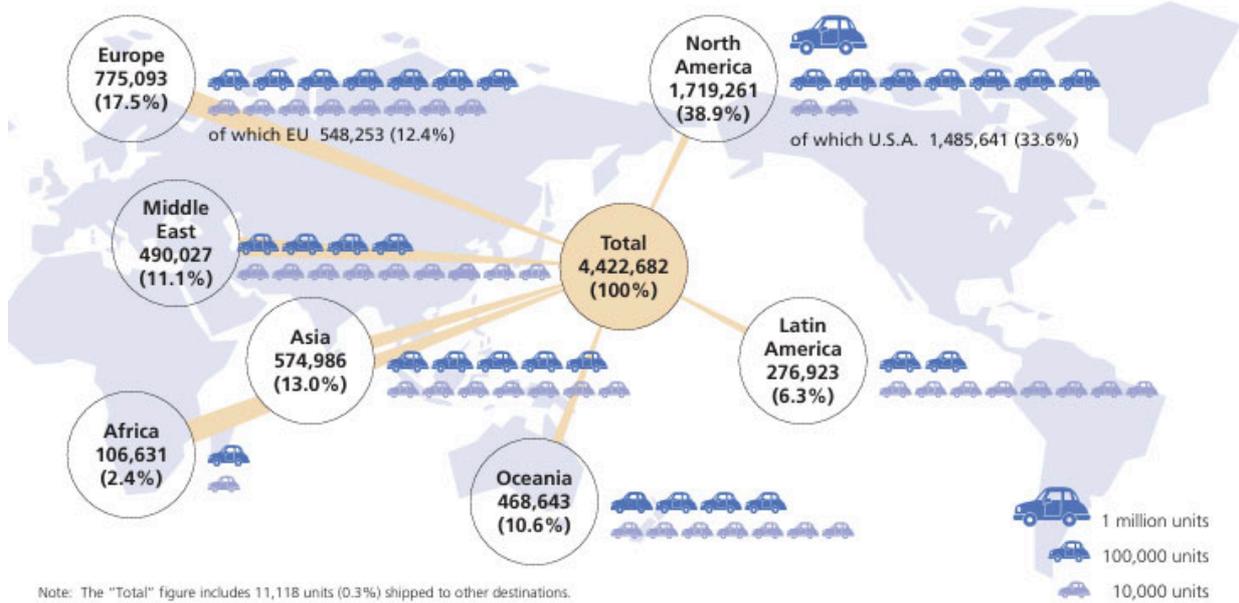
Japan is fourth in the world for the number of registered vehicles, after China, USA, and India.



Motor vehicle exports increased in 2023 from the previous year to North America (1.72 million units), Europe (775,100 units), the Middle East (490,000 units), Oceania (469,000 units), and Latin America (277,000 units), but decreased to Asia (575,000 units) and Africa (107,000 units).

## MOTOR VEHICLE EXPORTS BY DESTINATION IN 2023

In vehicle units



At the same time, vehicle imports are low-low, almost nothing. Sales of new imported vehicles in Japan in 2023 totalled 311,000 units, a figure quite stable over 10 years' time.

## TRENDS IN IMPORTED MOTOR VEHICLE SALES

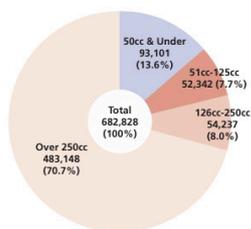
In vehicle units



If we have a look on the motorbike business, overall domestic motorcycle production in 2023 was 683,000 units. Sales were 405,000 units, and exports were 518,000 units.

## MOTORCYCLE PRODUCTION BY ENGINE CAPACITY IN 2023

In vehicle units



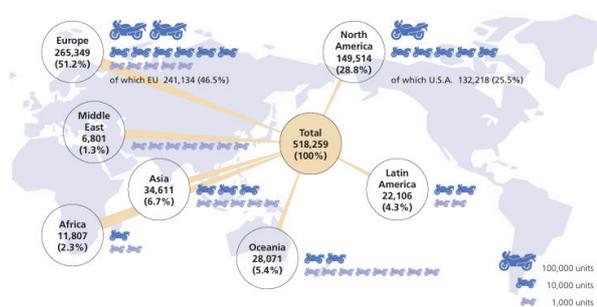
## TRENDS IN MOTORCYCLE PRODUCTION

x 1 million units



## MOTORCYCLE EXPORTS BY DESTINATION IN 2023

In vehicle units



The vehicle market has a special category in Japan, unique in the world, for mini vehicles, the widely-known 'kei car' class representing more than one third of the market.

## Sales of new vehicles

	Dec. 2024	Dec. 2023	Y-o-Y	Jan.-Dec. 2024	Jan.-Dec. 2023	Y-o-Y
Non-mini vehicles	210,746	232,320	-9.3%	2,863,626	3,034,167	-5.6%
Mini Vehicles	119,040	130,519	-8.8%	1,557,868	1,744,919	-10.7%
<b>Total</b>	<b>329,786</b>	<b>362,839</b>	<b>-9.1%</b>	<b>4,421,494</b>	<b>4,779,086</b>	<b>-7.5%</b>

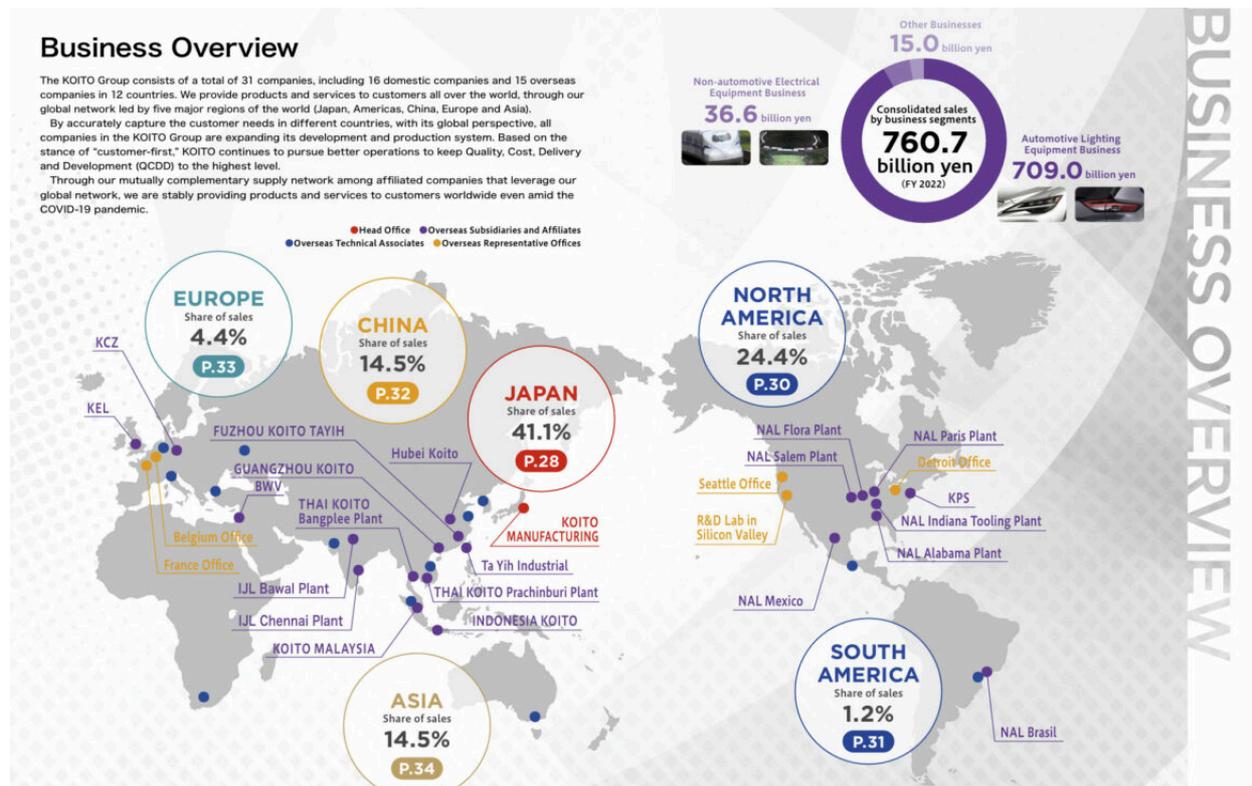
Source: Japan Automobile Dealers Association, Japan Light Motor Vehicle and Motorcycle Association

Kei cars have reduced technical specifications, low prices, and low taxes.

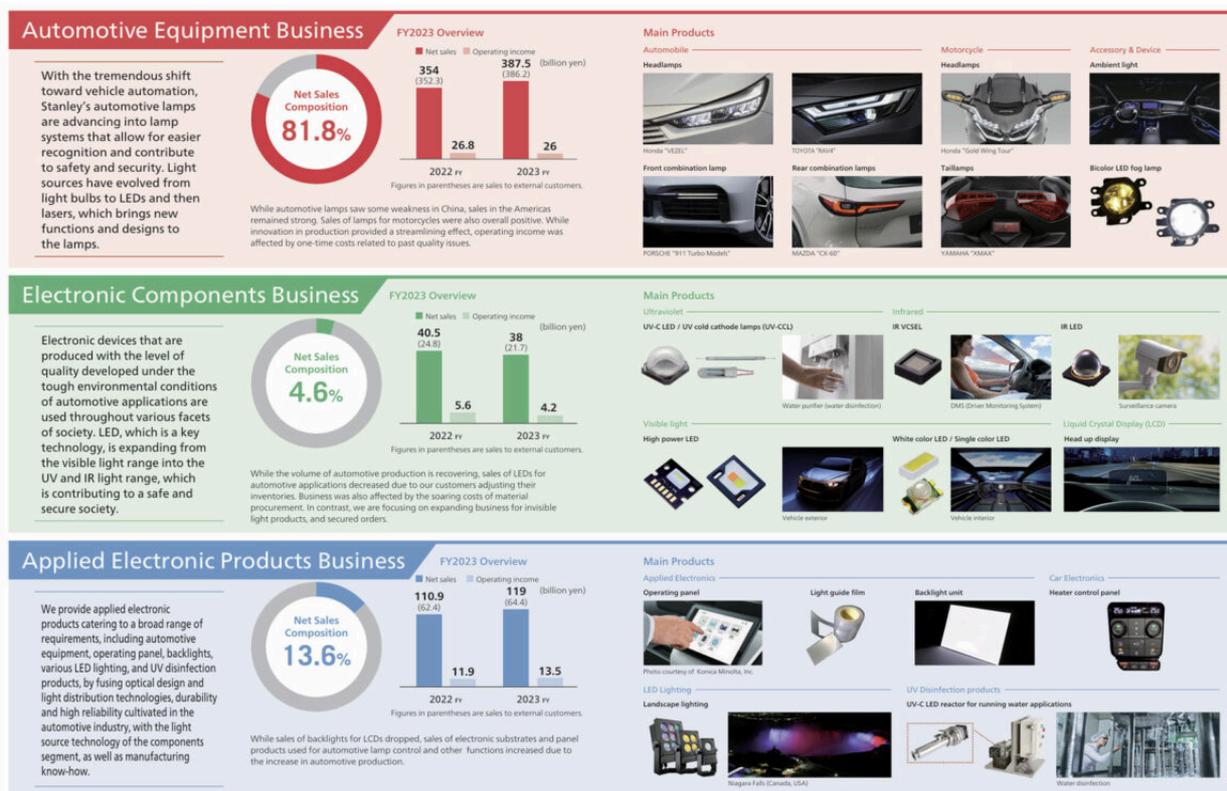


Turning to the vehicle lighting market: with an average value of €300 per car for all lighting equipment, we can estimate a market value around €3bn (including a 10 per cent additional value for aftermarket). This basket price is relatively lower compared to Europe, mainly due to the fact that technical content for kei cars is lower, and kei cars represent more than one third of the total volume.

**Koito**, worldwide leader in vehicle lighting, had ¥709bn in revenue in fiscal year 2022 for their vehicle lighting business unit, with 41.1 per cent in Japan—that's according to their Koito Integrated Report 2022. This represents around €1.8bn revenue in Japan.



**Stanley Electric's** revenue for vehicle lighting represented 81.8 per cent of their total revenue in fiscal year 2023 (¥354bn). We can add to this value their electronic components business focused on the LED market (revenue ¥40bn in FY22).



Based on Markline figures, we can estimate a vehicle lighting revenue in Japan in FY22 of €600m.

■ Sales by Geographic Area

(in million JPY)

	FY ended Mar. 31, 2024	FY ended Mar. 31, 2023	FY ended Mar. 31, 2022
Japan	129,975	119,448	119,755
Americas	133,023	109,410	80,222
China	108,392	91,085	89,135
Asia-Pacific	91,767	109,047	86,565
Other	9,238	8,798	6,881
Total	472,397	437,790	382,561

(Note) Sales are based on customer locations, categorized by country or region.

**Ichikoh**, part of the Valeo group, mentioned in their FY24 report a lighting revenue of ¥121bn, of which ¥87bn in Japan, equivalent to €550m.



## To sum up, here's some data about automaker market share and best-selling vehicles from JADA:

The top-selling vehicle manufacturers in Japan during the full calendar year 2024 were as follows according to JADA statistics:

–	Brand	Sales 2024	Sales 2023	% 24/23
–	Total	4,421,494	4,779,086	-7.5
1	Toyota	1,355,581	1,578,105	-14.1
2	Suzuki	721,785	650,567	10.9
3	Honda	668,414	594,285	12.5
4	Nissan	475,569	480,673	-1.1
5	Daihatsu	366,635	594,507	-38.3
6	Mazda	141,965	177,864	-20.2
7	Mitsubishi	119,480	103,725	15.2
8	Subaru	103,522	106,002	-2.3
9	Lexus	86,071	94,645	-9.1
10	Isuzu	67,832	64,590	5.0
11	Mercedes Benz	53,195	51,238	3.8
12	Hino	41,859	37,756	10.9
13	BMW	35,240	34,501	2.1
14	Mitsubishi Fuso	34,853	37,685	-7.5
15	Volkswagen	22,779	31,815	-28.4
16	Audi	21,415	24,632	-13.1
17	Mini	17,165	17,796	-3.5
18	Volvo	12,842	13,882	-7.5
19	UD Trucks	10,466	10,128	3.3
20	Jeep	9,633	11,535	-16.5
	Source: JADA			

The 20 best-selling car models (excluding minicars) in Japan in the full calendar year 2024 were as follows according to Jada:

	Brand	Model	Sales 2024	Sales 2023	% 24/23
1	Toyota	Corolla	166,956	154,870	7.8
2	Toyota	Yaris	166,162	194,364	-14.5
3	Toyota	Sienta	111,090	132,332	-16.1
4	Nissan	Note	101,766	102,508	-0.7
5	Honda	Freed	85,368	77,562	10.1
6	Toyota	Prius	83,485	99,149	-15.8
7	Nissan	Serena	80,899	75,673	6.9
8	Toyota	Alphard	79,374	53,086	49.5
9	Honda	Vezele	75,424	59,187	27.4
10	Toyota	Voxy	70,636	89,080	-20.7
11	Toyota	Noah	70,611	95,181	-25.8
12	Toyota	Roomy	67,698	100,800	-32.8
13	Toyota	Harrier	64,181	75,211	-14.7
14	Toyota	Aqua	64,180	80,268	-20.7
15	Toyota	Crown	62,628	43,029	45.5
16	Honda	Fit	61,808	57,033	8.4
17	Honda	Step Wagon	55,147	44,157	24.9
18	Suzuki	Sorio	52,404	47,983	9.2
19	Toyota	Land Cruiser	51,288	55,263	-7.2
20	Toyota	Raize	51,225	64,995	-21.2
	Source: JADA				

# Lighting News

## Sumitomo Starts Sales of Chem-Recycled PMMA to Big Companies

LIGHTING NEWS



On 6 March 2025, Sumitomo Chemical announced they will start selling their polymethyl methacrylate (PMMA, acrylic), which is made from methyl methacrylate (MMA) monomers produced through chemical recycling. South Korea's LG Display and Japan's Nissan Motor have decided to use this chemically-recycled material in their products. Sumitomo will accelerate the implementation of chemical recycling in the MMA supply chain. In 2022, Sumitomo built a new PMMA chemical recycling pilot facility at their factory in Niihama City, Ehime Prefecture, Japan. They also started a joint project with Niihama City to recycle PMMA protective partitions used to reduce droplet spread, and provided chemically recycled PMMA to Star Jewelry as raw material. In addition, Sumitomo have obtained third-party certifications such as ISCC PLUS. and are making efforts to implement practical recycling systems worldwide using the mass balance approach.

Sumitomo will supply chemically-recycled PMMA produced in their large-scale production facilities for high-quality applications such as electronics and automobiles. LG Display will be buying the Sumitomo PMMA as raw material for the light guide plates used in liquid crystal display backlights, and Nissan Motor as raw material for the lenses used in vehicle lighting components.

Sumitomo are making significant adjustments to their petrochemical-related business, creating value through technologies that reduce environmental impact. The value of recycled materials and products is increasingly recognized. To keep pace with this progress, Sumitomo will expand their chemical-recycling MMA material business and provide products widely throughout society through technology licensing, contributing to the realization of a sustainable society.

# GRE Glare Prevention Task Force (TF-GP)

## LIGHTING NEWS



**By Eric Blusseau, DVN regulation senior advisor**

During GRE 90, in April 2024, the expert of the Fédération Internationale de l'Automobile (FIA) presented the results of their 2024 European consumer study on glare in road traffic. Find the presentations on the UNECE website: [GRE 90-20](#) and [GRE 90-40](#). The main takeaways of these studies are:

- When the driver is dazzled, they can have reactions considered as potential road safety risks.
- Psychological (discomfort) glare causes distraction and reduced attention to road traffic.
- Physiological (disability) glare reduces visibility and the perception of objects and obstacles.

These should be recognized as risks to road safety. GRE invited interested parties to discuss this issue, and to prepare for the following session, draft terms of reference and rules of procedure for either a new task force or new informal working group.

During GRE 91 in October 2024, The expert of FIA proposed to establish a task force on glare prevention (TF GP) and introduced a first draft for terms of reference ([GRE 91 20](#)). GRE experts made several comments on the draft. GRE launched the task force and asked them to review the FIA proposal with the aim to submit updated terms of reference for adoption at the next session in April 2025. GRE also agreed that glare prevention should be listed among the 2025 priorities.

The task force's first meeting was held on 23 January, 2025, chaired by Germany's Marc Fischer. The GTB / TF Secretaries were Davide Puglisi and Federico Matarazzo.

38 persons attended the meeting who represented Contracting Parties including Australia, Finland, France, Germany, India, Japan, Netherlands, Norway, Spain, and UK, and some expert associations (AAPC, CLEPA, FIA, IEC, IMMA, OICA, SAE).

As outcomes of the meeting, participants reviewed and improved both the introduction and the objective sections of the terms of reference, on the basis of informal document GRE 91-20. The TF will not have the authority to commission studies, but can recommend research where there may be a knowledge gap.

- The TF will distinguish between avoidable and unavoidable glare occurrences as well as short- and long-term solutions.
- First priority shall be the glare caused by road illumination devices and, in a second step, glare caused by light signalling devices (including DRL).
- The TF shall investigate the best balance between glare, visibility: How to reduce glare while keeping a good visibility range.
- The TF did not consider within its primary objectives to develop proposal to amend the regulations, but rather to develop recommendations for GRE which will then decide how to proceed.

The revised terms of reference document should be submitted during the upcoming GRE Session as an informal document. The draft document is [available](#) on the UNECE website.

The next TF-GP meeting will occur on 8 April 2025, just before the next GRE Session.

DVN held a glare forum of our own on 18 February with 32 participants ([see summary here and all presentation](#)), ADAC is organizing a symposium on **25-26 March** at the ADAC Testzentrum in Penzing, Germany—send an [email](#) to register. Michael Hamm from DVN will cover the event and will make short summary. And the SAE Lighting Systems Group will hold a glare forum, its first, on **2 April** during their Spring meetings in Savannah, Georgia, USA. DVN's Daniel Stern will be one of the panellist speakers at that event.

# DVN Field Trip: CoSys PICS-L Lab

## LIGHTING NEWS



Roland Bremond and Paul-Henri Matha in the PICS-L photometry Lab at Marne la Vallée (measurement of road reflection)

P.H. Matha and J.P. Ravier from DVN visited the PICS-L laboratory in Marne la Vallée near Paris. Located in the Université Gustave Eiffel, a university with 17,000 students and 3,000 people supervising teaching and research. The PICS-L lab is one of the nine laboratories of the CoSys department (Components and Systems). This department was previously part of the former French science and technology institute for transport, planning and networks, under the authority of the French Ministry of Ecological Transition.

The PICS-L laboratory is involved in cognitive psychology (psychophysics, human factors), human vision (visibility, glare, visual attention), photometry (BRDF, lighting), computer vision (simulation of human vision), and computer graphics (image rendering), applied to road safety and urban mobility, with a focus on adverse visibility conditions. Among the research scientists of PICS-L, Roland Brémond and Céline Villa are particularly interested in the performance of fixed road lighting, but they also address vehicle-based lighting.

Bremond is the French representative at C.I.E. Division 4 on Transportation and Exterior Applications of lighting and signalling.

The PICS-L lab welcomes master's and PhD students and works in cooperation with foreign universities including the University of Bologna in Italy and the University of Queensland in Australia. They are involved in various National and European projects.

In our field of vehicle lighting, they have particularly worked on the subject of glare, among other things with a PhD work completed in 2019, and published ten papers between 2015 and 2023. On the three aspects of glare—disability, discomfort, and eye damage—they have particularly focused their research on discomfort and disability.

They are continuing their research, in particular on the effects of moving light sources, effect of glare for people affected by cataracts, analysis of glare for multisource front lighting and in relation with their size, etc.

For the future, they are interested to work more closely with the vehicle lighting industry in this domain of the effects of glare.

DVN visited their laboratory full of equipment including a driving simulator.



Driving simulator at Université Gustave Eiffel

Selected papers on glare from the PICS-L laboratory:

- Brémond et al. (2018). Driving at Night With a Cataract: Risk Homeostasis? *Transportation Research Part F* 53(2):61-73
- Brémond (2022). Stimulus Range Effect in Discomfort Glare Studies. *Light & Engineering* 30(5):40-46.
- Girard et al. (2017). Discomfort Glare Caused by Several LED Sources. In *Proc. Lux Europa*, pp. 212-216, Ljubljana, Slovenia
- Girard & al. (2021). Discomfort Glare from Several Sources: A Formula for Outdoor Lighting. *LEUKOS* 17(2):108-124
- Girard & al. (2022). Discomfort Glare from a Cyclic Source in Outdoor Lighting Conditions. *LEUKOS* 18(4):459-474
- Girard & al. (2023). Modelling the Probability of Discomfort Due to Glare at All Levels: The Case of Outdoor Lighting. *LEUKOS* 18(4):459-474
- Villa et al. (2015). Visibility and Discomfort Glare of LED Road Studs. *Lighting Research and Technology* 47(8):945-963
- Villa et al. (2017). Assessment of Pedestrian Discomfort Glare from Urban LED Lighting. *Lighting Research and Technology* 49(2):147-172
- Villa et al. (2017). Predicting the Discomfort Glare Experienced by Pedestrians: UGR and CBE. In *Proc. CIE Midterm*, pp. 1088-1097, Jeju, South Korea
- Villa et al. (2022). Discomfort Glare in Motion. In *Proc. 17th International Symposium on Science & Technology of Lighting*, Toulouse, France

# The New Mercedes CLA

## LIGHTING NEWS



Mercedes-Benz have revealed their new CLA's specifications and exterior design. It debuts a dramatic new look for forthcoming Mercedes models, with special emphasis on the iconic three-pointed star logo. It features in the CLA's headlamps and brake lights, and the EV also gets a flush front grilleboard with 142 backlit stars surrounding the emblem, which is also backlit. The outer ring of the emblem is lit on the US model, but EU legislation prevents this. The CLA hybrid has a traditional open grille to provide cooling airflow to the engine.

The Mercedes website describes the new CLA:

"The iconic and sporty A-shaped grille has been reinterpreted for the electric age. The innovative seamless star panel is fully illuminated for the first time on a Mercedes-Benz production vehicle. A total of 142 individually animated LED chrome-effect stars create a distinctive brand signature. One of the few visual differences distinguishing the CLA hybrid is its classic radiator grille. It features a Mercedes-Benz pattern in chrome, framed by an LED lightguide as standard.



"With the optional Multibeam LED headlights, the daytime running lights take the form of a Mercedes-Benz star. Connecting the headlights is a band of light. The taillights are also star-shaped and connected by an illuminated design element. This combination gives the CLA a strong and unique visual presence. In conjunction with the optional Multibeam LED headlights, it forms the new Mercedes-Benz signature. It makes a Mercedes instantly recognizable at all times of the day or night—an unmistakable statement of iconic luxury. The standard-fit LED high performance headlights have a chrome-plated design element in the shape of a star.



In cars without the Superscreen, the passenger screen will be replaced with a glass panel with LED-backlit star logos, which match the interior's ambient lighting.



# Mercedes AD-S Lamp: Turquoise Light in Germany

## LIGHTING NEWS



On 5 March, Mercedes-Benz got approval for their AD-S lamp with testing purposes through July 2028.

Germany once again underscores its pioneering role in the field of automated driving, having been first to permit conditionally automated (SAE Level 3) driving. Mercedes-Benz seized this opportunity and received the world's first internationally-valid type approval for conditionally automated driving for their Drive Pilot system at the end of 2021.

The exterior lighting now permitted by special exemption indicates to other road users whether the conditionally automated driving function is activated. This also allows traffic authorities and police to recognize the system status more easily, and discern whether the driver is allowed to engage in non-driving activities. The special marker lights are integrated into the front and rear lights as well as the side indicators in the exterior mirrors. When Drive Pilot is activated, these lights illuminate continuously in turquoise, the international-consensus colour for this function (though there is not yet consensus as to whether AD status indicator lights should be mandatory, optional, or prohibited). Turquoise has already been specified in relevant standards and draft regulations, such as SAE J3134, UN regulatory documents, and Chinese GB standards.



The special exemption granted by the Stuttgart Regional Council is initially valid for testing purposes. Insights gained from this testing phase can contribute to shaping the legal framework that will later enable series production. The U.S. states of Nevada and California granted Mercedes Benz similar exemptions at the end of 2023, and testing is already underway there.

# Valeo EvenLED Wins Road Safety Innovation Award

## LIGHTING NEWS



Valeo have received a 2025 Innovation Award in the Infrastructure and Vehicle Improvement category from Sécurité Routière—the French national road safety authority—for their innovative EvenLED technology used in the design of vehicle front and rear signalling systems.

Valeo Light Division CEO Maurizio Martinelli says, "We are extremely honoured by this award that recognizes our effort to develop technologies for more safety on the road. With its outstanding optical performance, Valeo's EvenLED technology provides drivers with increasingly visible, safer solutions, while offering automakers limitless styling possibilities to create unique and recognizable light signatures".

EvenLED uses proprietary Valeo technology that ensures high homogeneity and efficiency while meeting regulatory photometric standards. It can be used for all safety signals, both at the rear of the vehicle—tail, stop, and turn indicators—and at the front—daytime running lights, and position lights. With its highly uniform luminous appearance, it can be applied to light and heavy goods vehicles and complies with all international regulations.



The Road Safety Innovation Awards are organized annually by the French Authority for Road Safety and Traffic. They honour entrepreneurs, companies, and startups who leverage creativity to enhance road safety. The jury recognizes products or services that promote behavioural change or raise awareness about road safety, particularly those featuring new or groundbreaking aspects that are accessible to a broad audience.

# To go further ...

## Lighting Analysis: Tesla Y 'Juniper'

TO GO FURTHER ...



**By Paul-Henri Matha**

I took time some weeks ago to dig into the new Tesla Y with a lot of new lighting features. During my trip to Shenzhen I stopped in at a dealer to check details and be 100-per-cent sure.

**Front signature:** The Tesla Y has design aspects similar to the Cybertruck, with a full-width lighting signature. All videos and pictures released so far show only the position light function active. But it looks like the same in DRL mode—I checked for myself. Only the light intensity (and therefore luminance) changes. What is difficult to see in pictures, especially due to the PWM used for LED dimming, which makes flickering videos, is that the full-width light bar has different luminance intensity. Only a small rectangle, represented in yellow below, is bright with high intensity; I estimate 400 cd. The rest of the array, here in blue, has low intensity, I think around 50 cd.



It may be designed this way to comply with UN Regulation 148, though solutions are possible.

- By day, both DRL and front position lamps are lit. The DRL intensity minimum requirement is done by the high intensity area (yellow in the diagram here). To

reach the required 25-cm<sup>2</sup> surface, the low-intensity area is also part of the DRL. The center lamp is only a position lamp to meet the 600-mm separation requirement between left and right DRL.

- By night, the position light function is done by the entire array. The blue-area intensity is reduced by around half, as I saw when I turned the stalk from DRL to position lamp during daytime. The yellow-area intensity is reduced much more; I estimate 1/10.

In China, it may be possible (starting from 1 July) to have from a class-A2 front position lamp with a light intensity similar to a DRL by day, without a 600-mm distance requirement between left and right lamp. Perhaps this new A2 regulation is used by Tesla on this model, but I don't think so; it would be not valid for Europe. With such a design with low/high intensity, I think it is also useless.

This is also possible in USA with the front decorative lamp feature (though this what I saw on the Y may or may not be compliant with the relevant SAE standard, J3098).

The **front turn indicator** is part of the upper signalling lamp array, in a small cavity inside the DRL/position light function; that's the yellow area in my schematic. In USA, due to the steady-burning requirement for position lamps when turn indicator is active, the position lamp cannot be turned off during turn signal operation. This creates this behaviour you can see below; we can recognise this as a probable US model by the side marker light in the lower lamp. This turn indicator fulfills the US EPLLA requirement of 22 cm<sup>2</sup>, though it's a bit difficult to see in the picture. As with the 2.5-times-higher minimum front turn signal intensity ( $\geq 500$  cd instead of  $\geq 200$  cd on axis) if the front turn signal is within 100 mm of the DRL or low beam, similar requirements exist with the front decorative lamp if the DRL or front decorative lamp is not switched off during adjacent turn signal operation and that same distance is below 100 mm—which is the case on the Tesla Y.



I checked in China, looking at the position light mode and DRL mode: when the turn indicator is on, the adjacent white functions are still on around the turn indicator, but the common apparent surface (the yellow part in my schematic) is off.

Functions are partially optically incorporated, which means some particular provisions in UN R48 apply: when the turn indicator is operating, the rest of the DRL light intensity must be below 140 cd according to R48 ¶ 6.19.7.7.2.b. Looking again at my schematic, the yellow part in this case is the turn indicator (minimum 250 cd) and the blue part is dimmed DRL below 140 cd as required by the regulation.



Extract of UN R48-08:

6.19.7.7 If a front direction-indicator lamp is reciprocally incorporated with a daytime running lamp, either with:

6.19.7.7.2 Partially common apparent surfaces, the electrical connections of the daytime running lamp shall be such that (...)

(b) For category 1a or 1b front direction-indicator lamp the daytime running lamp function on the relevant side of the vehicle is switched OFF for the part of the apparent surface in common with the one of the front direction indicator lamp and the luminous intensity of the part of the apparent surface not in common is reduced during the entire period (both ON and OFF cycle) of operation of the front direction-indicator lamp, to attain not more than 140 cd within the angles of geometric visibility. The conformity to this requirement shall be verified at the time of the daytime running lamp type approval and indicated in the related communication form.

**Low beam and high beam** are part of the bumper lamp. Matrix headlamps seem to be available according to some media reports, with similar technology seen on current Tesla 3 Highland.



The front camera in the lower grille is equipped with a cleaning system, similar to the Cybertruck.



About the rear, “Model Y had a glow-up. The first indirect reflective body-panel taillight of its kind,” Tesla posted on X via its official account.



How does it work? the tail lamp is on the tailgate only. Light is aimed downward and reflects on the angled panel, which also has a tesla callout. So we do not see the apparent surface of the position lamp in the X-view. The side marker lamp is done by a dedicated light source on the side.



Is it allowed to project light on the ground? this is not an easy question to answer. For Europe, in UN R48 (lighting and light-signalling fitment), there is no requirement about projection and light intensity. In R148 (light-signaling device requirements), there is a limit on maximum light intensity at ¶ 4.8.3.1.b:

#### 4.8.3 Luminous intensities

4.8.3.1 If not otherwise specified, the intensity of light emitted by each of the two samples supplied shall (...)

**(b) In no direction where the lamp is visible, exceed the maximum, specified in the table of the pertinent function in paragraph 5**

In this case, maximum light intensity should be 17cd for a class-R1 (single-intensity) rear position lamp. If we estimate lamp height at 750 mm and a distance of glow at 1.5 m, it gives an estimated illuminance of 4 lux, that makes it visible.

However, does this criterion apply?

R148 says "visible". What is the definition of 'visible'? the apparent surface of this lamp is not visible, what we see is indirect light. Also the road projection comes from a part of the lamp that is not visible in the visibility angle area (regulated visibility angles extend to 15 degrees down; the Tesla projection is at 30 degrees down).

Secondly, the criterion is for the component, the device, the lamp. What we see here is a reflection of the light from the device. Vehicle installation is part of R48 and there is no mention in vehicle installation for such a requirement if I am correct.

Lastly: what about driving conditions? It was rainy the day I saw the car. How does this setup do with reflection from rain, dust, snow...? Not an easy question. This requires complex validations.

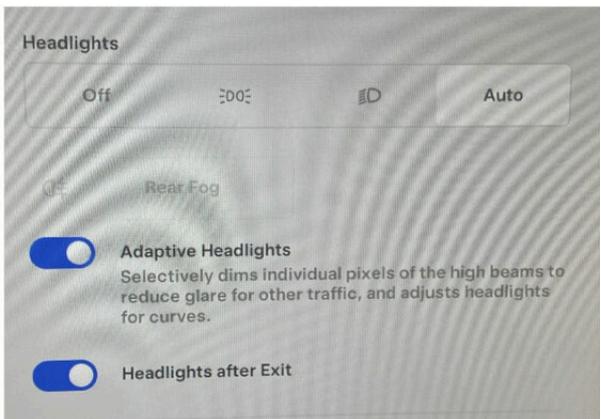


Picture of Tesla Y rearlamp under rainy condition, Shenzhen, march 2025

**Other signaling functions:** stop lamps and turn indicators are all on the tailgate. When the trunk is open, you can see additional lamps for turn, stop, and tail.



Last but not least, **lighting controls:** the turn indicator control is back on the steering wheel. Flash-to-pass is not on stalk but on a button (first time I see something like this). All other controls—position lamp, low beam, automatic high beam etc—are on the central display. ADB was proposed on the car.



The launch edition is equipped with a puddle light in the rocker panel.



For a flashy look at the Model Y lighting system, take a look at this video from Tesla

