



Automotive LiDAR

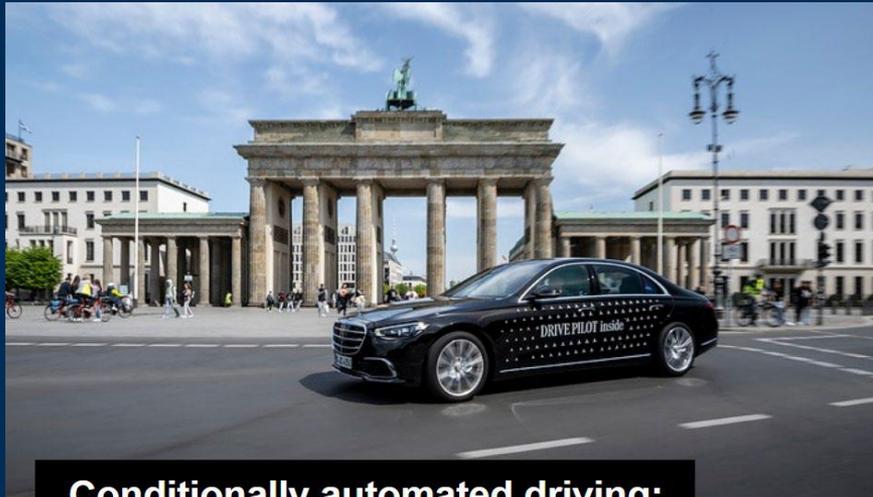
Valeo Market and Technology Outlook

The background of the slide is a dark blue point cloud visualization of a street scene. The point cloud consists of numerous small dots forming a grid-like structure. In the foreground, there are several human figures and a car, all rendered as point clouds. In the middle ground, a car is highlighted with a green wireframe box. On the right side, a motorcycle is highlighted with a red wireframe box. The overall scene is illuminated with a blue glow, suggesting a night or low-light environment.

SMART TECHNOLOGY FOR SMARTER MOBILITY

Market Update

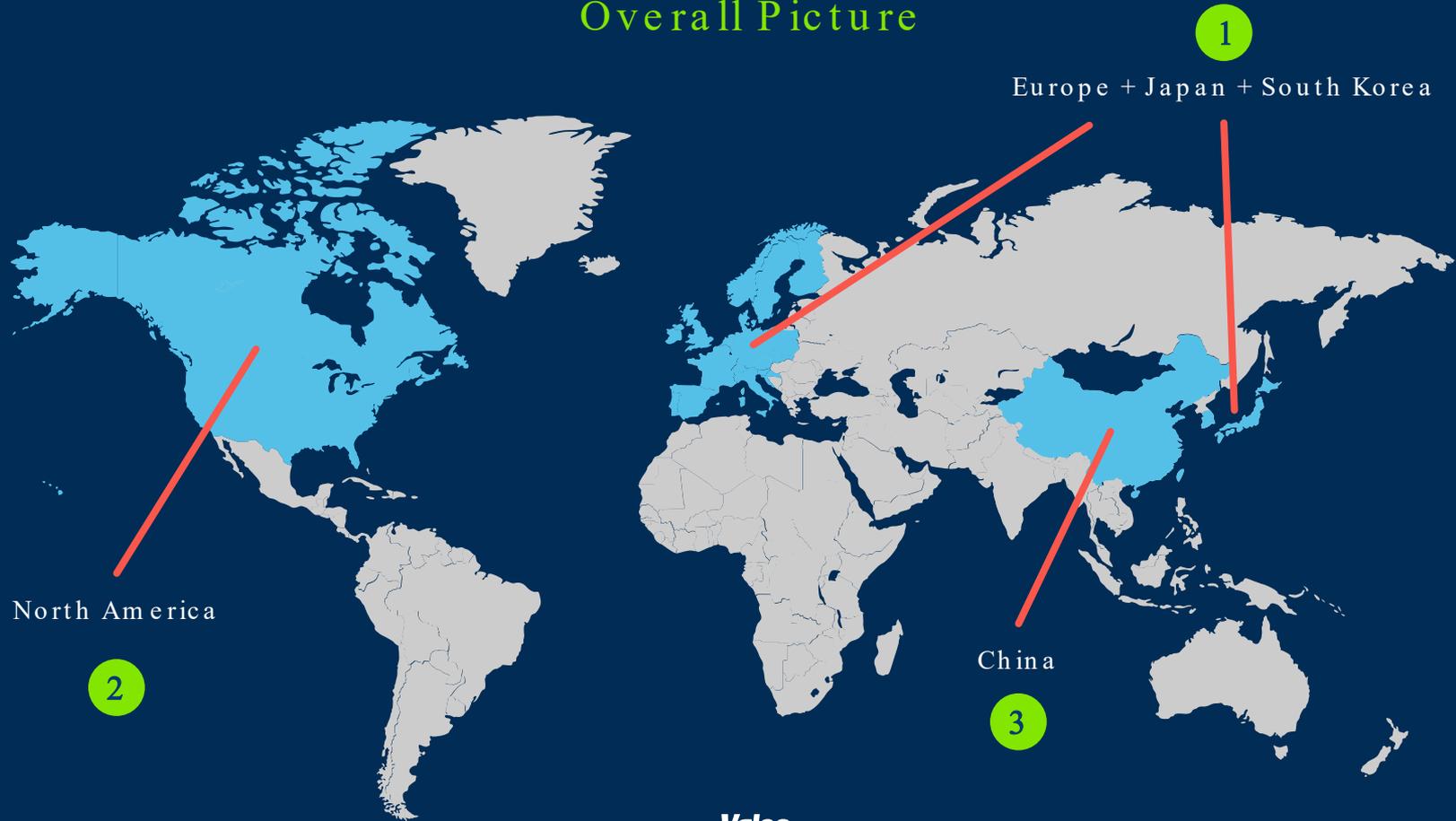
Level 3 is on Sale and OEMs take full responsibility



**Conditionally automated driving:
Mercedes-Benz announces sales launch of
DRIVE PILOT**

Market Update

Overall Picture



Market Update

Europe + Japan + South Korea



UN (1958 Agreement - 54 contracting parties world wide)

- Level 3 → UN R157 ALKS (highway ADS only)
- Level 4 → EU 2022/1426 ADS - harmonized in EU; further harmonization via UN FRAV and VMAD guidelines)

EUROPE

Market driver: level 3

Roll-out:

- Germany 2022
- Other countries (tbc)



SOUTH KOREA

Market driver: level 3 + functions improvements

Roll-out:

- 2022 (commercial)



JAPAN

Market driver: level 3

Roll-out:

- 2021 (fleet)
- 2026 (commercial)



Level 3-4 Legislation AD Regulation Plan

spec ready, implemented
or implementation started



Implementation Schedule

- EU L3,4 ADS
- UN L3 ALKS / R157-01-HWP (130kph starting)

Aug. 22 (spec approved in Jul. 22, implementation Aug. 22)

Jan. 23 (spec approved in Jun. 22, implementation HWP)

Market Update

North America



USA

Voluntary federal guidance vs. inconsistent state regulation produces a fragmented regulatory landscape. However about 42 states (including Hawaii) enacted the legislation pertaining to either testing or deployment of AVs on public roads.

→ **Testing allowed**

→ **Commercial deployment restricted**

Strong demand for robotaxi LiDAR (long & short range)

Market trends: Safety / Level 2 + Level 4

Market Update

China



Strategy for Innovation and Development of Intelligent Vehicles (2020)

- official regulations for Level 3 and 4 by ~2025(?)
- Nine provinces licensed and regulated L4 vehicles testing at the state / provincial level

LiDAR used as a “technology” feature

Market trend: “LiDAR-equipped Tesla”

Last DVN Conference

November 15, 2021 Valeo Ending Note

LiDAR Standardization

Conditions for a wider adoption

“We all share the same LiDAR development story”

... but this story cannot realize without industry standards solving

#1 How to qualify good performance

#2 How to tackle ADAS & AD corner cases

#3 How to ensure safe operation in all environments



12 years experience to support LiDAR technology adoption

LiDAR Regulation

Main performance assessment initiatives

Name	Presidence	Objective	Status
DIN-SAE 91471		Assessment methodology for automotive Lidars	Input from German industry to ISO standard Active Valeo contribution, SCALA 2 provided for tests Draft KPIs document available
ISO PWI 13228	 	Road Vehicles Lidar Test Methods	Valeo represented and actively engaged in each task group Framework definition of performance specification
CATARC / GBT		Lidar Performance Requirements & Test Methods	Valeo China contributing to the committees / led b CATARC Good participation of LiDAR suppliers and OEMs

Technology
Long Range

SMART
BUMPER



STELLANTIS

SCALA[®]
GEN 3

SATELLITE SLIM

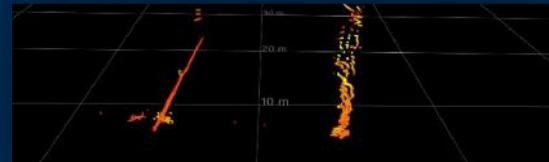
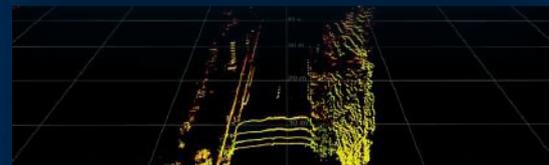


?

Valeo

Technology

Long Range: camera-like LiDAR



Technology Short Range



2020



2022

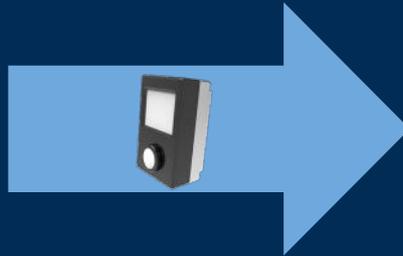


2025~

Technology

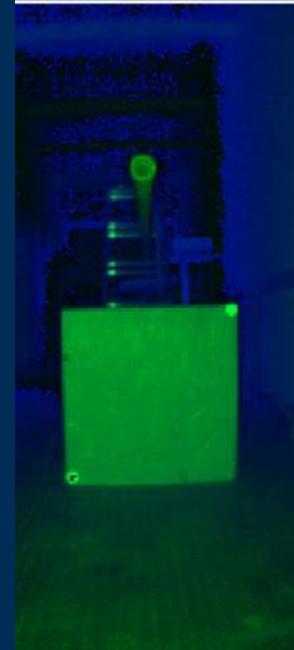
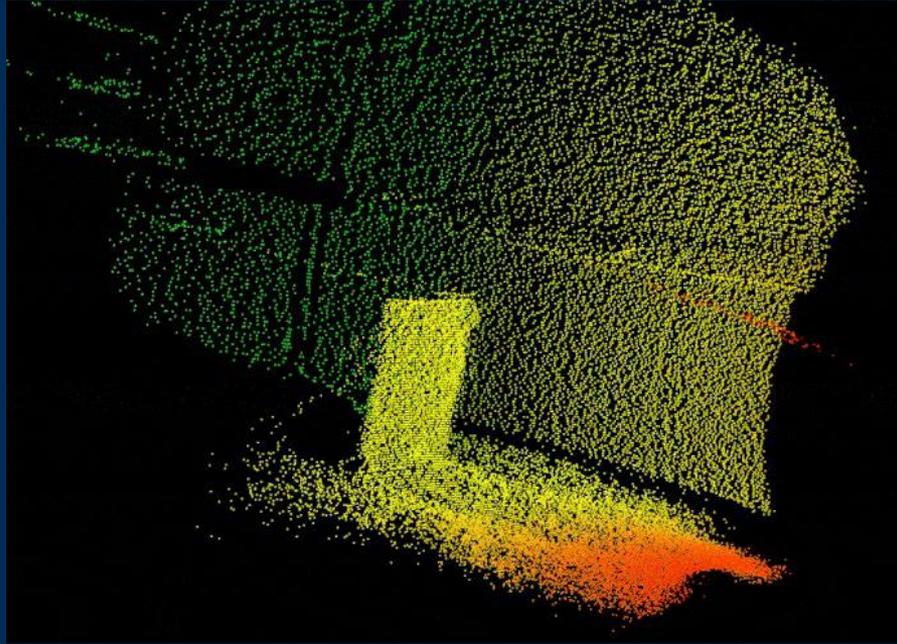
Short Range

- Cold start for Level 4 robotaxi operation
- Soft objects detection
- Objects which is partially out of the field of view
- Big vertical field of view for near range objects



Technology

Short Range



High resolution enhances the detection of small Objects

LiDAR market at a tipping point



- ⇒ AD level 3 & 4 get commercial
- ⇒ Standardization initiatives are set
- ⇒ Supply chain becoming robust & auto
- ⇒ Technology maturity ready for volume
- ⇒ Synergies with other sensor modalities favour automotive tier-1s





SMART TECHNOLOGY
FOR SMARTER MOBILITY