

# ADAS, a rebirth for the automotive industry<sup>1</sup>

## OUTLINES:

- Better sensor performance to enable automated driving.
- A sensor market worth US\$22.4 billion in 2025, led by radars.
- Greater ADAS<sup>2</sup> functionality will restart the industry after the coronavirus crisis.

*“The production of vehicles will be heavily impacted by the coronavirus crisis”, asserts **Pierrick Boulay, Technology & Market Analyst, Solid-state Lighting at Yole Développement (Yole)**. “It is expected that three years will be needed to recover and get back to the same level of output.”*

At Yole, analysts estimate, the global market for radars, cameras, LiDARs and computing ADAS should reach US\$8.6 billion in 2020. Almost half of this market revenue will be generated by radars with US\$3.8 billion, followed by cameras with US\$3.5 billion. LiDARs will not be significant, accounting for US\$0.04 billion and computing ADAS will generate US\$1.3 billion.

In this context, the market research & strategy consulting company Yole releases today the [Sensing and Computing for ADAS vehicle 2020 report](#). Under this new report, Yole’s experts have been investigating the industry in order to describe and provide market data on key sensors: Camera, LiDAR and Radar, including revenue forecast and volume shipments for each sensor type, market shares, with detailed breakdown by player and application focus of each sensor. This report points out an in-depth understanding of the main sensors value chains, infrastructure and players. It also presents key technical insights and analysis regarding future technology trends and challenges, and offers a deep understanding of how these sensors work together in a car.

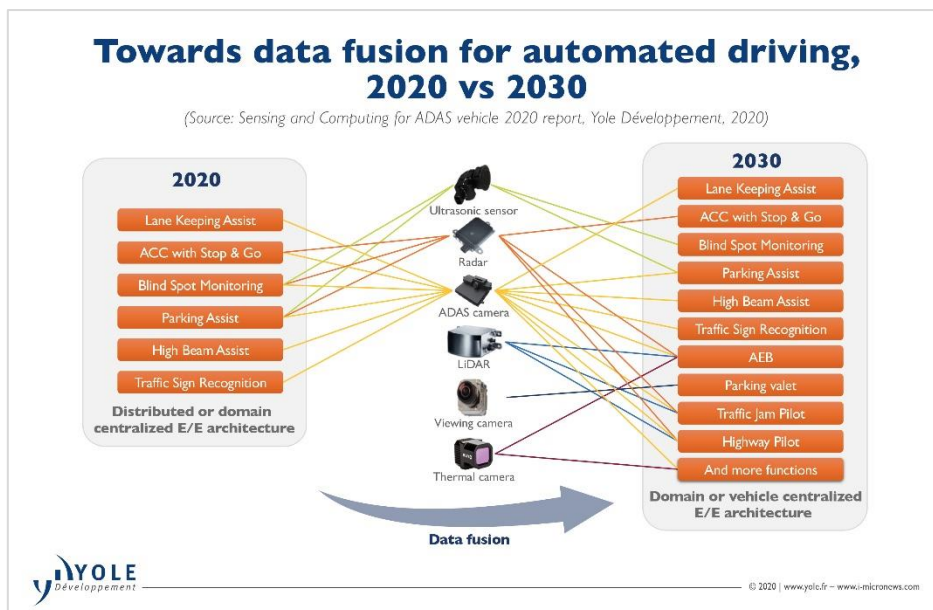
Which strategy will be used to restart the industry after the Covid-19 crisis? Who are the sensor players and how they are related? What is the supply chain of these sensors?... Yole’s analysts sheds light on the Sensing and Computing for ADAS vehicles sector.

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<sup>1</sup> Extracted from : [Sensing and Computing for ADAS vehicle 2020 report](#), Yole Développement

<sup>2</sup> ADAS : Advanced Driving Assistance Systems

The automotive industry has seen the impact of the coronavirus crisis evolve from a supply shock to a global demand shock. The production of new cars is expected to decline by 30% compared to the 2019 production level. The direction of the automotive industry towards the four major megatrends of connected, autonomous, shared and electric driving is expected to remain unchanged going forward. However, the speed of adoption might change due to the emergency. Electrification will be the main focus for OEM<sup>3</sup>s as restrictions and associated penalties on CO<sub>2</sub> emissions should remain valid.



The second target for OEMs will be related to the development of ADAS for safety and automated driving features. The development of AEB<sup>4</sup> is a great step to avoid forward collisions but is still perfectible, as demonstrated by the AAA<sup>5</sup> in October 2019. Automated driving features in traffic jams or on the highway will also be developed by OEMs as consumers are looking for these to ease driving. The development of such features will be a way for OEMs to differentiate themselves. To do so, the addition of more sensors, more computing power and a new E/E<sup>6</sup> architecture will be required.

**Cédric Malaquin, Technology & Market Analyst, RF Devices & Technology from Yole** comments: “Audi and Tesla, have both initiated this trend using a combination of radars, cameras and a LiDAR in Audi’s case. To fuse the data generated, Audi and Aptiv developed a domain controller, the zFAS, for front sensors. Tesla goes one step further in the development of domain controllers with its Autopilot hardware. Autopilot is much more complex and has more functionality, with the ability to perform frequent OTA<sup>7</sup> software updates”.

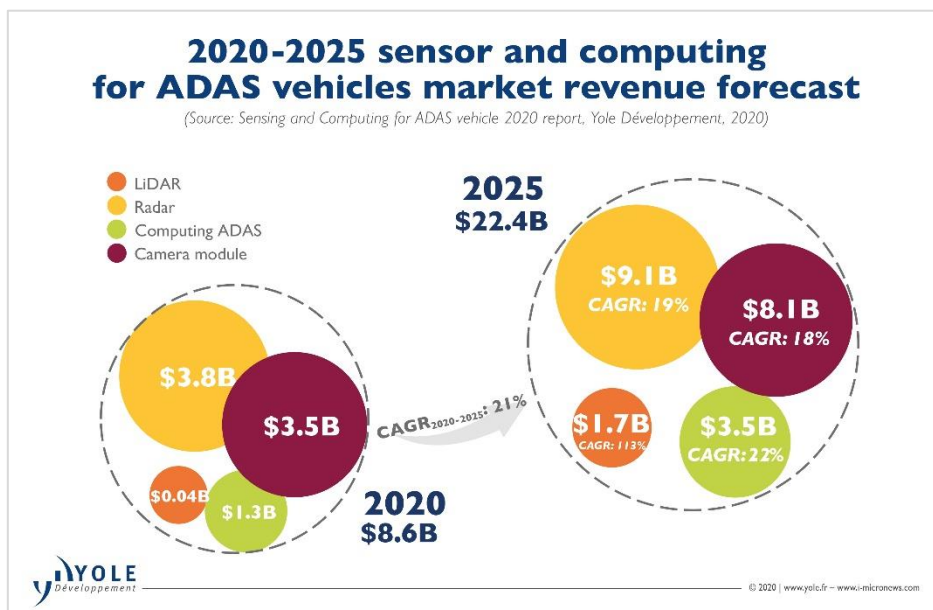
<sup>3</sup> OEM : Original Equipment Manufacturer  
<sup>4</sup> AEB : Advanced Emergency Braking Systems  
<sup>5</sup> AAA : American Automobile Association  
<sup>6</sup> E/E : Electric/Electronic  
<sup>7</sup> OTA : Over-The-Air

For example, technology advances dedicated to Audi A8 has been deeply detailed during an interview powered by **Junko Yoshida, EETIMES** with **Romain Fraux, CEO of System Plus Consulting**: “...The challenge for automotive manufacturers will no longer be offering the most speed, or the best acceleration from zero to 100 km/h, but to ensure increasingly advanced autonomous driving and assistance systems. This is the goal of the Audi A8, to continue improving level 2 driver assistance systems, using LiDAR technology...”. Full article on [i-Micronews](#).

Without doubts, innovation brought by such features will be a key differentiation factor for OEMs looking to relaunch the market.

With high penetration rates of radars and cameras in cars, the associated market revenues will recover rapidly from the coronavirus crisis.

According to **Pierrick Boulay from Yole**: “Radar market revenue is expected to surpass 2019’s revenue in 2021 and will reach US\$9.1 billion in 2025 at a CAGR<sup>8</sup> of 19%. Camera market revenue will also surpass 2019’s revenue in 2021 and will reach US\$8.1 billion in 2025 at a CAGR of 18%. Market revenue from computing ADAS is expected to reach US\$3.5 billion in 2025 at a CAGR of 22%”.



LiDAR market revenue is quite limited today as only one OEM is implementing this sensor as an option in some of its cars. Other OEMs like BMW and Volvo are expected to follow in coming years, but the implementation will remain limited to high-end vehicles, and therefore limited volumes are expected. In this context, LiDAR market revenue is expected to reach US\$1.7 billion in 2025 at a CAGR of 113%. LiDAR is a complex sensor for OEMs and Tier-1s to integrate while radars and cameras are, at the same time, continuously improving their performance.

<sup>8</sup> CAGR : Compound Annual Growth Rate

ADAS and the automotive industry will see lot of changes in the coming months and years. Pushed by innovations and the integration of new functions, the market will open the door to attractive opportunities and new players. The market research & strategy consulting company will follow this evolution and proposes its vision and analysis through its reports, articles and events. Stay tuned!

*Throughout the year, Yole Développement, publishes numerous sensing and computing-related reports. Make sure to be aware of the latest news coming from the industry and get an overview of our activities, including interviews with leading companies, analyses from our experts and dedicated online and onsite events on i-Micronews.*

### Press contacts

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### About our analysts

As part of the Photonics, Sensing & Display division at Yole Développement (Yole), **Pierrick Boulay** works as Market and Technology Analyst in the fields of Solid State Lighting and Lighting Systems to carry out technical, economic and marketing analysis. Pierrick has authored several reports and custom analysis dedicated to topics such as general lighting, automotive lighting, LiDAR, IR LEDs, UV LEDs and VCSELs. Prior to Yole, Pierrick has worked in several companies where he developed his knowledge on general lighting and on automotive lighting. In the past, he has mostly worked in R&D department for LED lighting applications. Pierrick holds a master degree in Electronics (ESEO – Angers, France).

As a Technology & Market Analyst, specialized in RF devices & technologies within the Power & Wireless division at Yole Développement (Yole), **Cédric Malaquin** is involved in the development of technology & market reports as well as the production of custom consulting projects. Prior his mission at Yole, Cédric first served Soitec as a process integration engineer during 9 years, then as an electrical characterization engineer during 6 years. He deeply contributed to FDSOI and RFSOI products characterization. He has also authored or co-authored three patents and five international publications in the semiconductor field. Cédric graduated from Polytech Lille in France with an engineering degree in microelectronics and material sciences.

As a Technology & Market Analyst, **Yohann Tschudi**, PhD is a member of the Semiconductor & Software division at Yole Développement (Yole). Yohann is daily working with Yole's analysts to identify, understand and analyze the role of the software parts within any semiconductor products, from the machine code to the highest level of algorithms. Market segments especially analyzed by Yohann include big data analysis algorithms, deep/machine learning, genetic algorithms, all coming from Artificial Intelligence (IA) technologies. After his thesis at CERN (Geneva, Switzerland) in particle physics, Yohann developed a dedicated software for fluid mechanics and thermodynamics applications. Afterwards, he served during 2 years at the University of Miami (FL, United-States) as a research scientist in the radiation oncology department. He was involved in cancer auto-detection and characterization projects using AI methods based on images from Magnetic Resonance Imaging (MRI). During his research career, Yohann has authored and co-authored more than 10 relevant papers. Yohann has a PhD in High Energy Physics and a master degree in Physical Sciences from Claude Bernard University (Lyon, France).

### About the report

#### **Sensing and Computing for ADAS vehicle 2020**

*Advanced Driver Assistance System functionality will attract customers and restart growth of the automotive business. – Performed by Yole Développement*

#### **Companies cited:**

AGC, Algolux, Altera, Ambarella, ams, Apple, Aptiv, Argo, ARM, Audi, Aurora, Avis, Baidu, Blackmore, Blickfeld, BMW, Bosch, BrightWayVision, Cambricon, Cepton, Chevrolet, Continental, Cruise, Delphi, Denso, Didi, Dodge, Excelitas, Fiat, First Sensor, Ford, Freescale, Fujitsu, Geely, GM, Google, Hella, Hitachi, Honda, Horizon Robotics, Hyundai, Hyundai-Mobis, Infineon, Innoviz, Jabil, Jaguar, Kalray, Koito, Kostal, Land Rover, Laser Components, Lattice, LeddarTech, Lexus, Lumileds, Luminar, Lumotive, Magna, Marelli, Maxel, May Mobility, Mazda, Melexis, Mercedes, Metawave, Micron, Mobileye, Nichia, Nidec, Nissan, NXP, Omnivision, OnSemiconductor, Osram, Ouster, Panasonic, Peugeot, Pioneer, Pony.ai, Porsche, Qualcomm, Quanergy, Renault, Robosense, Samsung, Seeing Machine, Seminex, Smart Eye, Sony, STMicroelectronics, Sunny Optical Technology, Tesla, Texas Instrument, Toshiba, Toyota, Trumpf, TSMC, Uber, Valeo, Velodyne, Veoneer, Volkswagen, Volvo, Waymo, Xenomatix, Xilinx, Xperi, ZF, ZKW and many more...

### Related reports

- [Imaging for Automotive 2019](#)
- [LiDAR for Automotive and Industrial Applications 2019](#)
- [The Audi A8 zFAS ADAS Platform by Aptiv](#)
- [Tesla Model 3 Driver-Assist Autopilot Control Module Unit](#)



## Press Release

### About Yole Développement

Founded in 1998, Yole Développement (Yole) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services and well as IP and patent analysis. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of companies has expanded to include more than 80 collaborators worldwide... [More](#)

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