

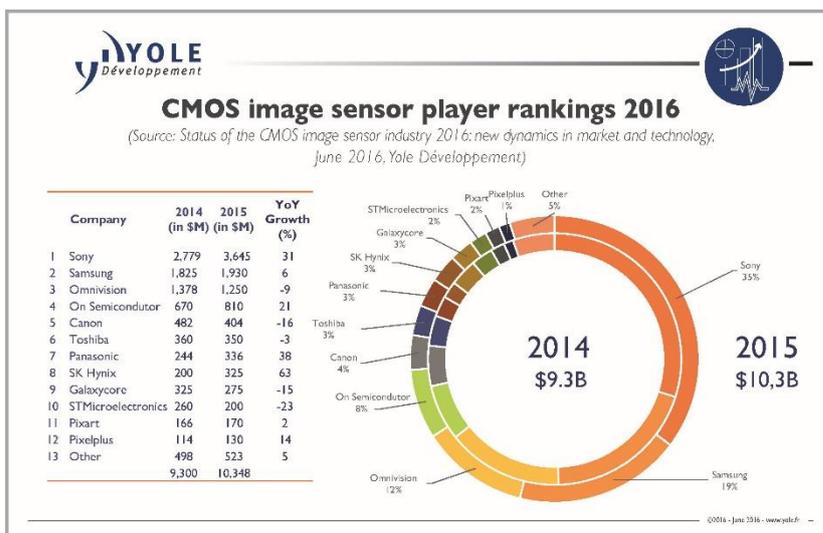
CMOS image sensor industry: new markets, new technology dynamics...

Status of the CMOS Image Sensor Industry 2016: New Market and Technology Dynamics report – June 2016

LYON, France – June 22, 2016: Driven by renewed mobile and automotive applications, the CIS¹ industry is expected to expand at a CAGR² of 10.4% from 2015 to 2021, reaching US\$18.8 billion market value by 2021. [Yole Développement \(Yole\)](#), the “More than Moore” market research and strategy consulting company, expects sustained growth of the CIS industry for the next five years. Increasing camera content in smartphones will more than offset slower smartphone volume growth. The trend for dual and 3D cameras will have a major impact on CIS volumes. While it is too early to fully describe the strategy of the main actors yet, some products are already on the market. What is the status of the CIS industry today? What will be the impact of the disruptive technologies? Beyond the technical challenges, who will be the winners? ...Under the [Status of the CMOS image sensor industry 2016: New market & technology dynamics report](#), **Pierre Cambou, Activity Leader, Imaging & Sensors at Yole** and **Jean-Luc Jaffard**, formerly at STMicroelectronics and part of Red Belt Conseil both pursue their investigation and propose you to discover the latest market & technology trends.

This 2016 edition comprehensively covers key market and technology

choices, announces Yole. Indeed with this new technology & market report, the consulting company proposes a powerful analysis of the CIS applications with a relevant market segmentation and detailed technology roadmap. Yole also points out the related sensor technologies per application and analyze the market positioning of the



¹ CIS : CMOS image sensor

² CAGR : Compound Annual Growth Rate

major CIS firms. This report presents the main drivers and challenges of the CIS industry.

One big story in 2016 is the consumer market, which is recovering from the total collapse of digital photography. While action cameras seem to have reached a ceiling, new applications such as drones, robots, virtual reality and augmented reality are ready to rejuvenate this emblematic market. The automotive camera market has established itself as a key growth market for CIS. The ADAS³ trend is further increasing pressure on vendors to provide sensors beyond their current technical capabilities. Image analysis is the new frontier and early usage of artificial intelligence is catching people's imagination. *"We are therefore in the middle of an explosive growth pattern that will not slow down before 2021,"* comment Pierre Cambou from Yole. *"An exceptionally high 23% CAGR is predicted in automotive for the 2015-2021 period."*

For similar reasons to automotive, namely increasing usage of image analytics and improved performance and productivity, the security, medical and industrial market are currently thriving and all deserve specific analysis.

"The CIS industry has become an attractive part of the semiconductor industry, generating more than US\$7 billion of mergers & acquisitions last year", asserts Pierre Cambou.

Big moves in the CIS industry have greatly modified the competitive landscape:

- Sony is now a market, production and technology leader.
- Samsung and Omnivision have remained strong.
- Notable mergers and acquisitions in 2015 include:
 - The purchase of Axis by Canon for US\$2.8 billion
 - Fairchild by On Semiconductor for US\$2.4 billion
 - And Omnivision by a Chinese investor consortium for US\$1.9 billion.
- Other notable news items are the sale of Toshiba's CIS business to Sony for US\$155 million and in 2016 Toshiba's medical business to Canon for US\$5.9 billion.

Sony truly demonstrated its leadership in 2015. Its capital expenditure hit US\$2 billion, a level never seen before. That Sony has 50% of the world's production capacity with 'only' 35% global market share shows its ambition. Its current lack of profitability shows that market pressure is extremely high. It is also in the middle of key transformative changes to adapt to the impressive growth of the last five years. Nevertheless Yole expects competition in CIS will remain relatively open as long as

³ ADAS : Advanced Driver Assistance Systems

the growth pattern is maintained and key technology changes occur almost every other year.

SK Hynix is a great example of how quickly a prominent position can be obtained. The company has propelled itself into the top 10 in very little time. It has been able to monetize the increasing resolution of smartphone front-facing cameras, therefore capturing business from Galaxycore and Omnivision.

Navigating through this pivotal time is difficult. Giant tech companies seem to rise and fall overnight.

Under this new report, Yole's analysts gives a global overview of key markets and technologies for CIS. It shows the present situation and the dynamic forces shaping the future. A detailed description of this technology & market analysis is available on i-micronews.com, [imaging reports section](#).



About [Status of the CMOS Image Sensor Industry 2016: New Market and Technology Dynamics](#) report

New functions are pushing change in CMOS image sensors, boosting the market toward \$18.8B in 2021 at 10.4% CAGR.

For more information about the report, please contact [David Jourdan](#) - Phone: +33 472 83 01 90

- About the authors:

From 1999, **Pierre Cambou** has been part of the imaging industry. Pierre took several positions at Thomson TCS which became Atmel Grenoble in 2001 and e2v Semiconductors in 2006. In 2012 he founded a start-up called Vence Innovation (now Irlinx) in order to bring to market a disruptive infrared interaction technology. He has an Engineering degree from Université de Technologie de Compiègne and a Master of Science from Virginia Tech. More recently he graduated from Grenoble Ecole de Management's MBA. He joined Yole Développement as Imaging Activity Leader in 2014.

From 1996 to 1999 **Jean-Luc Jaffard** paved the way of imaging activity at STMicroelectronics being at the forefront of the emergence and growth of this business. At STMicroelectronics Imaging division he has been appointed Research Development and Innovation Director managing a large multidisciplinary and multicultural team and was later on promoted Deputy General Manager and Advanced Technology Director in charge of identifying, sourcing or developing the breakthrough Imaging Technologies and Applications to transform them into innovative and profitable products. In 2010 he was appointed STMicroelectronics Intellectual Property Business Unit Director. In 2014 he created the Technology and Innovation branch of Red Belt Conseil, to support High Tech actors like SME, Research Institutes, Start-ups, Analysts, Investors and public authorities. Jean-Luc Jaffard owns multiple patents in semiconductor and Imaging domains and has been invited speaker in many conferences worldwide. He studied Electronic and Microelectronic and has been graduated from Ecole Supérieure d'Electricité of Paris in 1979.

- Companies cited in the report:

Almalence, Ambarella, Apple, Agilent, ARM, Axis, Basler, Bosch, Brigates, BYD, Caeleste, Canon, Clairpixel, Cmosis, Cognex, Continental, Core Photonics, Crysview, CSEM, Dongbu HiTek, DXO, Dynamax, e2v, Espros, Evg, Excelitas, Fairchild Imaging, FLIR, Forza Silicon, Fotonic, Foxconn, Fraunhofer, Fujitsu, GalaxyCore, Given Imaging, GoPro, Grace Valley, Hamamatsu, Hassellblad, Heliotis, Himax Imaging, Honeywell, Hoya, HTC, Huawei, SK Hynix, Image Lab, Imec, Infineon, Invisage, InvenSense, JVC Altasens, Kingpak, Lattice, Leap Motion, Leica, Lenovo, LFoundry, LG, Luxima, Lytro, Magna, Magneti Marelli, Mantis Vision, Medigus, Melexis, Mesa Imaging, Micron, Microsoft, Mobileye, Mobotix, Movidius, New Imaging Technologies, Nikon, NXP, Nvidia, Odos Imaging, Omnivision, Omron, On Semiconductor, Panasonic, Pelican Imaging, PerkinElmer, Philips, Pixart, PixelPlus, Pelco, PMD Technologies, Point Grey Research, Pyxalis, Raytrix, Rosnes, Samsung, Sanei Hytech, SETi, Sharp, SiliconFile, Sirona, Soft Kinetic, SK Hynix, SMIC, Siemens, Socionext, Softkinetics, Soitec, Sony, STMicroelectronics, SuperPix, Teledyne Dalsa, Teradyne, Tessera, Toshiba, Trixell, TSMC, Toshiba Teli, TowerJazz, Tridicam, UMC, Valeo, Videantis, Viimagic, WLCSP, Xiaomi, X-Fab, XinTec, ZTE and more....

About Yole Développement – www.yole.fr

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole Développement group has expanded to include more than 50 collaborators worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Nanomaterials, Power Electronics and Batteries & Energy Management.

The “More than Moore” company Yole and its partners System Plus Consulting, Blumorpho and KnowMade support industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

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