

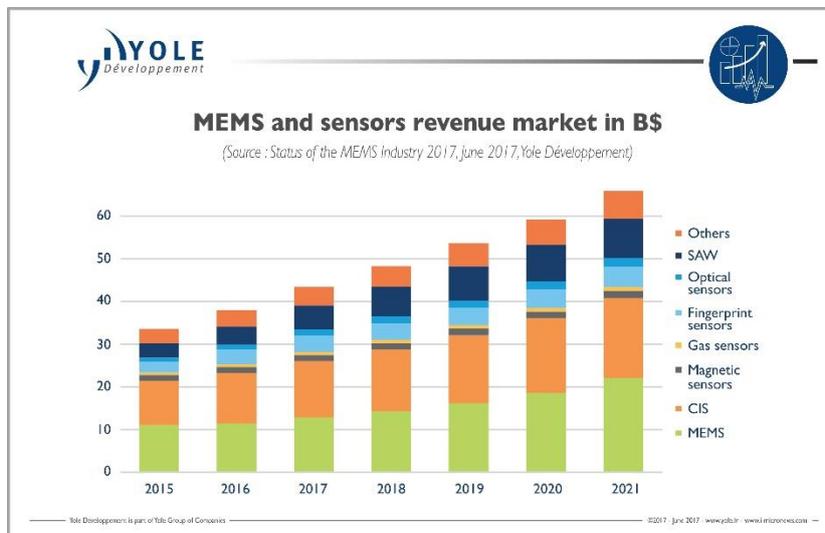


FOR IMMEDIATE RELEASE:

New market perspectives for the MEMS & sensors

Status of the MEMS Industry 2017 report – June 2017 – Yole Développement

LYON, France – 20 June 2017: “We have entered a time when MEMS¹ and semiconductor-based sensors, combined with increasing processing power, will bring exciting new applications such as AR/VR², autonomous vehicles, 3D sensing, and 5G communications,” explains Dr **Eric Mounier, Sr Technology & Market Analyst at Yole Développement (Yole).**



Yole releases this week its annual technology & market analysis focused on the MEMS & Sensors industry titled [Status of the MEMS Industry](#). Under this new edition, analysts propose for the first time an overview of the global sensors market with related market data and technology trends including MEMS, CIS, magnetic sensors, gas sensors, fingerprint sensors, optical sensors (ALS, proximity, RGB, TOF...), SAW filters...

Yole’s analysts are following more than 150 applications and tracking 300+ companies. This new report highlight the strategy of the MEMS & Sensors manufacturers including a companies’ ranking and market shares. Which applications are driving the growth of the market? What are the dynamics of the MEMS & Sensors players? What are the perspectives of this industry? Yole offers you today its understanding of the MEMS, sensors and actuators markets and applications.

A wide range of semiconductor-based sensors and actuators will be critical for the realization of future smart systems. The list includes imagers, magnetic sensors, chemical sensors, biometric sensors, optical sensors, RF³ devices and MEMS. Yole’s analysts estimated that

¹ MEMS : Micro Electro Mechanical Systems

² AR/VR : Augmented & Virtual Reality

³ RF : Radio-Frequency

the market for MEMS and sensor devices will grow from US\$38 billion in 2016 to US\$66 billion in 2021, which is an impressive 12% CAGR⁴. In volume, the number of sensors and actuators including SAW⁵ and BAW⁶ filters, oscillators, ink-jet heads, micro mirrors, and microfluidic devices will jump from 65 billion units to almost 138 billion units in 2021.

“In this buoyant market, MEMS technology still has the lion’s share,” confirms Dr Mounier from Yole. *“Indeed, MEMS comprises 30% of the value of the total sensor and actuator market in 2016 and will grow at 14% CAGR.”* Among diverse MEMS devices, RF MEMS, oscillators, silicon microfluidics and environmental MEMS will have impressive growth. Piezoelectric MEMS are also gaining momentum. Indeed, piezo thin-films offer new advantages, both in manufacturing and in new enabling usages. Thin-film lead zirconate titanate (PZT) is currently the material of choice for the piezo-ejection process. New foundry-offered services from companies like STMicroelectronics and Rohm could also deliver PZT fingerprint sensing. Thin-film PZT is already the choice for piezo MEMS fingerprint sensors manufactured by Qualcomm.

New MEMS devices are on the way, also enabled by piezo technology. MEMS micro-speakers based on PZT piezoelectric material, which could be the next disruptive technology in this industry, would offer advantages over traditional technology in terms of smaller size, batch processing, high performance and electronic integration. It could halve power consumption compared to voice-coil actuator speakers for portable and headphone applications. Manufactured in large volumes, they could provide a 40% to 80% cost reduction.

However, MEMS is not the only sensing technology. More demand is coming for optical sensors for 3D imaging and sensing such as time-of-flight sensing and LIDAR. For decades, 3D imaging and sensing has been implemented solely in high-end markets, featuring in medical, industrial and defense applications. But, the volume of 3D imaging and sensing devices manufactured is set to take off in 2017, propelled by initial entry into the smartphone market. Further, into the future this increase in volume will also be supported by computing, wearable and automotive applications.

Status of the MEMS Industry, 2017 edition is the result of a daily work of Yole’s analysts. Yole’s MEMS & Sensors team update its forecasts thanks to interviews and meetings with more than 3,500 companies every year. Aim of these discussions is to understand market trends, technical issues and developments, and strategic moves... Yole takes

⁴ CAGR : Compound Annual Growth Rate

⁵ SAW : Surface Acoustic Wave

⁶ BAW : Bulk Acoustic Wave

part in major trade shows and conferences to present its results. [Transducers 2017](#) taking place this week was part of Yole's 2017 agenda, with a dedicated presentation titled "MEMS & Sensors Industry Trends" (Speaker: **Claire Troadec, Technology & Market Analyst, Yole Développement**). [EMVA](#) (From June 22 to 24 - Prague, Czech Republic) focused on the machine vision industry is the next date with **Pierre Cambou, Activity Leader, Imaging at Yole Développement** ("*Machine Vision sensors & cameras competitive landscape*" on June 23 at 3.50 PM - [Program](#)). Yole is also part of [Sensors Expo. & Conference 2017](#) (From June 27 to 29 - San Jose, CA, United-States) program. Guillaume Girardin, Technology & Market Analyst at Yole proposes two presentations focused on MEMS & Sensors technology trends and IoT applications ([More info.](#)). All presentations made by Yole's analysts are available on [i-micronews.com](#). Stay tuned!

A detailed description of Status of the MEMS Industry, 2017 edition is available on [i-micronews.com, MEMS & Sensors reports section](#).



About [Status of the MEMS Industry 2017](#) report

With 14% market growth from 2017-2022, MEMS remain the backbone of the sensor industry – This report has been performed by Yole Développement (Yole) part of Yole Group of Companies.

Companies cited in the report:

AAC, AKM, Alps Electric, Amphenol, AMS, Analog Devices, Apple, Asia Pacific Microsystems, Boehringer Ingelheim Microparts, Bosch, Broadcom, Canon, Colibrys, Cyrrus Logic, Denso, DRS, Epcos, Epson, First Sensor Technology, Flir Systems, Formfactor, Fujifilm Dimatix, Funai, Gettop, Globalfoundries, Goertek, Hewlett Packard, Hitachi Automotive, Honeywell, IMT, Infineon Technologies, Kistler, Knowles Electronics, Kulite, Maxim, Mcube, Meggitt Sensing Systems, Melexis, Memjet, Memscap, Memsensing, Memsic, Micralyne, Microvision, Murata, NXP, Omnivision, Omron, On Semi, Panasonic, Qorvo, Qualcomm, Raytheon, Rohm, Samsung, SCD, SDI, Semefab, Sensata, Sensirion, Sensoror, Si Time, Silex Microsystems, Silicon Sensing Systems, Smic, Sony, Stmicroelectronics, TDK, TE, Teledyne Dalsa, Texas Instruments, Tower Jazz, Tsmc, Ulis, Umc, Utc Aerospace System, X Fab, Yamaha and many more

Author:

Dr. Eric Mounier has a PhD in microelectronics from the INPG in Grenoble. He previously worked at CEA LETI R&D lab in Grenoble, France in marketing dept. Since 1998 he is a cofounder of Yole Développement, a market research company based in France. At Yole Développement, Dr. Eric Mounier is in charge of market analysis for MEMS & Sensors, visible and IR imagers (CIS, microbolometers), semiconductors, printed electronics and photonics (e.g. Silicon photonics). He has contributed to more than 200 marketing & technological analysis and 100 reports. Eric is also an expert at the OMNT («Observatoire des Micro & Nanotechnologies») for Optics.



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, RF Electronics, Solid-State Lighting, Displays, Image Sensors, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Nanomaterials, Power Electronics and Batteries & Energy Management.

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

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