LYON, France – Sep. 5, 2016: This year again, both market segments, high end and low end, are the main targets of the TSV technologies providers. In its latest advanced packaging technology and market analysis entitled 3DIC and 2.5D TSV Interconnect for Advanced Packaging: 2016 Business Update report, Yole Développement (Yole) announces, high volume production started: 3D TSV is a reality, especially in the memory industry. Amongst a dynamic advanced packaging market showing an overall advanced packaging revenue CAGR estimated at 8%, rising to US$ 30 billion in 2020, the development of TSV platforms is still pushed by the need to the increase of performance, functionalities and integration; in addition, form factor and cost reduction are also part of the playground.

The More than Moore market research and strategy consulting company proposes today an overview of the 3D/2.5D IC packaging technologies per application. In addition to wafer forecast for 2015-2021 for different TSV applications, Yole’s analysts review the status of the current and future 3D IC products. They also describe and analyze the dedicated technology roadmap per device and highlight the organization of this market including supply chain activities, list of key players and OSAT and foundry strategies.

3D TSV technology is becoming a key solution platform for heterogeneous interconnection, high end memory and performance applications… Discover today the status of the market.

The higher end market segment is led by 3D stacked memories, 2.5D integration and emerging application such as photonics. From its side,
the low end application includes CIS, MEMS devices and other sensors and new applications such as LEDs.

TSVs have now become the preferred interconnect choice for high-end memory. They are also an enabling technology for heterogeneous integration of logic circuits with CIS, MEMS, sensors, and RF filters. In the near future they will also enable photonics and LED function integration.

“The market for 3D TSV and 2.5D interconnect is expected to reach around 2.1 million wafers in 2021, expanding at an 18% CAGR,” asserts Santosh Kumar, Senior Technology & Market Analyst at Yole. The growth is driven by increased adoption of 3D memory devices in high-end graphics, high-performance computing, networking and data centers, and penetration into new areas, including fingerprint and ambient light sensors, RF filters and LEDs.

CIS still commanded more than 80% share of TSV market wafer volume in 2015, although this will decrease to around 56% by 2021. This is primarily due to the growth of the other TSV applications, led by 3D memories, RF filters and fingerprint sensors. However, hybrid stacked technology, which uses direct copper-copper bonding, not TSVs, will penetrate around 38% of CIS production by 2021. The TSV markets for RF filters and fingerprint sensors are expected to reach around US$2.6 billion and US$0.7 billion by 2021 respectively.

Under this new report, Yole’s analysts also highlight the diversity of business models within the 3D & 2.5D TSV supply chain. They identify:
- **IDMs** with Samsung, Micron, Freescale, Sony, Toshiba, STMicroelectronics…
- **OSATs** including SPIL, Amkor Technology, ASE, Powertech…
- **CMOS foundries** with TSMC, SMIC and more.

Si interposers suppliers, 3D packaging foundries and R&D services are also part of the business models identified by Yole’s analysts.

So will 3D TSV open the doors for new strategies? Indeed each player has its own approach:
- Both OSATs, Amkor Technology and SPIL are strongly involved in the memory and the MEMS & Sensor market.
- In parallel Samsung, an IDM, is well positioned in the CIS, Si interposer and LED market segments only.
- In addition no foundries for memory products have been identified by Yole’s advanced packaging team.

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4 CIS : CMOS image sensor  
5 MEMS : Micro Electro Mechanical Systems  
6 RF : Radio frequency  
7 CAGR : Compound annual growth rate  
8 IDM : Integrated Devices Manufacturer  
9 OSAT : Outsourced Semiconductor Assembly & Test company
Amongst the numerous 3D & 2.5D TSV players, Micron, SKHynix, Samsung, AMS and Avago Technologies are investing in capex… A detailed analysis per player is available in Yole’s report, especially the OSATs and foundries strategies, that are willing to increase their market shares for TSV applications.

According to Yole’s analysts, 3DIC & 2.5D TSV continue its attractive growth. Under a dynamic ecosystem, a lot of valuable companies are involved in this field and propose innovative solutions. Because of the increasing consumer market, as well as the need for higher performance products such as 4K gaming, networking, 2.5D/3D TSV packaging platform becomes a key solution platform.

During the Electronics Packaging Technology Conference (EPTC) taking place from November 30 to December 3 in Singapore, Yole’s expert, Santosh Kumar will present his vision of the 3DIC & 2.5D TSV industry. His presentation is entitled: “What’s happening in TSV based 3D/2.5D IC packaging: Latest market & technology trends”. Discover the program and register on EPTC 2016.

More detailed information about Yole’s report is available on i-micronews.com, advanced packaging reports section.
About the **3DIC and 2.5D TSV Interconnect for Advanced Packaging: 2016 Business Update** report

3D TSV technology is becoming a key solution platform for heterogeneous interconnection, high end memory and performance applications.

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- **About the author:**

  Santosh Kumar is currently working as Senior Technology and Market Research Analyst at Yole Développement, the «More than Moore» market research and strategy consulting company. He worked as senior R&D engineer at MK Electron Co. Ltd, where he was engaged in electronics packaging materials development and technical marketing. His main interest areas are advanced electronic packaging materials and technology including TSVs and 3D packaging, modeling and simulation, reliability and material characterization, wire bonding and novel solder materials and processes.

  He received bachelor’s and master’s degrees in engineering from the Indian Institute of Technology (IIT), Roorkee and University of Seoul respectively. He has published more than 20 papers in peer-reviewed journals and has obtained two patents. He has presented and given talks at numerous conferences and technical symposiums related to advanced microelectronics packaging.

- **Companies cited in the report:**


About Yole Développement – [www.yole.fr](http://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, along with 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 grow their business.

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