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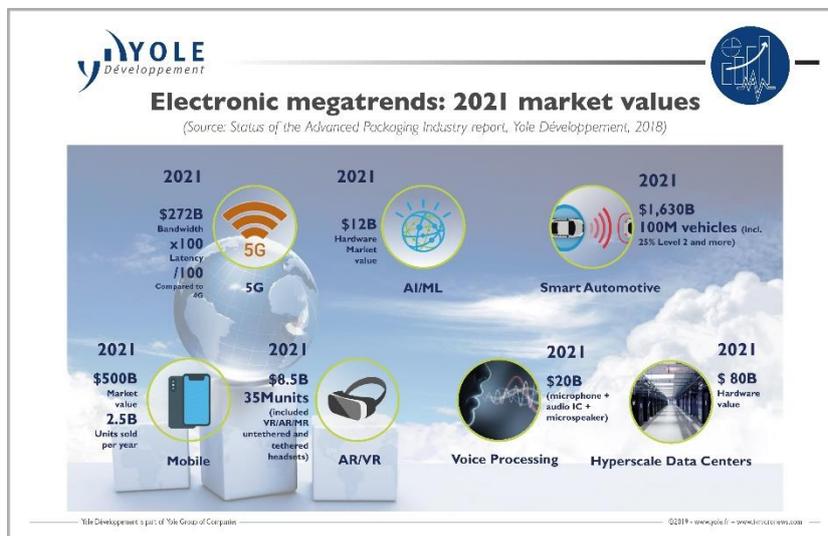
### Advanced packaging: at the heart of innovation

Advanced Packaging & System Integration  
Technology Symposium - April 22&23 – Shanghai,  
China

Source: Status of the Advanced Packaging Industry report, Yole Développement, 2018



**LYON, France – February 14, 2018:** The semiconductor industry showed impressive figures in 2017: +21.6% YoY<sup>1</sup> growth to reach about US\$ 412 billion. Without any doubt, the industry is entering a new age, where innovation and disruption are the key words. In addition to mobile, [Yole Développement \(Yole\)](#) analysts identified emerging mega-drivers that are step by step changing our world. Big data, AI<sup>2</sup>, 5G, HPC<sup>3</sup>, IoT<sup>4</sup>, smart automotive, industry 4.0, datacenters and more..., all mega-trends becoming part of our day to day life, with a direct impact on the semiconductor industry and its supply chain. But not only... In its latest report, Status of the Advanced Packaging Industry, Yole predicts an impressive US\$39 billion advanced packaging market in 2023 with 7% CAGR...<sup>56</sup>



“The advanced packaging is also driven by the wind of changes, due to the impressive impact of the megatrends,” explains **Emilie Jolivet, Division Director, Semiconductor & Software at Yole.** “Yole and NCAP China have decided to combine their expertise this year again to propose the Advanced Packaging & System Integration Technology Symposium in Shanghai, prior NEPCON China. This Shanghai

edition will be the place to be to understand the industry evolution and measure the impact of the megatrends”.

[NCAP CHINA](#) and Yole build an innovative program fully dedicated to the advanced packaging industry: the [Advanced Packaging &](#)

<sup>1</sup> YoY: Year to Year

<sup>2</sup> AI: Artificial Intelligence

<sup>3</sup> HPC: High Performance Computing

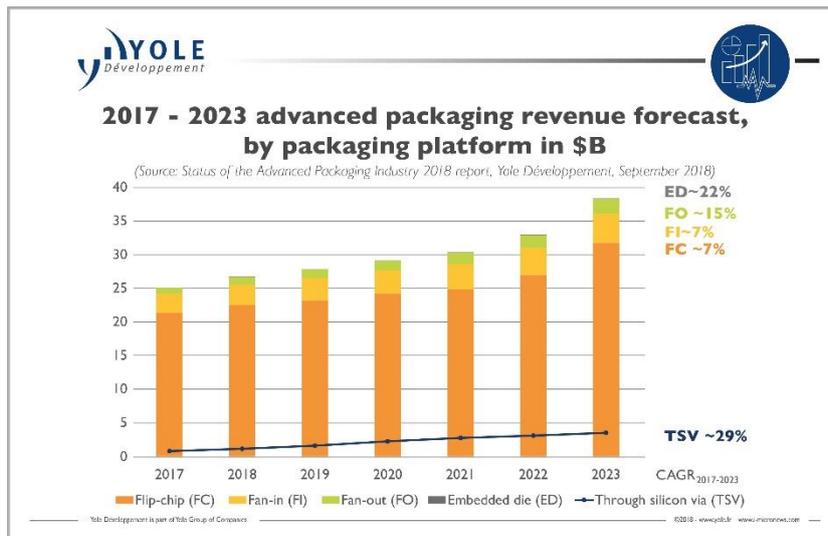
<sup>4</sup> IoT: Internet of Things

<sup>5</sup> Source : [Status of the Advanced Packaging Industry report](#), Yole Développement, 2018

<sup>6</sup> CAGR : Compound Annual Growth Rate

**System Integration Technology Symposium** takes place in Shanghai, China, from April 22 to 23, 2019, prior to NEPCON China 2019. During 2 days, all packaging aspects, including Panel Level, Fan-Out, SiP<sup>7</sup>, Advanced Substrates and 3D Technology, will be discussed. A focus on key applications such as AI, HPC, memory, transportation (48V, EV/HEV<sup>8</sup>, embedded die packaging platform, PCB<sup>9</sup>, advanced substrates...), 5G and consumer (WLP<sup>10</sup> and Fan-Out platforms)... will be at the heart of the conference.

Both partners invite you to meet the leading executives and gain an in-depth understanding of the market evolution! [More info.](#)



Mega-trends create huge business opportunities amongst various advanced packaging platforms. Therefore, advanced packaging technologies are just ideal for fulfilling numerous performance and complex heterogeneous integration needs.

“Two advanced packaging roadmaps are foreseen: scaling and functional,” asserts

**Santosh Kumar, Principal Analyst & Director Packaging, Assembly & Substrates, Yole Korea.** “And the semiconductor industry is developing products for both of them. Advanced packaging is seen as a way to increase the value of a semiconductor product, adding functionality, maintaining/increasing performance while lowering cost...”

Both roadmaps developed by the Semiconductor & Software team at Yole, hold more multi-die heterogeneous integration, called SiP, and higher levels of package customization in the future. A variety of SiP solutions is developing in both high and low end, for consumer, performance and specialized applications. Heterogeneous integration has clearly created opportunities for both the substrate and WLP based SiP...

More than that. The advanced packaging supply chain is also involved in this fantastic story. Leading companies, startups, R&D institutes, the worldwide advanced packaging industry is playing the game. In order to expand the business, explore new areas and prepare for future uncertainty, advanced packaging players are moving to different business models:

<sup>7</sup> SiP: System in Package

<sup>8</sup> EV/HEV : Electric Vehicle / Hybrid Electric Vehicle

<sup>9</sup> PCB : Printed Circuit Board

<sup>10</sup> WLP : Wafer Level Packaging

- Some IDMs<sup>11</sup> such as Intel are entering the foundry business to leverage their front-end technology expertise and create additional revenue stream by utilizing their excess capacity. Samsung, SK Hynix are also part of the playground...
- OEMs<sup>12</sup>, software and service companies are designing their own chips and controlling the supply chain of equipment & materials related to it. Betting on mega-trends such as AI, some OSATs<sup>13</sup> are expanding into the fablite business model.
- Pure play foundries including TSMC, XMC, UMC and SMIC are entering the high-end packaging business to provide turnkey solution to their customers.
- OSATs, such as Amkor Technology, JCET/STATS ChipPAC, ASE, SPIL, Powertech Technology..., are directing considerable efforts in developing advanced wafer level and 3D IC packaging capability to support requirements for scaling & density. OSATs are expanding their testing expertise & traditional pure test players are investing in assembly and packaging capability.
- Substrate manufacturers are penetrating the advanced packaging area with panel-level fan-out packaging and embedded die in organic laminate.

It is a fact. Advanced packaging is at the heart of innovation. Mega-trend applications are bringing new challenges, and leading advanced packaging companies from all over the world will come to exchange ideas on their vision and future perspectives at the [Advanced Packaging & System Integration Technology Symposium](#).

**Dr Cao LiQiang, NCAP's CEO asserts:** *“Under the background of China 13th Five-Year Plan and Made in China 2025, local organizations, including NCAP, focus on the core technology development for semiconductor industry and make big progresses. Promoting international communication as well as global cooperation on advanced packaging is the goal shared by Yole and NCAP, and the reason why we insist to organize the activity and make it an annual big event. With good reputations, hot topics and insightful presentations, we firmly believe that 2019 symposium will be a success. Don't miss the opportunity to learn technology trend and expand your business at China.”*

Yole and NCAP have created an unprecedented program to understand the status of the advanced packaging industry and help the companies to be part of the 'tomorrow' industry. The Advanced Packaging & System Integration Technology Symposium is unique. [Don't miss it!](#)

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<sup>11</sup> IDM : Integrated Devices Manufacturer

<sup>12</sup> OEM : Original Equipment Manufacturer

<sup>13</sup> OSAT : Outsourced Semiconductor Assembly and Test

For more information about the Symposium (Program, list of speakers, networking and sponsoring), please contact **Camille Veyrier, Dir. Marketing & Communication, Yole Développement.**

**ABOUT THE REPORT:****Status of the Advanced Packaging Industry**

In the era of a slowing Moore's Law, advanced packaging has emerged as the savior of future semiconductor development. – Produced by Yole Développement (Yole).

**Companies cited in the report:**

Altera, Amkor, Analog Devices, Ardentec, Atmel, AOI Electronics, Apple, ARM, ASE, Avago, Broadcom, Carsem, China WLCSP, Chipbond, ChipMOS, Cisco, Cypress Semiconductor... [Full list](#)

**Author:**

**Santosh Kumar** is Director of Packaging, Assembly, and Substrates at Yole Korea. He is involved in the market, technology, and strategic analysis of microelectronic assembly and packaging technologies. His main interest areas are advanced IC packaging technology, including equipment and materials. He has also authored several reports on fan-out/fan-in WLP, flip chip, and 3D/2.5D packaging.

Santosh received a bachelor's degree and master's degree in Engineering from the Indian Institute of Technology (IIT) Roorkee and the University of Seoul, respectively. He has published more than 40 papers in peer-reviewed journals and has obtained two patents. Moreover, Santosh has presented and given talks at numerous conferences and technical symposiums related to advanced microelectronics packaging.

**ABOUT NCAP**

The National Center for Advanced Packaging Co., Ltd. (NCAP China) is a joint venture established by ten investors, including the leaders of the IC packaging and testing industry in China. NCAP's goal is to establish a world class R&D center for advanced packaging and system integration, play a leading role in the development and marketing of advanced technologies for microelectronics packaging and system integration, and promote and sustain the technological and commercial progress of the microelectronics industry in China.

As a national center for advanced packaging, testing and system integration, NCAP, in collaboration with system OEMs and supply chain partners, aggressively pursues research and development in order to offer complete solutions for the IC industry. NCAP's current research areas include: 2.5D/3D technology (including TSV), high-density wafer level packaging, SiP product development capabilities, and certain advanced materials and equipment technologies for microelectronics packaging.

The NCAP R&D platform includes a 3200-m<sup>2</sup> fully equipped cleanroom, for 300mm wafer size, for 2.5D/3D IC backend processes, and packaging assembly, testing and reliability, as well as design and simulation capabilities. More information on [www.ncap-cn.com](http://www.ncap-cn.com).

**ABOUT YOLE DEVELOPPEMENT**

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 covering MEMS & Sensors - Imaging - Medical Technologies - Compound Semiconductors - RF Electronics - Solid State Lighting - Displays - Photonics - Power Electronics - Batteries & Energy Management - Advanced Packaging - Semiconductor Manufacturing - Software & Computing and more...

The "More than Moore" market research, technology and strategy consulting company Yole Développement, along with its partners System Plus Consulting, PISEO and KnowMade, support industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to grow their business. For more information, visit [www.yole.fr](http://www.yole.fr) and follow Yole on [LinkedIn](#) and [Twitter](#).

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