



FOR IMMEDIATE RELEASE:

MicroLEDs for displays: how we can make it happen

MicroLED Displays: hype and reality | Hopes & challenges – Webcast on March 29, 5:00 PM CET

LYON, France – March 22, 2017: Many large companies and startups are currently working on microLED technologies for display applications: from LED makers such as Epistar, Nichia or Osram to display makers like AUO, BOE or CSOT and OEMs¹ such as Apple or Facebook/Oculus. Due to the multiplicity of players and the diversity of strategies, [KnowMade](#), part of Yole Group of Companies underlines a complex and heavy patent landscape. “Enabling large scale microLED displays manufacturing requires to bring together 3 major disparate know-how and supply chain bricks including LED manufacturing, display manufacturing and technology transfer & assembly”, asserts **Dr Eric Virey, Senior Technology & Market Analyst at [Yole Développement \(Yole\)](#)**, part of Yole Group of Companies. The microLED displays supply chain is therefore still under construction: the participants have to find the way to collaborate together and define the most efficient manufacturing approach.

While very promising in terms of performance, there are still multiple manufacturing challenges that need to be addressed to enable cost effective, high volume manufacturing of microLED displays. Based on its latest [microLED display technology & market report](#)², the “More than Moore” market research and strategy consulting company Yole proposes a live event titled [Microled Displays: hype and reality | Hopes & challenges](#). Taking place on March 29 at 5:00 PM CET this webcast powered by I-micronews.com welcomes Dr Eric Virey from Yole. During this event, Dr Virey will expose the technical challenges and market opportunities of the microLED technologies. To register, click [MicroLED Display](#).



“Even if the remaining technology roadblocks are removed, no company beside Apple and its startup Luxvue acquired in 2014 currently appear to have the positioning and leverage to enable the supply chain,” comments Yole’s expert. So what could happen?

¹ OEM : Original Equipment Manufacturers

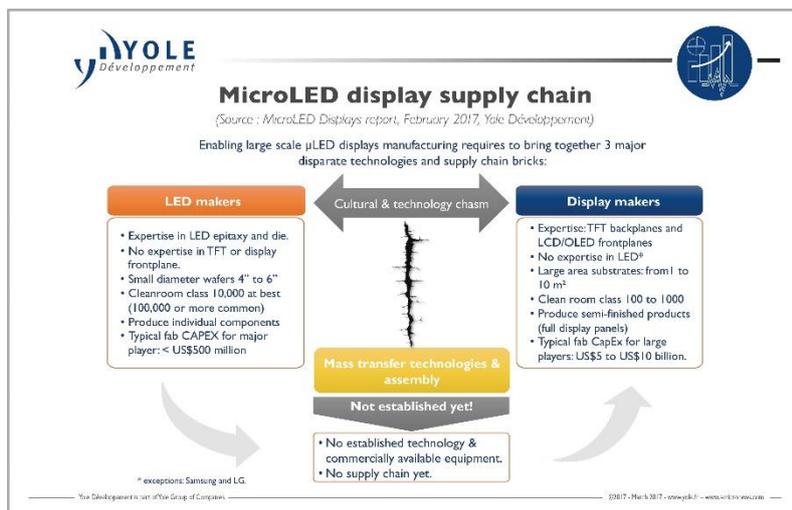
² [MicroLED Display](#) report, Yole Développement, February 2017

If successful, microLED displays could have a profound impact on both the LED and display supply chains. Indeed, the development of large scale microLED displays requires the combination of three major disparate technologies: LED, TFT³ backplane and chip transfer. The supply chain is complex and lengthy compared with that of traditional displays.

Each process is critical and managing every aspect effectively will be challenging. “No single player can solve all the issues and it seems unlikely that any will fully vertically integrate”, comments Dr Virey from Yole. And he details:

- Small companies could bring together the different technologies to serve the AR/MR⁴ market, but for high volume consumer applications such as mobiles or TVs, only a strong push from a leading OEM can enable a supply chain.
- Apple has a unique market positioning: and appears to be the most likely candidate with enough leverage and financial strength to bring all partners together.
- Other candidates including Oculus for example, have also invested in microLEDs for AR/MR applications.

So what will be the next step? Yole confirms: each company will attempt to capture as much added value as it can.



For LED makers, low defect requirements and high resolution features of microLED mean large investments in new clean room and lithography equipment which might be better suited to CMOS⁵ foundries.

Traditional display makers are used to manufacturing both back and front planes in an integrated fashion and delivering finished panels to OEMs. With microLEDs, they will push back against becoming component

suppliers, only providing a TFT backplane to whichever participant will produce the final display assembly: OEMs or OSAT⁶ players.

In parallel, some companies will benefit from microLED displays independently of how the supply chain is shaped. These beneficiaries include MOCVD⁷ reactor and other LED equipment manufacturers as well as wafer suppliers...

So what's missing? The science is here... During the [MicroLED Displays](#) webcast, speaker Dr Eric Virey will discuss about technologies and applications. What are the added-value of microLED technologies? What are the drawbacks for display applications? To discover the program and register, click [MicroLED Displays](#).

³ TFT : Thin-Film Transistor

⁴ AR/MR : Augmented Reality / Mixed Reality

⁵ CMOS: Complementary Metal Oxide Semiconductor

⁶ OSAT : Outsourced Semiconductor Assembly and Test

⁷ MOCVD : Metal-Organic Chemical Vapor Deposition



About **MicroLED Displays** report

Hype and reality: hopes for smartwatches and beyond must overcome technical and manufacturing challenges.

▪ Author:

Dr Eric Virey serves as a Senior Market and Technology Analyst at Yole Développement (Yole), the “More than Moore” market research and strategy consulting company. Eric is a daily contributor to the development

of LED, OLED, and Display activities at Yole, with a large collection of market and technology reports as well as multiple custom consulting projects: business strategy, identification of investments or acquisition targets, due diligence (buy/sell side), market and technology analysis, cost modelling, technology scouting, etc. Thanks to its deep knowledge of the LED/OLED and displays related industries, Eric has spoken in more than 30 industry conferences worldwide over the last 5 years. He has been interviewed and quoted by leading media over the world. Previously Eric has held various R&D, engineering, manufacturing and business development positions with Fortune 500 Company Saint-Gobain in France and the United States.

Dr Eric Virey holds a PhD in Optoelectronics from the National Polytechnic Institute of Grenoble.

▪ Companies cited in the report:

Aledia (FR), Allos Semiconductor (DE), Apple (US), AUO (TW), BOE (CN), CEA-LETI (FR), CIOMP (CN), Columbia University (US), Cooledge (CA), Cree (US), CSOT (CN), eMagin (US), Epistar (TW), Epson (JP), Facebook (US), Foxconn (TW), Fraunhofer Institute (DE), Glo (SE), GlobalFoundries (US), Goertek (CN), Hiphoton (TW), HKUST (HK), HTC (TW), Ignis (CA), InfiniLED (UK), Intel (US), ITRI (TW), Kansas State University (US), Kopin (US), Lumiod (US), Luxvue (US), Metavision (US), Microsoft (US), Mikro-Mesa (TW), mLED (UK), Nichia (JP), Nth Degree (US), Oculus (US), Osterhout Design Group (US), Osram (DE), Ostendo (US), Playnitride (TW), PSI Co (KR), Rohinni (US), Saitama University (JP), Samsung (KR), Sanan (CN), Semprius (US), Sharp (JP), Sony (JP), Strathclyde University (UK), Sun Yat-Sen University (TW), Texas Tech (US), TSMC (TW), Tyndall National Institute (IE), University of Illinois (US), VerLASE (US), VueReal (CA), Vuzix (US), X-Celeprint (IE) and many 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, 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, 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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