LYON, France – November 26, 2018: The excitement about microLEDs has grown exponentially since Apple acquired technology startup Luxvue in 2014. All major display makers have now invested in the technology and other semiconductor or hardware companies such as Intel, Facebook Oculus or Google have joined the pool. Amidst this flurry of news and activity, a new term emerged in early 2017: miniLED. But more than size, the technology and manufacturing infrastructure requirements and the applications clearly differentiate microLEDs and miniLEDs.

Under this dynamic ecosystem, the market research and strategy consulting company, Yole Développement (Yole), releases a dedicated technology & market analysis focused on miniLEDs for display applications. Entitled MiniLED for Display Applications: LCD & Digital Signage, this report provides a detailed analysis of miniLED technologies in two major display applications: high performance LCDs and narrow pixel pitch LED direct view display digital signage. Yole’s analysts present a comprehensive understanding of miniLED display technologies and describe their competitive landscapes and supply chains.

MiniLED vs. MicroLED: are they the same technologies? Are the applications identical? Contrary to MicroLEDs, miniLEDs can easily be manufactured in existing fabs, even though they might require new equipment to enable cost-effective assembly. So who is doing what? What are the market drivers? Does a dedicated supply chain already exist? MiniLEDs advantages are two-fold in terms of applications: they bring new strength to LCD players in the battle against OLED, and they enable increased LED adoption for digital signage, announce Yole’s analysts. Discover today a snapshot of the miniLED industry,
For smartphone applications, miniLEDs are facing a strong incumbent in OLEDs, as their cost to performance ratio has already gained the technology a strong position in high-end/flagship segments. OLED is expected to further increase its share and become dominant as the number of suppliers and global capacity increase dramatically over the next five years and cost continues to drop.

MiniLEDs, however, have a card to play in various small to mid-size high added-value display segments, where OLEDs have been less efficient at overcoming its weaknesses such as cost, lack of availability and longevity issues such as burn-in or image retention. For example, in high-end monitors for gaming applications, miniLEDs could bring excellent contrast, high brightness and thin form factors at lower cost than OLEDs.

“The automotive segment is especially compelling, first because of its strong growth potential in terms of volume and revenue, and also because miniLEDs can deliver on every aspect auto-makers are aspiring to: very high contrast and brightness, lifetime, conformability to curved surfaces and ruggedness,” comments Eric Virey, PhD, Senior Market & Technology Analyst at Yole.

Regarding the last point on ruggedness, miniLED based LCDs offer significant benefits over OLEDs since they only use proven technologies, LED backlights and liquid crystal cells, not much different from already established LCDs. Automakers therefore do not have to make a leap of faith and hope the new technology will meet the demanding lifetime, environmental and operating temperature specifications they require.

On the TV side, miniLEDs could help LCDs bridge the gap and regain market share against OLEDs on the highly profitable high-end segment. “This opportunity is all the more enticing to panel and display makers that have not invested in OLED technologies and see the potential to extend the lifetime and profitability of their LCD fabs and technologies,” explains Zine Bouhamri, PhD, Technology & Market Analyst at Yole.

For direct view LED displays, miniLEDs used in conjunction with COB architecture could enable higher penetration of narrow pixel pitch LED displays in multiple applications, hence increasing the serviceable market. Die size will evolve continuously toward smaller dimensions,

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4 COB: Chip On Board
possibly down to 30-50µm in order to reduce cost. Adoption in cinema is still highly uncertain but even modest adoption rates would generate very significant upsides.

A detailed description of Yole’s miniLEDs for display application report is available on i-micronews.com, display reports section.
ABOUT THE REPORT:

MiniLED for Display Applications: LCD and Digital Signage

MiniLEDs bring new strength to LCD players in the battle against OLED and enable increased LED adoption on digital signage. – Produced by Yole Développement (Yole)

Companies cited in the report:

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- **As a Technology & Market Analyst, Displays, Zine Bouhamri, PhD** is a member of the Photonics, Sensing & Display division at Yole Développement (Yole). Zine manages the day to day production of technology & market reports, as well as custom consulting projects. He is also deeply involved in the business development of the Displays unit activities at Yole. Previously, Zine was in charge of numerous R&D programs at Aledia. During more than three years, he developed strong technical expertise as well as a detailed understanding of the display industry. Zine is author and co-author of several papers and patents. Zine Bouhamri holds an Electronics Engineering Degree from the National Polytechnic Institute of Grenoble (France), one from the Politecnico di Torino (Italy), and a Ph.D. in RF & Optoelectronics from Grenoble University (France).

- **Eric Virey**, PhD serves as a Senior Market and Technology Analyst at Yole Développement (Yole), within the Photonics & Sensing & Display division. Eric is a daily contributor to the development of LED, OLED, and Displays activities, with a large collection of market and technology reports as well as multiple custom consulting projects. Thanks to its deep technical knowledge and industrial expertise, 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 Ph-D in Optoelectronics from the National Polytechnic Institute of Grenoble.

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 - Memory 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](https://www.linkedin.com/company/yole-developpement/) and [Twitter](https://twitter.com/yole_developpe).  

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