



FOR IMMEDIATE RELEASE:

Edge Emitting Lasers (EEL): Yole’s analysts point out the emergence of potential killer applications

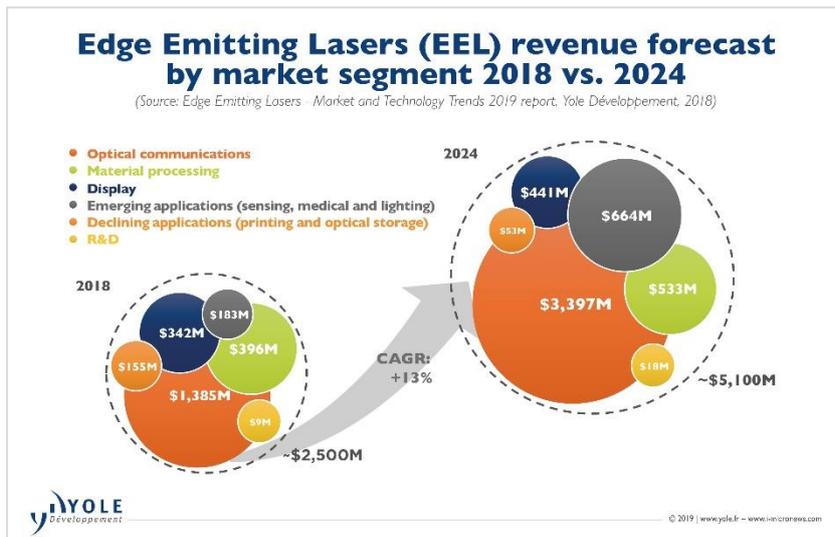
Extracted from: Edge Emitting Laser Market & Technology Trends report, Yole Développement, 2019

LYON, France – May 21, 2019: Last year, EELs represented a US\$2.5B market, announces [Yole Développement \(Yole\)](#) in its latest technology & market analysis, [EEL market and technology trends](#) published last month.

“This figure should reach more than US\$5B by 2024 with a 13% CAGR¹ between 2018 and 2024”, comments **Martin Vallo, PhD., Technology & Market Analyst at Yole**. “Indeed the growth is still driven by the optical communication market segment with optical systems for datacom and telecom. It is today the largest EELs segment with 56% of the total revenue in 2018.” However, some killer applications emerge in parallel...

The market research and strategy consulting company Yole pursues its investigations towards the SSL² world. Analysts combine their expertise from materials to devices including equipment to get a deep understanding of this industry and the status of the technologies. They perform valuable photonic technology and market reports to identify technical breakthroughs and business opportunities. VCSEL³, GaAs⁴ and EEL are part of the collection of reports proposed by Yole today. The new EEL market & technology report aims to give a

comprehensive account of the forces driving the EEL industry in the short, middle and long term. The analysts propose an overview of the global landscape of EELs in terms of laser systems for different applications. They also provide a detailed description of the technology and different types of EELs. This report reviews selected applications of EELs with insights into the basic principles, typical lasers used



¹ CAGR: Compound Annual Growth Rate
² SSL: Solid-State Lighting
³ VCSEL: Vertical Cavity Surface-Emitting Laser
⁴ GaAs: Gallium Arsenide

and their characteristics, in addition to market forecasts for EEL sources between 2017 and 2024.

Without doubts, fast growing new applications are driving the EEL industry. Yole’s analysts invite you to discover the global EEL landscape and its latest market and technical challenges.

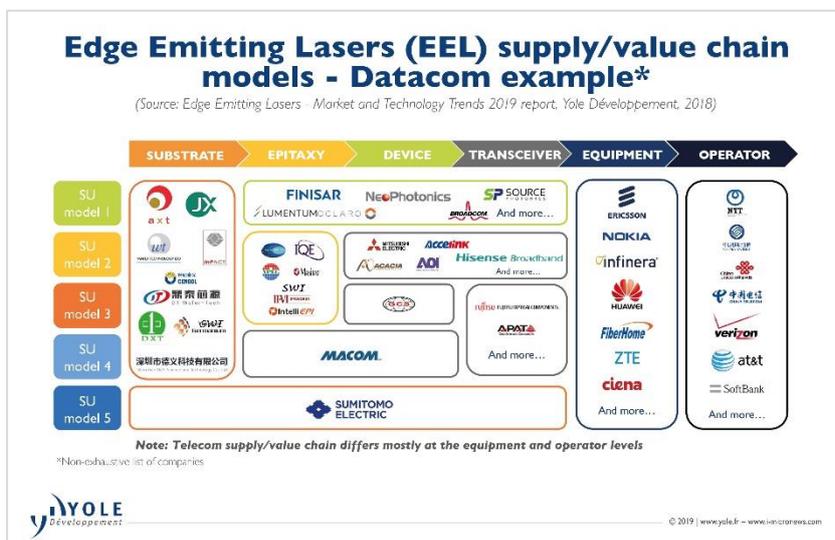
Since the development of lasers in the 1960s, they have been increasingly used in a large number of applications. This has propelled the laser market to a trillion dollar business since the 1990s. Nowadays, laser technologies are ubiquitous in plenty of traditional, as well as emerging, applications. These span material processing, optical communications, automotive front lighting, medical surgery and 3D sensing. The laser landscape is highly fragmented, with a wide variety of laser types, including diode lasers, fiber lasers, DPSSLs⁵, CO₂ lasers and excimer lasers. Traditional applications cover industrial, scientific, consumer markets, but there are also many peculiar applications including military and biomedical markets with spectroscopic analysis.

“EELs are showing different functionalities: they can be used a “direct” lasers or coupled with optical fibers or crystals to make fibre-lasers or DPSSLs”, details Martin Vallo from Yole. “As a consequence number of applications is impressive. Optical communication, material processing, medical, sensing, printing, display, optical storage and lighting... all market segments have been deeply analyzed in this new EEL report”.

Further the impressive optical communication market segment, material processing and display applications are also substantial, making up 16% and 14% of the market respectively in 2018. However, their market shares will decline in the future as 3D sensing in LiDAR, and face/gesture recognition, medical and lighting applications emerge in

the next five years. Those might represent potential killer applications for EELs in the middle/long term...

The EEL business has clearly a bright future. But it also represents a challenging market for the industry. *“There is a large variety of applications and system and device specifications, as well as a strong competitive landscape at the technology level, between direct diodes, fiber lasers, CO₂*



⁵ DPSSL: Diode-Pumped Solid State Lasers

laser, DPSSLs and excimer lasers”, comments **Pars Mukish, Business Unit Manager at Yole.**

Consequently, the EEL industry is highly fragmented and diversified. Each application addresses a specific supply/value chain, and different positions have to be developed by industrials to access different markets:

- Leading players in the material processing domain are vertically integrated from EEL device to laser system, for example making laser dicers. Therefore, customers require turnkey solutions for their specific manufacturing process.
- For sensing or lighting applications, the trend is for companies to be much more specialized, as in pure EEL device manufacturers. This strategy is due to the numerous challenges at device level with increasing performance, beam shaping, and decreasing cost.
- Another good example is the datacom industry, which highlights a diversity of positioning along the supply chain...

Yole's SSL team are developing a significant collection of photonic technology & market reports. Detailed description of each report is available on i-micronews.com, [SSL reports section](#).

ABOUT THE REPORTS:**Edge Emitting Lasers Market & Technology Trends**

Fast growing new applications will drive the EEL market to reach US\$5.1B in 2024 - Produced by Yole Développement

Companies cited in the report:

3SPTechnologies, Access Pacific Ltd., Adtech Optics, Advanced Laser Diode Systems, Akela Laser Corp., Allwave Lasers, Alpes Lasers, Amonics, Applied Optoelectronics, Arima Lasers, Bright Solutions, Broadcom, Brolis Semiconductors, BWT, Canadian Photonics Fabrication Centre – Unit of National Research Council of Canada, Changchun New Industries (CNI) Optoelectronics Technology, Coherent – DILAS – Rofin-Sinar Technologies, Compound Photonics, CST Global Ltd, Denselight Semiconductors Pte., Diode Laser Concepts, Eagleyard Photonics, Eblana Photonics, Egismos Technology, Emcore and more ...

About the authors:

- **Pars Mukish** holds a master degree in Materials Science & Polymers (ITECH - France) and a master degree in Innovation & Technology Management (EM Lyon - France). Since 2015, Pars has taken on responsibility for developing SSL and Display activities activities as Business Unit Manager at Yole Développement (Yole). Pars is part of the Photonics, Sensing & Display division at Yole. Previously, he has worked as Marketing Analyst and Techno-Economic Analyst for several years at the CEA (French Research Center).
- **Martin Vallo**, PhD is serves as a Technology & Market Analyst specialized in solid-state lighting technologies, within the Photonics, Sensing & Display division at Yole Développement (Yole). With 9 years' experience within semiconductor technology, Martin is involved today in the development of technology & market reports as well as the production of custom consulting projects at Yole. Prior his mission at Yole, he worked at CEA (Grenoble, France), with a mission focused on the epitaxial growth of InGaN/GaN core-shell nanowire LEDs by MOCVD and their characterization for highly flexible photonic devices. Martin graduated from Academy of Sciences, Institute of Electrical Engineering (Slovakia) with an engineering degree in III-nitride semiconductors.

As well as:

- [VCSEL – Vertical Cavity Surface Emitting Laser 2018](#)

3D sensing in the Apple iPhone X paves the way for new VCSEL opportunities. How is the VCSEL-related patent landscape impacted by the rise of new applications? – Produced by Yole Développement

Companies cited in the report:

Icoh, Finisar, Seiko Epson, Broadcom, Canon, Fuji Xerox, Honeywell, Philips, Samsung, Agilent Technologies, Osram, Hewlett Packard, Furukawa Electric, Motorola, University of California, Sony, Nec, Kodak, AT&T, Pakon, Optical Communication Products, IBM, Creo Manufacturing America, Far East and more...

- [VCSEL in Smartphone – Comparison 2019](#)

Physical analysis and cost comparison of ten leading flagship smartphone VCSEL dies (dot projector, flood illuminator, and proximity sensor) from Apple, Huawei, Xiaomi, Oppo, Lenovo, and Intel. – Produced by System Plus Consulting

Companies listed in this comparison: Apple, Huawei, Xiaomi, Oppo, Lenovo, and Intel.

- [GaAs Wafer and Epiwafer Market: RF, Photonics, LED and PV Applications 2018](#)

Photonics applications are driving the GaAs wafer and epiwafer market into a new era – Produced by Yole Développement

Companies listed in this report:

AXT, Alight Technologies, Alta Devices, AMS, Apple, APT Electronics, Arima, Avago, AWSC, Broadcom, Bridgelux, Changelight, China Crystal Technologies, CMK, Dowla, Epistar, Epitex, Finisar, Flir, Freiburger Compound Materials, Fuji Xerix, GCS, HC Semitek, Hexawave and more...



ABOUT YOLE DEVELOPPEMENT

Founded in 1998, **Yole Développement** 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 and image sensors, Compound Semiconductors, RF Electronics, Solid-state lighting, Displays, software, Optoelectronics, Microfluidics & Medical, Advanced Packaging, Manufacturing, Nanomaterials, Power Electronics and Batteries & Energy Management.

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 and follow Yole on [LinkedIn](#) and [Twitter](#).

- Consulting & Financial Services: Jean-Christophe Eloy (eloy@yole.fr)
- Reports: David Jourdan (jourdan@yole.fr)

Yole Group of Companies - Press Relations & Corporate Communication: Sandrine Leroy (leroy@yole.fr)

###