

IR LEDs AND LASER DIODES TECHNOLOGY, APPLICATIONS, AND INDUSTRY TRENDS

Market & Technology report - October 2018

Application proliferation and technology diversity are reshaping the IR light source industry.

WHAT'S NEW

- In-depth analysis of automotive, smartphone, and datacom/telecom applications
- Comprehensive review of emerging applications
- IP landscape analysis for IR LED, EEL, and VCSEL

KEY FEATURES

- Detailed technical and market analysis of IR LED and laser diode applications, with in-depth analysis of emerging segments
- Analysis of IR system roadmap
- Analysis of IR LED and laser diode light sources, including the technology and industry, along with their integration into sensors and modules
- 2010 - 2023 IR LED and laser market forecast, with insights on trends for 2024 - 2028

OBJECTIVES OF THE REPORT

- Give readers an understanding of the global landscape related to IR LED, EEL, and VCSEL
- Review all applications for IR LED, EEL, and VCSEL, offering insights into principles, technology, technical requirements, trends, key players, and more
- Analyze the technology and industry behind IR LED and laser light sources, and their integration into sensors and modules
- Provide and analyze IR light source market forecasts for 2010 -2023, with insights into trends for 2024 - 2028
- Analyze the intellectual property landscape for IR LED, EEL, and VCSEL

A PROLIFERATION OF NEW IR LIGHTING APPLICATIONS, THANKS TO SOLID-STATE LIGHTING SOURCES

Developed in the 1960s, IR light-emitting diodes (LEDs) and laser diodes (LDs) are not new technologies, but rather have evolved quickly with the recent development of solid-state lighting (SSL). Initially developed for optical communication applications, LED and LD are now integrated into high-value functions for datacom/telecom, consumer, automotive, and industrial applications.

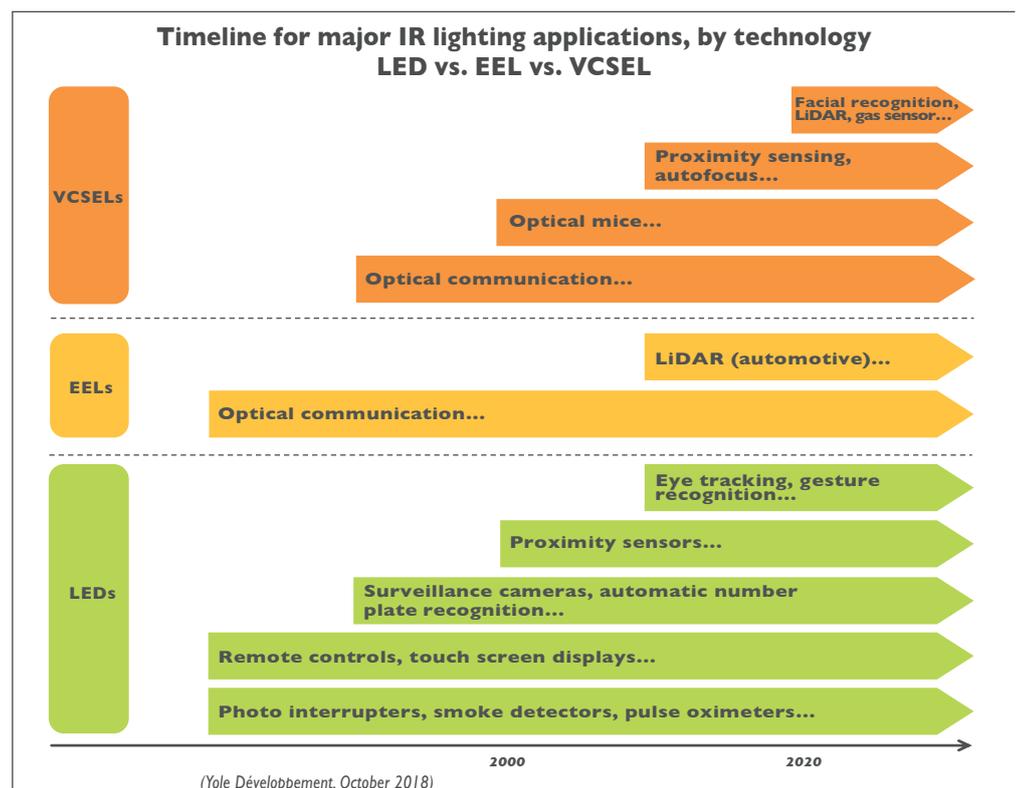
These technologies are part of a new revolution, with each one finding its own path:

- Initially focused on low-end applications (photo-interrupters, remote controls, etc.), IR LEDs are now increasingly implemented into smartphones for proximity sensing; automotive for gesture recognition; and VR/AR headsets for eye-tracking.
- For edge-emitting lasers (EEL), the market has historically been driven by optical communication applications. This is likely to continue, given the always-increasing amount of data exchanged with optical fiber networks. However, in the mid-term the technology may also find strong growth relays in new applications, i.e. LiDAR.

• Today, vertical cavity surface-emitting lasers (VCSEL) might be the fastest-growing technology. Having originally found its sweet spot in short-distance data communication, Apple's 2017 release of the iPhone X (which has a 3D sensing function based on VCSEL technology) has completely changed the business landscape.

All of these infrared SSL sources have different semiconductor structures (i.e. epitaxy, front-end, back-end), emit at different wavelengths/power outputs, and provide different light-emission profiles/shapes, thus creating a large variety of possible specifications - and so too applications. With increasing interest from the automotive and consumer industries in photonic technologies, IR lighting has a bright future ahead.

This report offers an in-depth analysis of all IR light-source technologies and applications, including: basic principles, trends, key players, and market size. It highlights the global landscape for IR light sources, including classification of applications by wavelength, market segment, and function. Specific focus is also given to automotive, smartphone, and datacom applications.



IR LIGHT SOURCE MARKET - A POTENTIAL \$6.5B OPPORTUNITY IN 2023

More than 40 different applications have been identified as integrating IR SSL sources. Among these, some are expected to make the IR LED and LD markets boom in the next five years.

Optical communication, one of the oldest applications driving the IR light-source market, is still expected to be one of the major drivers in the coming years. Indeed, the amount of data exchanged on the internet is exploding, and will continue to do so with

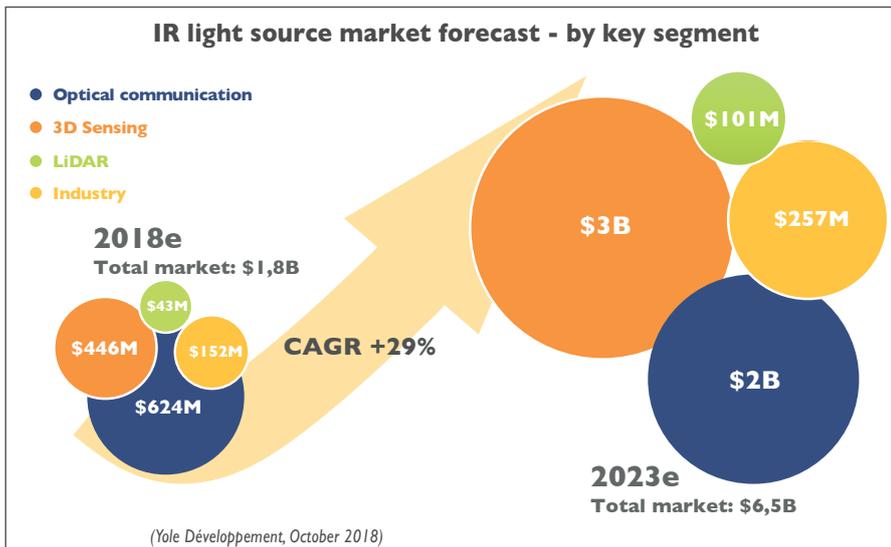
the emergence of the internet of things (IoT), cloud-based services, autonomous cars, and more.

Driven by additive manufacturing, industrial applications are also expected to generate high revenue in the coming years. Traditional IR light sources that emit light in all directions and consume large amounts of energy are starting to be replaced by VCSEL that can be individually controlled, resulting in lower energy consumption.

Finally, 3D sensing is expected to be the killer application for IR light sources. VCSEL's integration in the iPhone X for facial recognition has generated much interest in 3D sensing, and after Apple some key Android-based smartphone manufacturers are starting to release new products integrating this technology. However, 3D sensing is not limited to smartphones. It also has potential for automotive LiDAR, which is necessary for the development of ADAS. Not surprisingly, many start-ups in this field have entered the market in order to develop this technology and join the coming revolution.

As a result, the IR light source market is estimated to reach \$1.8B in 2018, increasing to \$6.5B in 2023 at a CAGR₂₀₁₈₋₂₀₂₃ of 29%.

This report presents detailed market forecasts in volume and revenue, by application and by light source technology (LED vs. EEL vs. VCSEL).



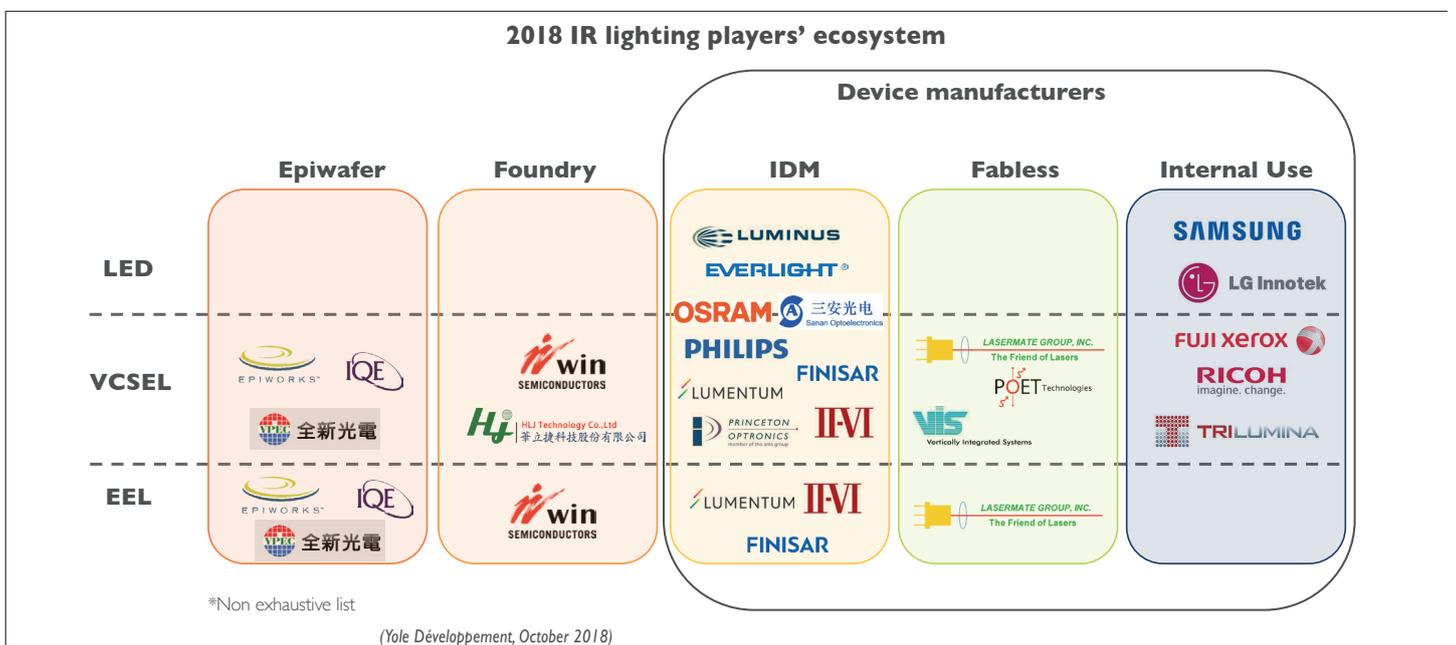
DIFFERENT INDUSTRY STRUCTURES AND MATURITY LEVELS FOR LED, EEL, AND VCSEL

Fueled by visible lighting applications, today's LED industry is quite mature. Almost all players are vertically integrated, from epitaxy to packaging. In this industry, more than 40 IR LED suppliers are confirmed, with the majority coming from Asia. The manufacturing process is well controlled and there are few remaining challenges, except for high-power and long-/multi-wavelength IR LED devices.

The landscape is quite different for EEL and VCSEL, where most of the identified players hail from the

U.S. and Europe. The manufacturing process is much more complex and there is still a need for R&D and engineering to increase device performance and production yields. As a result, there are a variety of players with different positioning along the supply chain: epihouses, foundries, IDMs, fabless players, and more.

In this context, and since EEL and VCSEL will drive the bulk of future IR lighting revenue, there is still a large business opportunity for specialized players



(epihouses and foundries primarily, but also designers). This is related to the manufacturing process, which still must be optimized, and also to the challenges of integrating light sources into packages and/or systems. Indeed, VCSEL and EEL can be combined with complex optics: for example, the dot projector used in facial recognition; or integrated in packages for optical communication and its future evolution: silicon photonics.

This report presents an analysis of IR SSL source industries, including a map of manufacturers, insights into manufacturing processes and technology, positioning within the supply chain, and current limitations/challenges. This report also describes IR system roadmaps in key market segments such as datacom, smartphones, and automotive.

COMPANIES CITED IN THE REPORT (non exhaustive list)

A-Bright, Alhua, Alight, Alpha Sense, American Bright, American Opto Plus, Amphenol, Ams, Apple, APT, Arima Lasers Corporation, Autochim, Autoliv, Avago, Baanto, Bosch, Bridgelux, BrightLED, BrightWayVision, Broadcom, Callahan Cellular LLC, Cambridge CMOS Sensor, Chronocam, CNI, Cnoga Medical, Cognitec, Coherent, Consumer Physics, Continental, Daina, Delphi, Delta ID, Denso, e2v, Edinburgh Sensors, Egismos Technology Corporation, Epistar, Epitex, Everlight, Everstar, Excelitas, Eye Verify, Fastree 3D, Finisar, FlatVision, Fujitsu, GSS, GTT, Hamamatsu, Harman, Helio, Heliospectra, Hella, Heptagon, Hitachi, Honglitrionic, HPLighting, Hueyjan, , lbeo, Ideum, II-VI Incorporated, Imec, Infineon, InlLabs, Intel, IPG Photonic, IrisKing, Iritech, Itswell, Kidde Kodenshi, Lasermate, Lasertel, LED Engin, Leti, Lextar, LG, Ligitek, LiteOn, Lucky Light, Lumentum Holding, Luminus Devices, Masimo, Mok San Electronics, Morpho, MSA, Nonin, Oclaro, Omnivision, Optek Technology, Optotech, Osram, Panasonic, Paralight, Pelco, Philips Lighting, Philips Photonic, Pips Technology, pmd, Primesense, Princeton Optronics, Prolight Opto Technology, QSI Laser, Quanergy, Raycan, Renesas, Rohm, Sacher Lasertechnik, Samsung, Santec Corporation, Sensirion, SensL, Sharp, Shenzhen Mason Technologies, Shenzhen Orient Opto, Shenzhen Refond, SK Hynix, SMI Vision, SoftKinetic, Sony, STMicroelectronics, Stanley, Sumitomo Electric, Sunpu Opto, Suprema, Syonix, Tobii, UPEC, US Lasers Inc., Ushio, Vaisala, Valeo, Velodyne, Vertilas, Vishay, Vixar, VTT, Winsen, Zephyr Photonics...



AUTHORS

As part of the Photonics, Sensing and Display division at Yole Développement (Yole), **Pierrick Boulay** works as Market and Technology Analyst in the fields of LED, OLED and Lighting Systems to carry out technical, economic and marketing analysis. He has experience in both LED lighting (general lighting, automotive lighting...) and OLED lighting. In the past, he has mostly worked in R&D department for LED lighting applications. Pierrick holds a master degree in Electronics (ESEO - France).

TABLE OF CONTENTS (complete content on [i-Micronews.com](http://i-micronews.com))

IR LED/Laser Landscape <u>47</u>	> Light sources (applications, opportunities and challenges, integration aspects and roadmap)
> From IR lamps to IR LEDs and lasers (IR light sources, wavelengths and applications)	
> Classification of IR LED/laser applications (by wavelength market segment, function, light source and package type)	
IR LED/Laser Market <u>68</u>	IR LEDs And Lasers In Datacom/Telecom Applications <u>184</u>
> Overview by application	> Applications
> IR light source LED and laser diode market	> Industry (manufacturers, integrators and supply chain)
> Focus on IR LED market (volume/revenue by application and package power/type)	> Light sources (applications, opportunities and challenges, integration aspects and roadmap)
> Focus on IR EEL market (volume/revenue by application and package power/type)	IR LED And Laser Light Sources <u>209</u>
> Focus on IR VCSEL market (volume/revenue by application and package power/type)	> IR LEDs (status of the industry, key manufacturers, manufacturing process and key challenges)
> 10 years trend	> EELs (status of the industry, key manufacturers, manufacturing process and key challenges)
IR LEDs And Lasers In Automotive Applications <u>104</u>	> VCSELs (status of the industry, key manufacturers, manufacturing process and key challenges)
> Applications (exterior and interior)	Intellectual Property Analysis <u>231</u>
> Industry (manufacturers, integrators and supply chain)	> IR LEDs and EELs (timeline of IP activity, geographic mapping of patent applications, ranking of patent applicants, main IP players and newcomers)
> Light sources (applications, opportunities and challenges, integration aspects and roadmap)	> IR VCSELs (timeline of IP activity, geographic mapping of patent applications, ranking of patent applicants, main IP players and newcomers)
IR LEDs And Lasers In Smartphone Applications <u>142</u>	Conclusion <u>258</u>
> Applications	
> Industry (manufacturers, integrators and supply chain)	



Pars Mukish holds a master degree in Materials Science and Polymers (ITECH - France) and a master degree in Innovation and Technology Management (EM Lyon - France). Since 2015, Pars has taken on responsibility for developing SSL and Display activities as Business Unit Manager at Yole Développement (Yole). Pars is part of the Photonics, Sensing and Display division at Yole. Previously, he has worked as Marketing Analyst and Techno-Economic Analyst for several years at the CEA (French Research Center).

RELATED REPORTS

Benefit from our **Bundle & Annual Subscription** offers and access our analyses at the best available price and with great advantages



- 3D Imaging & Sensing 2018
- LiDARs for Automotive and Industrial Applications 2018
- LeddarVu8: The first off-the-shelf solid state high-definition LiDAR module from LeddarTech
- Apple iPhone X – Infrared Dot Projector
- Lenovo Phab2Pro 3D Time of Flight (ToF) Camera Google Tango Ready

Find all our reports on www.i-micronews.com





ORDER FORM

IR LEDs and Laser Diodes – Technology, Applications, and Industry Trends

BILL TO

Name (Mr/Ms/Dr/Pr):

Job Title:

Company:

Address:

City:

State:

Postcode/Zip:

Country*:

*VAT ID Number for EU members:

Tel:

Email:

Date:

PAYMENT

BY CREDIT CARD

Visa Mastercard Amex

Name of the Card Holder:

Credit Card Number:

□□□□ □□□□ □□□□ □□□□

Card Verification

Value (3 digits except AMEX: 4 digits):

□□□□

Expiration date:

□□ / □□

BY BANK TRANSFER

BANK INFO: HSBC, 1 place de la Bourse,

F-69002 Lyon, France,

Bank code: 30056, Branch code: 00170

Account No: 0170 200 1565 87,

SWIFT or BIC code: CCFRFRPP,

IBAN: FR76 3005 6001 7001 7020 0156 587

RETURN ORDER BY

• FAX: +33 (0)472 83 01 83

• MAIL: YOLE DÉVELOPPEMENT, Le Quartz,
75 Cours Emile Zola, 69100 Villeurbanne/Lyon - France

SALES CONTACTS

• Western US & Canada - Steve Laferriere:
+ 1 310 600-8267 – laferriere@yole.fr

• Eastern US & Canada - Troy Blanchette:
+ 1 704 859 0453 – troy.blanchette@yole.fr

• Europe & RoW - Lizzie Levenez:
+ 49 15 123 544 182 – levenez@yole.fr

• Japan & Rest of Asia - Takashi Onozawa:
+81 34405-9204 – onozawa@yole.fr

• Greater China - Mavis Wang:
+886 979 336 809 – wang@yole.fr

• Specific inquiries: +33 472 830 180 – info@yole.fr

⁽¹⁾ Our Terms and Conditions of Sale are available at
www.yole.fr/Terms_and_Conditions_of_Sale.aspx
The present document is valid 24 months after its publishing date:
October 11, 2018

PRODUCT ORDER - Ref YDI8039

Please enter my order for above named report:

One user license*: Euro 5,990

Multi user license: Euro 6,490

- The report will be ready for delivery from October 22, 2018
- For price in dollars, please use the day's exchange rate. All reports are delivered electronically at payment reception. For French customers, add 20% for VAT

I hereby accept Yole Développement's Terms and Conditions of Sale⁽¹⁾

Signature:

*One user license means only one person at the company can use the report.

SHIPPING CONTACT

First Name:

Email:

Last Name:

Phone:

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.

CONSULTING AND ANALYSIS

- Market data & research, marketing analysis
- Technology analysis
- Strategy consulting
- Reverse engineering & costing
- Patent analysis
- Design and characterization of innovative optical systems
- Financial services (due diligence, M&A with our partner)

More information on www.yole.fr

MEDIA & EVENTS

- i-Micronews.com website & related @Micronews e-newsletter
- Communication & webcast services
- Events: TechDays, forums...

More information on www.i-Micronews.com

REPORTS

- Market & technology reports
- Patent investigation and patent infringement risk analysis
- Teardowns & reverse costing analysis
- Cost simulation tool

More information on www.i-micronews.com/reports

CONTACTS

For more information about :

- 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)

Definitions: "Acceptance": Action by which the Buyer accepts the terms and conditions of sale in their entirety. It is done by signing the purchase order which mentions "I hereby accept Yole's Terms and Conditions of Sale".

"Buyer": Any business user (i.e. any person acting in the course of its business activities, for its business needs) entering into the following general conditions to the exclusion of consumers acting in their personal interests.

"Contracting Parties" or "Parties": The Seller on the one hand and the Buyer on the other hand.

"Intellectual Property Rights" ("IPR") means any rights held by the Seller in its Products, including any patents, trademarks, registered models, designs, copyrights, inventions, commercial secrets and know-how, technical information, company or trading names and any other intellectual property rights or similar in any part of the world, notwithstanding the fact that they have been registered or not and including any pending registration of one of the above mentioned rights.

"License": For the reports and databases, 3 different licenses are proposed. The buyer has to choose one license:

- One user license: one person at the company can use the report.
- Multi-user license: the report can be used by unlimited users within the company. Subsidiaries and Joint-Ventures are not included.
- Corporate license: purchased under "Annual Subscription" program, the report can be used by unlimited users within the company. Joint-Ventures are not included.

"Products": Depending on the purchase order, reports or database on MEMS, CSC, Optics/MOEMS, Nano, bio... to be bought either on a unit basis or as an annual subscription. (i.e. subscription for a period of 12 calendar months). The annual subscription to a package (i.e. a global discount based on the number of reports that the Buyer orders or accesses via the service, a global search service on line on I-micronews and a consulting approach), is defined in the order. Reports are established in PowerPoint and delivered on a PDF format and the database may include Excel files.

"Seller": Based in Lyon (France headquarters), Yole Développement is a market research and business development consultancy company, facilitating market access for advanced technology industrial projects. With more than 20 market analysts, Yole works worldwide with the key industrial companies, R&D institutes and investors to help them understand the markets and technology trends.

I. SCOPE

- 1.1 The Contracting Parties undertake to observe the following general conditions when agreed by the Buyer and the Seller. ANY ADDITIONAL, DIFFERENT, OR CONFLICTING TERMS AND CONDITIONS IN ANY OTHER DOCUMENTS ISSUED BY THE BUYER AT ANY TIME ARE HEREBY OBJECTED TO BY THE SELLER, SHALL BE WHOLLY INAPPLICABLE TO ANY SALE MADE HEREUNDER AND SHALL NOT BE BINDING IN ANY WAY ON THE SELLER.
- 1.2 This agreement becomes valid and enforceable between the Contracting Parties after clear and non-equivocal consent by any duly authorized person representing the Buyer. For these purposes, the Buyer accepts these conditions of sales when signing the purchase order which mentions "I hereby accept Yole's Terms and Conditions of Sale". This results in acceptance by the Buyer.
- 1.3 Orders are deemed to be accepted only upon written acceptance and confirmation by the Seller, within [7 days] from the date of order, to be sent either by email or to the Buyer's address. In the absence of any confirmation in writing, orders shall be deemed to have been accepted.

2. MAILING OF THE PRODUCTS

- 2.1 Products are sent by email to the Buyer:
 - within ^[1] month from the order for Products already released; or
 - within a reasonable time for Products ordered prior to their effective release. In this case, the Seller shall use its best endeavours to inform the Buyer of an indicative release date and the evolution of the work in progress.
- 2.2 Some weeks prior to the release date the Seller can propose a pre-release discount to the Buyer

The Seller shall by no means be responsible for any delay in respect of article 2.2 above, and including incases where a new event or access to new contradictory information would require for the analyst extra time to compute or compare the data in order to enable the Seller to deliver a high quality Products.
- 2.3 The mailing of the Product will occur only upon payment by the Buyer, in accordance with the conditions contained in article 3.
- 2.4 The mailing is operated through electronic means either by email via the sales department or automatically online via an email/password. If the Product's electronic delivery format is defective, the Seller undertakes to replace it at no charge to the Buyer provided that it is informed of the defective formatting within 90 days from the date of the original download or receipt of the Product.

- 2.5 The person receiving the Products on behalf of the Buyer shall immediately verify the quality of the Products and their conformity to the order. Any claim for apparent defects or for non-conformity shall be sent in writing to the Seller within 8 days of receipt of the Products. For this purpose, the Buyer agrees to produce sufficient evidence of such defects. .
- 2.6 No return of Products shall be accepted without prior information to the Seller, even in case of delayed delivery. Any Product returned to the Seller without providing prior information to the Seller as required under article 2.5 shall remain at the Buyer's risk.

3. PRICE, INVOICING AND PAYMENT

- 3.1 Prices are given in the orders corresponding to each Product sold on a unit basis or corresponding to annual subscriptions. They are expressed to be inclusive of all taxes. The prices may be reevaluated from time to time. The effective price is deemed to be the one applicable at the time of the order.
- 3.2 Yole may offer a pre release discount for the companies willing to acquire in the future the specific report and agreeing on the fact that the report may be release later than the anticipated release date. In exchange to this uncertainty, the company will get a discount that can vary from 15% to 10%.
- 3.3 Payments due by the Buyer shall be sent by cheque payable to Yole Développement, credit card or by electronic transfer to the following account:
 HSBC, 1 place de la Bourse 69002 Lyon France
 Bank code: 30056
 Branch code: 00170
 Account n°: 0170 200 1565 87
 BIC or SWIFT code: CCFRFRPP
 IBAN: FR76 3005 6001 7001 7020 0156 587
 To ensure the payments, the Seller reserves the right to request down payments from the Buyer. In this case, the need of down payments will be mentioned on the order.
- 3.4 Payment is due by the Buyer to the Seller within 30 days from invoice date, except in the case of a particular written agreement. If the Buyer fails to pay within this time and fails to contact the Seller, the latter shall be entitled to invoice interest in arrears based on the annual rate Refi of the «BCE» + 7 points, in accordance with article L. 441-6 of the French Commercial Code. Our publications (report, database, tool...) are delivered only after reception of the payment.
- 3.5 In the event of termination of the contract, or of misconduct, during the contract, the Seller will have the right to invoice at the stage in progress, and to take legal action for damages.

4. LIABILITIES

- 4.1 The Buyer or any other individual or legal person acting on its behalf, being a business user buying the Products for its business activities, shall be solely responsible for choosing the Products and for the use and interpretations he makes of the documents it purchases, of the results he obtains, and of the advice and acts it deduces thereof.
- 4.2 The Seller shall only be liable for (i) direct and (ii) foreseeable pecuniary loss, caused by the Products or arising from a material breach of this agreement
- 4.3 In no event shall the Seller be liable for:
 - a) damages of any kind, including without limitation, incidental or consequential damages (including, but not limited to, damages for loss of profits, business interruption and loss of programs or information) arising out of the use of or inability to use the Seller's website or the Products, or any information provided on the website, or in the Products;
 - b) any claim attributable to errors, omissions or other inaccuracies in the Product or interpretations thereof.
- 4.4 All the information contained in the Products has been obtained from sources believed to be reliable. The Seller does not warrant the accuracy, completeness adequacy or reliability of such information, which cannot be guaranteed to be free from errors.
- 4.5 All the Products that the Seller sells may, upon prior notice to the Buyer from time to time be modified by or substituted with similar Products meeting the needs of the Buyer. This modification shall not lead to the liability of the Seller, provided that the Seller ensures the substituted Product is similar to the Product initially ordered.
- 4.6 In the case where, after inspection, it is acknowledged that the Products contain defects, the Seller undertakes to replace the defective products as far as the supplies allow and without indemnities or compensation of any kind for labor costs, delays, loss caused or any other reason. The replacement is guaranteed for a maximum of two months starting from the delivery date. Any replacement is excluded for any event as set out in article 5 below.
- 4.7 The deadlines that the Seller is asked to state for the mailing of the Products are given for information only and are not guaranteed. If such deadlines are not met, it shall not lead to any damages or cancellation of the orders, except for non acceptable delays exceeding [4] months from the stated deadline, without information from the Seller. In such case only, the Buyer shall be entitled to ask for a reimbursement of its first down payment to the exclusion of any further damages.

- 4.8 The Seller does not make any warranties, express or implied, including, without limitation, those of sale ability and fitness for a particular purpose, with respect to the Products. Although the Seller shall take reasonable steps to screen Products for infection of viruses, worms, Trojan horses or other codes containing contaminating or destructive properties before making the Products available, the Seller cannot guarantee that any Product will be free from infection.

5. FORCE MAJEURE

The Seller shall not be liable for any delay in performance directly or indirectly caused by or resulting from acts of nature, fire, flood, accident, riot, war, government intervention, embargoes, strikes, labor difficulties, equipment failure, late deliveries by suppliers or other difficulties which are beyond the control, and not the fault of the Seller.

6. PROTECTION OF THE SELLER'S IPR

- 6.1 All the IPR attached to the Products are and remain the property of the Seller and are protected under French and international copyright law and conventions.
- 6.2 The Buyer agreed not to disclose, copy, reproduce, redistribute, resell or publish the Product, or any part of it to any other party other than employees of its company. The Buyer shall have the right to use the Products solely for its own internal information purposes. In particular, the Buyer shall therefore not use the Product for purposes such as:
 - Information storage and retrieval systems;
 - Recordings and re-transmittals over any network (including any local area network);
 - Use in any timesharing, service bureau, bulletin board or similar arrangement or public display;
 - Posting any Product to any other online service (including bulletin boards or the Internet);
 - Licensing, leasing, selling, offering for sale or assigning the Product.
- 6.3 The Buyer shall be solely responsible towards the Seller of all infringements of this obligation, whether this infringement comes from its employees or any person to whom the Buyer has sent the Products and shall personally take care of any related proceedings, and the Buyer shall bear related financial consequences in their entirety.
- 6.4 The Buyer shall define within its company point of contact for the needs of the contract. This person will be the recipient of each new report in PDF format. This person shall also be responsible for respect of the copyrights and will guaranty that the Products are not disseminated out of the company.
- 6.5 In the context of annual subscriptions, the person of contact shall decide who within the Buyer, shall be entitled to access on line the reports on I-micronews.com. In this respect, the Seller will give the Buyer a maximum of 10 password, unless the multiple sites organization of the Buyer requires more passwords. The Seller reserves the right to check from time to time the correct use of this password.
- 6.6 In the case of a multisite, multi license, only the employee of the buyer can access the report or the employee of the companies in which the buyer have 100% shares. As a matter of fact the investor of a company, the joint venture done with a third party etc...cannot access the report and should pay a full license price.

7. TERMINATION

- 7.1 If the Buyer cancels the order in whole or in part or postpones the date of mailing, the Buyer shall indemnify the Seller for the entire costs that have been incurred as at the date of notification by the Buyer of such delay or cancellation. This may also apply for any other direct or indirect consequential loss that may be borne by the Seller, following this decision.
- 7.2 In the event of breach by one Party under these conditions or the order, the non-breaching Party may send a notification to the other by recorded delivery letter upon which, after a period of thirty (30) days without solving the problem, the non-breaching Party shall be entitled to terminate all the pending orders, without being liable for any compensation.

8. MISCELLANEOUS

All the provisions of these Terms and Conditions are for the benefit of the Seller itself, but also for its licensors, employees and agents. Each of them is entitled to assert and enforce those provisions against the Buyer.

Any notices under these Terms and Conditions shall be given in writing. They shall be effective upon receipt by the other Party. The Seller may, from time to time, update these Terms and Conditions and the Buyer, is deemed to have accepted the latest version of these terms and conditions, provided they have been communicated to him in due time.

9. GOVERNING LAW AND JURISDICTION

- 9.1 Any dispute arising out or linked to these Terms and Conditions or to any contract (orders) entered into in application of these Terms and Conditions shall be settled by the French Commercial Courts of Lyon, which shall have exclusive jurisdiction upon such issues.
- 9.2 French law shall govern the relation between the Buyer and the Seller, in accordance with these Terms and Conditions.