

SOLID-STATE MEDICAL IMAGING

Market & Technology report - January 2017

Advanced solid-state technologies are disrupting the medical imaging industry.

KEY FEATURES OF THE REPORT

Get the sample of the report on www.i-Micronews.com

- Overview of the selected solid-state technologies and trends for medical imaging modalities
- Market forecast for solid-state IC by modalities, as well as for the solid-state IC market (CMOS image sensors, a-Si TFT flat panel, CCD imagers, silicon photomultipliers, silicon photodiode array, etc.)
- Major players, supply chain, and mapping
- Market drivers and technology trends, by medical imaging modalities
- Roadmap for imaging modalities
- Market share at sensor and medical device levels

WHAT'S NEW

This report has a broader focus with additional modalities: molecular imaging, computed tomography, optical coherence tomography, and ultrasound

- Application-oriented report
- Market forecast 2015 - 2022
- Major news and M&As since the last report
- New technology trends and roadmaps for each modality
- New players and new industrial supply chain
- Additional value chain information for major products
- Review of advanced packaging solutions for medical camera modules

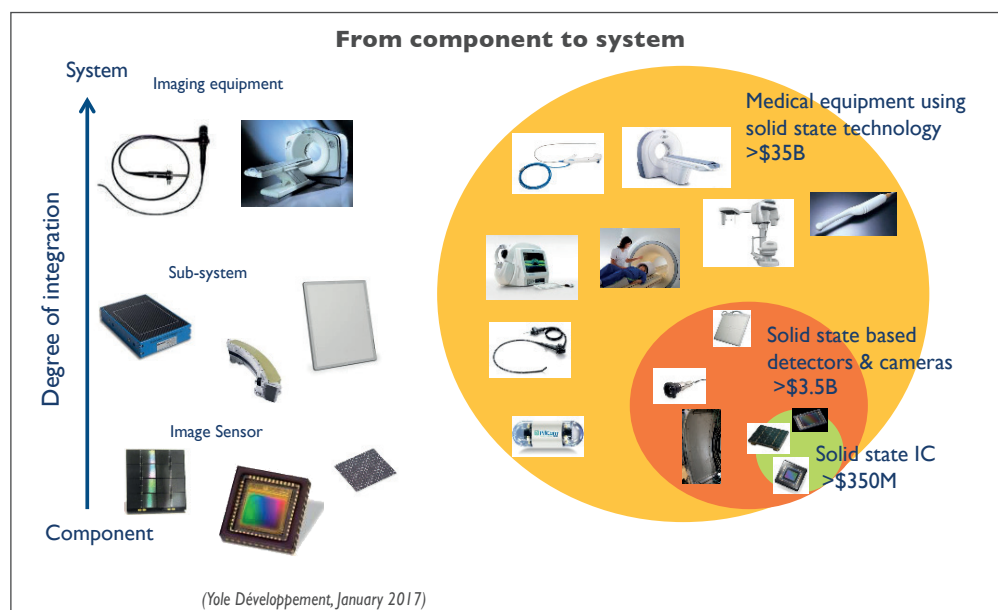
SOLID-STATE IC TECHNOLOGIES ARE QUIETLY DISRUPTING THE MEDICAL IMAGING INDUSTRY

The medical imaging equipment industry is a huge \$35B market with a few mega-players and a comfortable +5.5% CAGR. Solid-state IC technologies, which encompass CCD, CIS, a-Si FPD, a-Se FPD, SiPM, and now cMUT and pMUT, are slowly creating disruptive market forces within the industry. The solid-state medical sensor market has reached \$350M and is expected to grow at +8.3% from 2016 - 2022, representing \$600M by 2022. Clearly the importance of these technologies cannot be understated, since they will create opportunities for new entrants (especially companies with Asian roots) and be a potential obstacle for large incumbents.

These new technologies are changing the business model and decreasing the possibility of completely integration. With large facility investments needed in order to achieve the required size for profitability, independent players from medical equipment companies are able to enter the supply chain. This is the case for the Israeli-Japanese company JV TPSCo for CIS technology, and for American company Varian and its a-Si FPD technology.

Almost every medical imaging modality is part of this technological transformation. In our previous report we focused on x-ray and endoscopy, two key areas of this paradigm shift. In our new report we have expanded the breath of our analysis to encompass CT, PET, OCT, and US, as they will all either be affected by the move or are just witnessing complete technology turnaround, as is the case for PET.

Solid-state IC will become key technology know-how for tomorrow's medical equipment manufacturers. In a world that is increasingly data-driven, doctors and scientists expect continuous improvements in image quality while also developing new applications where these solid-state imaging capabilities can be used to their full extent. Capsule endoscopy, intravascular OCT, and PET/MRI hybrids are a few examples of solid-state technology becoming the key enabler. This report offers the keys to understanding this medical imaging metamorphosis.



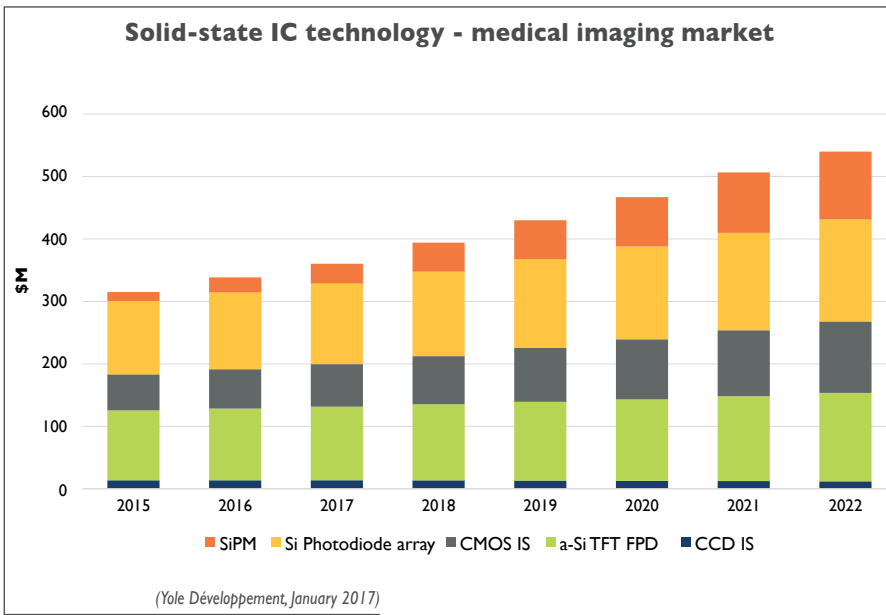
SOLID-STATE TECHNOLOGY'S MEDICAL IMAGING VALUE FAR TRANSCENDS WAFER COUNTS

Looking first at solid-state sensors, then sub-system detectors, and finally the complete medical equipment or system, there are at least two orders of magnitude required to leverage the

core technology performance. From an industry perspective, the value at stake greatly eclipses the current \$35B in sales of medical equipment relying on solid-state technology.

For some technologies and applications, wafer volume growth is very significant. The combined

“CMOS x-ray sensor + molecular imaging sensor” will multiply in quantity by more than 6x over the next five years. This massive transformation could have indirect consequences, spreading all the way to conventional CT.



For other modalities the initial growth is over, since the digitization process is almost complete. This is the case for endoscopy, in which usage of CCD or CMOS has now completely transformed the landscape. Small-diameter fiberscope is the last endoscopy domain making the transition. This report looks in-depth at the potential roadmap for these evolutions, and the drivers for fueling the final transition.

The last two modalities under study are OCT and ultrasound. Both have very special application cases. In our report, forecasts are paired with each modality’s technology and application overview, since some key players have made significant moves via solid-state technology.

This report offers vital metrics and insight regarding the medical imaging industry’s transformation.

RATHER THAN REPLACE OLD MARKETS, NEW TECHNOLOGIES SEEM TO CREATE NEW ONES

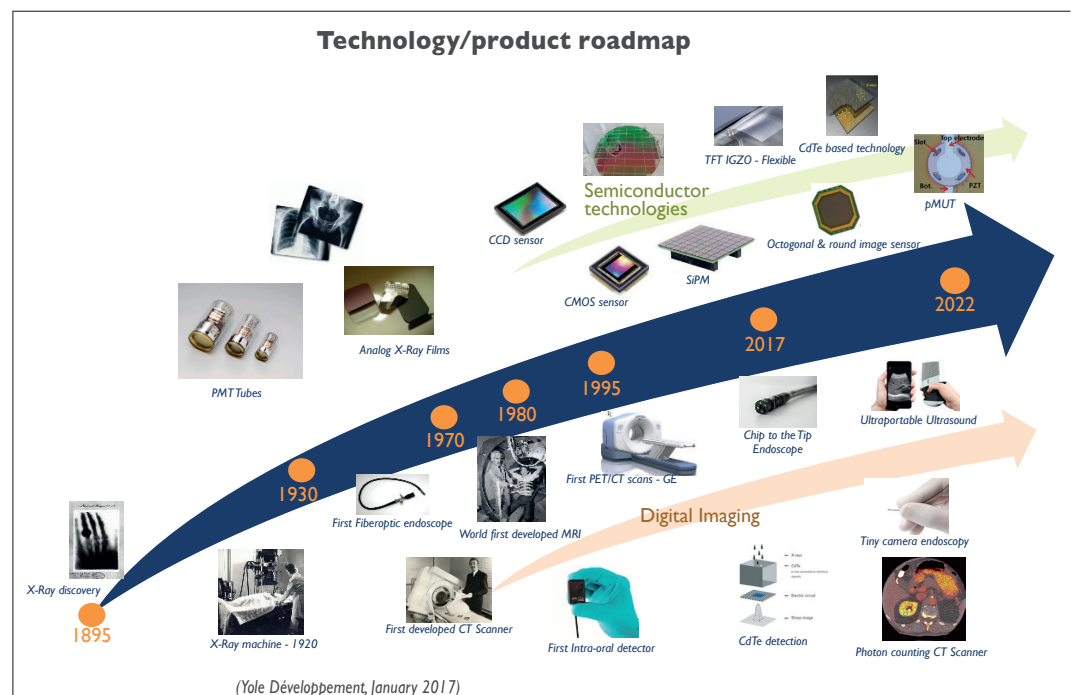
When trying to understand technology shifts, things may look fuzzy from afar. But by looking very methodically at each segment of the medical imaging equipment industry, and through the filter of solid-state technology, we can perceive where the disruption arises. New medical equipment players like Canon, Leica, Hamamatsu, Vieworks, iRay, and Varian are direct consequences of these changes.

The technologies and related use-cases are constantly evolving, providing space for innovators to differentiate themselves. Numerous new solid-state innovations are ready to enter the market, and the knowledge found in this report will provide you with

the extra edge you need to position your company, technology, and/or product in the ecosystem.

Despite intense M&A activity from big players, the end-game is not as stable as we thought it might be. Toshiba Medical Systems is one clear-cut example, with its being absorbed by Canon. This case is not a result of the CMOS image sensor (CIS) revolution, but a direct consequence of the medical imaging industry being increasingly controlled by technology specialists.

This report delivers insights into the key technologies that are ready to transform the medical imaging industry landscape.



COMPANIES CITED IN THE REPORT (non exhaustive list)

Abbott, Acteon, Ajat, Aloka, Analogic, Ambu, AMS, Avinger, Belmont, BioVision Technologies LLC , Biotigen, Boston Scientific, Caeleste, Canon, CapsoVision Inc., Carestream Health, Circon, Covidien, Corindus, Cmosis (AMS), Crystalvue, Cyber Medical, Dectris, Dexis, Dongbu, Dpix, e2v (Teledyne Dalsa), EndoOptiks, Esaote, Excelitas, ExO System, Fujifilm, Fujifilm Dimatix, Fujifilm Sonosite, General Electric Healthcare, Genoray, Gendex, GI View, Hansen Medical, Hamamatsu, Heidelberg Engineers, Hitachi, Hologic, Hoya Life Sciences, Huvitz, Imasonic, imXPAD, IntroMedic, Integrated Endoscopy, Intuitive Surgical, Invendo Medical, Italray, Jinshan, Johnson & Johnson, Karl Storz, Ketek, Kolo, Konica Minolta, Kyocera, Medigus, Medtronic, MicroTomography, Micro-Imaging Solutions, Nidek, NinePoint, NovioMEMS, Olympus, OmniVision, ON Semiconductor, Opcom, Optopol, Optovue, Opto, Opko, Owandy, Panasonic, Pentax (Hoya), Perkin Elmer (Varex), Philips Healthcare, Pixel Plus, Pyxalis, Richard Wolf, Rock West, Samsung, Sayaka, Schick Dental, Schöilly, Sectra, SensL, Shimadzu, Siemens Healthineers, Sirona, SK Hynix, Sony, Sonic Concepts, Stereotaxis, Stephanix, STMICROELECTRONICS, Stryker, St. Jude Medical, Suoer, Swissray, Teledyne Dalsa, Terumo, Texas Instruments, Thales, Topcon, Toshiba, TowerJazz, Trixell, Tronics, TSMC, UMC, Varian, Valtronic, Vatech, Vermon, Vims, VivoSeight, Volcano, X-Counter, Xenics, X-FAB, Zeiss, and more

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

Executive summary	8	> Flexible endoscopy	
Introduction	9	> Capsule endoscopy	
> Medical imaging landscape and market		> Single-use endoscopy	
> Key solid-state devices for medical imaging		Molecular imaging	173
> Solid-state market		> PET/SPECT imaging	
What has happened in the last two years?	29	> Hybrid PET-CT, PET-MRI	
Market forecast - Sensors	32	Optical coherence tomography	187
Digital X-ray market	69	> Ophthalmology	
> Introduction		> Intravascular imaging	
> General radiography		Ultrasound imaging	218
> Computed tomography		> Ultrasound probes	
> Dental x-ray		> Intravascular imaging	
Endoscopy	124	Technology trends	210
> Introduction		Supply chain	223
> Rigid endoscopy		Value chain	233
		Conclusions	243

OBJECTIVES OF THE REPORT

1. Provide relevant data for key medical image sensor market metrics and dynamics:
 - Shipments, revenue, and wafer production by application and technology
 - Major solid-state, IC-based product player market share
2. Offer key technical insights regarding future technology trends and challenges:
 - From a technological standpoint: design and manufacturing innovations
 - From an applicative standpoint: new applications and key market drivers
3. Deliver an in-depth understanding of the medical imaging value chain, infrastructure, and players:
 - Who are the players (IDMs, foundries, design houses, OEMs) and how are they related?
 - What is currently happening in the imaging sensor supply chain?

RELATED REPORTS

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

- Status of the CMOS Image Sensor Industry 2016: New Market and Technology Dynamics
- Camera Module Industry
- Given Imaging - PillCam COLON 2 Capsule

Find all our reports on

www.i-micronews.com



AUTHORS

In 1999 **Pierre Cambou** joined the imaging industry. He had earned an Engineering degree from Université de Technologie de Compiègne in parallel to a Master of Science from Virginia Tech in 1998. More recently he graduated from Grenoble Ecole de Management's MBA. Pierre took several positions at Thomson TCS which became Atmel Grenoble in 2001 and e2v Semiconductors in 2006. In 2012 he founded the start-up Vence Innovation (now called Irlynx) in order to bring to market a disruptive Man to Machine interaction technology. He joined Yole Développement, the "More than Moore" market research and strategy consulting company, as Imaging Activity Leader in 2014.



As a Technology & Market Analyst, **Marjorie Villien** is member of the Microfluidic & Medical Technologies (MedTech) business unit at Yole Développement, the "More than Moore" market research and strategy consulting company. She is a daily contributor to the development of MedTech activities with a dedicated collection of market & technology reports as well as custom consulting projects. After spending two years at Harvard, Marjorie served as a research scientist at INSERM in the field of MRI & PET imaging. She has spoken in numerous international conferences and has authored or co-authored 11 papers and 1 patent. Marjorie Villien is graduated from Grenoble INP and holds a PhD in physics & medical imaging.



Jérôme Mouly serves as a Technology & Market Analyst specialized in microtechnologies for biomedical & medical imaging applications at Yole Développement, the "More than Moore" market research and strategy consulting company. Since 2000, Jérôme has participated in more than 100 marketing and technological analyses for industrial groups, start-ups and institutes related to semiconductor & medical technologies industry. Jérôme holds a Master of Physics from the University of Lyon.





ORDER FORM

Solid-State Medical Imaging

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

PRODUCT ORDER - Ref YDMTI7002

Please enter my order for above named report:

One user license*: Euro 5,490

Multi user license: Euro 6,490

- The report will be ready for delivery from February 6, 2017

- 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:

⁽¹⁾One user license means only one person at the company can use the report.

SALES CONTACTS

- North America - Steve Laferriere: +13106 008 267 laferriere@yole.fr
- Europe & RoW - Lizzie Levenez: + 49 15 123 544 182 levenez@yole.fr
- Japan & Rest of Asia - Takashi Onozawa: +81 3 6869 6970 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: February 6, 2017

SHIPPING CONTACT

First Name: Last Name:

Email: Phone:

ABOUT YOLE DEVELOPPEMENT

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media in addition to corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing (technology or process), Yole Développement group has expanded to include more than 50 associates worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Photovoltaics, Advanced Packaging, Manufacturing, Nanomaterials and Power Electronics. The group supports industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

CONSULTING

- Market data & research, marketing analysis
- Technology analysis
- Reverse engineering & costing services
- Strategy consulting
- Patent analysis

More information on www.yole.fr

FINANCIAL SERVICES

- Mergers & Acquisitions
- Due diligence
- Fundraising

More information on Jean-Christophe Eloy (eloy@yole.fr)

REPORTS

- Collection of technology & market reports
- Manufacturing cost simulation tools
- Component reverse engineering & costing analysis
- Patent investigation

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

MEDIA & EVENTS

- i-Micronews.com, online disruptive technologies website
- @Micronews, weekly e-newsletter
- Communication & webcasts services
- Events: Yole Seminars, Market Briefings...

More information on www.i-micronews.com

CONTACTS

For more information about :

- Consulting Services: Jean-Christophe Eloy (eloy@yole.fr)
- Financial Services: Jean-Christophe Eloy (eloy@yole.fr)
- Report Business: Fayçal Khamassi (khamassi@yole.fr)
- Press relations: 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.