

For immediate release:



“Energy harvesters challenge batteries into wireless sensors”, announces Yole Développement.

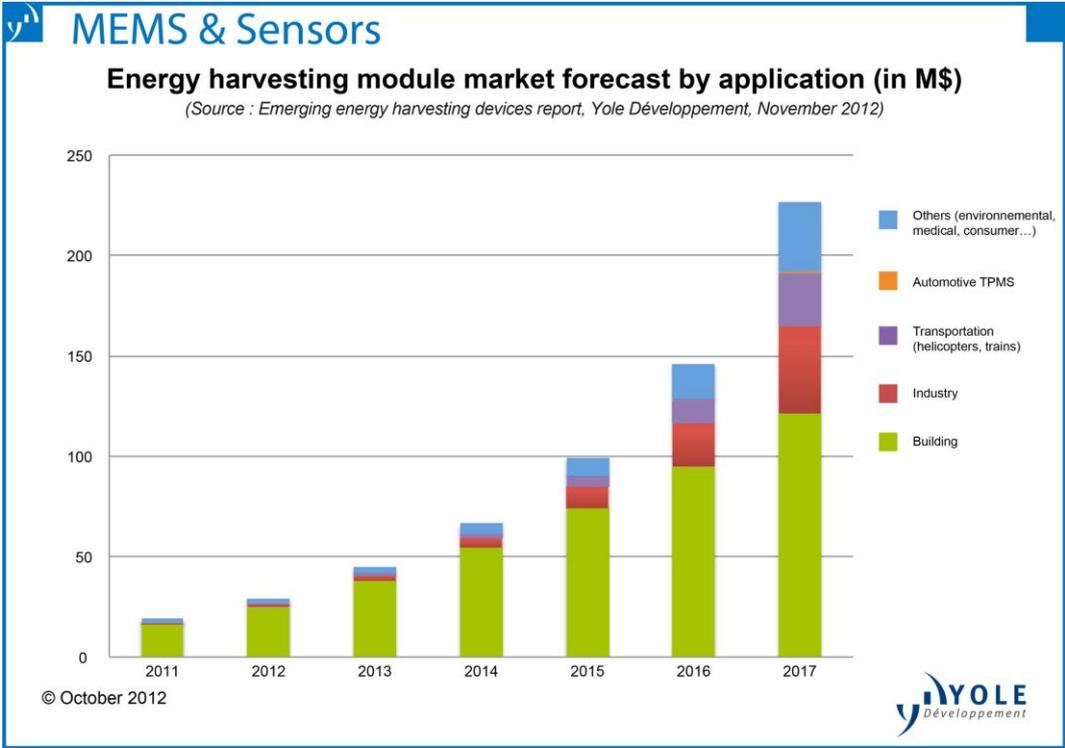
“Emerging Energy Harvesting Devices”, a report from Yole Développement

Lyon, France – October 31, 2012 – Yole Développement announces its new analysis “**Emerging Energy Harvesting Devices**”. In this report, Yole Développement analysts describe why and how emerging energy harvesting devices will be increasingly used in the dynamic wireless sensor business.

Building and industry will drive market growth to + 51 %/year

Until now, batteries were dominantly used to power those networks, but progress in low power electronics and communication protocols are enabling sensor networks to run of energy harvesters in conditions where it’s not practical to replace batteries. Yole Développement’s report is an overview of the energy harvesting applications with a focus on building and industrial applications.

Building applications are by far the main use for energy harvesters with 1M units sold in 2011. They are used in commercial building where large networks of wireless switches (for lighting) and sensors (presence, humidity...) are installed. The clear market drivers for energy harvesters are the huge installation cost reduction (no wiring), and their being maintenance free. Hence, production will be multiplied by a factor of more than 10 between 2012 and 2017.



“The industrial market will be the second key area for energy harvesters, again with applications in wireless sensors that are used to monitor machines and processes”, announces Antoine Bonnabel, Technology & Market Analyst, MEMS Devices & Technologies at Yole Développement. Energy harvesters increase the autonomy of the battery and thus the measurement data rates which are today limited with batteries. Maintenance free is also a great argument for EH in those applications where accessibility is sometimes critical (oil & gas industry for instance). “Today, sales are limited because there is no real agreement on a low power radio protocol, as in buildings, but this will soon change and will allow significant price reduction and production ramp-up to several hundred thousand units in 2017”, pursues Antoine Bonnabel.

Other emerging applications will also likely adopt energy harvesters to replace batteries in wireless sensors applications and will add additional volumes to the global energy harvester business: transportation (helicopters, trains), automotive TPMS, environmental, medical.... Yole Développement report provides a deep understanding of the market drivers and challenges for energy harvesters, and identifies the real businesses among hype applications.

“Overall, the global emerging energy harvesting business at the wireless module level will grow from \$19 M in 2012 to \$227 M in 2017, meaning an impressive growth of + 51 % /year”, announces Yann de Charentenay, Senior Analyst at Yole Développement.

Mechanical and thermal harvesters are the most dynamic technologies

Wireless sensor modules require a power source from tens of microwatts up to tens of milliwatts, and energy harvesters have now enough power output in many applications to provide an infinite lifetime to those modules. The scope of technology candidates is very broad, with very variable technological maturity. In this report, Yole Développement’s experts analyze and provide a detailed description of different energy harvesting technologies currently used and under development, along with their strengths and limitations. Those technologies have been segmented by mechanical, thermal and solar PV categories. Yole Développement’s report provides market share of each technology per application, trend until 2017, and market forecast.

Mechanical and thermal are the most dynamic and innovative technologies and will experience a rapid adoption in several markets (building, industry, transportation) that will drive their sales to reach respectively 39% and 25% of the total energy harvesting sales in 2017. Price erosion will be very significant (-12%/year) thanks to production ramp up.

“Energy harvesting devices produced by MEMS technologies will be mainly thermal thin-film technology whose production will start industrially in 2012”, announces Yole Développement. Other mechanical vibration MEMS harvesters will take longer time to be adopted specially for TPMS due to cost challenge.

Analysis of energy harvesting industry dynamic

The report identifies and positions the key energy harvesting market players depending on technologies developed, level of maturity, business model and targeted markets. The dynamics of

the supply chain is analyzed, in order to understand:

- Who are the key market players, in each application field at both transducer and module level
- How the competitive landscape will evolve

About the report “Emerging Energy Harvesting Devices”

- **Authors:**

Antoine Bonnabel, works as market & technology analyst for MEMS devices and technologies at Yole Développement. He holds a M.Sc. in microelectronics and microsystems from Grenoble Institute of Technologies and a M.Sc. in marketing and business management from Grenoble Graduate School of Business.

Yann de Charentenay has worked for Yole Développement in the field of MEMS, materials and compound semiconductors since 2003. He has contributed to more than 60 marketing & technological analyses since the beginning of our collaboration.

- **Catalogue price:** Euros 3,990.00 (single user license) - Publication date: November 2012.

For special offers and the price in dollars, please contact David Jourdan (jourdan@yole.fr).

- **Companies cited in the report:**

A.raymond, ABB, Advanced ceramics, Alphabet energy, Arveni, Bently Nevada (GE Energy), Boston Scientific, CEA Leti, Continental, Cymbet Corporation, Dust Networks / Linear Technology, Emerson, EnOcean, Ferrotec, GE Bently Nevada (GE Energy), Global Thermoelectric, Hager, Holst centre / IMEC, Infineon, Infinite Power Solutions, Kavlico, Kryotherma, Laird technologies, Legrand, Lightning switch, Linear technology, Lord, Lumedyne, LV Sensors, Marlow Industries, Maxim, Medtronic, MEMS@MIT, MEMSIC, MEMSIC, Microchip, Microgene systems, Micropelt, Microstrain, Midé, MIT, National instrument, Nextreme, Perpetua, Perpetuum, Phononic devices, Piezotag, Powercast, Saint Jude, Savi Technology, Schneider electric, Shraeder , Siemens Corporate Technology, Smartire, Somfy, Sorin Group, ST Microelectronics, Swatch, Tellurex, Texas Instrument, TPL micro power, Transense, Visityre, Xtrion, Yokogawa...

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Beginning in 1998 with Yole Développement, we have grown to become a group of companies providing market research, technology analysis, strategy consulting, media in addition to finance services. With a solid focus on emerging applications using silicon and/or micro manufacturing, Yole Développement group has expanded to include more than 50 associates worldwide covering MEMS, Microfluidics & Medical, Advanced Packaging, Compound Semiconductors, Power Electronics, LED, and Photovoltaics. The group supports companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

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