



**LFOUNDRY**  
Solutions  
for great visions

A **SMIC** COMPANY

**L'Aquila 31 Maggio 2017**  
**Aula Magna DSU**  
**Università degli Studi dell'Aquila**

# The challenges posed by the use of substances and mixtures in the semiconductor industry



***Fabrizio Marchili***  
***EHSS Director***



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within the “LIFE BITMAPS” Project LIFE15 ENV/IT/000332.***



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*LFoundry, a SMIC company, is a leading specialized foundry.*

*From the heart of ancient Europe, with the Headquarter in Avezzano (Italy), LFoundry is focused on providing access to most advanced analogue manufacturing service with a capacity of >40,000 wafers/month, innovative technology extensions, including volume 90nm and copper manufacturing, a strong emphasis on flexibility and customer partnership.*

*LFoundry is supporting own technology IP for 150nm and 110nm with a large portfolio of process-proven libraries, IP, design tools and reference flows. LFoundry's key focus is primarily in automotive and industrial related applications including CIS, security, smart power, embedded memory, and others.*

*As a **SMIC** Company, LFoundry can leverage skills and capabilities of one of the leading semiconductor foundries in the world and the largest and most advanced foundry in mainland China.*



Semiconductor Manufacturing International Corporation ("SMIC") (NYSE: SMI; SEHK: 981) is one of the leading semiconductor foundries in the world and the largest and most advanced foundry in mainland China. SMIC provides integrated circuit (IC) foundry and technology services at 0.35-micron to 28-nanometer.

Headquartered in Shanghai, China, SMIC has a 300mm wafer fabrication facility (fab) and a 200mm mega-fab in Shanghai; a 300mm mega-fab and a majority owned 300mm fab for advance nodes in Beijing; and 200mm fabs in Tianjin and Shenzhen. SMIC also has marketing and customer service offices in the U.S., Europe, Japan, and Taiwan, and a representative office in Hong Kong.



# LFoundry Company Base Data



## FOUNDATION

**October, 2008.**  
MBO from Renesas.

HQ & Manufacturing in  
Italy, former Micron Fab.



## REVENUE

225 million \$



## CAPACITY

Wafer per month:  
40.000



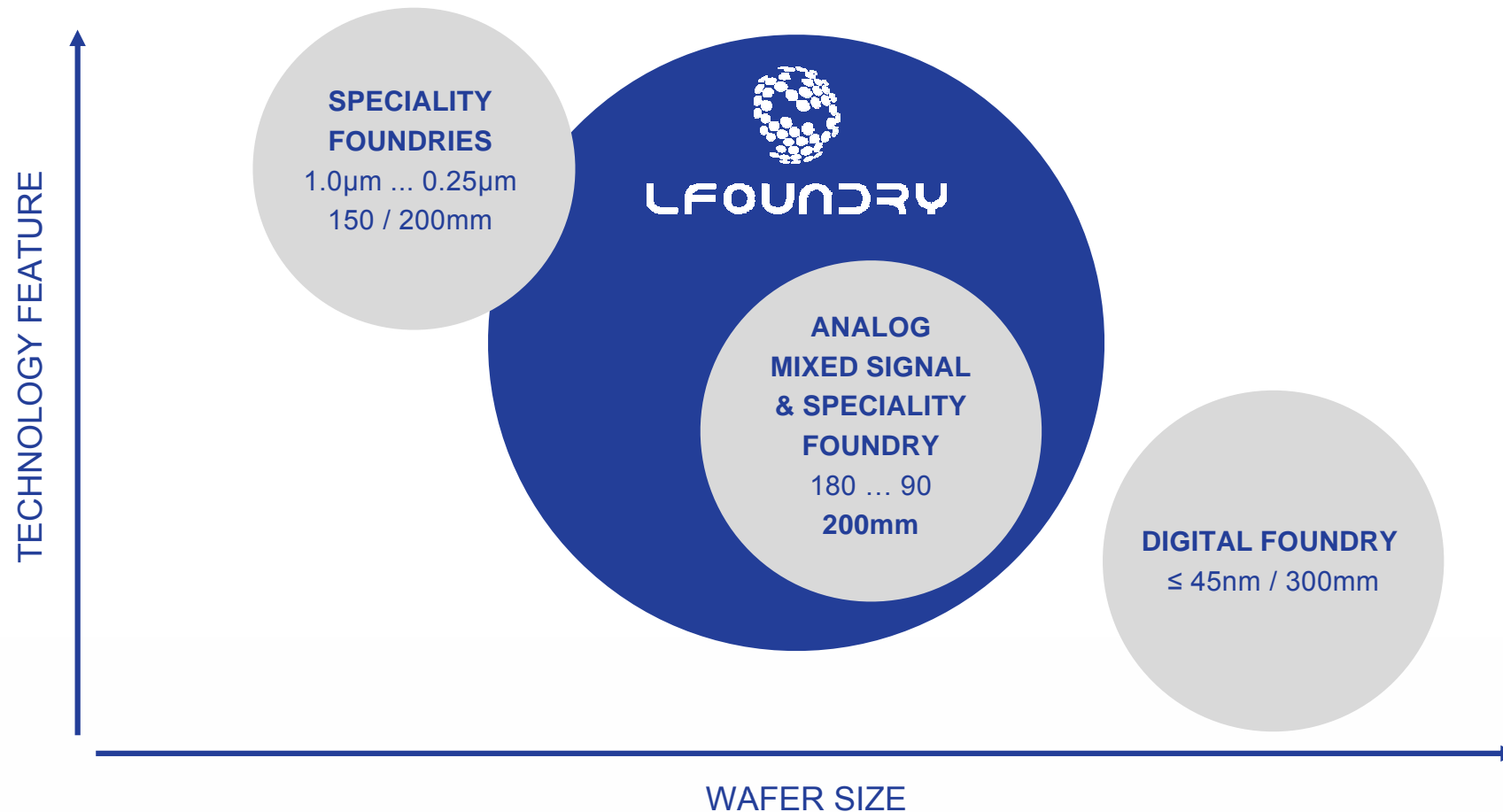
## TECHNOLOGY TEAM

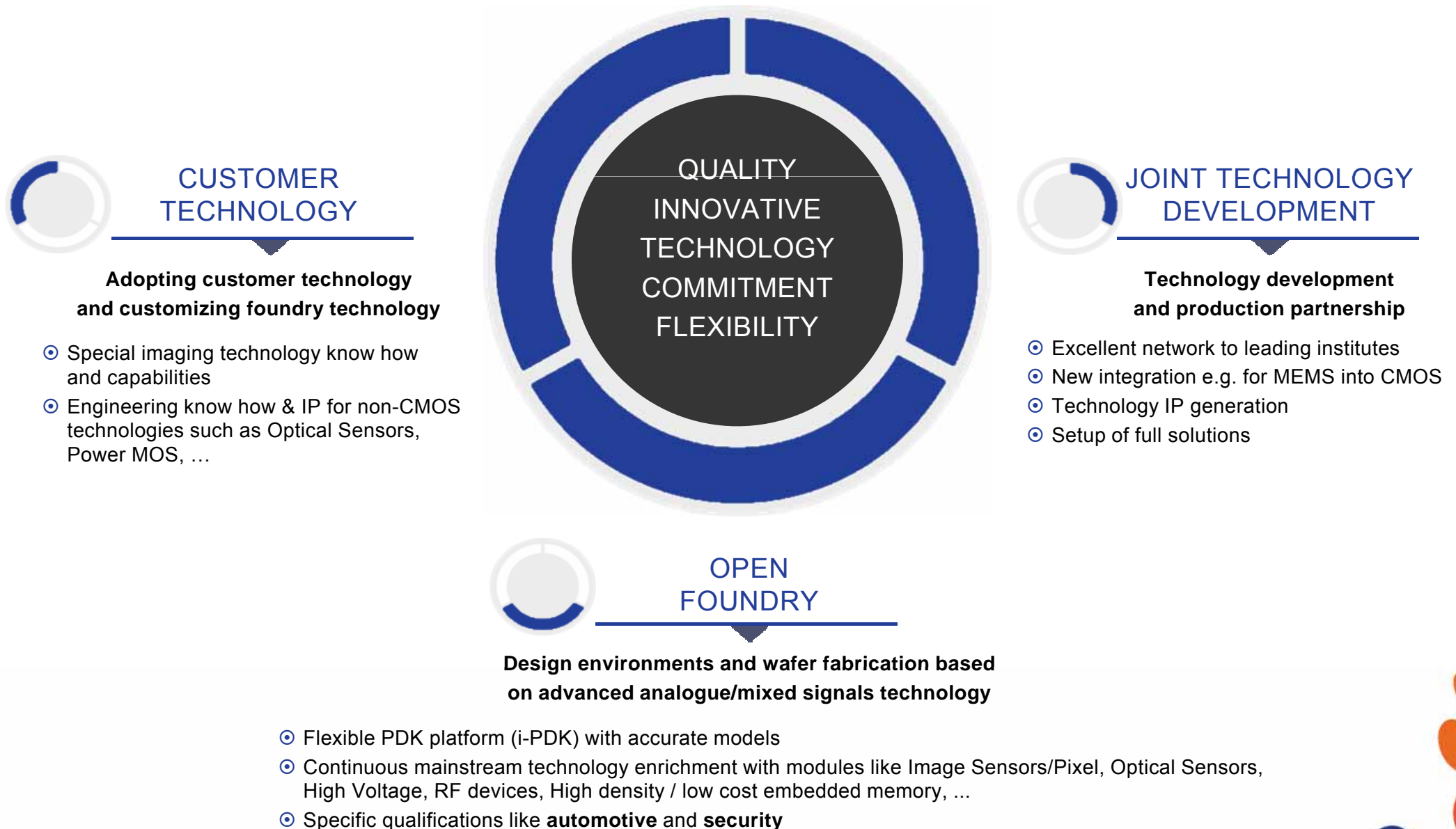
R&D Engineering:  
90

Process & Equipment Engineering:  
110

Design:  
14

- ◎ Combining 200mm **mainstream** technologies for analog mixed signal:
- with **specialty** foundry offerings
  - on moving forward technology nodes and wafer size requirements





## GERMAN OFFICE



Landshut, Germany:

- Management
- Sales & Marketing Head Office
- Design

## HEADQUARTER AND FAB



Avezzano, Italy:

- Management
- Headquarter Functions
- Manufacturing, Technology

## SALES REPS EUROPE

Paris, France

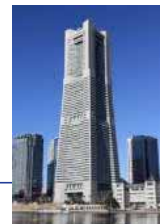
## SALES REPS AND BUSINESS DEVELOPMENT OFFICE USA

Irvine, CA  
Austin, TX



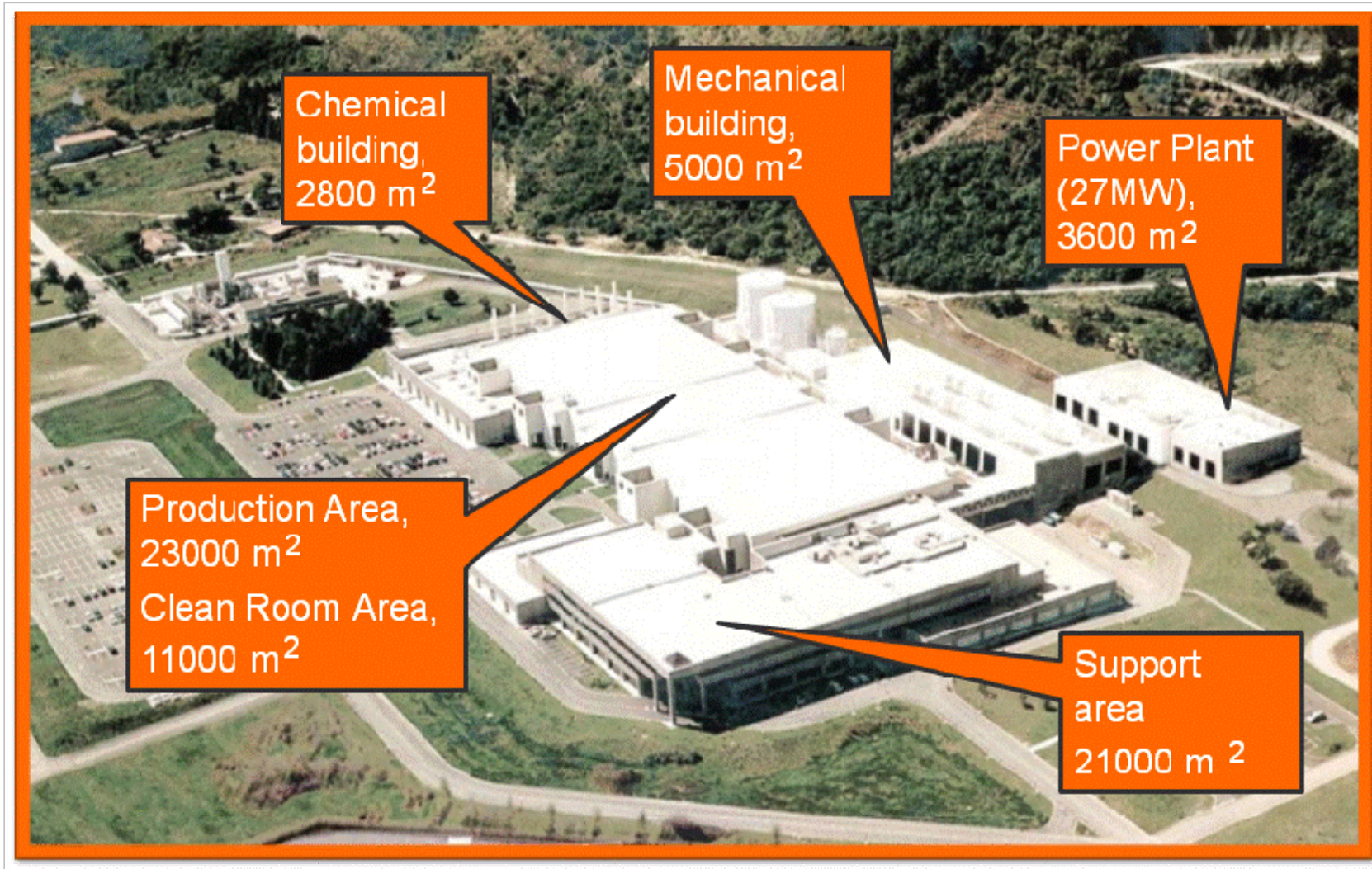
## JAPAN OFFICE

Yokohama, Japan

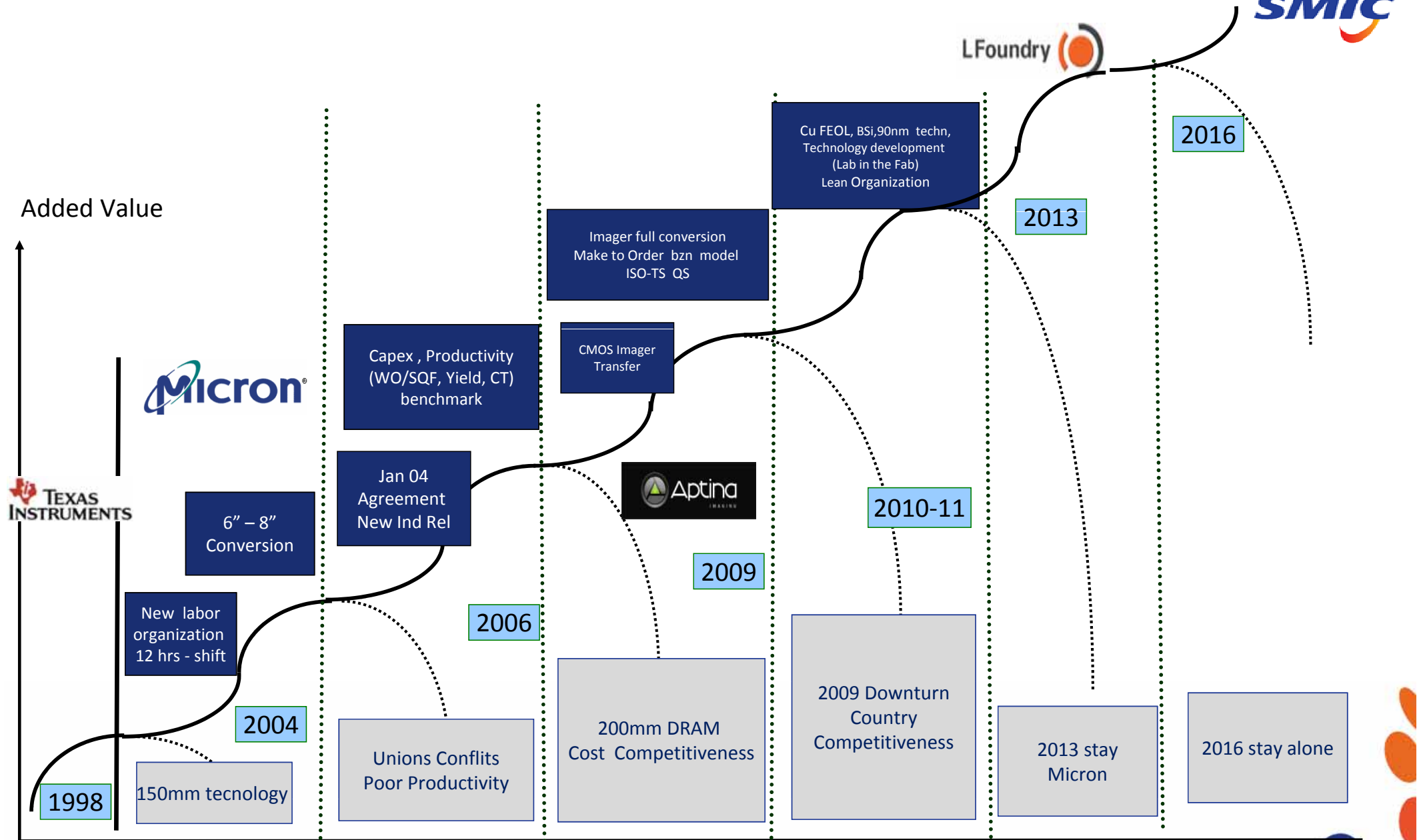


## SALES REPS ASIA

South Korea



# Avezzano's site: a history of resilience





**Dr. TZU-YIN CHIU**

CHAIRMAN

- Appointed to CEO and Executive Director of SMIC in 2011.
- More than 30 years of semiconductor experience
- Prior to joining SMIC, Dr. Chiu was President and CEO of Hua Hong NEC

**SERGIO GALBIATI**

VICE-CHAIRMAN

- More than 30 years of semiconductor experience
- Formerly working for SGS-Thompson, Texas Instruments and Micron in various management positions



## LFoundry Board of Directors



**GÜNTHER ERNST**

CEO

- More than 20 years of semiconductor experience
- Formerly held various engineering and management positions at Renesas

**GARETH KUNG**

DIRECTOR

- Joined SMIC in July 2012. He works as Executive Vice President, Investment and Strategic Business Development and Finance and Company Secretary.
- Between 2003 and 2009, Mr. Kung worked at SMIC as the Group Treasurer and Group Controller and from July 2012 to February 2014 as the Company's Chief Financial Officer.
- More than 25 years of work experience
- Prior to joining SMIC, Gareth Kung worked as chief financial officer in publicly listed companies, private equity investment manager, banker and auditor.



**JASON LI**

DIRECTOR

- Appointed to Executive Vice President Legal/PA/GA of SMIC in Nov., 2014.
- More than 30 years of semiconductor experience
- Prior to joining SMIC, he was the Deputy-Director Secretary of the President's office of the China Electronic Information Industry Group,



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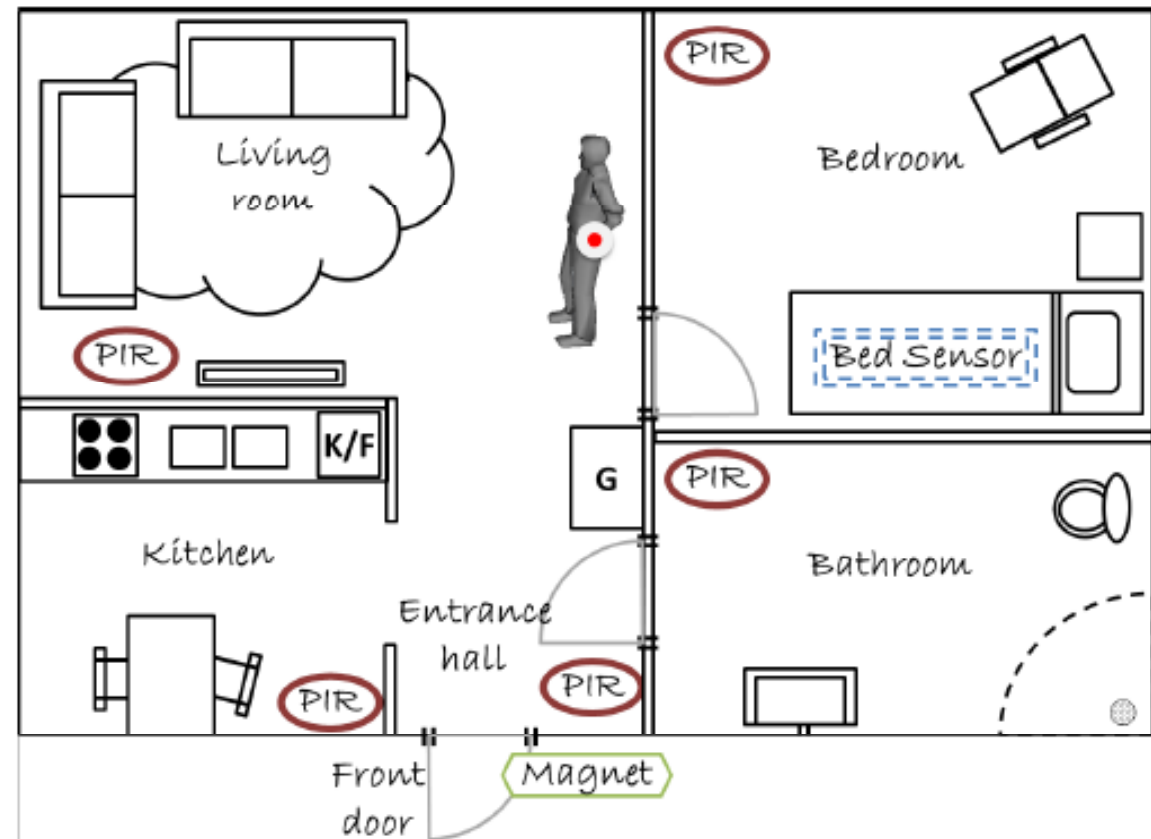
# About Semiconductors



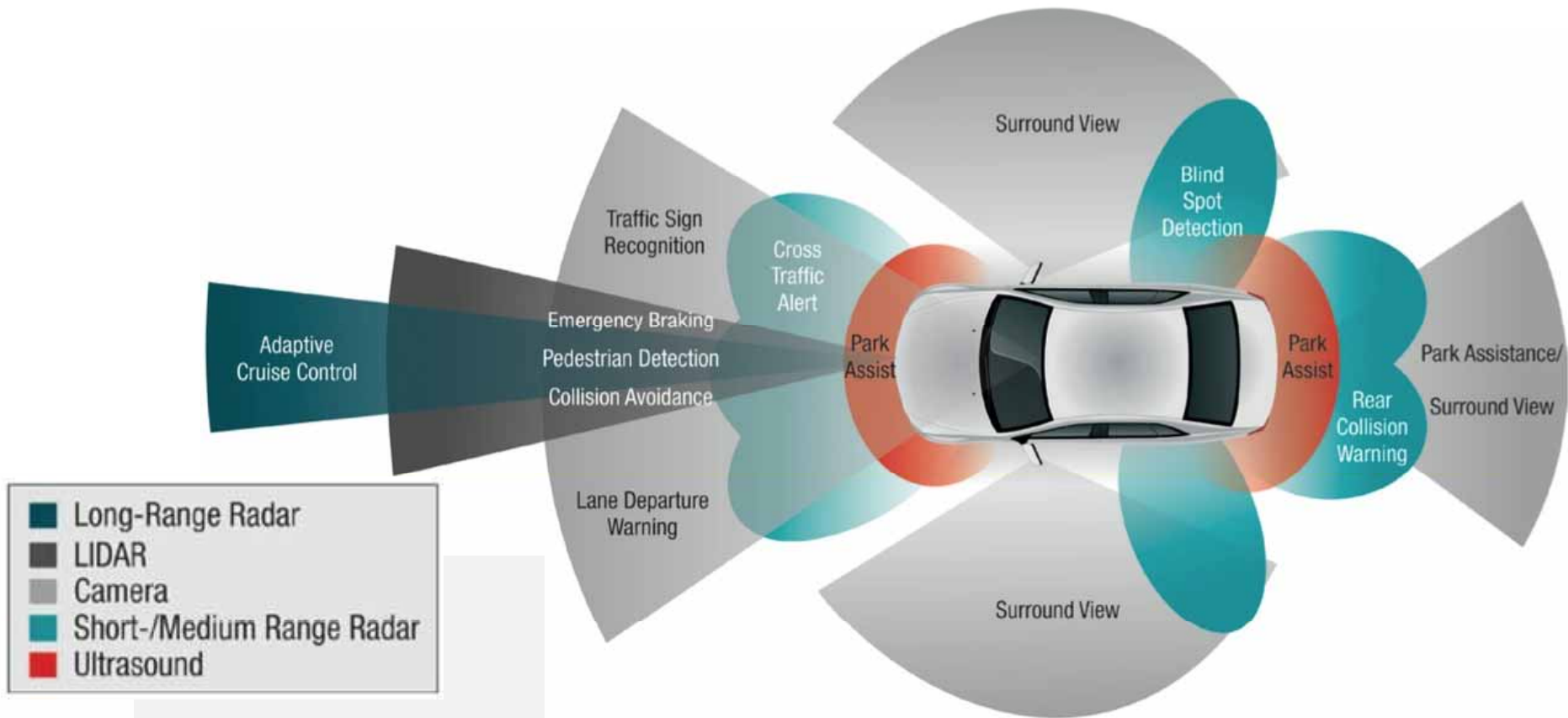
**We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people FUN (selfies)**



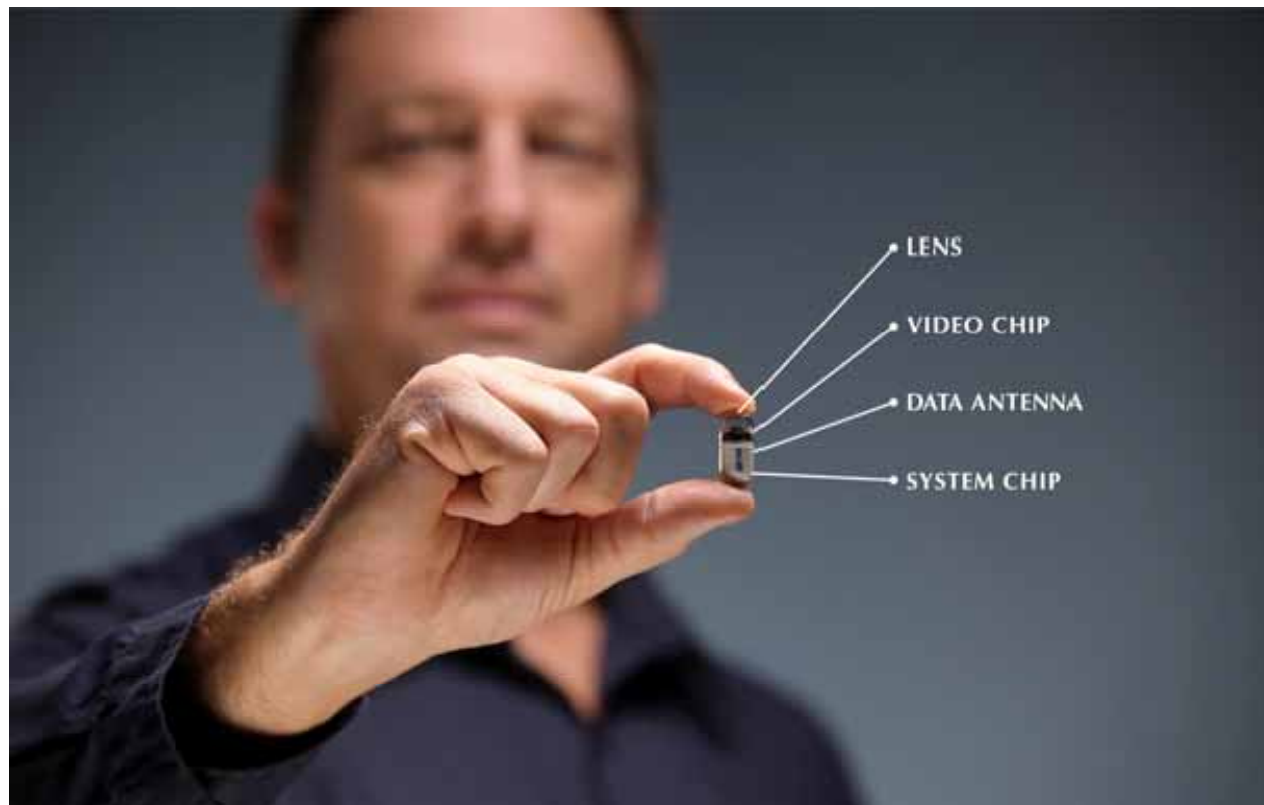
We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people FUN (selfies), **WELLBEING (AAL- Active and Assisted Living )**



We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people FUN (selfies), WELLBEING (AAL), **SAFETY (ADAS – Advanced Driver Assistance Systems)**



We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people FUN (selfies), WELLBEING (AAL), SAFETY (ADAS), **HEALTH (Medical Imaging)**



We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people FUN (*selfies*), WELLBEING (AAL), SAFETY (ADAS), HEALTH (Medical Imaging),  
**PRODUCTIVITY (Machine Vision)**



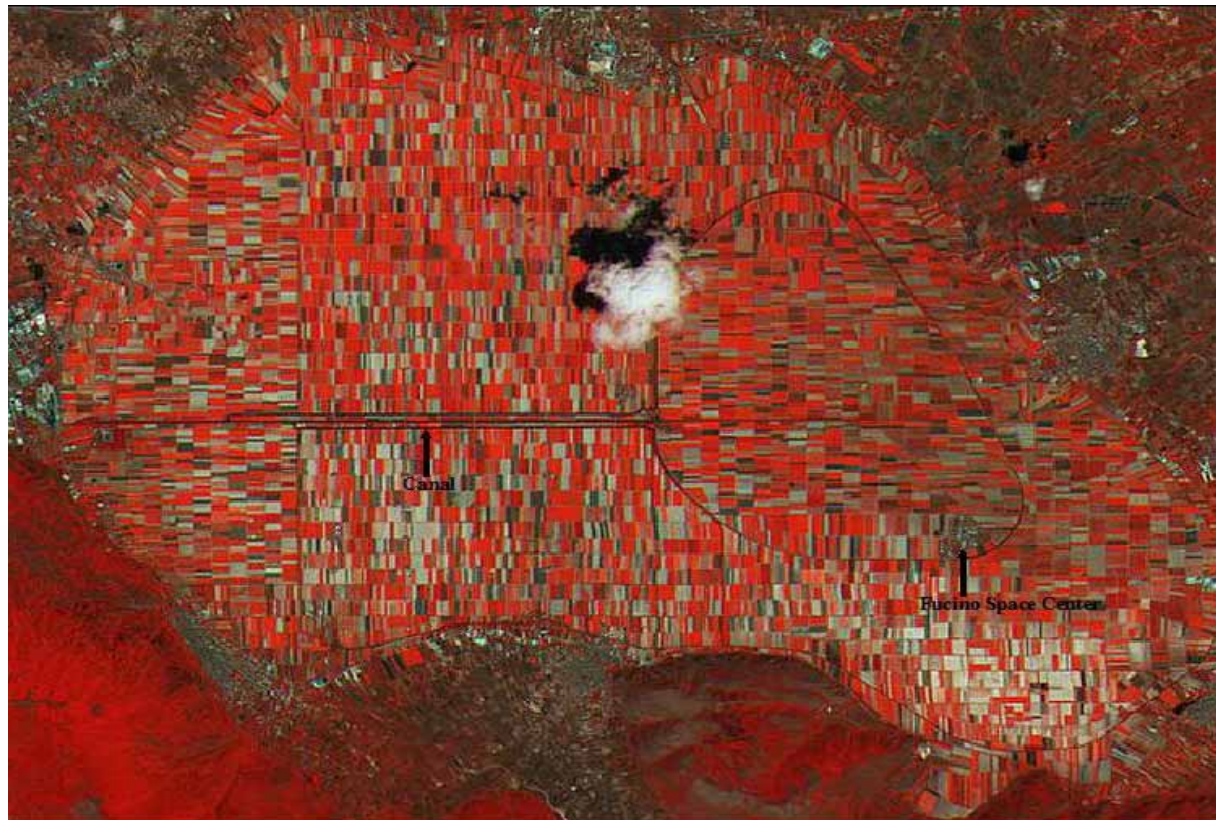


We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people FUN (*selfies*), WELLBEING (AAL), SAFETY (ADAS), HEALTH (Medical Imaging), PRODUCTIVITY (Machine Vision), **SECURITY (Surveillance Systems)**





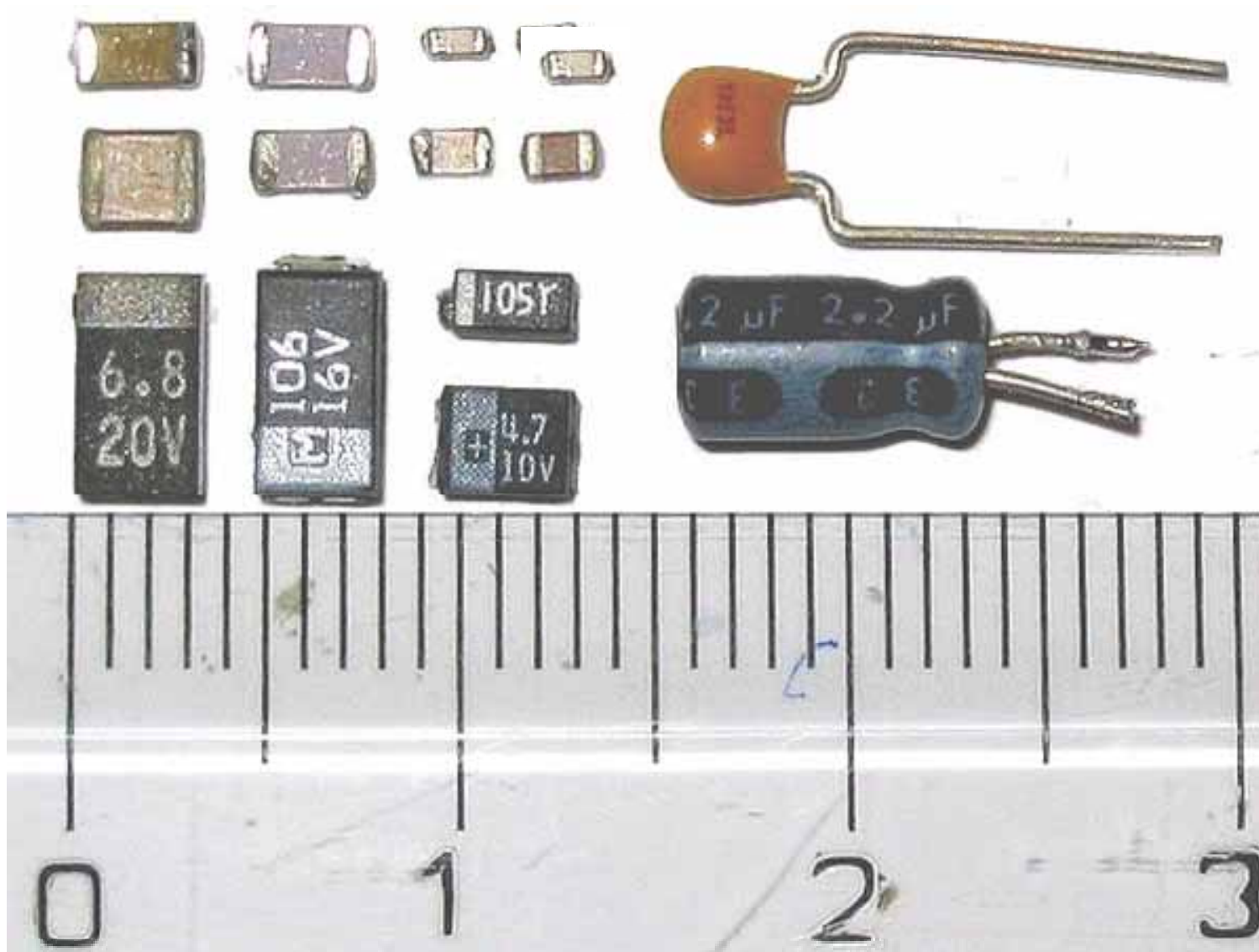
We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people Fun (selfies), Wellbeing (AAL), Safety (ADAS), Health (Medical Imaging), Productivity (Machine Vision), Security (Surveillance Systems) and **KNOWLEDGE (Scientific and Space Imaging)**

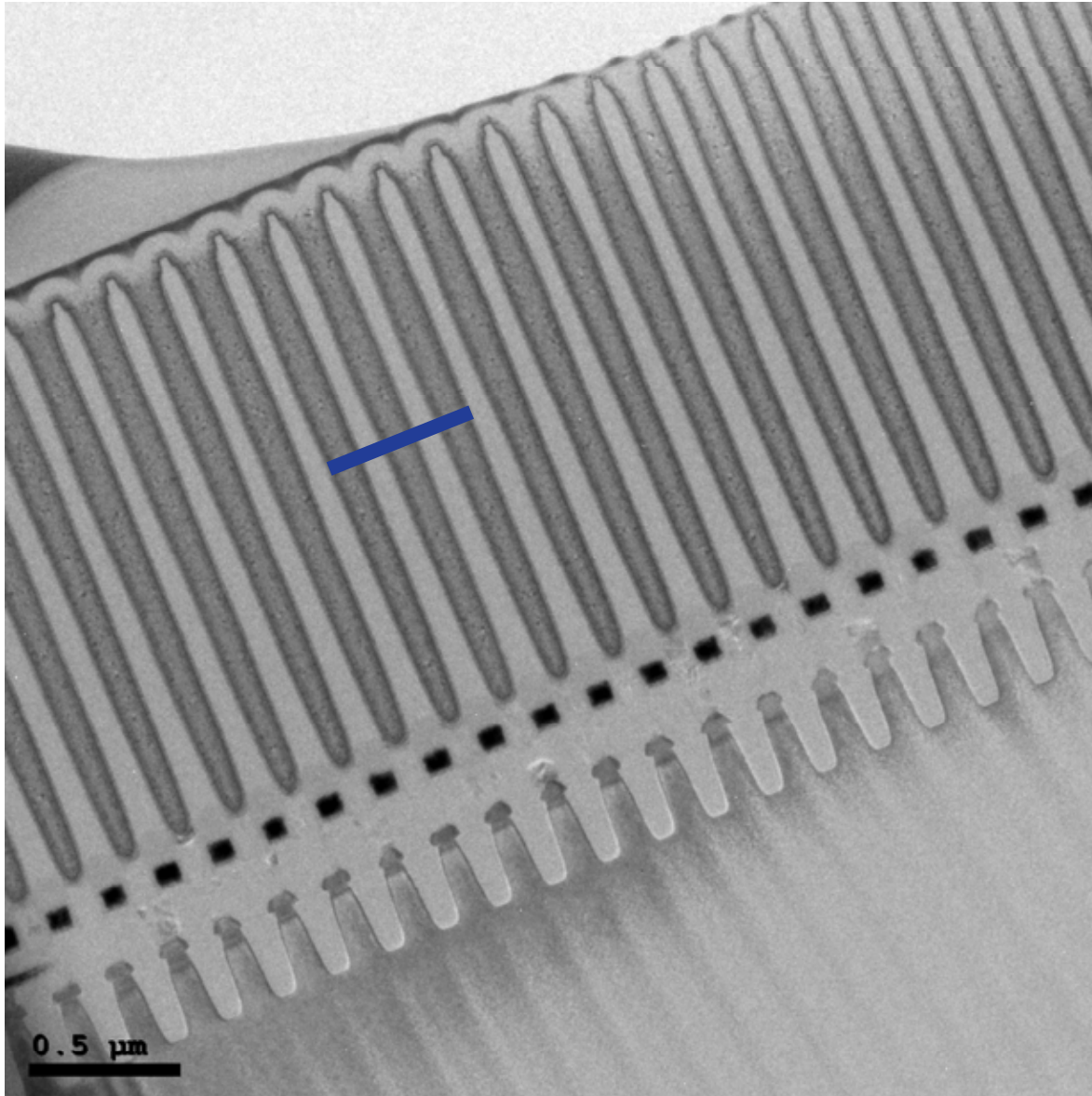


Microelectronics relates to the study and manufacture of **very small** electronic designs and components. Usually this means micrometer-scale or smaller. These devices are typically made from semiconductor materials. Many components of normal electronic design are available in a microelectronic equivalent.

These

include transistors, **capacitors**, inductors, resistors, diodes and (naturally) insulators and conductors can all be found in microelectronic devices.



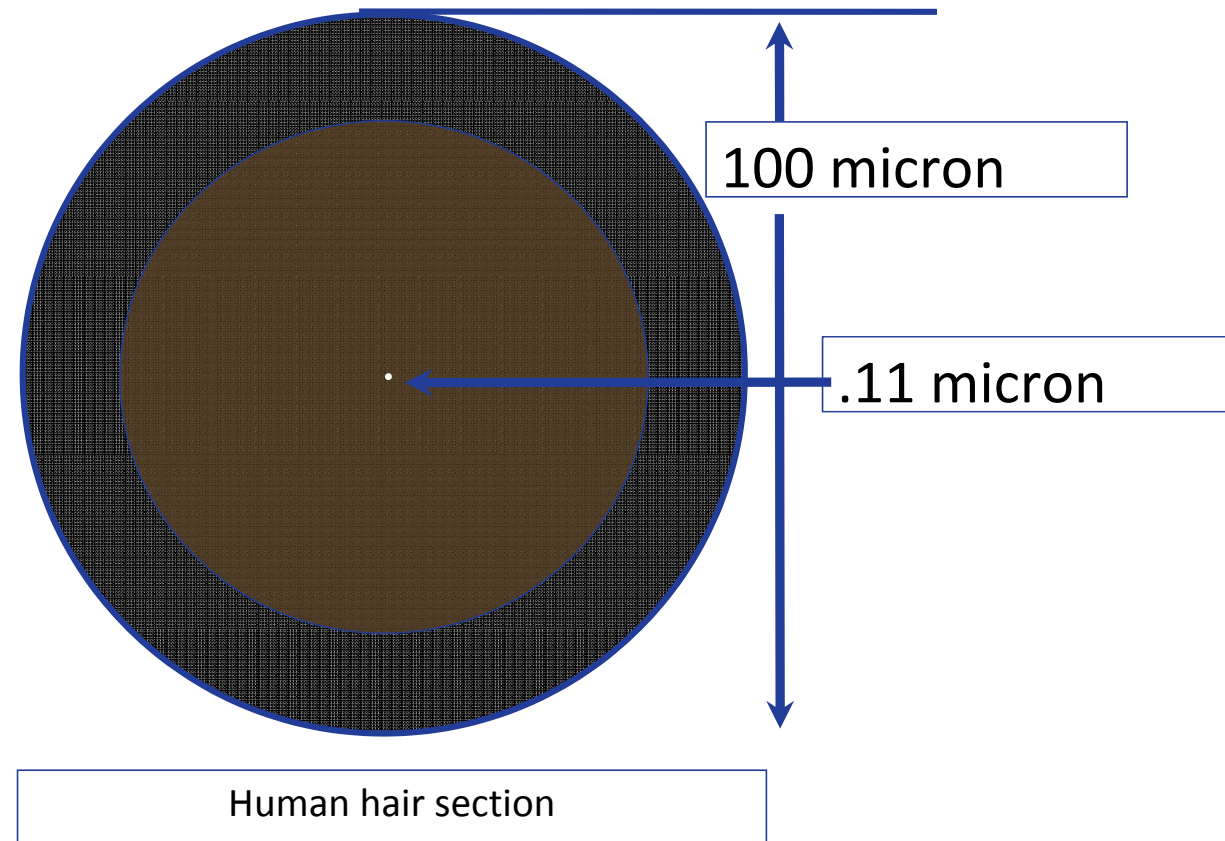


$\sim 1\text{mm} = 10^{-3}\text{m}$

$\sim 100\text{ nm} = 100 \times 10^{-9}\text{ m}$   
 $= 1 \times 10^{-7}\text{ m}$

$10^4$  times smaller

10000 times smaller



# From a Different Perspective ...

<http://learn.genetics.utah.edu/content/cells/scale/scale.html>

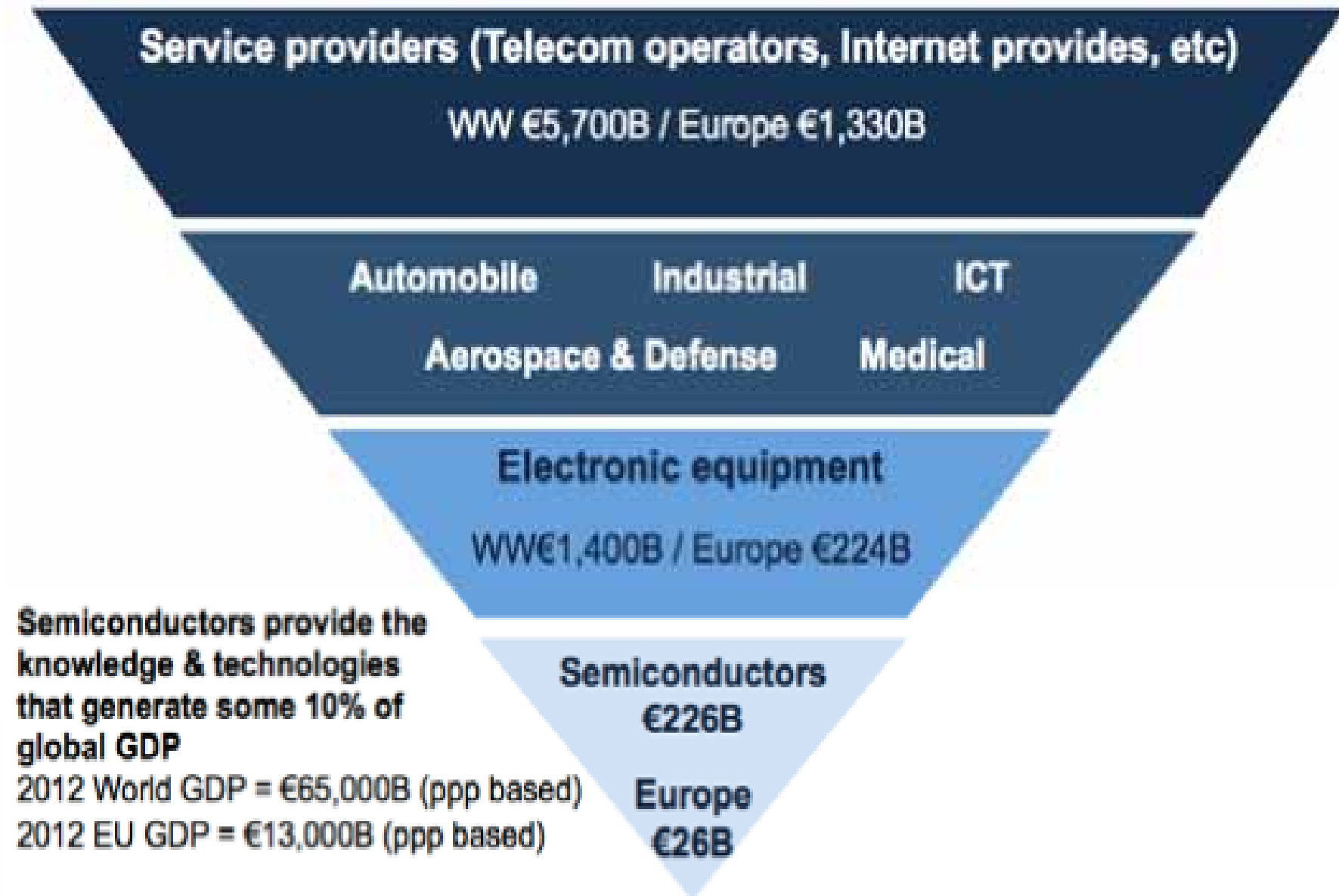


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# Semiconductor in Europe

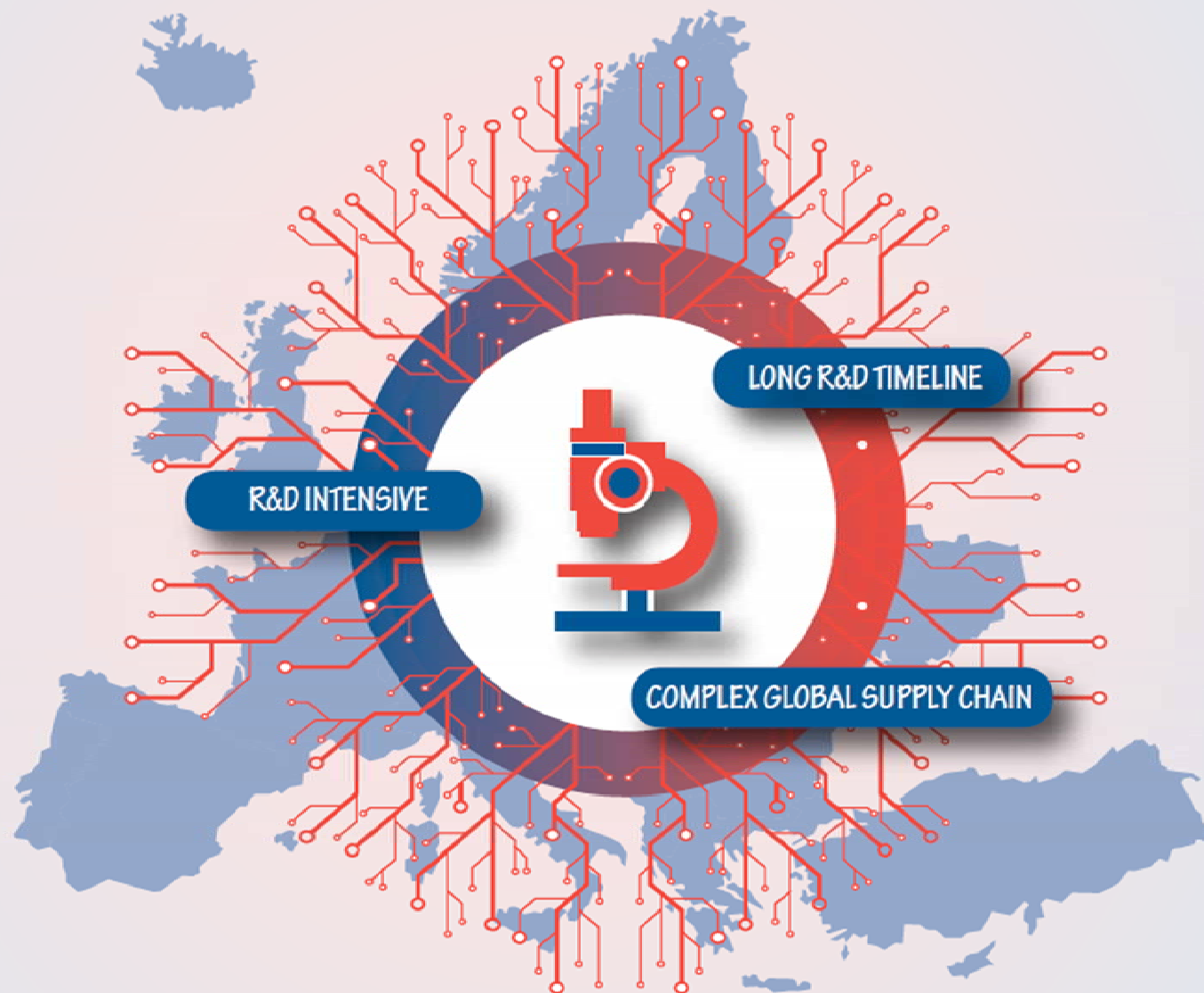


**200.000**

direct jobs

**1million**

indirect jobs



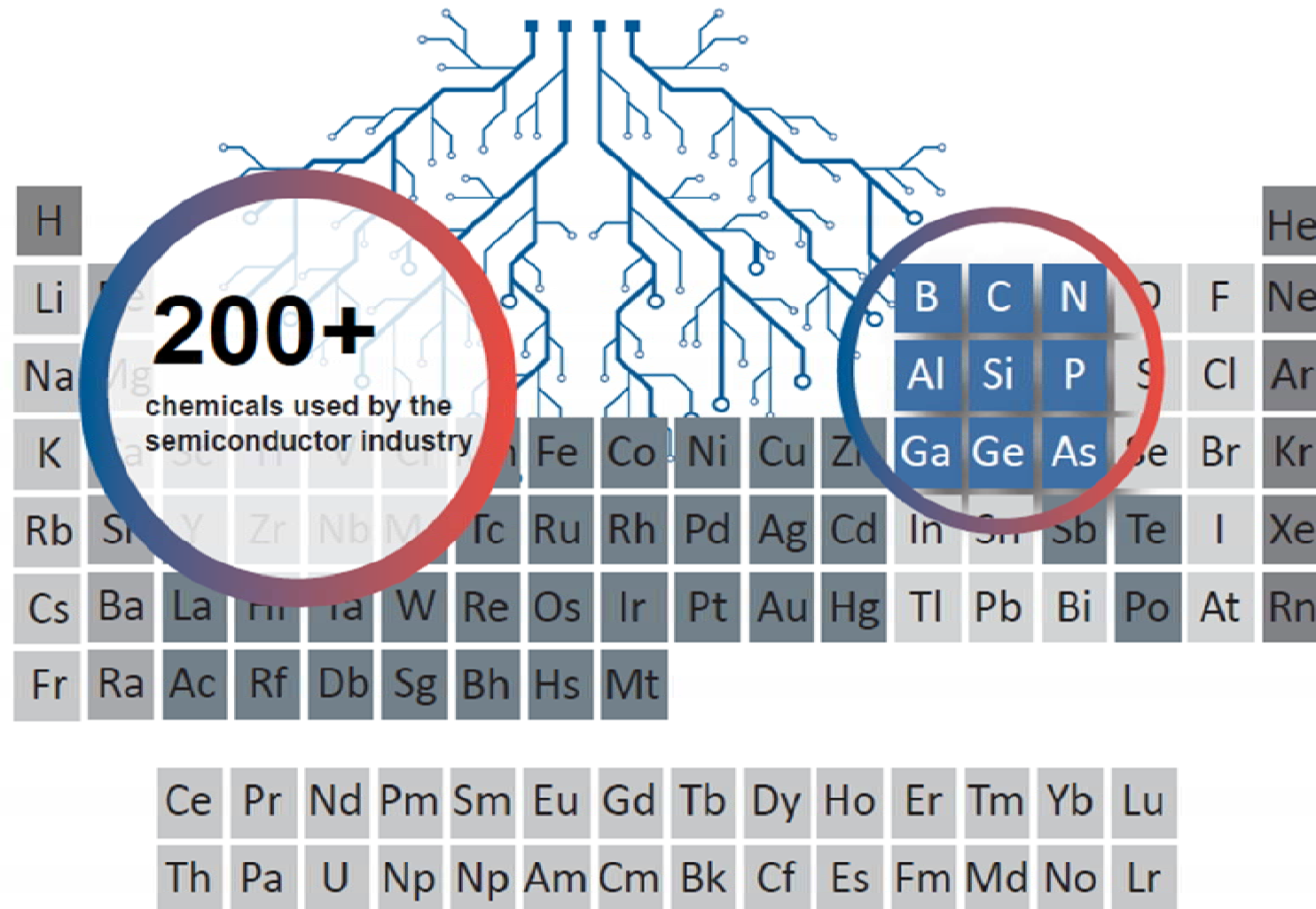


**The most complex and sophisticated  
manufacturing process in the world**

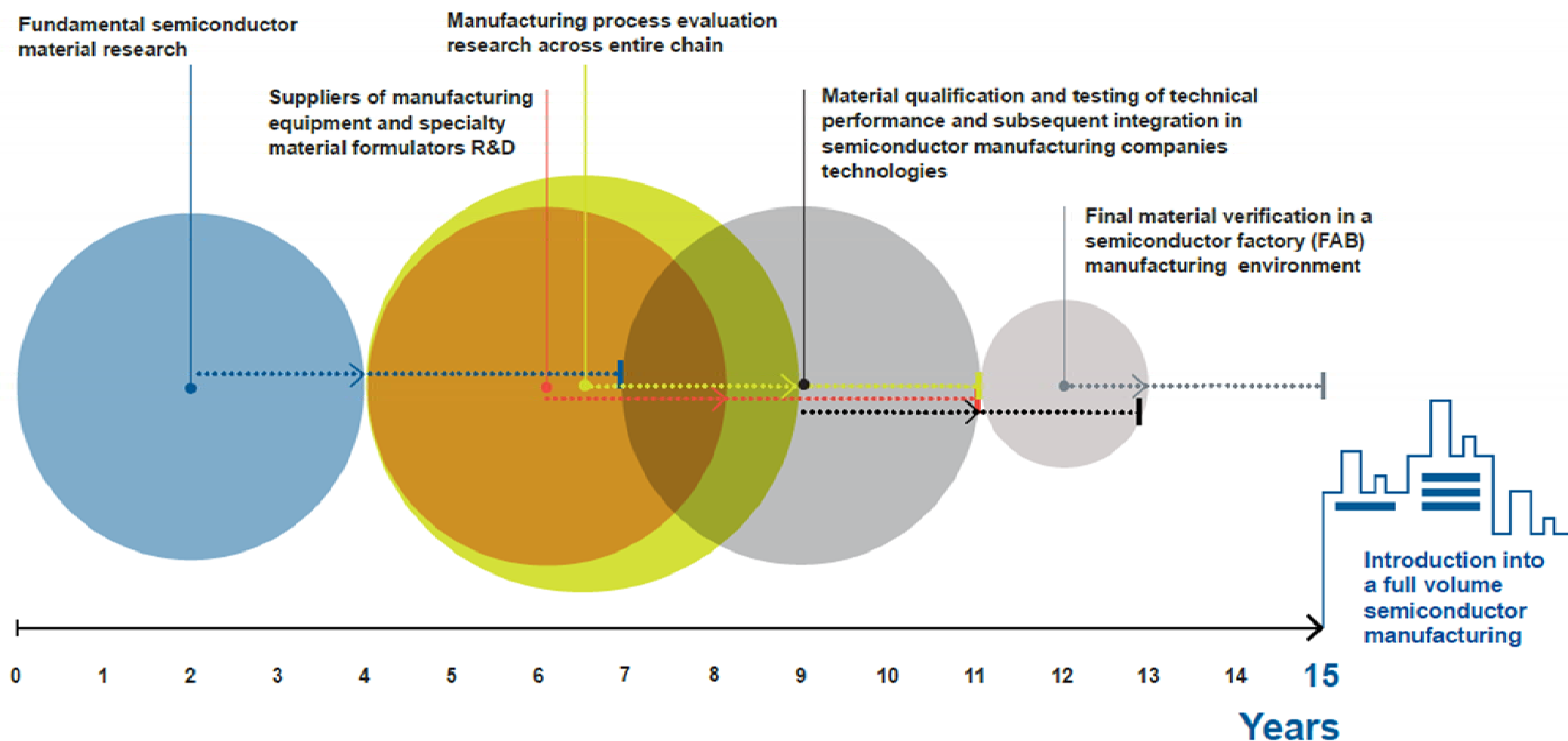
**500**  
manufacturing  
steps

**CLEAN  
Environment**  
Max one 0.5 $\mu$ m  
particle per  
33cm<sup>3</sup> of air

**Semiconductor innovations are dependent upon the use and availability of specialty materials and chemicals**



# Introducing new materials: a complex and lengthy journey from R&D to final manufacturing



**EU chemical regulations should not affect the ability of the European semiconductor industry to innovate and compete globally.**

**Regulations must provide certainty for the continued future use of semiconductor materials. The industry will continue to use materials responsibly.**



**Vulnerable business environment**



**Capital investments for manufacturing**



**Limits on innovation**



**Long-term effects on the customers**

On 2009 the European Commission disclosed its strategy about the so-called Key Enabling Technologies (KETs) for Europe.

- The semiconductor business has been included on the KETs list

Based on the document “Vision, Mission & Strategy: RnD in European Micro- and Nano-Electronics”, Europe shows strengths related to:

- RnD capabilities and capacities in industry, institutes and academia;
- global leadership on More than Moore technologies and applications;
- leadership on the above-mentioned segments;
- high skills of people.

- ☐ We provide innovative solutions to bring our customer's idea to life. We wish an eco-system by shaping strong partnerships with RTOs, SMEs and Universities as well.
- ☐ We believe that the development of silicon-based technological solutions through an **open manufacturing** model can be part of Europe's renaissance on this business.





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# THANK YOU



# LIFEbitmaps

