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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

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EHSS Director

LIFEBITMAPS

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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.

About SMIC

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.

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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

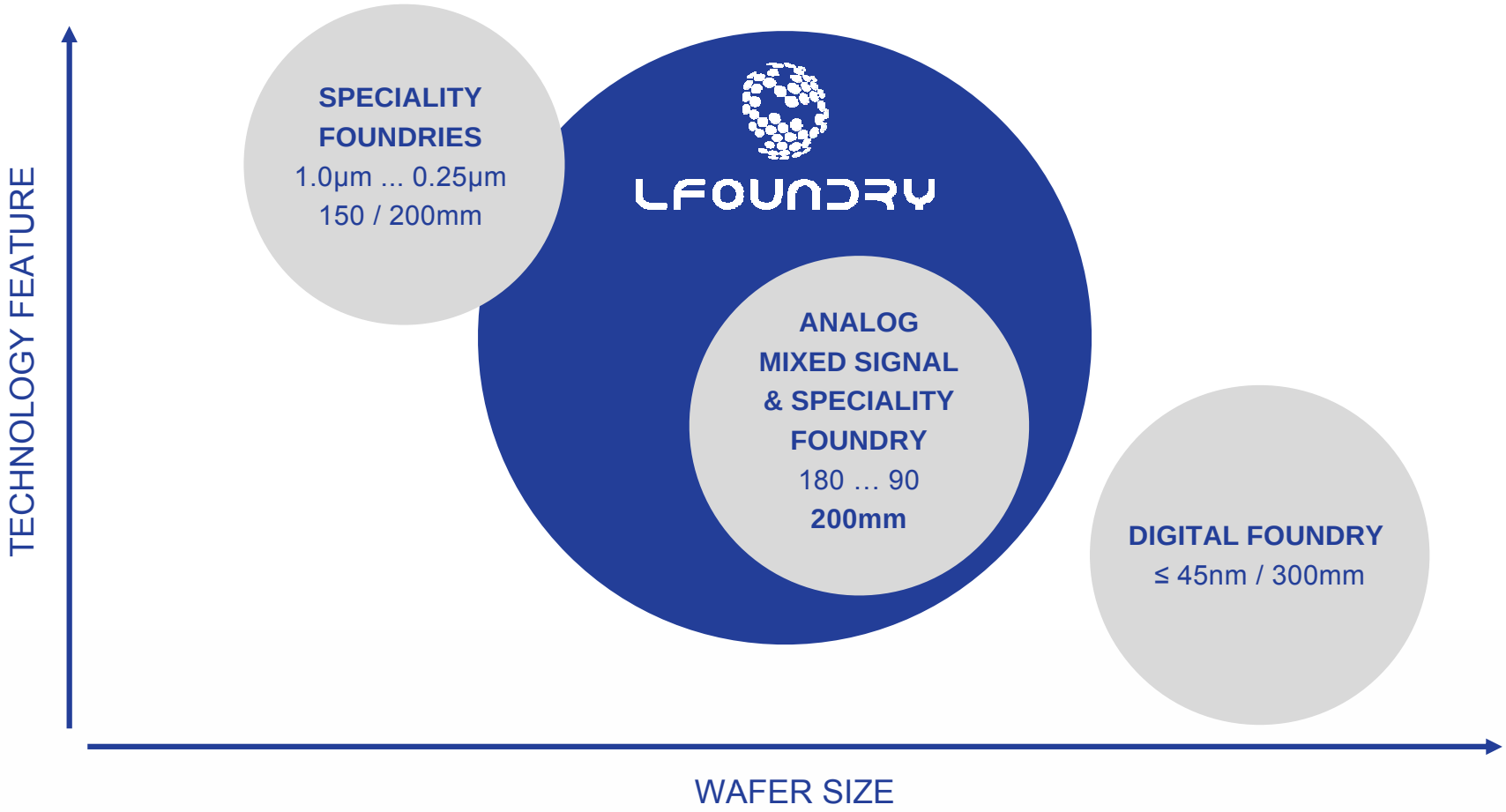
R&D Engineering:
90

Process & Equipment Engineering:
110

Design:
14

Positioning in Foundry Market

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



Service Model

CUSTOMER TECHNOLOGY

Adopting customer technology and customizing foundry technology

- Special imaging technology know how and capabilities
- Engineering know how & IP for non-CMOS technologies such as Optical Sensors, Power MOS, …

JOINT TECHNOLOGY DEVELOPMENT

Technology development and production partnership

- Excellent network to leading institutes
- New integration e.g. for MEMS into CMOS
- Technology IP generation
- Setup of full solutions

OPEN FOUNDRY

Design environments and wafer fabrication based on advanced analogue/mixed signals technology

- Flexible PDK platform (i-PDK) with accurate models
- Continuous mainstream technology enrichment with modules like Image Sensors/Pixel, Optical Sensors, High Voltage, RF devices, High density / low cost embedded memory, ...
- Specific qualifications like **automotive** and **security**

LFoundry Global Footprint

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

JAPAN OFFICE

Yokohama, Japan

SALES REPS AND BUSINESS DEVELOPMENT OFFICE USA

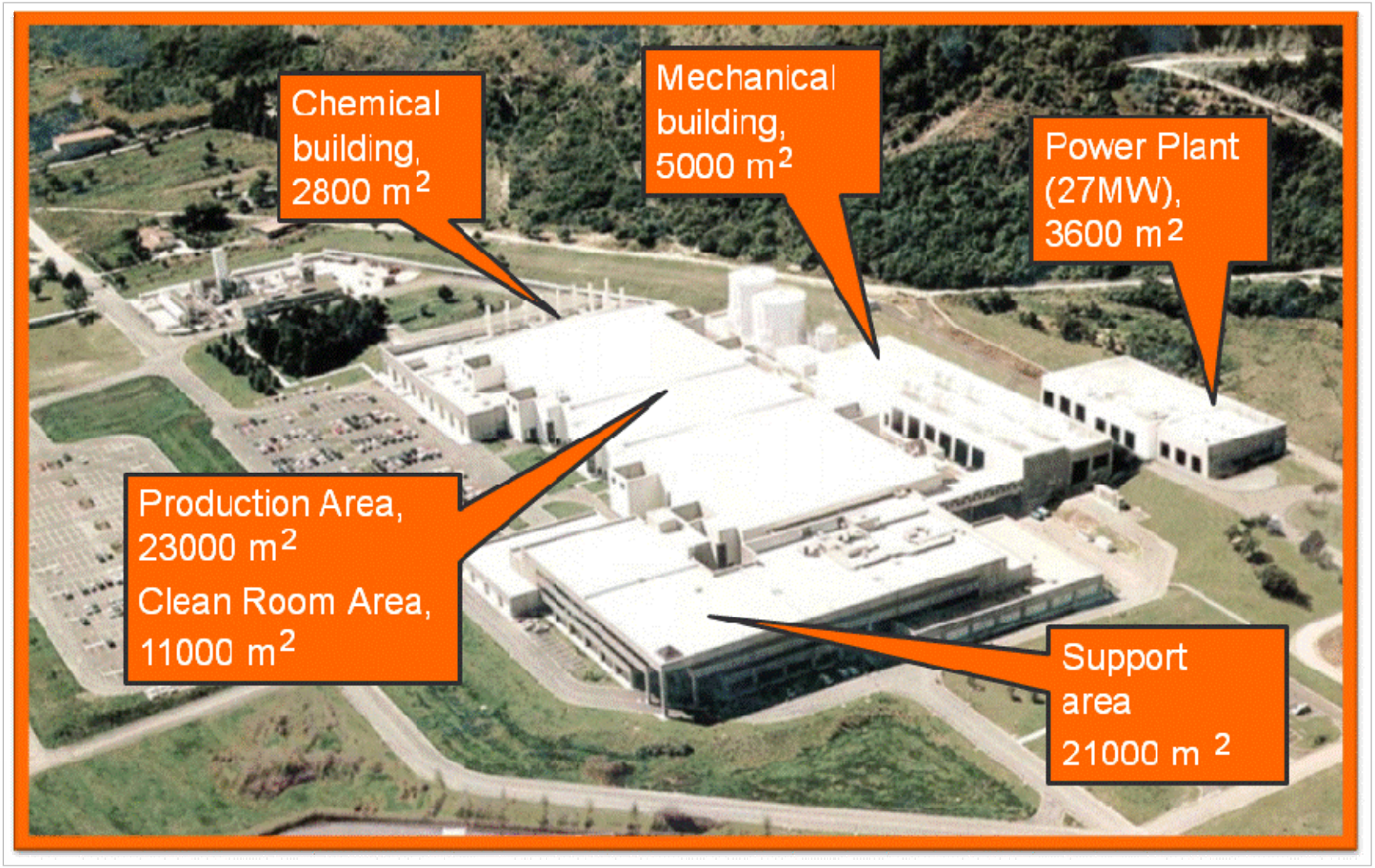
Irvine, CA

Austin, TX

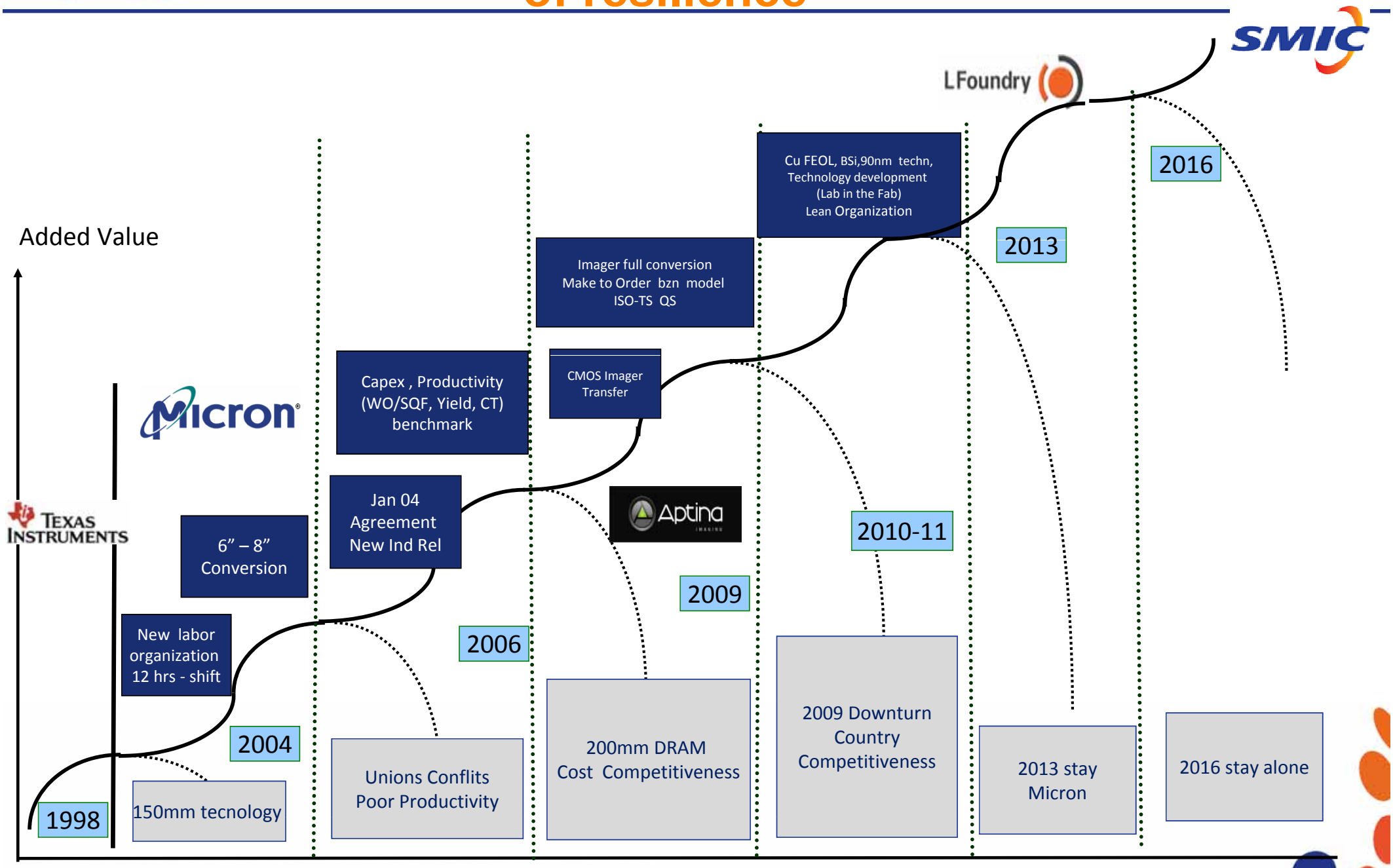
SALES REPS ASIA

South Korea

Avezzano Fab At A Glance



Avezzano's site: a history of resilience



Management

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,

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*)

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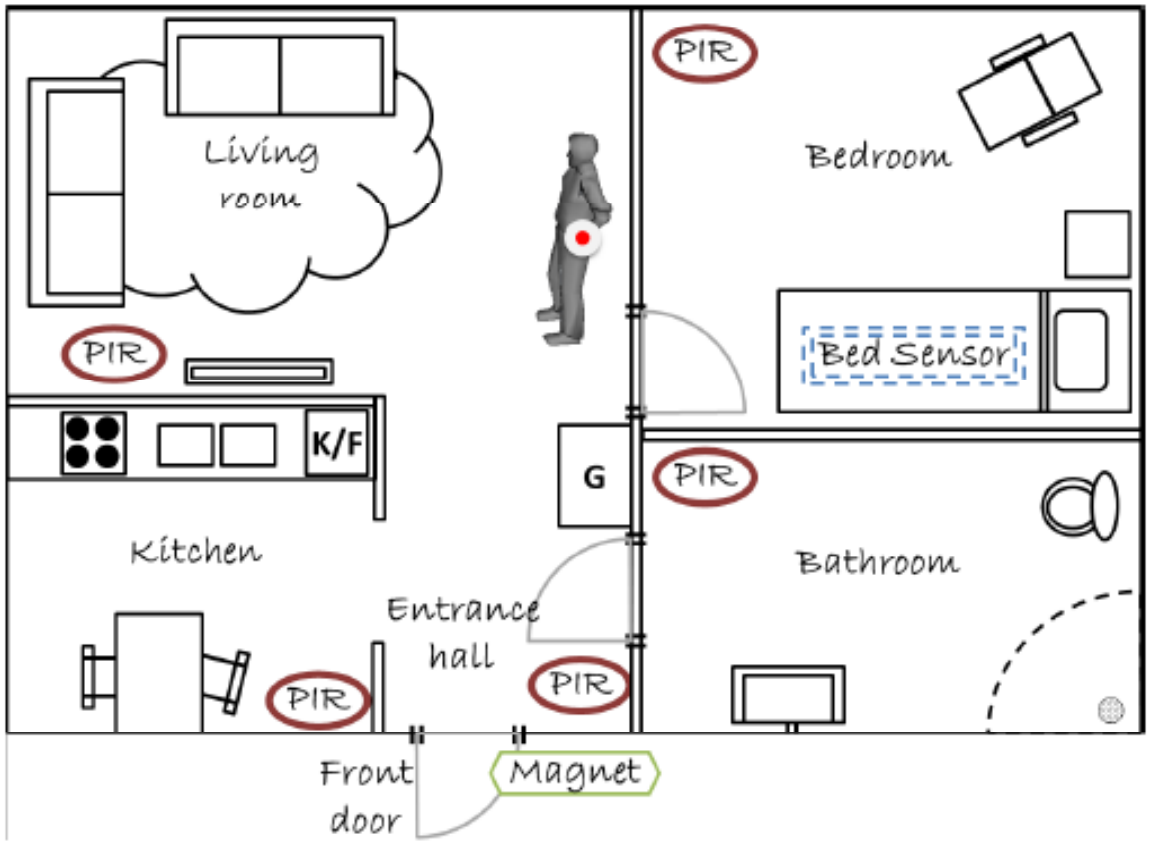
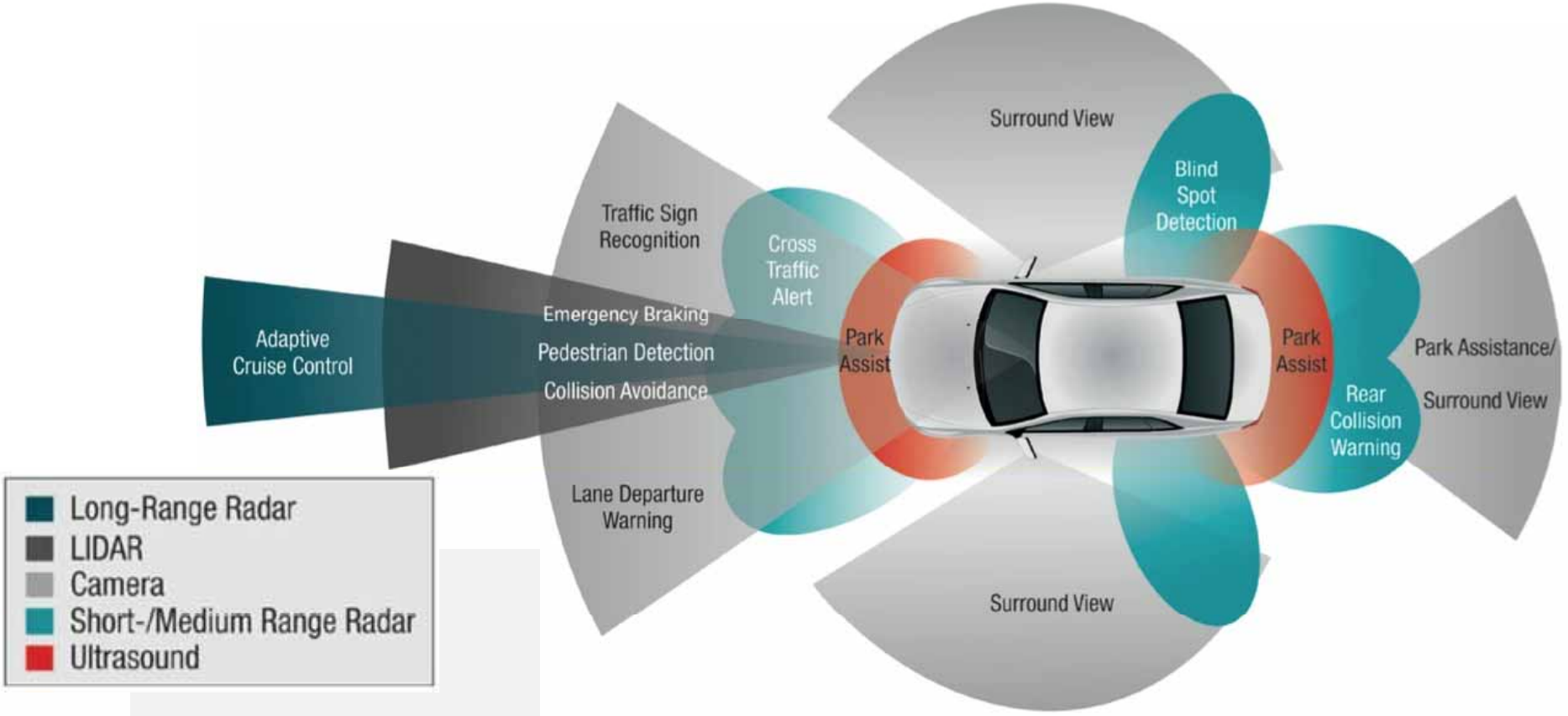
We are experiencing an incredible progress in all kind of detector/sensor technologies. Image sensor are spread everywhere contributing to people FUN (*selfies*), **WELLBEING (AAL- Active and Assisted Living)**

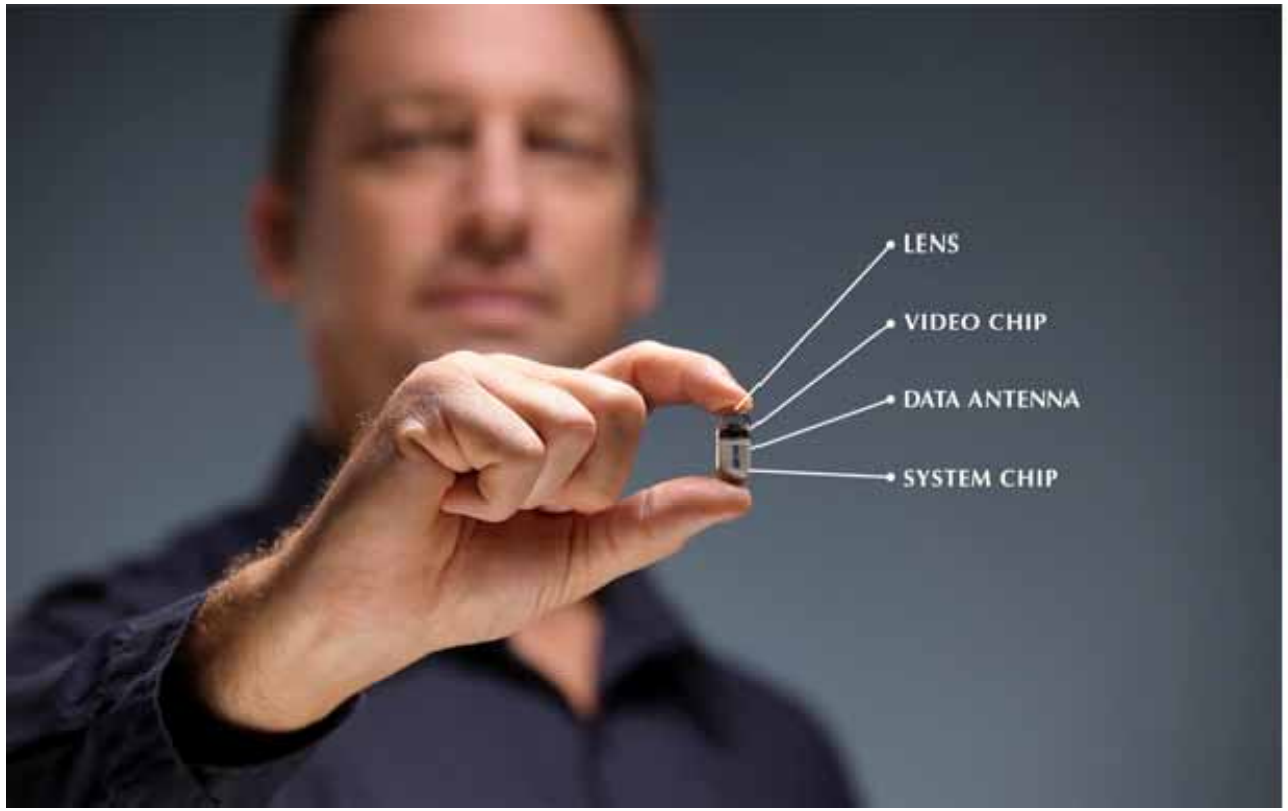


PIR – Passive Infra-Red

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)



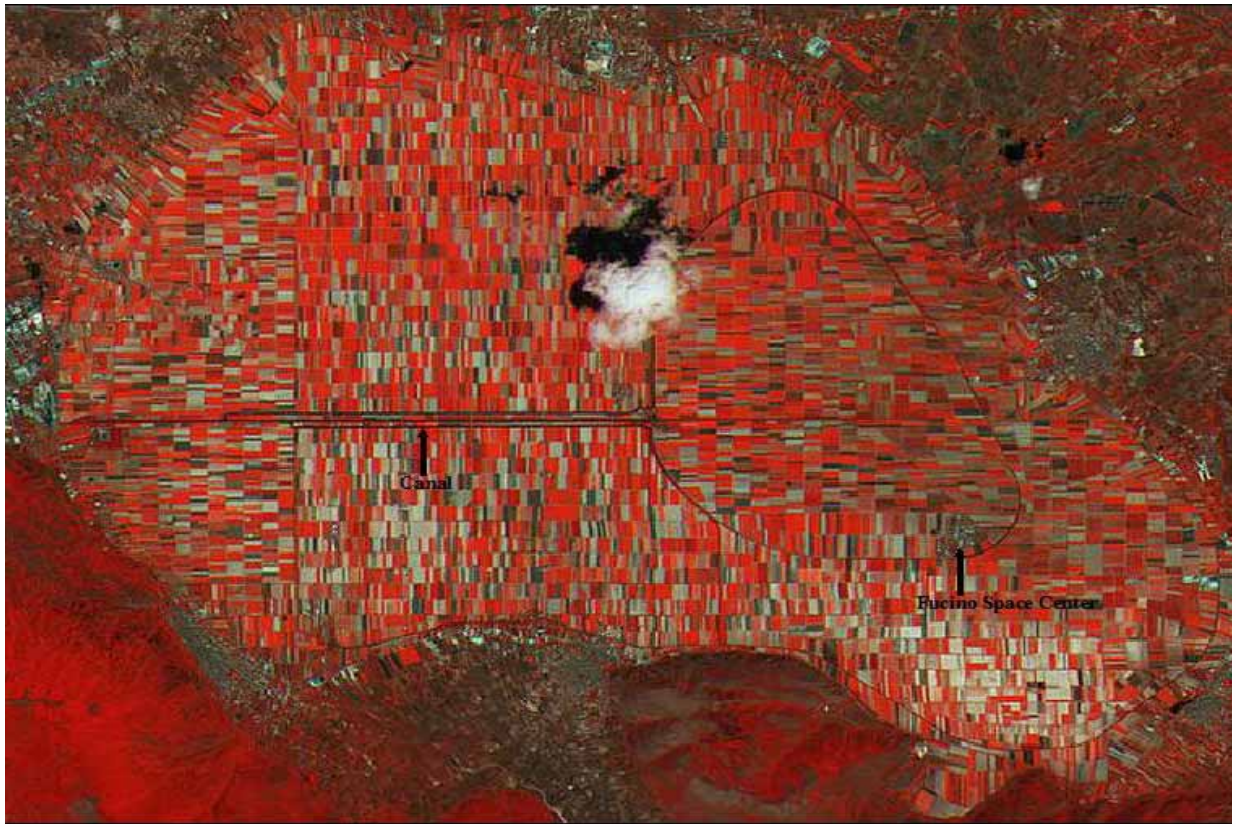
15

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)**

16

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 (Surveilliance Systems) and **KNOWLEDGE (Scientific and Space Imaging)**

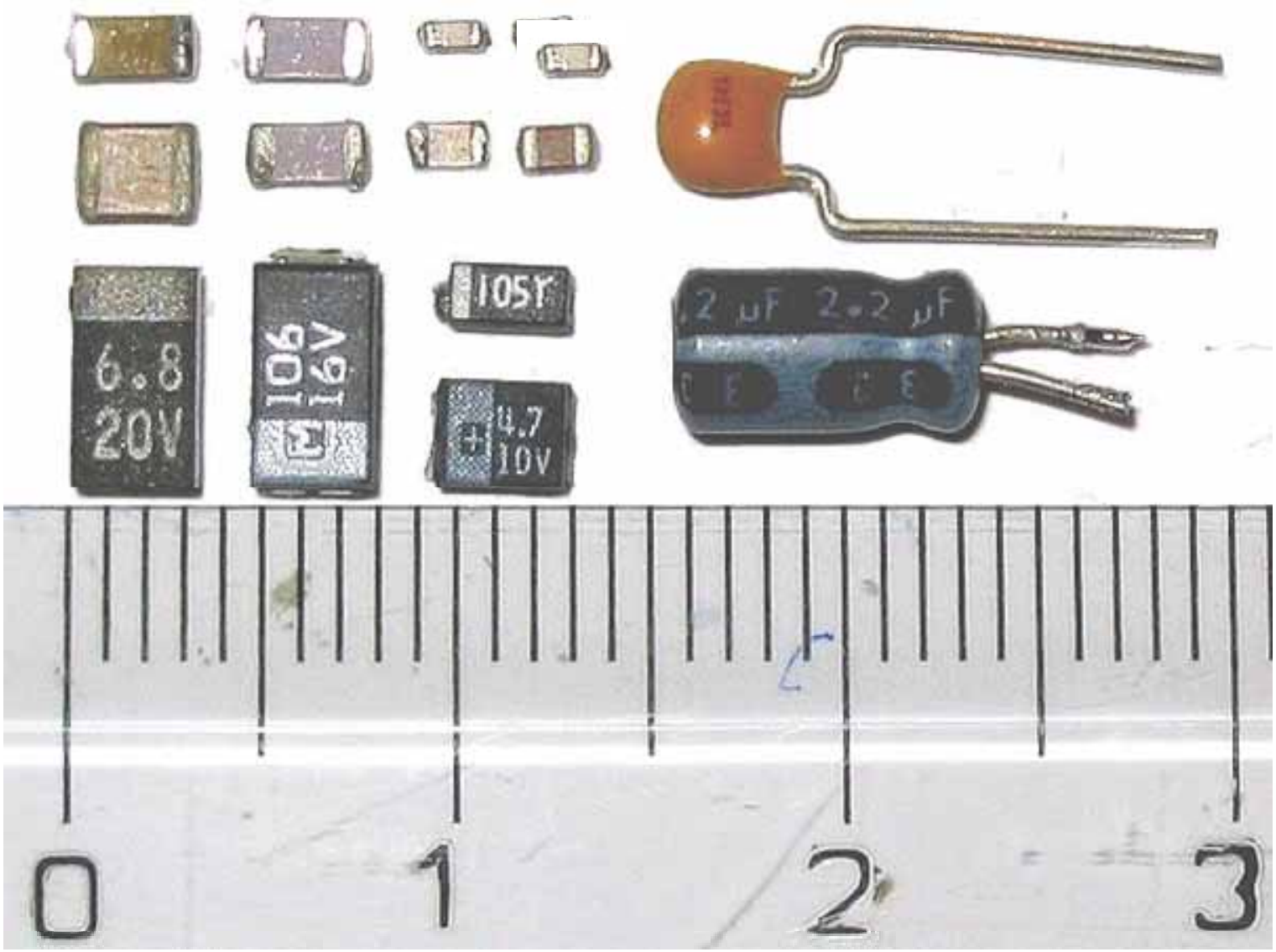


Microelectronics

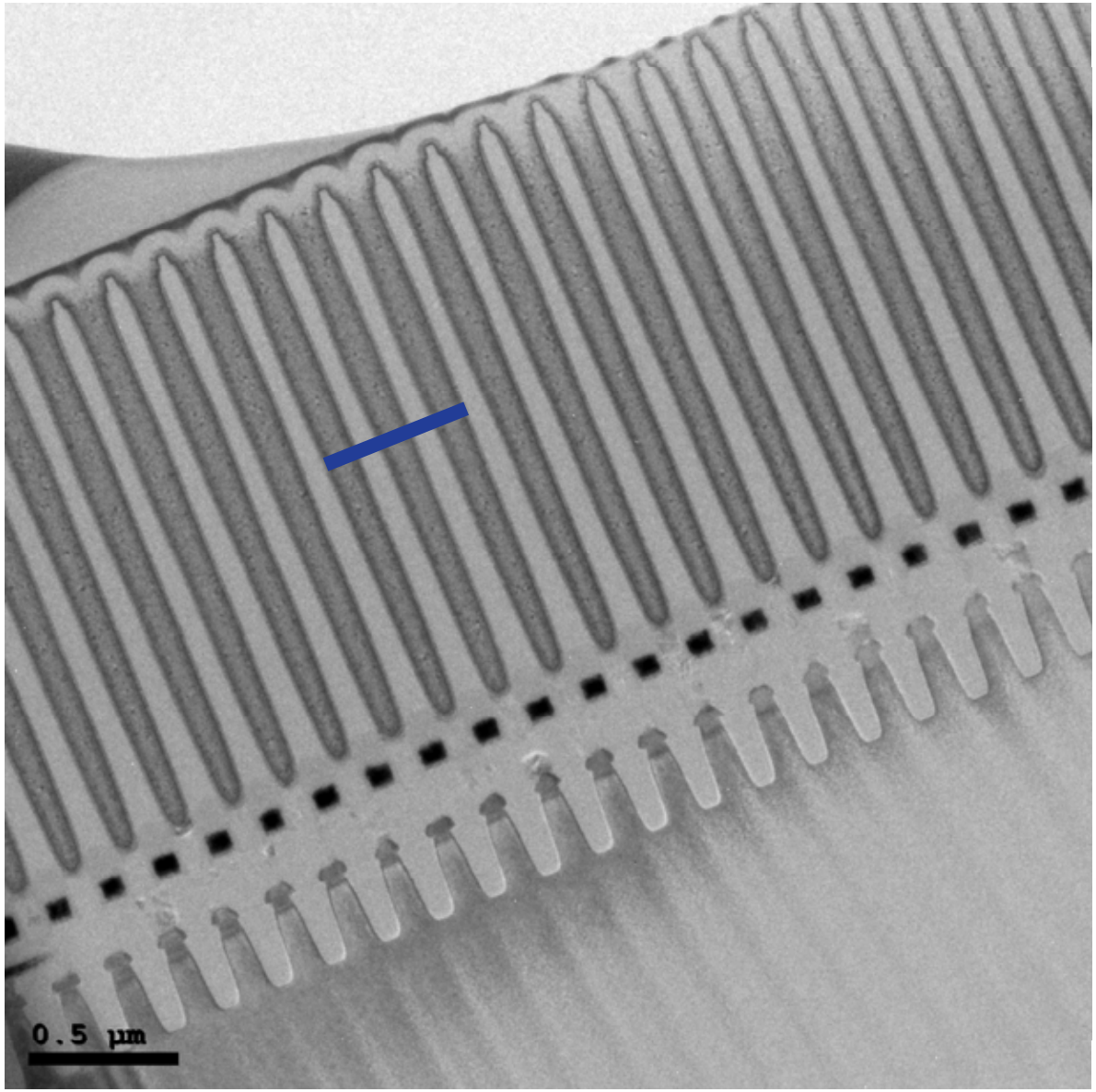
Microelectronics relates to the study and manufacture of very small electronic designs and components. Usually this means micrometer-scale or smaller. These devices are typically made from semiconductor materials. Many components of normal electronic design are available in a microelectronic equivalent.

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

Capacitors Available in Electronics



…and in Microelectronics



~ 1mm = 10^{-3}m

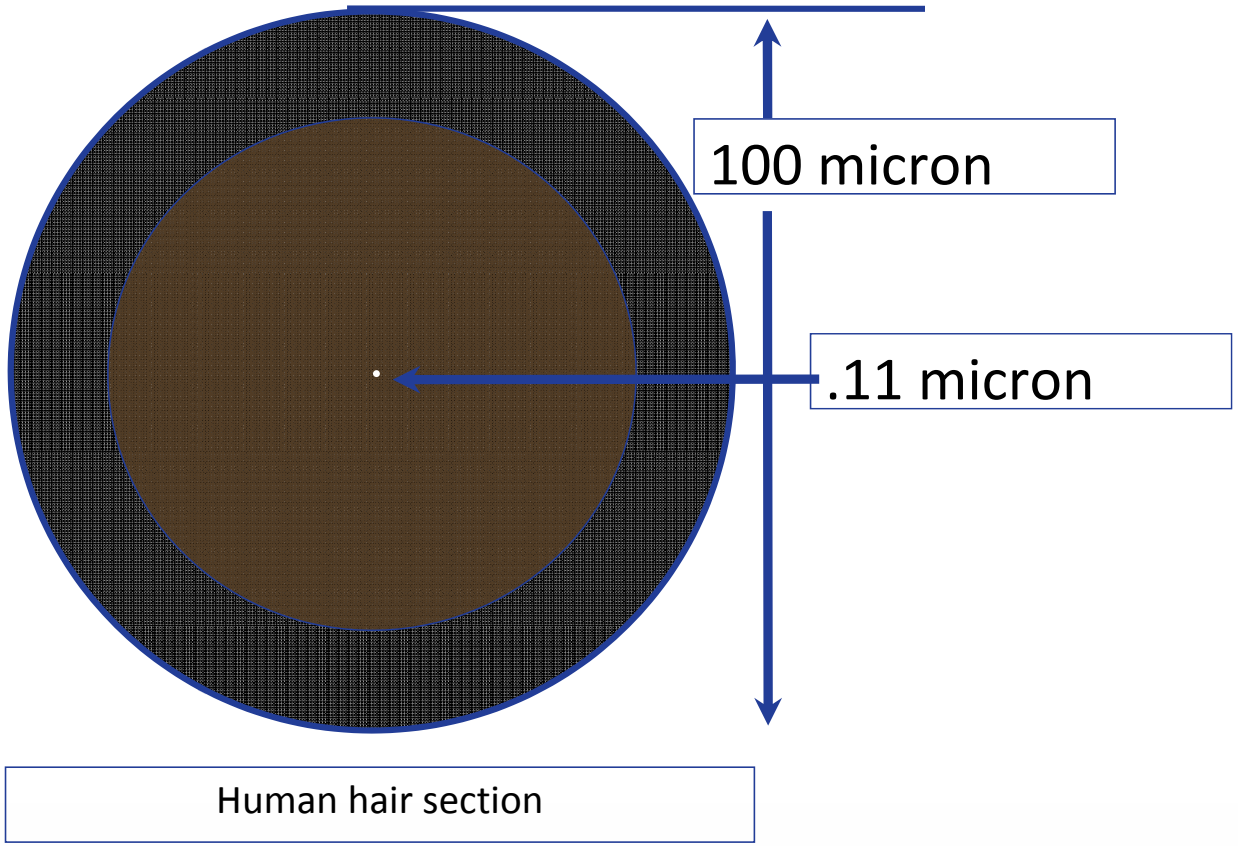
~ 100 nm = 100 x 10^{-9} m
= 1 x 10^{-7} m

10^4 times smaller

10000 times smaller

21

How small is small

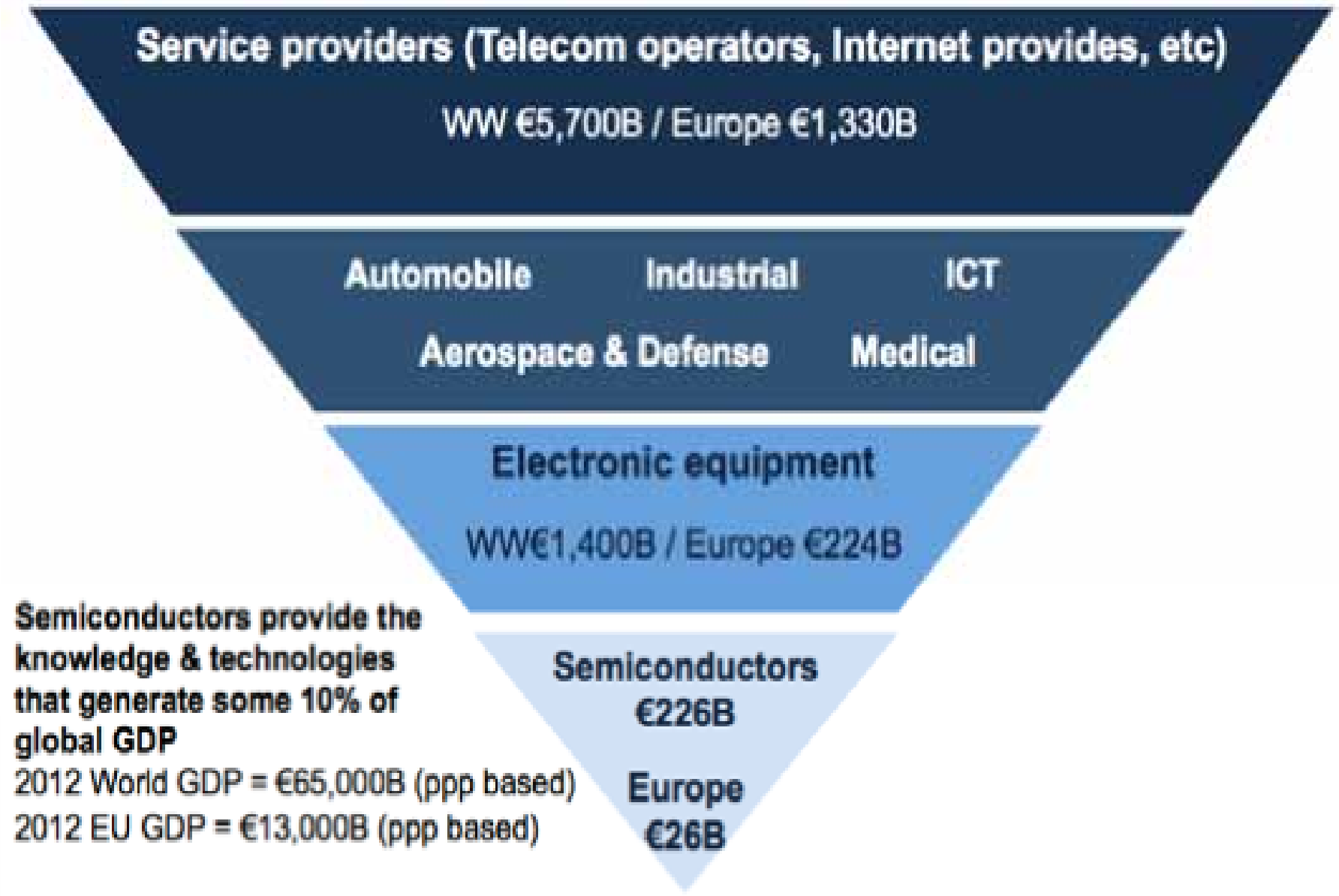


From a Different Perspective …

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

Semiconductor in Europe

Supply chain



(sorgente: WSTS 2013)

ESIA

European Semiconductor Industry Association

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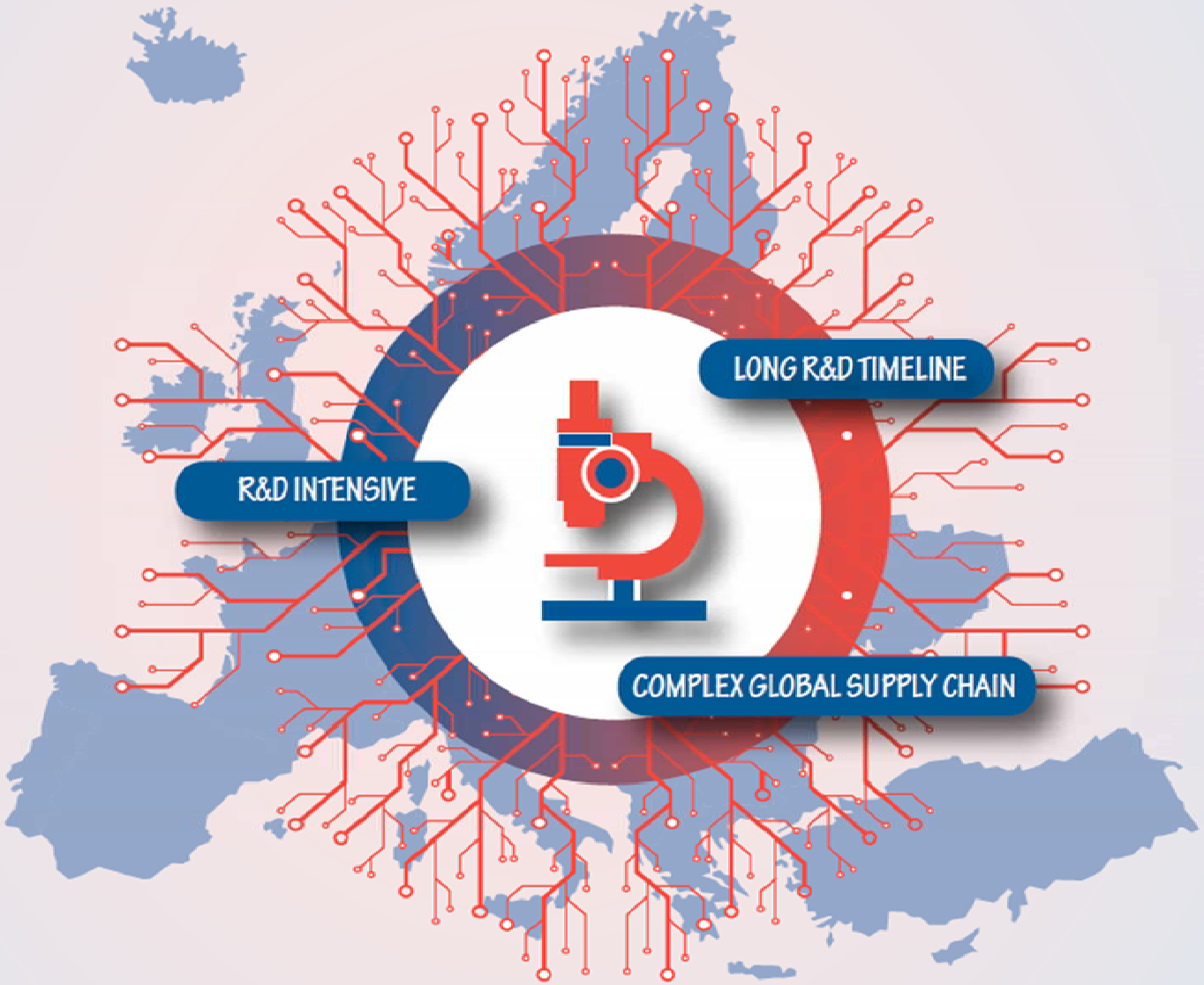
200.000
direct jobs

1million
indirect jobs




The most complex and sophisticated manufacturing process in the world
500
manufacturing steps
CLEAN Environment
Max one 0.5µm particle per 33cm³ of air

ESIA
European Semiconductor Industry Association

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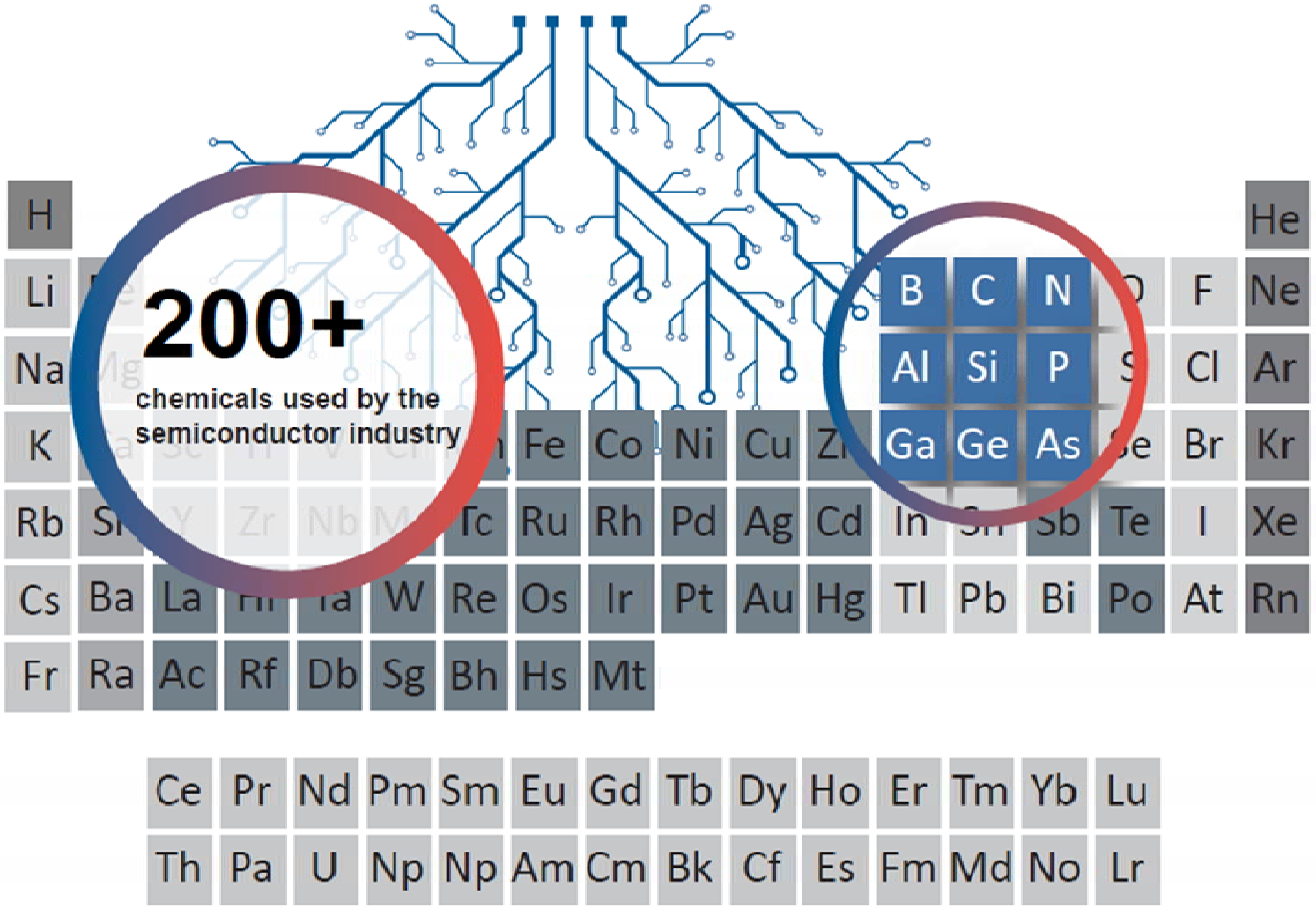
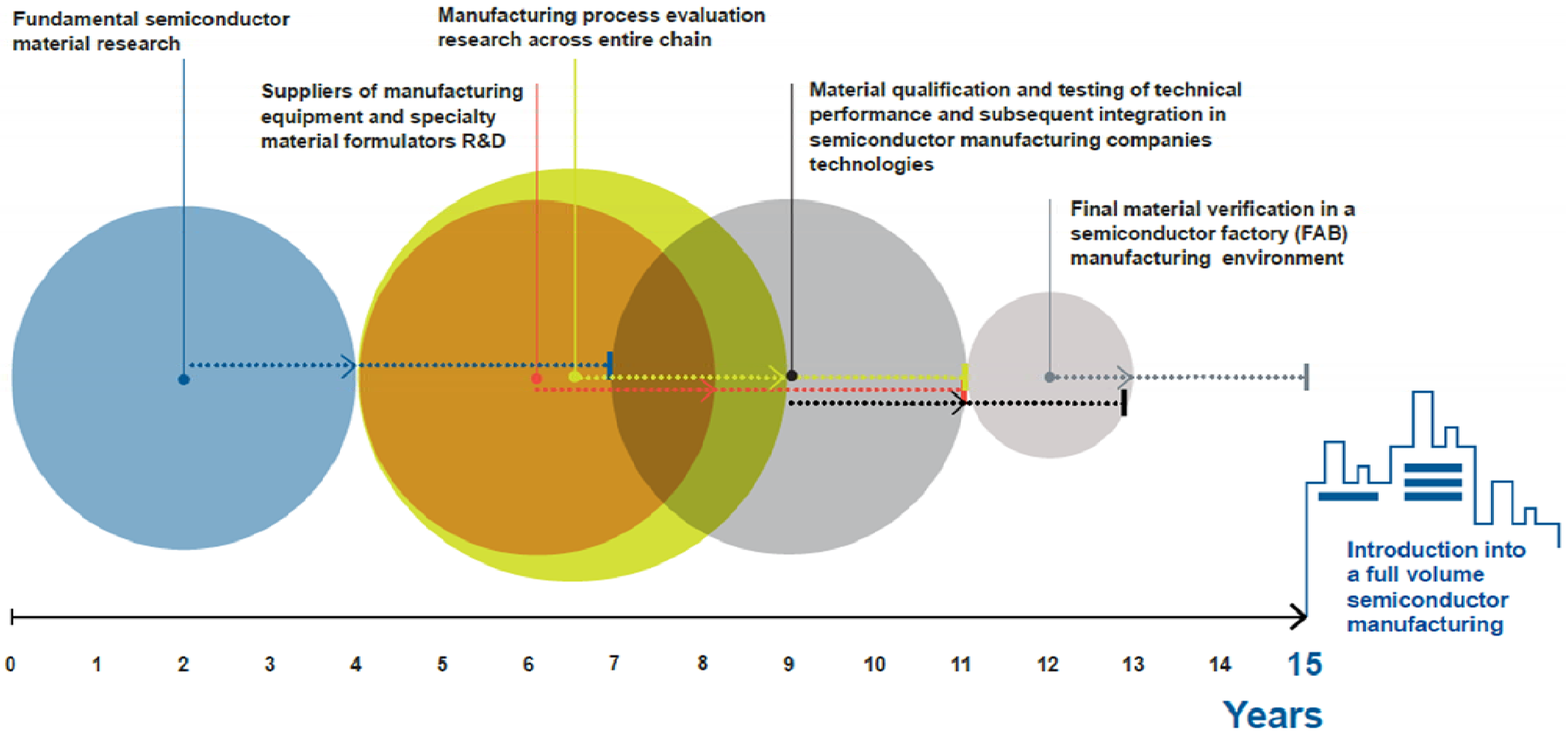
Semiconductor innovations are dependent upon the use and availability of specialty materials and chemicals



ESIA

European Semiconductor Industry Association

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



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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