European Competitiveness in the Global Digital Economy

Laith Altimime, President of SEMI Europe

20 November 2018, Lisbon

Outline

SEMI at a Glance

Drivers of Growth

European Competitiveness

Key Messages

SEMI Is the Gateway to the $2T+ Electronics Supply Chain

10+ TECHNOLOGY COMMUNITIES

2000+ MEMBER COMPANIES

170+ PROGRAMS

7 SEMICONS

1.3MIL PEOPLE SERVED

5000+ VOLUNTEERS

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SEMI is your global multiplier

2300+ PROGRAM HOURS

970+ STANDARDS

1 ORGANIZATION
1 SEMI

SEMI
Evolving to Connect the Full Electronics Manufacturing Supply Chain

SEMI Vertical Application Platforms

IOT
SMART TRANSPORTATION
SMART MANUFACTURING
SMART MEDTECH
SMART DATA

SEMI Strategic Association Partners

semi | Electronic System Design Alliance
semi | FOA fab owners alliance
semi | MEMS & Sensors Industry Group®
semi | FlexTech

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SEMI Mantra

SEMI *speeds the time to better business results* for its members across the global electronics manufacturing supply chain.

SEMI Connects the Global Electronics Manufacturing Supply Chain

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Electronic System Design Alliance

FOA fab owners alliance

MEMS & Sensors Industry Group®

FlexTech

SEMI – ESDA Strategic Partnership

Connects the Global Design and Manufacturing Communities

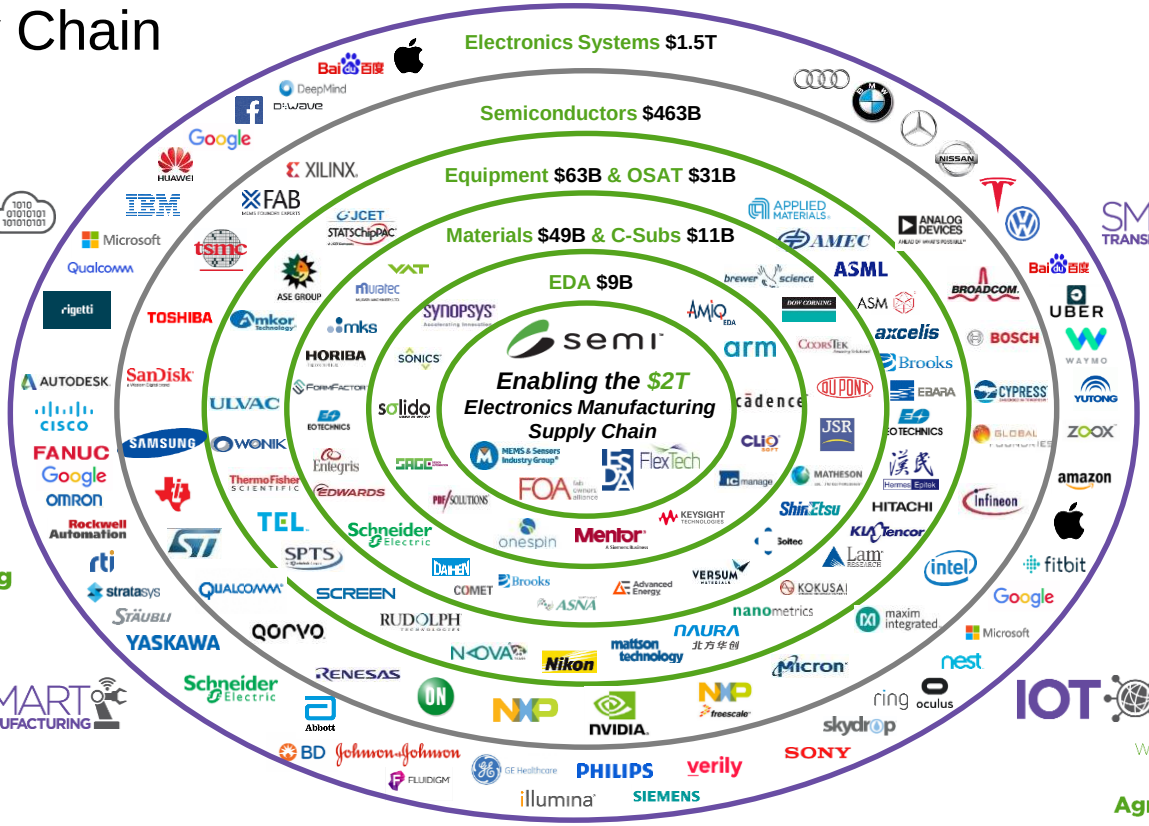
Altair
AMIQ EDA
ANSYS
arm
AWR
Blue Pearl Software
BREKER
cadence
CAST
CLIO SOFT
concept engineering
C-SKY
DASSAULT SYSTEMES
EDDR software
Helic
IC manage
ICSCAPE
intel
KEYSIGHT TECHNOLOGIES
LORENTZ SOLUTION
Mentor A Siemens Business
methodics
Minima
onespin
PDF SOLUTIONS
REAL INTENT Accelerating Advanced Sign-off
Revulytics
SAGE DESIGN AUTOMATION
Sigasi
SmartFlow Compliance Solutions
SONICS
SUSE
SYNOPSYS Accelerating Innovation
Verific Design Automation
ZUKEN

SEMI – Fab Owners Alliance Strategic (FOA) Partnership

26 device makers join 2000+ SEMI members globally

ams www.ams.com
EVERSPIN TECHNOLOGIES
RENESAS
Polar Semiconductor, LLC
TOWER SEMICONDUCTOR LTD.
BROADCOM
Honeywell
ON Semiconductor
SKYWORKS
XFAB MIXED-SIGNAL FOUNDRY EXPERTS
CYPRESS EMBEDDED IN TOMORROW
hp
NXP
WD Western Digital
skywater
DB HiTek
dpiX
infineon
GLOBALFOUNDRIES
qorvo all around you
MIT Lincoln Laboratory
emcore
LUMILEDS
Microsemi a Microchip company
SEAGATE
MACOM

$2T Supply Chain



A.I.

Machine Learning

Blockchain **5G**

Bitcoin Mining

Quantum Computing

SMART DATA

Autonomous Vehicles

Trucking

Fleet

SMART TRANSPORTATION

Drones

Driver Assistance

3D Printing

IIoT

Industry 4.0

Realtime Configuration

Robots

SMART MANUFACTURING

Adaptive Manufacturing

Smart City

AR/VR

Gaming

Fitness Tracking

Voice Assistant

Wearables

Smart Home

GPS

IOT

Agriculture

Human Performance Monitoring

CRISPR

Biometrics

SMART MEDTECH

Digital Health

Dosage Monitoring

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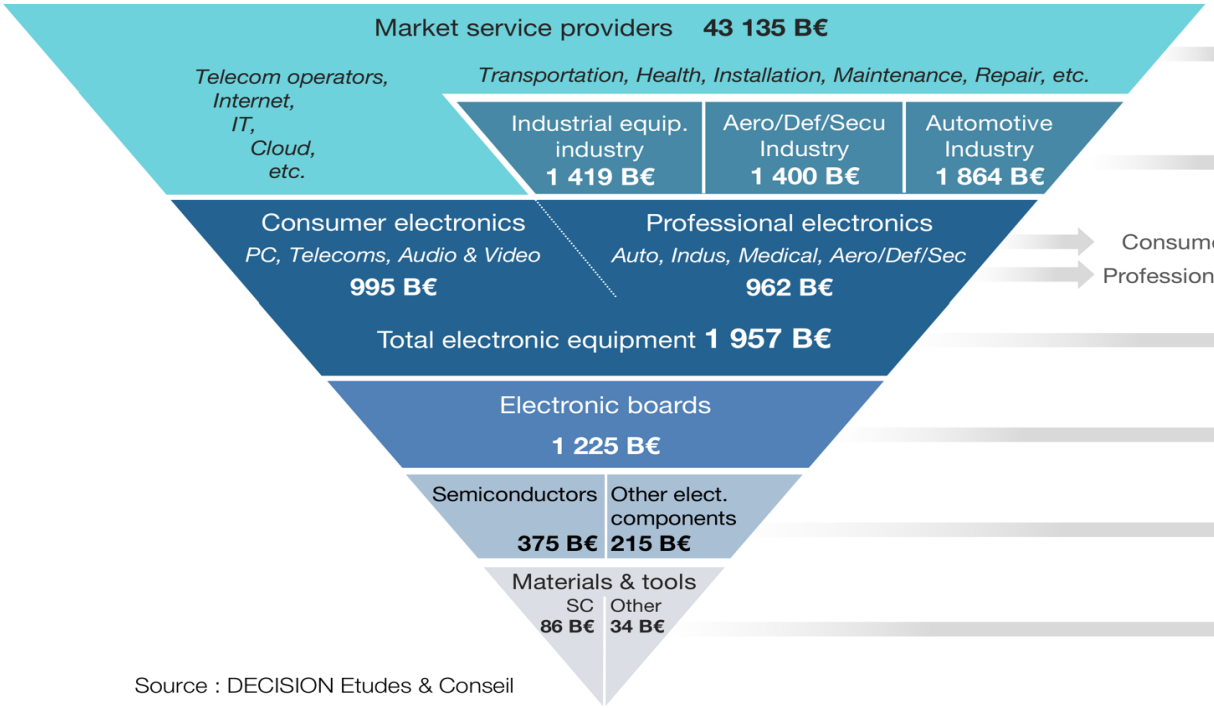
Forecasts for 2018: IC Insights, SEMI, WSTS, TechSearch, ESDA

Europe's Overall Competitiveness Mirrored in its electronics Value Chain

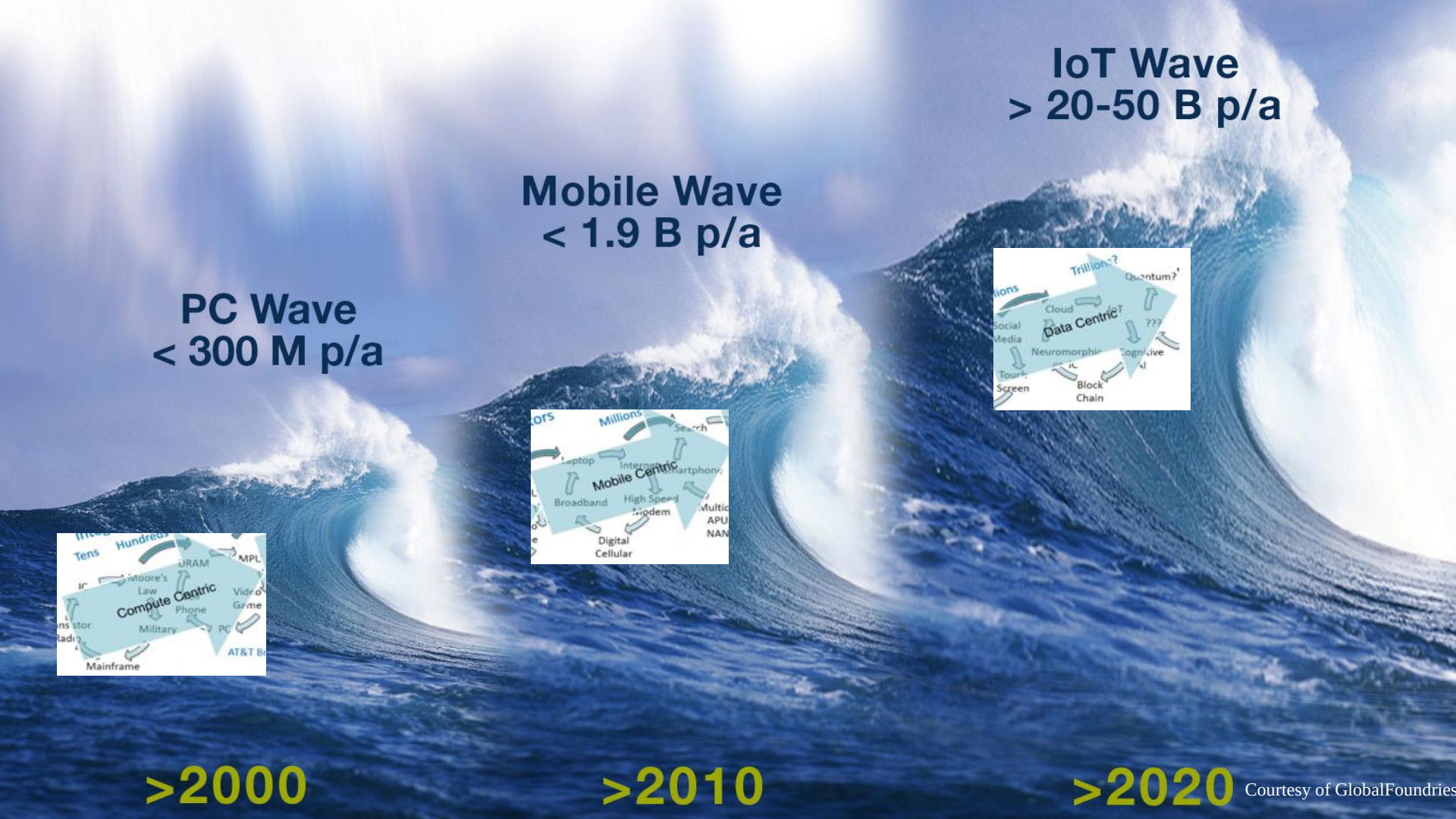
Worldwide Electronics value chain in 2017



	Prod. in Europe (€ B)	% Europe / World
Market service providers	9 463	22%
Industrial equip. / Aero/Def/Secu / Automotive	947	20%
Consumer electronics	60	6%
Professional electronics	217	23%
Total electronic equipment	277	14%
Electronic boards	122	10%
Semiconductors / Other elect. components	27[1]	5%
Materials & tools	21[1]	18%

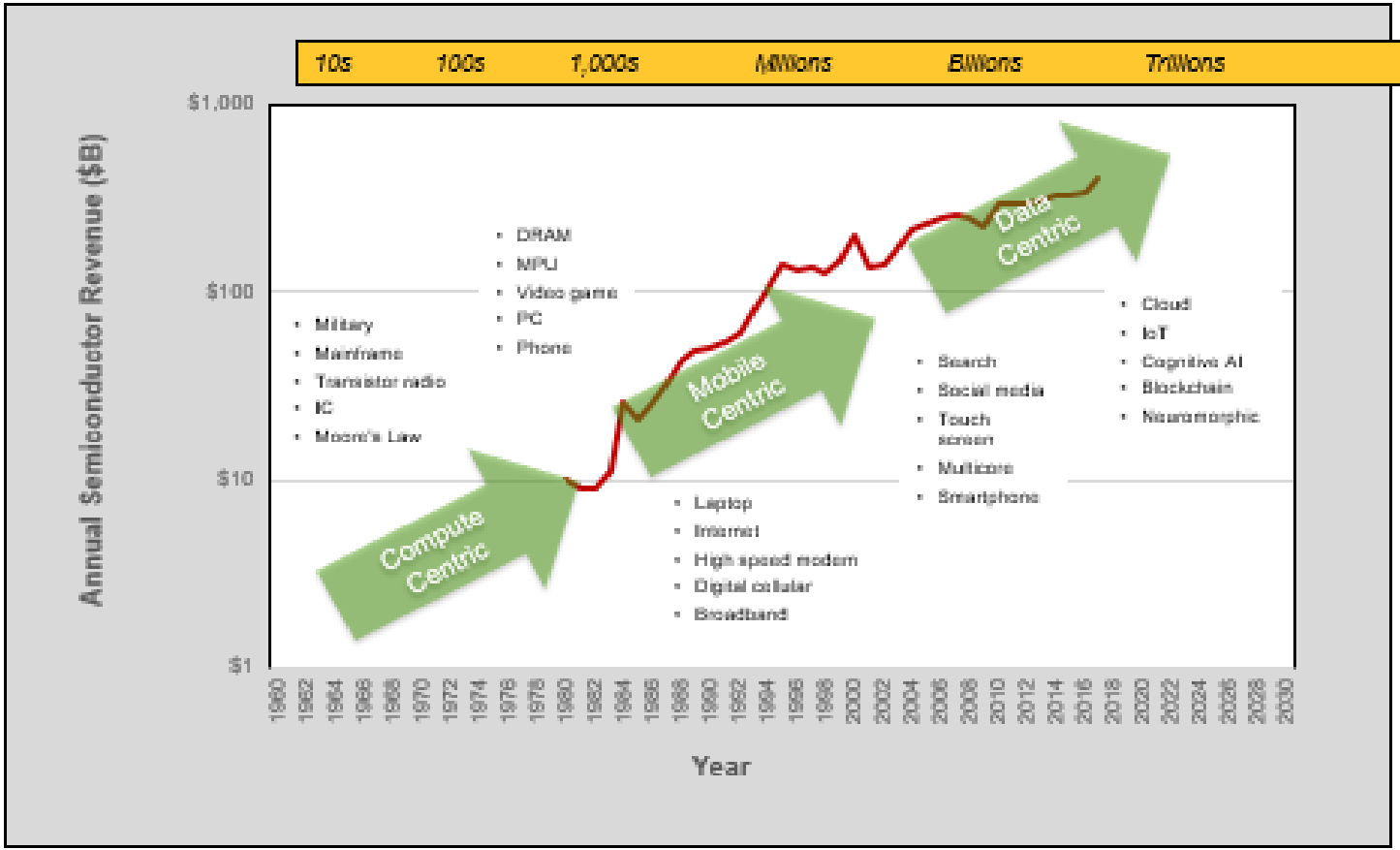
Source : DECISION Etudes & Conseil

[1] The semiconductor industry is very internationalized and the different production steps of a semiconductor systematically occurs in different countries. As a consequence, the production in Europe in this diagram corresponds to the share of the world production made by companies whose nationality of principal shareholder is European.



Courtesy of GlobalFoundries

Growth Drivers of the Data Centric Era



Sources: IC Insights and VLSI Research

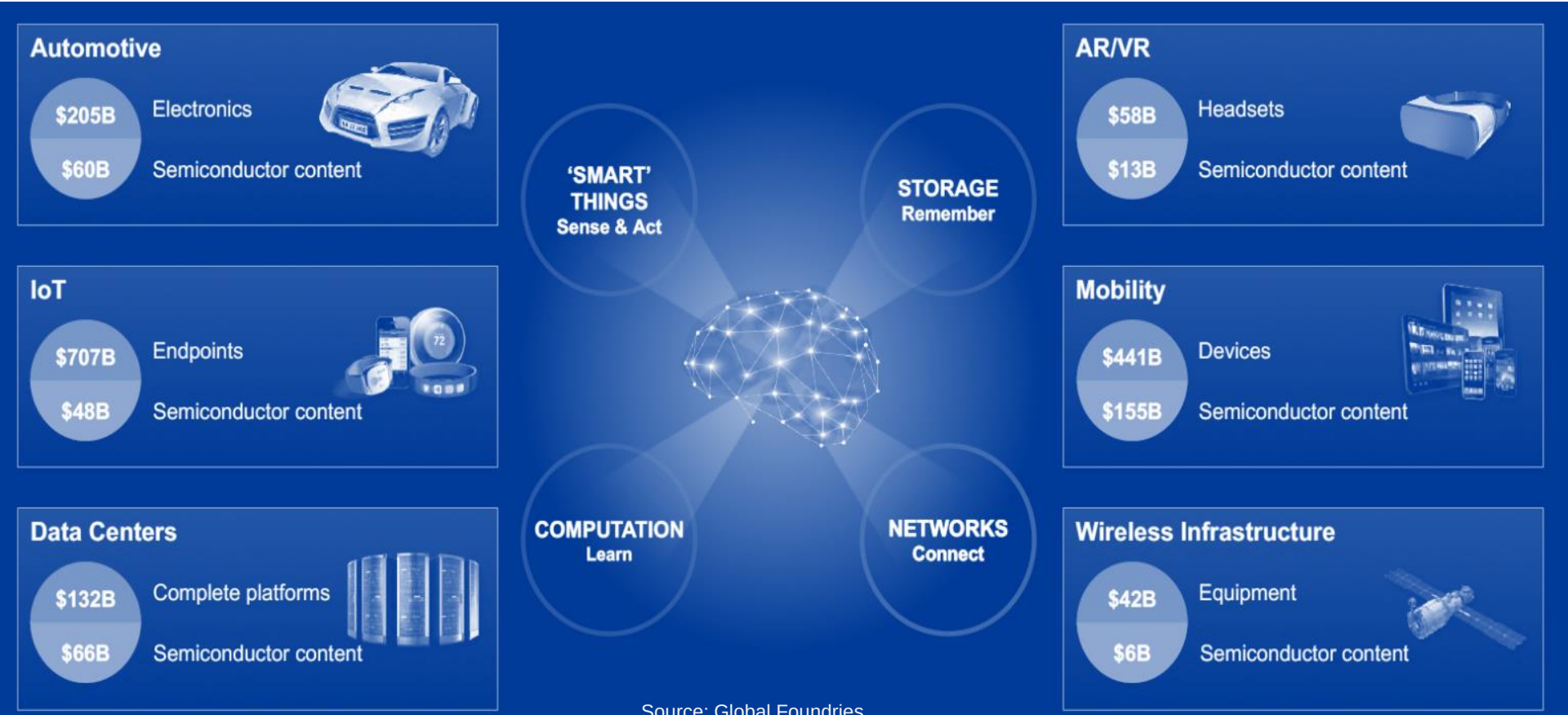
Worldwide semiconductor market approaching

$1 Trillion

by 2030

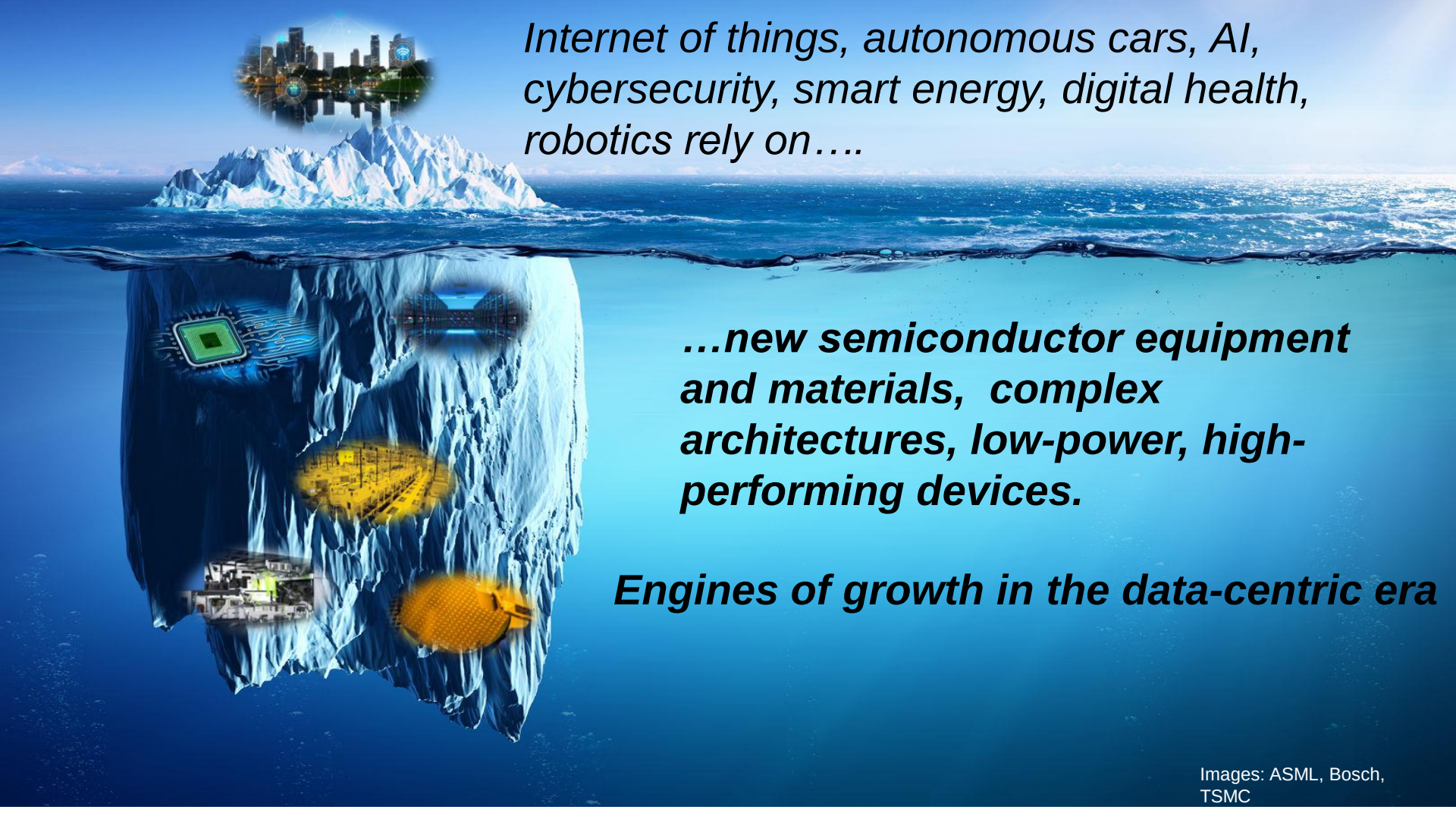
Source: data from Handel Jones,CEO **International Business Strategies (IBS).**

Growth Drivers of the Semiconductor Value Chain

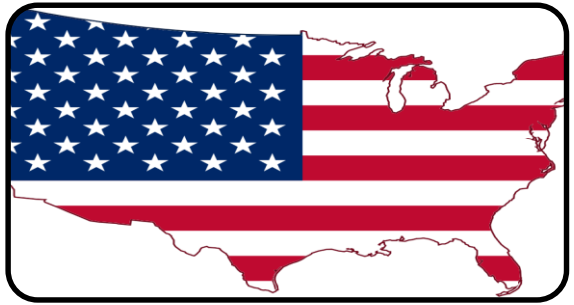


Source: Global Foundries

All data, except for 5G, refer to 2020. Sources: Based on various internal and public sources.


Internet of things, autonomous cars, AI, cybersecurity, smart energy, digital health, robotics rely on….
…new semiconductor equipment and materials, complex architectures, low-power, high-performing devices.
Engines of growth in the data-centric era
Images: ASML, Bosch, TSMC

European Competitiveness in the Global Digital Economy



Creative Destruction

Dominating the Internet & B2C

Digital

Leading automotive, cybersecurity, med-tech, B2B & servo-manufacturing

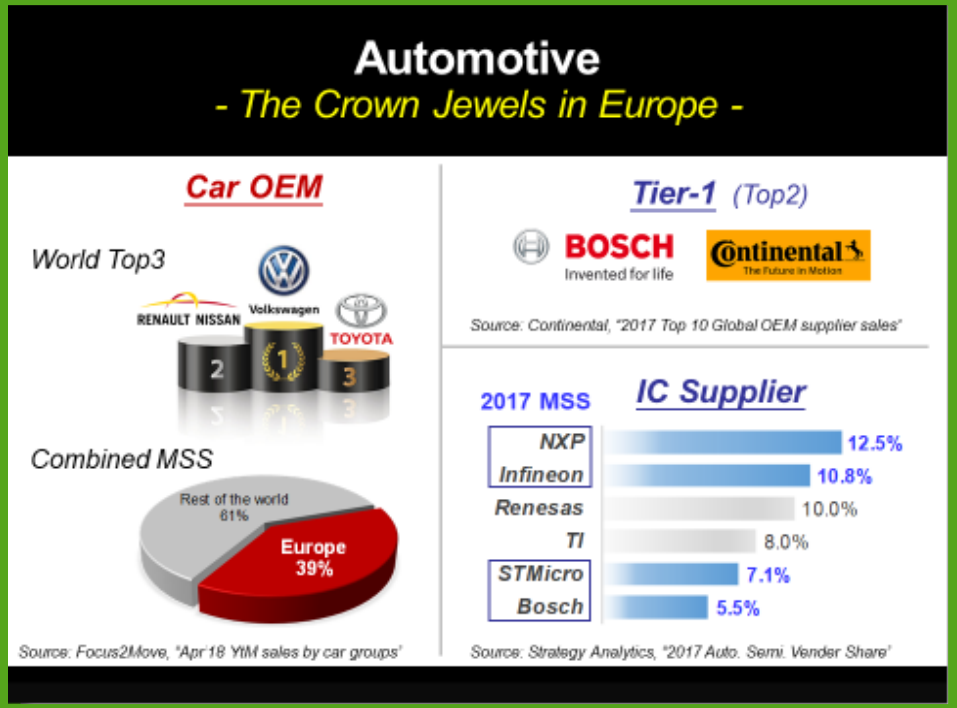
smart city &

Enormous manufacturing capacity

Immense Government Support &

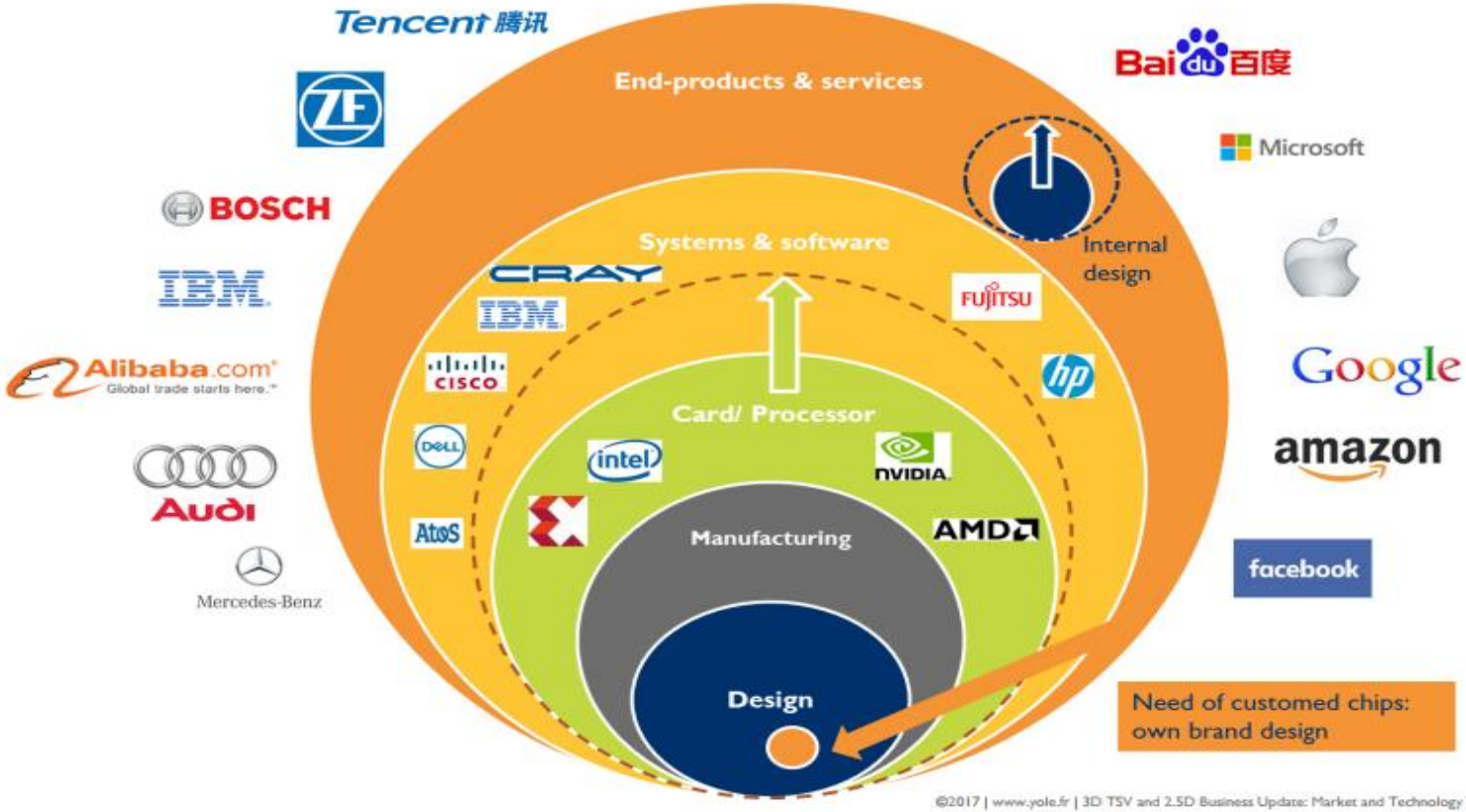
Protection

Automotive: The Crown Jewels in Europe,

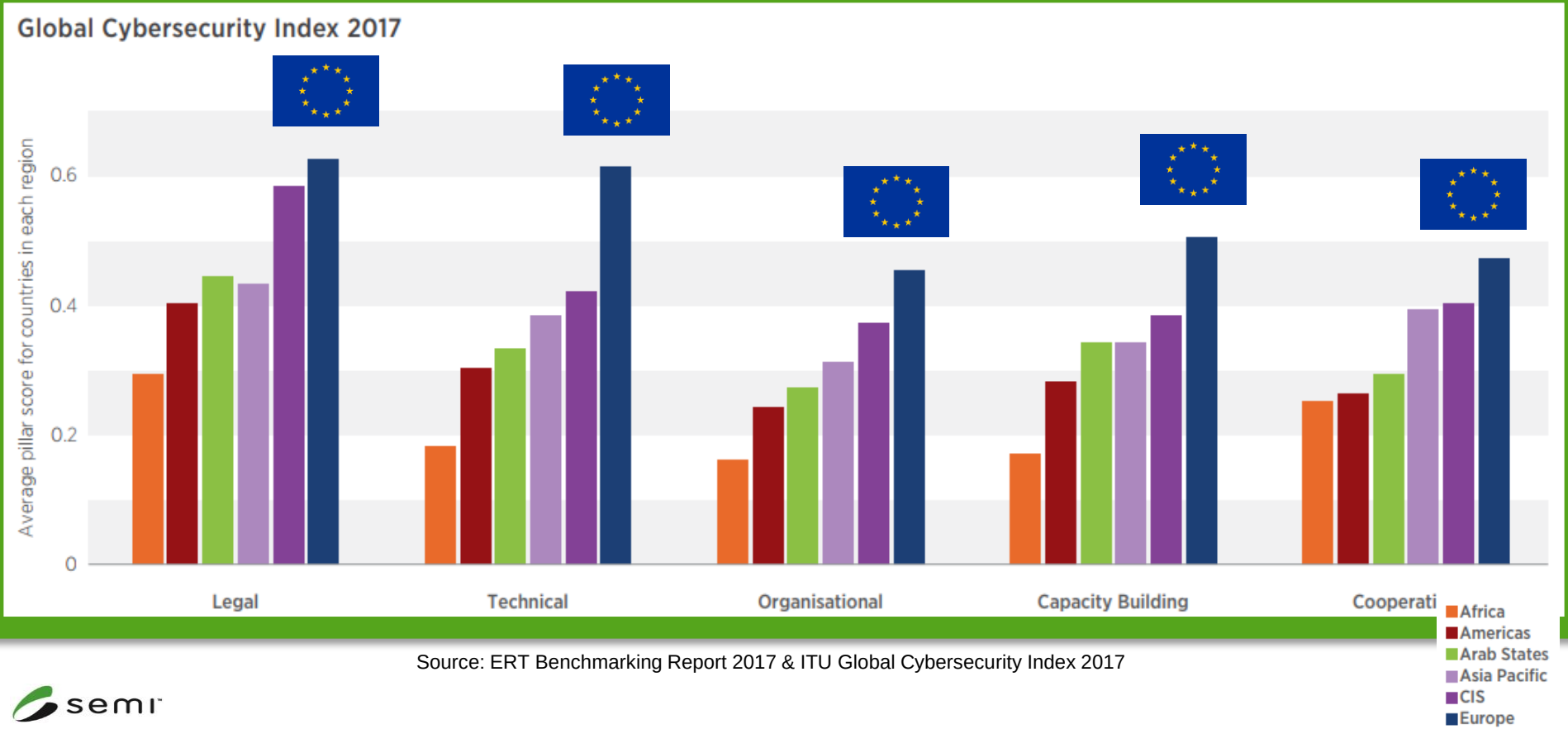


Semiconductors Drive Smart AI Applications

HPC & DEEP LEARNING: VALUE CHAIN IN MOTION



Cybersecurity:
Europe is the World's Most Competitive in all Categories



Source: ERT Benchmarking Report 2017 & ITU Global Cybersecurity Index 2017

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Med-tech: Europe is World Leader in Med-Tech Patent Applications & well positioned in revenues

PATENT APPLICATION IN MEDICAL TECHNOLOGY FIELD FILLED WITH EPO IN 2016

41%

EU28, Norway and Switzerland

59%

Other countries

Medical Device Industry: Top 3 Segments Revenue Share By Region, Global, 2018

	Orthopaedic	Endoscopy	Cardiac
United States	62.5%	44.7%	40.1%
Europe	22.5%	23.8%	28.1%
Asia Pacific	11.0%	19.5%	24.0%
Rest of World	4.0%	12.0%	7.8%

Source: Medtech Europe and Frost and Sullivan

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Smart Cities: 19 out of 50 Global Smart Cities in Europe

Source: ERT Benchmarking Report 2017 & 2thinknow Innovation City Index

Europe is Well Positioned in Education Quality & Overall Innovation

Quality of Education

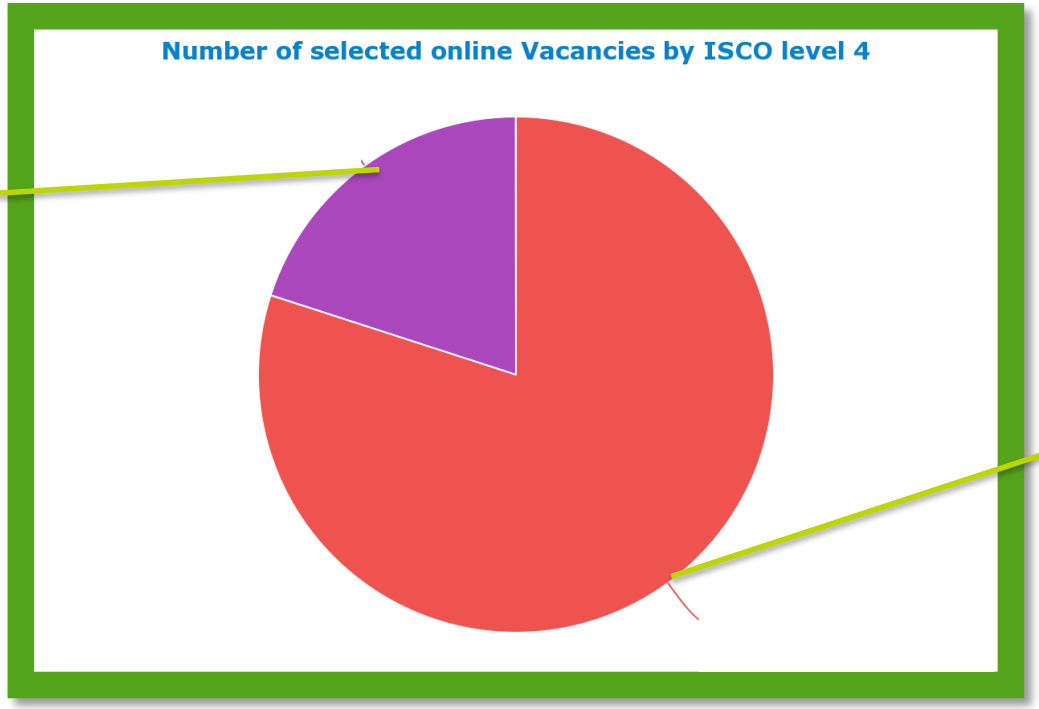
- Switzerland
- Singapore
- Belgium
- Qatar
- Ireland
- Netherlands
- Norway
- New Zealand
- UAE
- Iceland
- Malaysia
- Germany

WORLD ECONOMIC FORUM

Overall Innovation

- Switzerland
- Israel
- Finland
- USA
- Germany
- Sweden
- Netherlands
- Japan
- Singapore
- Denmark
- Taiwan
- Belgium

… Need to Maintain the Talent Pipeline



Electronics mechanics & services: 16,000 open vacancies

Electronics engineer: 64,000 open vacancies

More than 80000 electronics related open vacancies in Europe, many of them at engineering level (data: Commission ICT Monitor)

SEMI Growing Workforce Development Response

SEMI High Tech U launched in 2000 to ignite interest in STEM and build the STEM pipeline. **Delivered 236 programs globally to date**.

"SEMI has made workforce development a top strategic priority. Globally, the industry is confronted with more than 10,000 job vacancies."

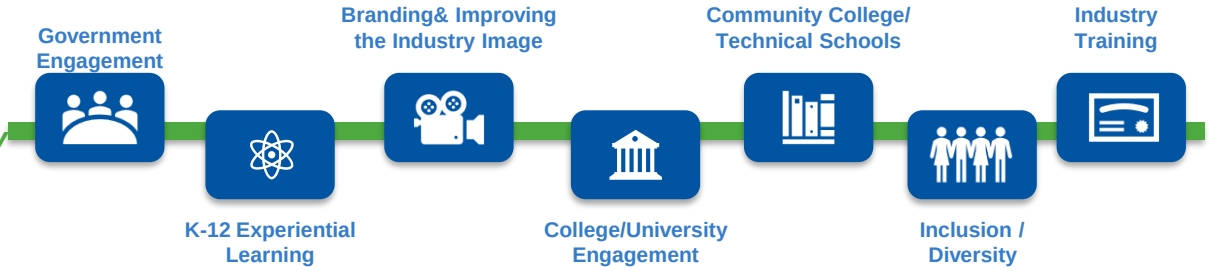
Collaboration in war for talent
is essential for continued industry growth
AND
will help support a better future for our industry

Dan Durn, CFO Applied Materials
SEMI Industry Strategy Symposium, 18 January 2018

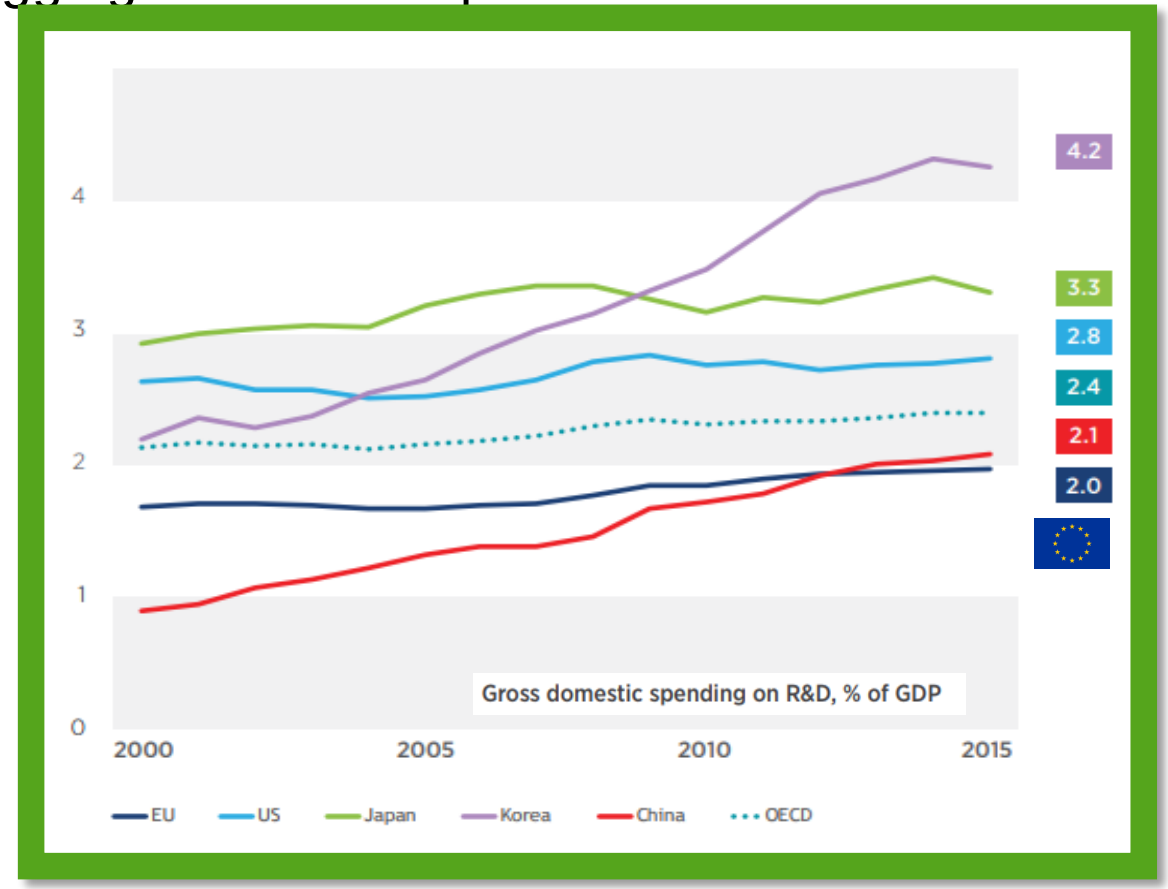
Additional talent priority issues identified as:

- Higher education partnerships
- Training and mentorship
- Diversity and inclusion
- Industry image

WFD Programs underway

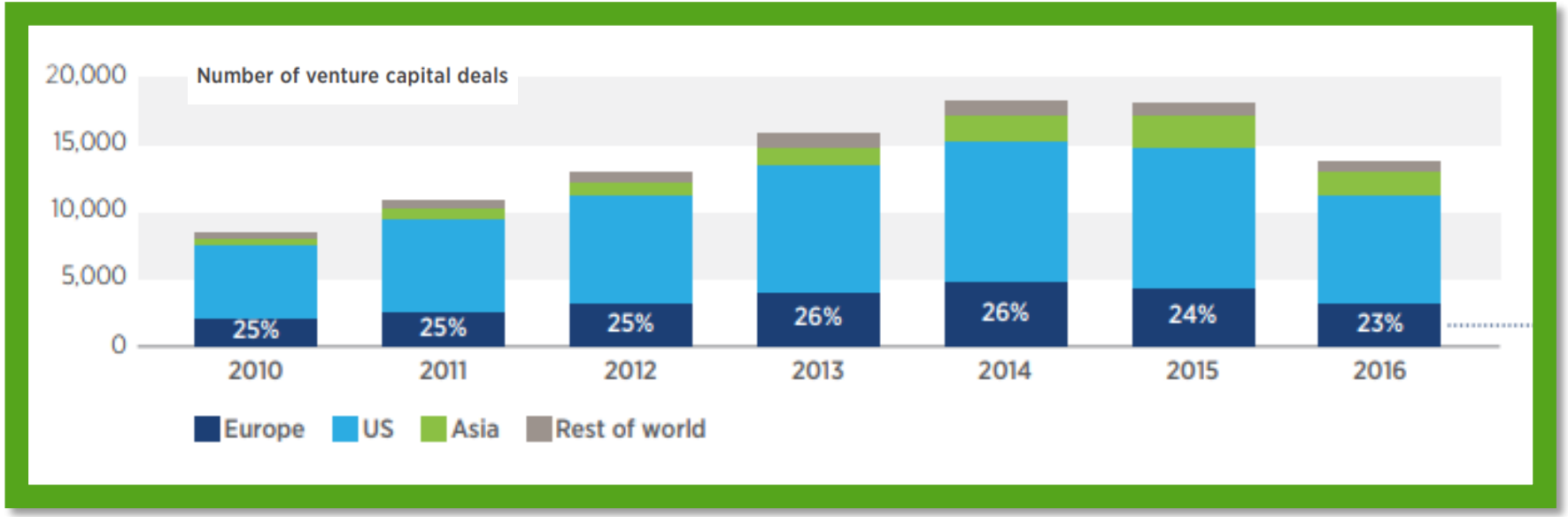


R&D Spending:
EU is Lagging Behind Competitors and Needs to Catch Up



Source: ERT Benchmarking Report 2017 & OECD

Europe needs to improve its VC landscape



Europe needs more VC,

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>$2T Electronics Design & Manufacturing Eco-SYSTEM

Without this.

amazon NETFLIX Tencent 腾讯 NAVER Google facebook LINE Alibaba.com JD.COM 京东 Baidu 百度

None of these.

- **Semiconductors, the heartbeat of the $2T Electronics Design & Manufacturing Ecosystem**
  - Semiconductors are the driving force behind Automotive, AI IoT Evolution
  - Design Ecosystem critically strategic part of the Semiconductor industry
  - Collaborations across the global manufacturing supply chain

- **Europe is strategically positioned in the Global Electronics Supply Chain**
  - Automotive & Electronics – The Crown Jewels of Europe "**Innovation to Applications**"
  - MEMS, sensors, power, analog
  - Europe has the state of the art R&D centers fueling the industry roadmaps
  - **Medical** is the next Automotive

- **Investment to grow the Semiconductors industry in Europe and strategic competitiveness**
  - Workforce development to maintain the talent pipeline
  - Maintain excellence and leadership in research and education
  - Invest in Start-Ups, "Scale-Up" to promote entrepreneurship

Thank You!