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
SEMI
Evolving to Connect the Full Electronics Manufacturing Supply Chain

SEMI Vertical Application Platforms

SEMI Strategic Association Partners
SEMI Mantra

Connect ◆ Collaborate ◆ Innovate ◆ Grow ◆ Prosper

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
SEMI – ESDA Strategic Partnership
Connects the Global Design and Manufacturing Communities
SEMI – Fab Owners Alliance Strategic (FOA) Partnership
26 device makers join 2000+ SEMI members globally
$2T Supply Chain

A.I.
- Machine Learning
- Blockchain
- Bitcoin Mining
- Quantum Computing

3D Printing
- IIoT
- Industry 4.0
- Realtime Configuration
- Robots
- Adaptive Manufacturing

Autonomous Vehicles
- Trucking
- Fleet
- Drones
- Driver Assistance

Digital Health
- CRISPR
- Biometrics
- Human Performance Monitoring
- Dosage Monitoring

SMART DATA
- SEMI
- WSTS
- TechSearch
- ESDA

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

- **Market service providers**: 43 135 B€
  - **Telecom operators, Internet, IT, Cloud, etc.**
  - **Transportation, Health, Installation, Maintenance, Repair, etc.**
  - **Industrial equip. industry**: 1 419 B€
  - **Aero/Def/Secu Industry**: 1 400 B€
  - **Automotive Industry**: 1 864 B€

- **Consumer electronics**: 995 B€
  - **PC, Telecoms, Audio & Video**
  - **Professional electronics**: 962 B€
  - **Auto, Inclus, Medical, Aero/Def/Sec**

- **Total electronic equipment**: 1 957 B€

- **Electronic boards**: 1 225 B€
  - **Semiconductors**: 375 B€
  - **Other elect. components**: 215 B€

- **Materials & tools**: 86 B€
  - **SC**: 34 B€

- **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.
Growth Drivers of the Data Centric Era

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

- **Automotive**
  - Electronics: $205B
  - Semiconductor content: $60B

- **IoT**
  - Endpoints: $707B
  - Semiconductor content: $48B

- **Data Centers**
  - Complete platforms: $132B
  - Semiconductor content: $66B

- **AR/VR**
  - Headsets: $58B
  - Semiconductor content: $13B

- **Mobility**
  - Devices: $441B
  - Semiconductor content: $155B

- **Wireless Infrastructure**
  - Equipment: $42B
  - Semiconductor content: $6B

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
European Competitiveness in the Global Digital Economy

- **Creative Destruction**
  Dominating the Internet & B2C

- **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

Tencent 腾讯
Bosch
IBM
Alibaba.com
CISCO
Dell
Intel
NVIDIA
AMD
Google
Amazon
Microsoft
Apple
Facebook

End-products & services
Systems & software
Card/Processor
Manufacturing
Design

Internal design
Need of customized chips: own brand design
Cybersecurity:
Europe is the World’s Most Competitive in all Categories

Global Cybersecurity Index 2017

Source: ERT Benchmarking Report 2017 & ITU Global Cybersecurity Index 2017
Med-tech: Europe is World Leader in Med-Tech Patent Applications & well positioned in revenues

Source: Medtech Europe and Frost and Sullivan
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

**Overall Innovation**
- Switzerland
- Israel
- Finland
- USA
- Germany
- Sweden
- Netherlands
- Japan
- Singapore
- Denmark
- Taiwan
- Belgium
… Need to Maintain the Talent Pipeline

More than 80,000 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."

Additional talent priority issues identified as:

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

WFD Programs underway

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
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,
Without this.

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!