

AIXTRON Investor Presentation

5G
Networks

Energy
Storage

Renewable
Energy

**AIXTRON
ENABLES
INNOVATION**

Autonomous
Driving

Internet
of Things

NextGen
Displays

IR Presentation – 9M/2018

(FSE: AIXA, ISIN DE000A0WMPJ6)

Forward-Looking Statements

This document may contain forward-looking statements regarding the business, results of operations, financial condition and earnings outlook of AIXTRON. These statements may be identified by words such as “may”, “will”, “expect”, “anticipate”, “contemplate”, “intend”, “plan”, “believe”, “continue” and “estimate” and variations of such words or similar expressions. These forward-looking statements are based on the current assessments, expectations and assumptions of the executive board of AIXTRON, of which many are beyond control of AIXTRON, based on information available at the date hereof and subject to risks and uncertainties. You should not place undue reliance on these forward-looking statements. Should these risks or uncertainties materialize, or should underlying expectations not occur or assumptions prove incorrect, actual results, performance or achievements of AIXTRON may materially vary from those described explicitly or implicitly in the relevant forward-looking statement. This could result from a variety of factors, such as those discussed by AIXTRON in public reports and statements, including but not limited to those reported in the chapter “Risk Report”. AIXTRON undertakes no obligation to revise or update any forward-looking statements as a result of new information, future events or otherwise, unless expressly required to do so by law. This document is an English language translation of a document in German language. In case of discrepancies, the German language document shall prevail and shall be the valid version.

Due to rounding, numbers presented throughout this report may not add up precisely to the totals indicated and percentages may not precisely reflect the absolute figures for the same reason.

Our registered trademarks: AIXACT[®], AIXTRON[®], APEVA[®]; Atomic Level SolutionS[®], Close Coupled Showerhead[®], CRIUS[®], EXP[®], EPISON[®], Gas Foil Rotation[®], Optacap[™], OVPD[®], Planetary Reactor[®], PVPD[®], STExS[®], TriJet[®]

Our Vision

Technology. Materials. Performance.

Technology.

We are the **recognized technology leader** in complex material deposition.

Materials.

We **enable our customers** to successfully shape the markets of the future, exploiting the potential offered by **new materials**.

Performance.

We **deliver the performance** driving **economic success** through our expertise, our employees and the quality of our products.

Who we are



- Headquarters based near Aachen, Germany
- Worldwide presence in 7 countries
- R&D and production facilities in Germany and UK
- ~ 600 employees
- Company founded in 1983 – 35 years of experience
- Technology leader in deposition systems
- More than 2,700 deposition systems installed worldwide

Global Presence



Technology Portfolio for Complex Material Deposition

OLED: OVPD®/PVPD®



Our technology. Your future.

Carbon – PECVD

NANO: Innovation Pool

LEDs / Optoelectronics



Lasers (VCSEL/EEL)

(e.g. 3D Sensing; Consumer Electronics; Telecom/Datacom)



GaN Power | GaN RF

(e.g. Wireless Charging; 5G, Fast Charging, Power Supply)



Specialty LEDs

(e.g. Fine Pitch-, MiniLED-, MicroLED-Displays; Horticulture; Purification)



SiC Power

(e.g. Electric Vehicles, Charging Stations, Infrastructure)

Power Management

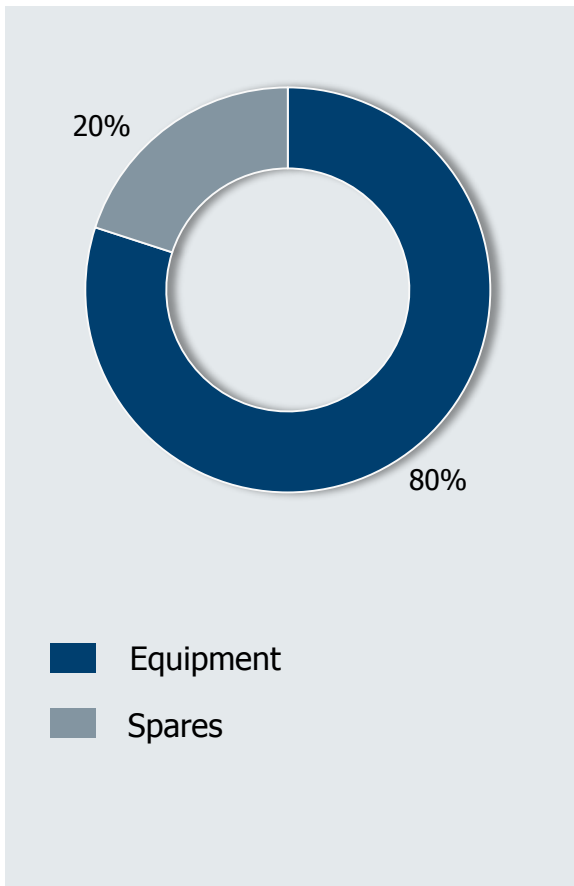
MOCVD Core Technology



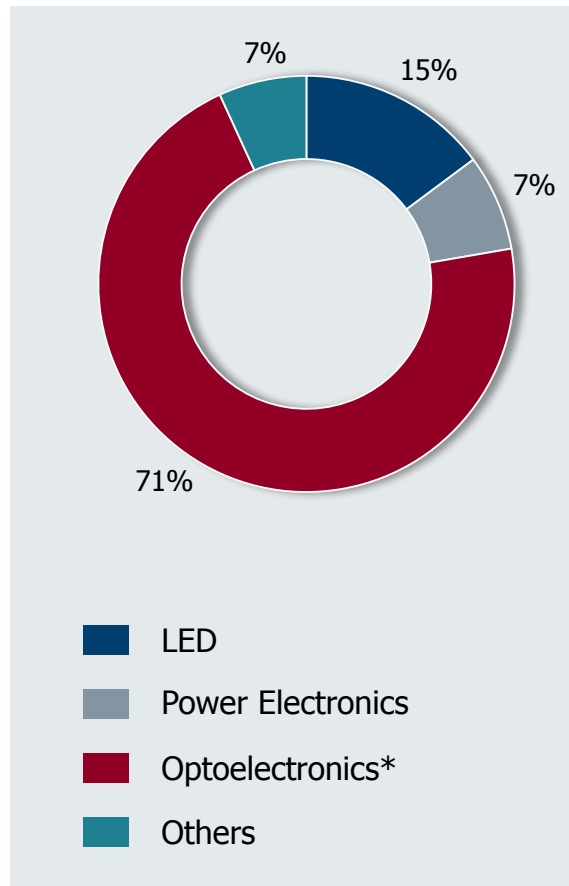
Revenue Analysis*

* Rounded figures; may not add up

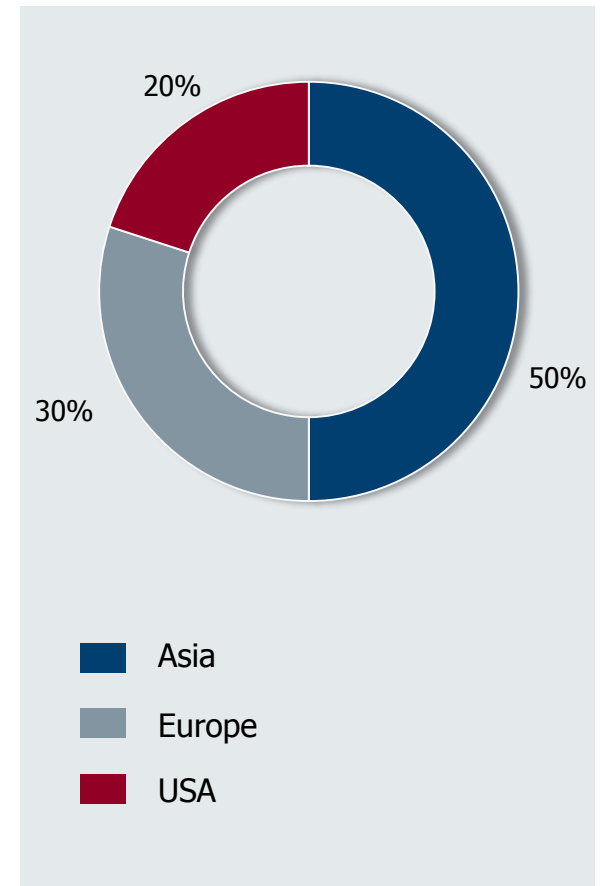
9M/2018:
by equipment & spares



9M/2018:
by end application
(equipment only)



9M/2018:
by region

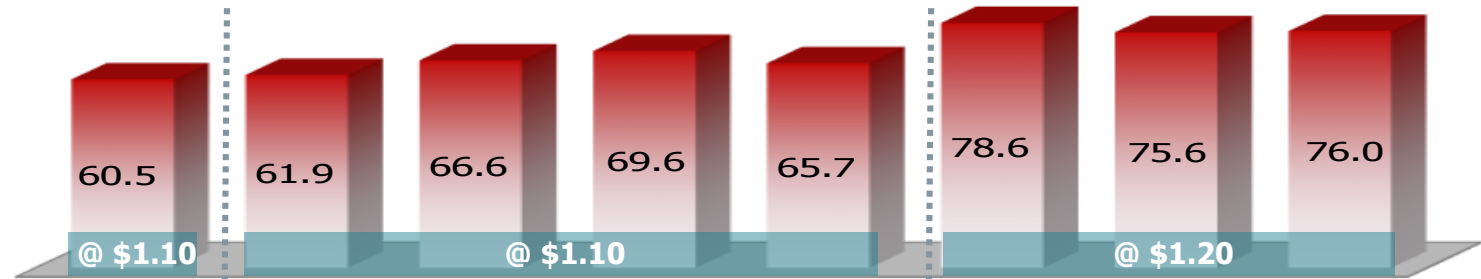


* Optoelectronics includes applications in Consumer Optoelectronics, Telecom/Datacom and Solar

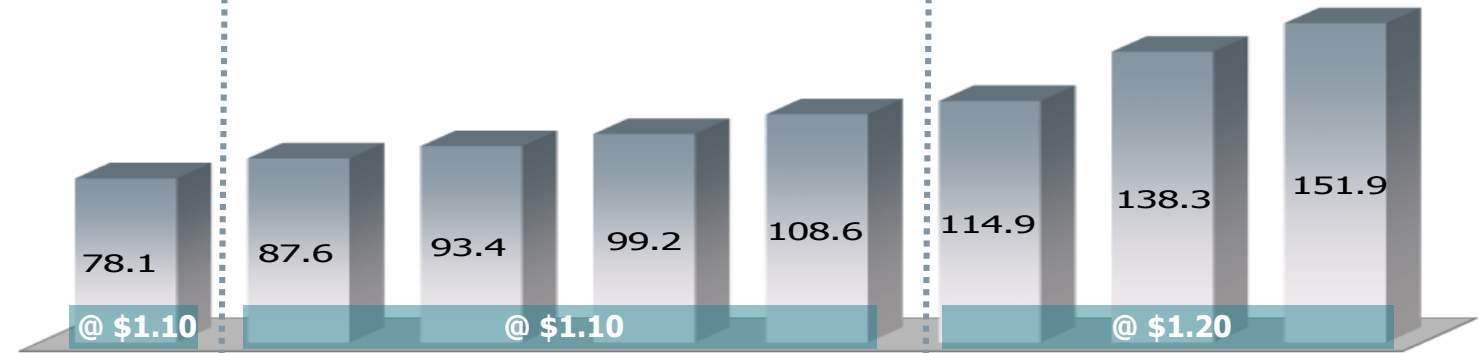
24 - Month Business Development

(€ million)

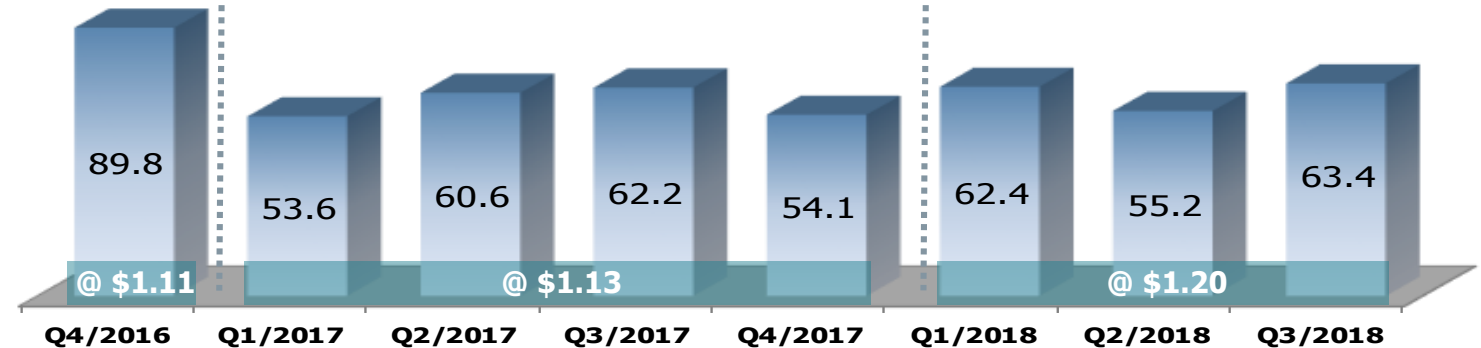
Order Intake
(incl. equipment,
service, spare parts)



Order Backlog
(equipment only)



Revenues
(incl. equipment,
service, spare parts)



USD order intake and backlog were recorded at the prevailing budget rate (2017: \$1.10/€; 2018: \$1.20/€)

USD revenues were converted at the actual period average FX rate (2017: \$1.13/€; 2018: \$1.20/€)

Consolidated Income Statement*

* Rounded figures; may not add up

| (€ million) | 9M/18 | 9M/17 | +/- % | Q3/18 | Q2/18 | +/- % |
|----------------------------|--------------|--------------------------|------------|-------------|-------------|------------|
| Revenues | 180.9 | 176.3¹ | 3 | 63.4 | 55.2 | 15 |
| Cost of sales | 102.7 | 123.3 | -17 | 35.8 | 31.3 | 14 |
| Gross profit | 78.2 | 53.0 | 48 | 27.6 | 23.8 | 16 |
| % | 43 | 30 | 13 pp | 44 | 43 | 1 pp |
| Selling expenses | 6.7 | 7.9 | -15 | 2.1 | 2.3 | -8 |
| General & admin expenses | 13.3 | 14.5 | -8 | 4.6 | 4.4 | 4 |
| R&D | 40.0 | 52.3 | -23 | 13.1 | 13.2 | -1 |
| Net other operating income | -2.5 | -2.2 | 12 | -0.9 | -0.3 | 258 |
| EBIT | 20.7 | -19.5 | 206 | 8.7 | 4.1 | 112 |
| % | 11 | -11 | 22 pp | 14 | 7 | 7 pp |
| Net result | 27.7 | -20.6 | 234 | 11.7 | 3.7 | 216 |
| % | 15 | -12 | 27 pp | 18 | 7 | 11 pp |

¹ Includes EUR 37.6m revenues of the ALD/CVD product line sold in 2017

Balance Sheet*

* Rounded figures; may not add up

| (€ million) | 30/09/18 | 30/06/18 | 31/12/17 |
|---------------------------------|--------------|--------------|--------------|
| Property, plant & equipment | 63.8 | 64.4 | 64.3 |
| Goodwill | 71.5 | 71.6 | 71.2 |
| Other intangible assets | 1.6 | 1.7 | 1.8 |
| Others | 12.9 | 9.0 | 4.0 |
| Non-current assets | 149.8 | 146.7 | 141.3 |
| Inventories | 71.4 | 60.1 | 43.0 |
| Trade receivables | 35.4 | 37.7 | 19.3 |
| Others | 7.1 | 7.4 | 5.0 |
| Cash & Cash Deposits | 245.4 | 234.7 | 246.5 |
| Current Assets | 359.2 | 339.9 | 313.8 |
| Shareholders' equity | 399.5 | 388.0 | 368.9 |
| Non-current liabilities | 1.7 | 1.5 | 2.0 |
| Trade payables | 17.0 | 18.9 | 14.3 |
| Advance payments from customers | 63.7 | 53.2 | 30.3 |
| Others | 27.2 | 25.0 | 39.7 |
| Current liabilities | 107.9 | 97.1 | 84.2 |
| Balance Sheet total | 509.0 | 486.6 | 455.1 |

Consolidated Statement of Cash Flows*

* Rounded figures; may not add up

| (€ million) | 9M/18 | 9M/17 | Q3/18 | Q2/18 |
|--|--------------|--------------|--------------|--------------|
| Net Result | 27.7 | -20.6 | 11.7 | 3.7 |
| Adjust for | | | | |
| Non Cash Items | -0.1 | 16.8 | -0.1 | 2.9 |
| Changes in Working Capital | -22.2 | 60.4 | 2.3 | 5.9 |
| Cash Flow from Operating Activities | 5.4 | 56.5 | 13.9 | 12.5 |
| Capital Expenditures | -7.1 | -8.0 | -2.7 | -2.9 |
| Fixed Asset disposals/FX/Other | 0.6 | -4.7 | -0.5 | 1.7 |
| Total Cash Flow | -1.1 | 43.8 | 10.7 | 11.4 |
| | | | | |
| Cash & Deposits | 245.4 | 203.9 | 245.4 | 234.7 |

AIXTRON – 2018 Guidance: Upper End of Ranges to be Reached

- ✓ **Q4/2018 Revenues > Q3/2018 Revenues**

- ✓ **Upper-end of Guidance Range to be reached:**
 - Order Intake*: Around EUR 290 million (from EUR 260 ~ 290 million)
 - Revenues: Around EUR 260 million
 - Gross Margin: Around 40%
 - EBIT: EUR 35 ~ 40 million (from 10% of revenues or about EUR 26 million)
 - Positive Total Cash Flow for Full Year 2018 (from Positive Operating Cash Flow for 2018)

* Based on 1.20 USD/EUR Budget Rate

Market Prospects

Short- to Mid-Term

- Increasing adoption of compound semiconductor-based lasers for 3D sensor systems in mobile devices as well as sensors for infrastructure applications.
- Further increasing demand for lasers for ultra-fast optical data transmission of large volumes, such as for video streaming and Internet-of-Things (IoT) applications.
- Increasing use of LEDs and specialty LEDs (esp. red-orange-yellow, UV or IR) in displays and other applications.
- Increasing use of wide-band gap GaN- or SiC-based components for energy-efficient communication and power management in autos, consumer electronics and mobile devices.
- Progress in the development of OLED displays that require an efficient deposition technology.

Long-Term

- Development of new applications based on wide-band gap materials such as high-frequency chips or system-on-chip architectures with integrated power management.
- Increased use of compound semiconductor-based sensors for autonomous driving.
- Increased development activities for high performance solar cells made of compound semi-conductors.
- Development of new materials with the help of carbon nanostructures (carbon nanotubes, -wires and graphene).
- Development of alternative LED applications, such as visual-light communication technology or micro LED displays.



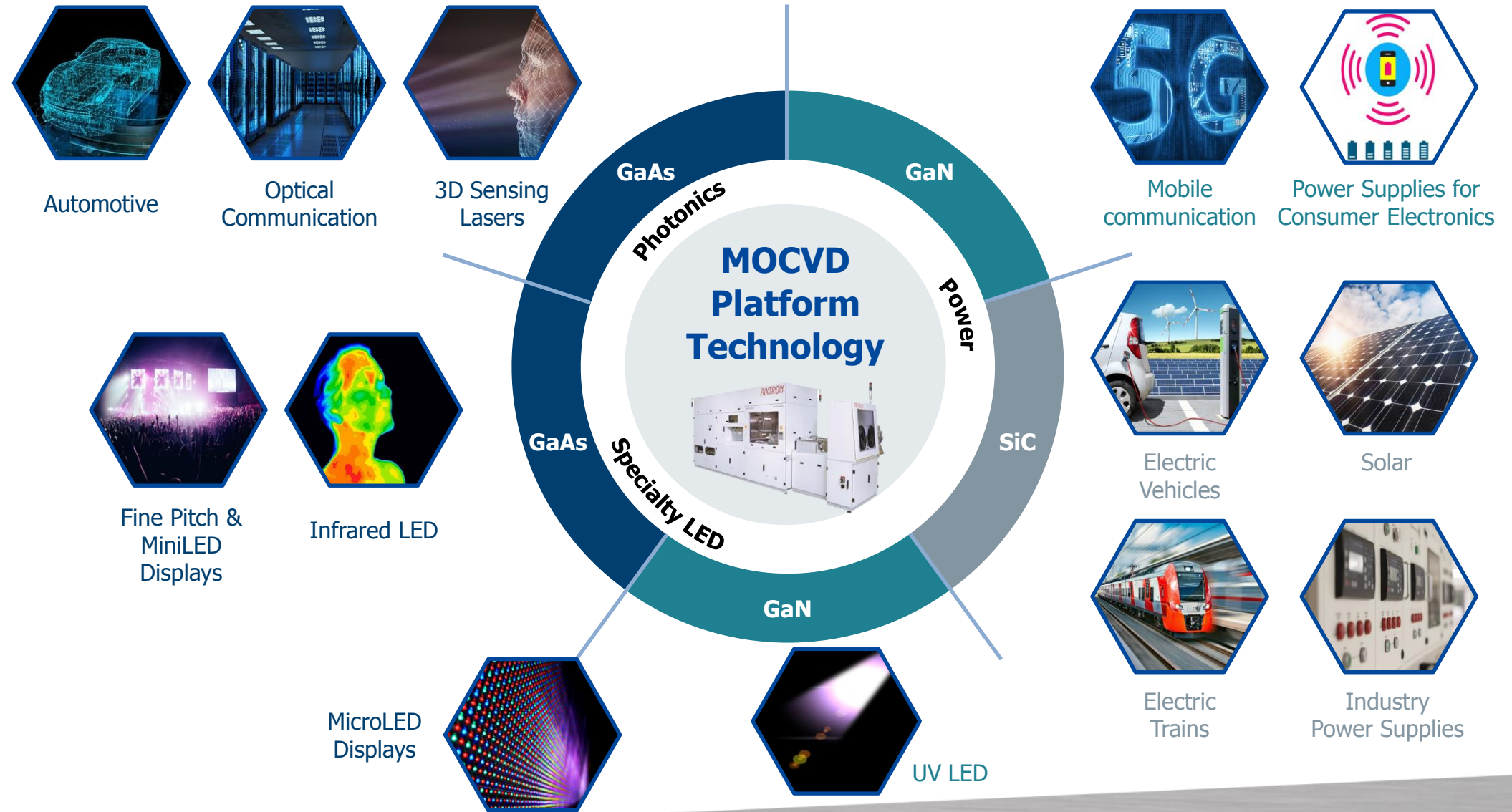
Our *technology*. YOUR FUTURE.

AIXTRON MOCVD – Planetary Reactor[®]: Tool-of-Record

- ✓ Individual Wafer Rotation = Best Material Uniformity
- ✓ Individual wafer temperature adjustment = Wafer Level Control/Optimization
- ✓ Highest Epi / Product Yield = Lowest Production Cost



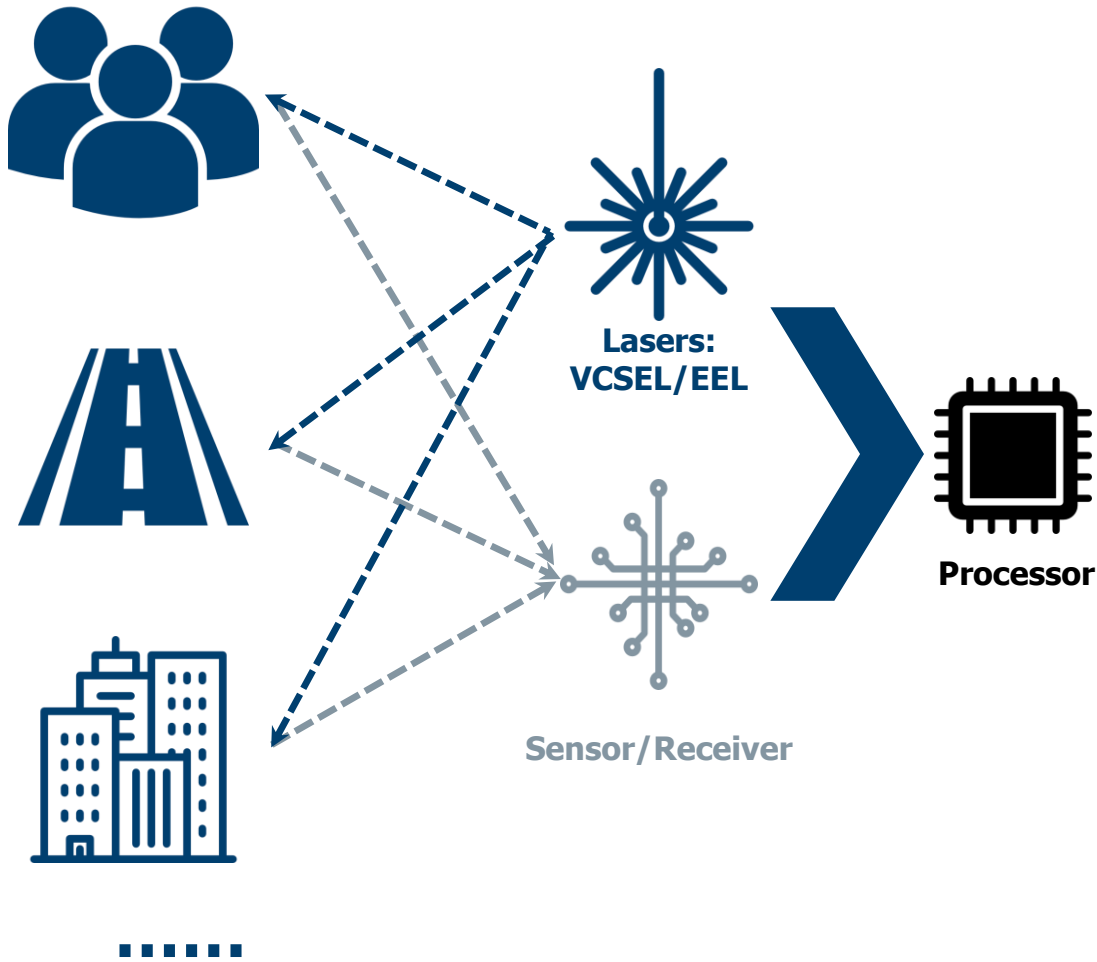
AIXTRON – Enabling Emerging Global Mega Trends



Devices: VCSEL/EEL – Internet of Things Creates New Opportunities

Source: icons from www.flaticon.com

3D Sensing Functionality



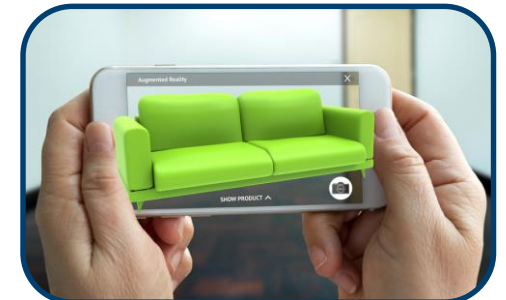
Facial Recognition



Autonomous Driving



Tailor-made clothing/shoes



Interior Design



Mapping



Industry 4.0

Devices: GaN/SiC Power Electronics – Superior Performance

Source: icons from www.flaticon.com



More Efficient



Energy Saving

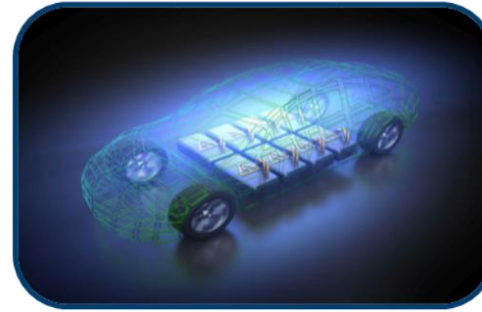
Less Heat

Light Weight

Lower System Cost



Smaller



Electric Vehicles



EV-charging



Data Centers



Renewable Energy



Wireless Charging

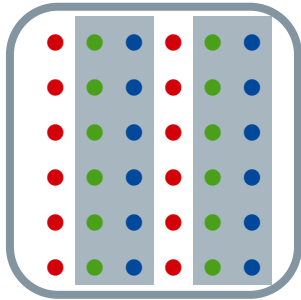


Fast Charging

Devices: ROY LEDs for RGB* Displays; UV LEDs for Niche Markets

Source: LEDinside, Yole Développement

RGB* LED DISPLAYS



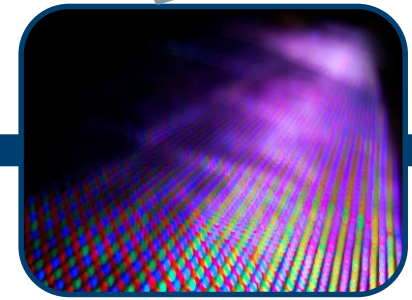
Stadium Outdoor Display
(Pixel Pitch $\geq 10\text{mm}$)
(Chip size: $\geq 200\mu\text{m}$)



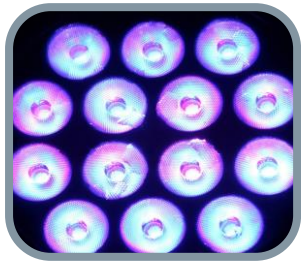
Fine Pitch Indoor Display
(Pixel Pitch $\leq 2.5\text{mm}$)
(Chip size: $\geq 200\mu\text{m}$)



MiniLED for Consumer Electronics
(Chip size: $\leq 200\mu\text{m}$)



MicroLED for Consumer Electronics
(Chip size: $\leq 50\mu\text{m}$)



UV LED



Curing



Water Disinfection

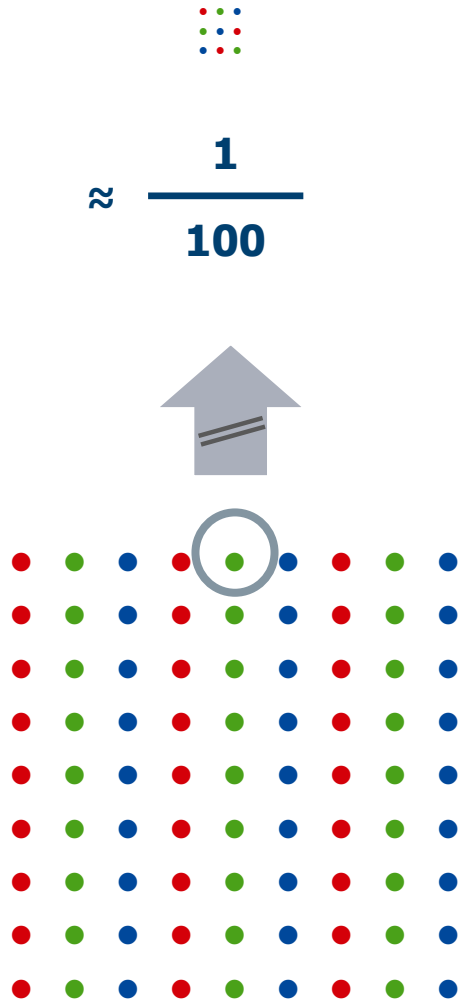


Air Purifier

*RGB = Red, Green & Blue

Devices: MiniLED & MicroLED – The Perfect Future Display Technology

RGB*
MicroLED
Display



RGB*
LED
Display

Self-Emissive

Low Power
Consumption

Perfect
Contrast

High
Brightness

Fast
Response

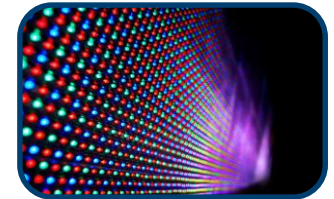
Source: LEDinside



Wearables



AR/VR



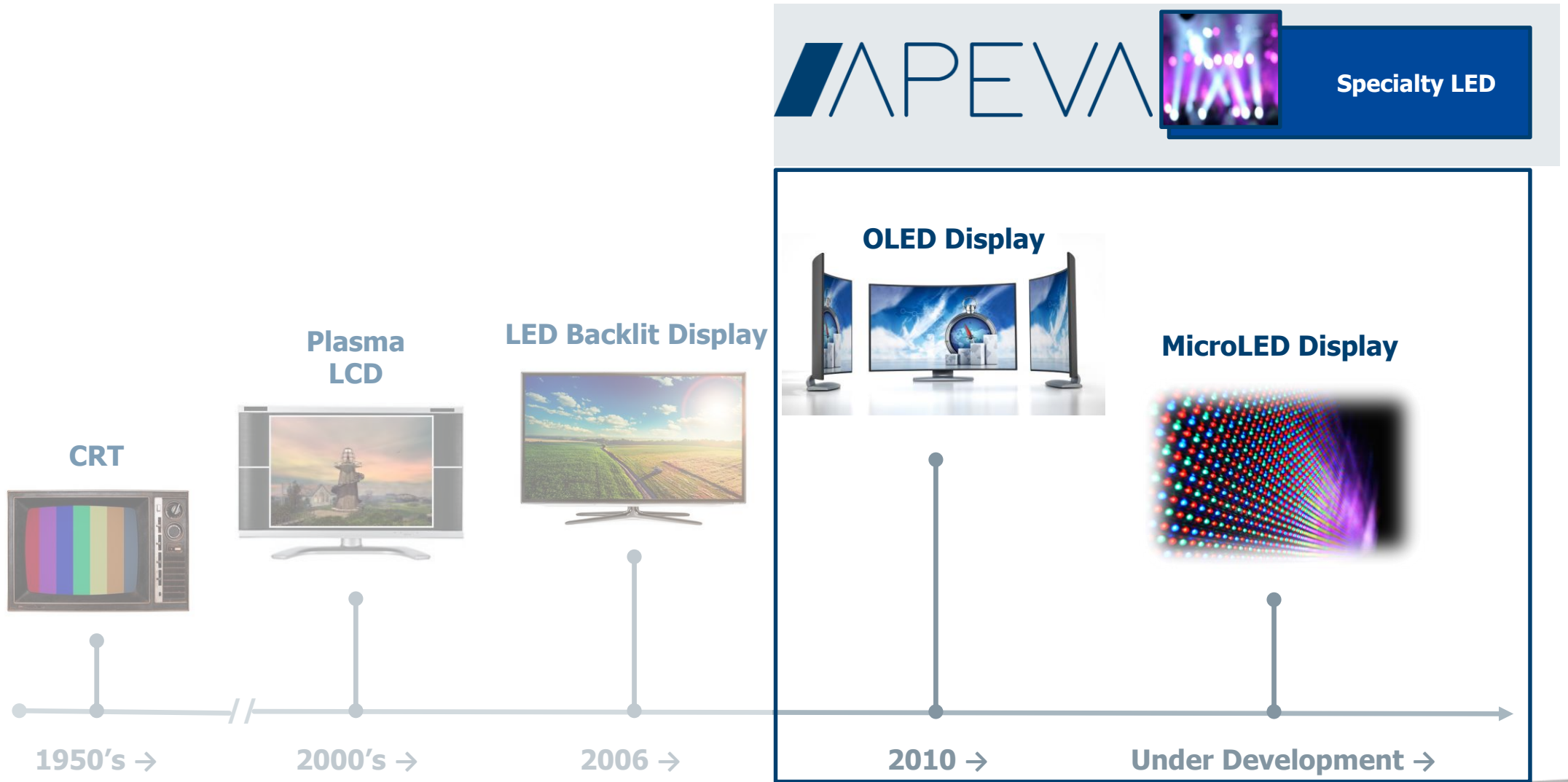
Signage



Smartphones/Tablets/TVs

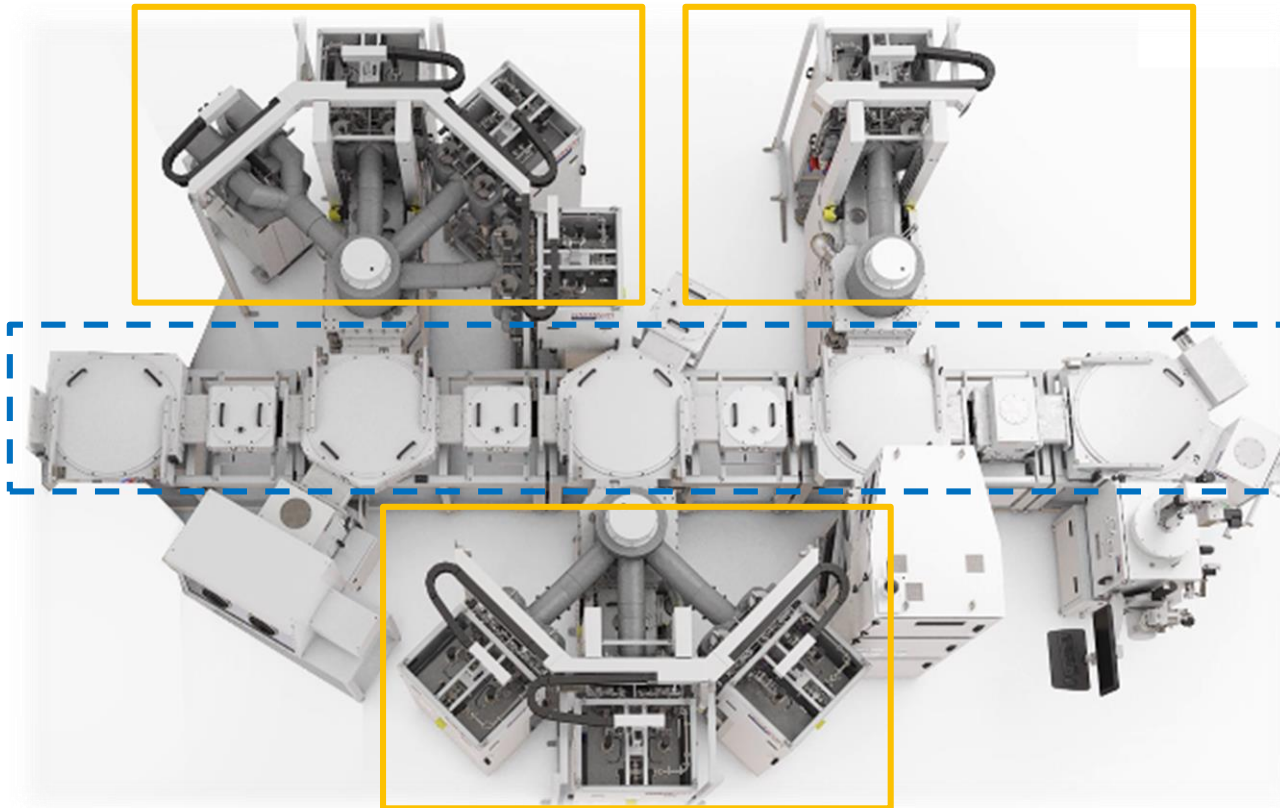
*RGB = Red, Green & Blue

AIXTRON – Instrumental in Evolving Display Technologies



APEVA: Complete OLED Deposition System Provider

OVPD Deposition Line*



 OVPD Deposition

AIXTRON

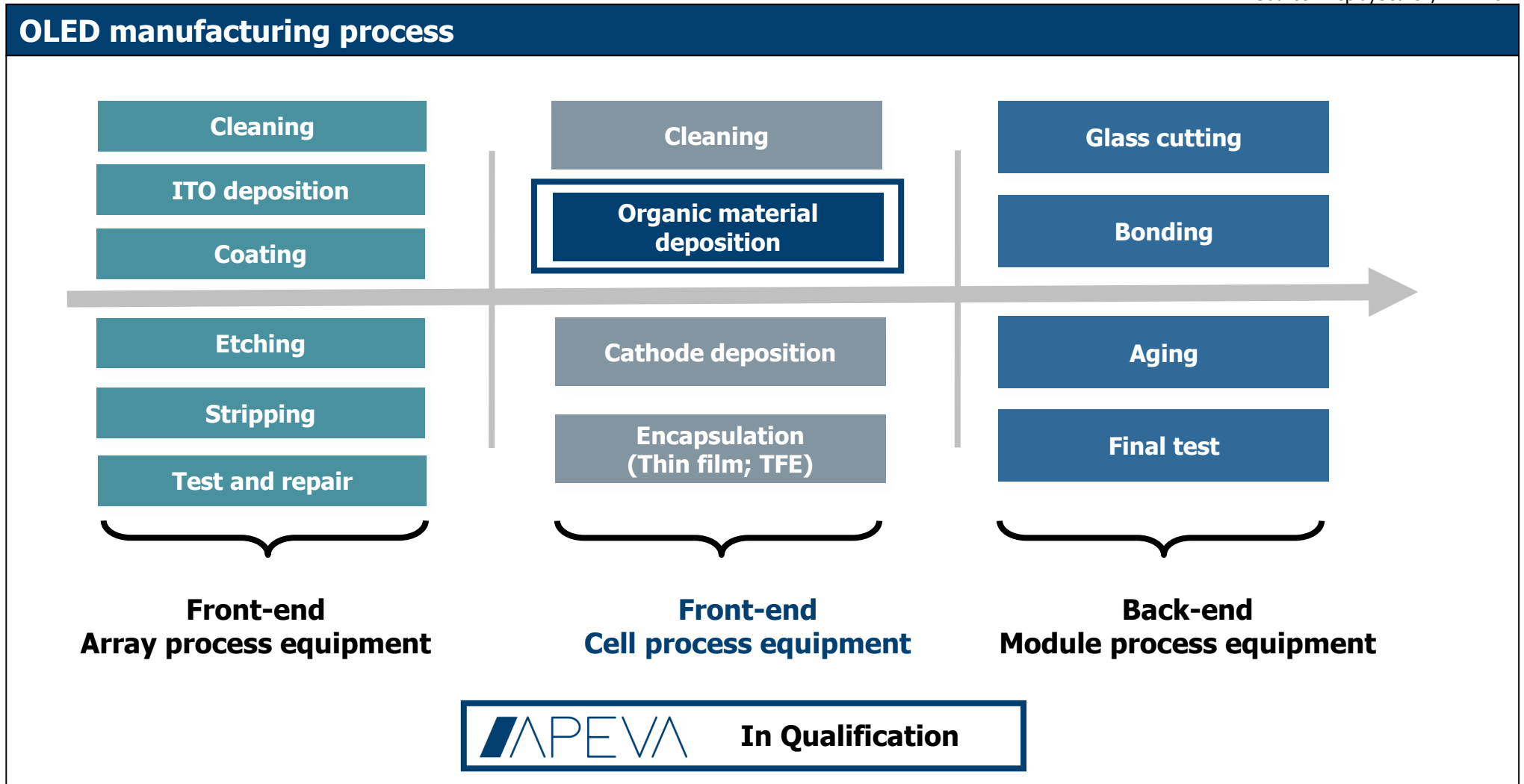
 Automation & Handling  H&iruja

- Fully Automated OLED Deposition Lines and Fab Integration as a Complete System Provider
- Innovative Deposition Technology with
 - Higher Efficiency of OLED Material Deposition
 - Mixing and Doping of Materials via Multiple Material Deposition in One Chamber
 - Maintaining the Delicate Organic Material Properties improving Lifetime






* Pictures shown are for illustration purpose only

Organic Electronics – OVPD[®] – APEVA

Source: DisplaySearch, AIXTRON



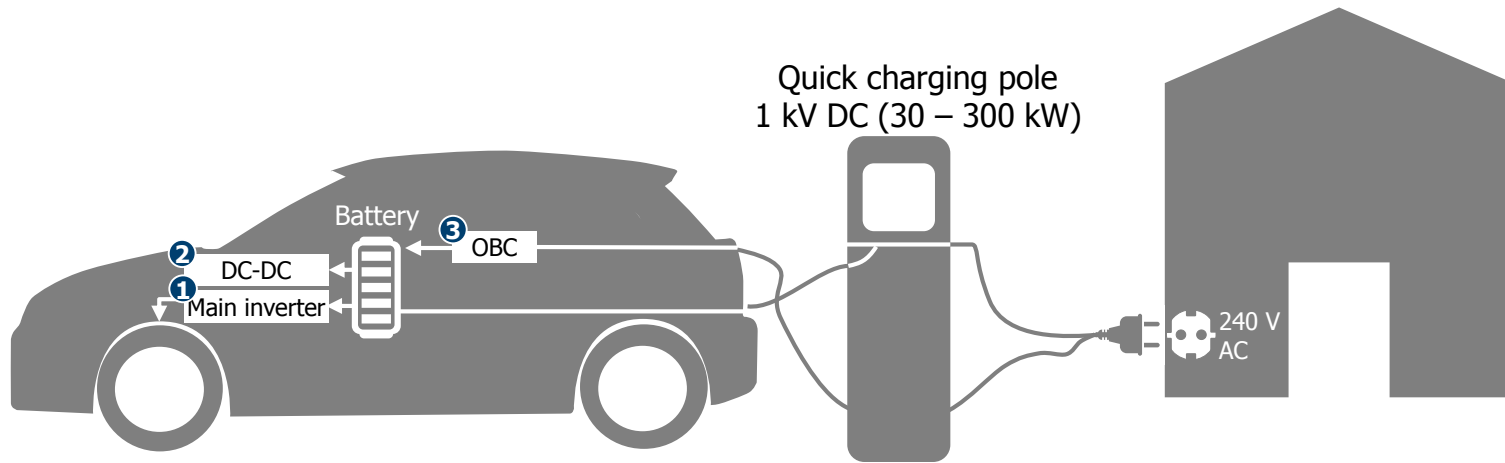
Overview: GaN/SiC as Wide Band Gap (WBG) Power Electronics

| Consumer Electronics & IT | | Automotive | Energy | Industrial |
|---|---|--|--|---|
| Power Management | | Power Switching | | |
| 30V | 600V | 1.2 kV | ≥2kV | |
| <ul style="list-style-type: none"> • Electronic appliances • Computing • Wireless charging • Power supplies • PFC  | <ul style="list-style-type: none"> • Infotainment • GPS • Connected car • Autonomous driving • EMI/EMC • Adaptive cruise control  | <ul style="list-style-type: none"> • General automotive electronic • HEV/EV • Charging station • Inverter / motor drives • Converter • Radar test applications  | <ul style="list-style-type: none"> • Power Grid / Smart meter / appliances • Solar / Wind inverters • Solar / Wind power DC distribution • storage • UPS  | <ul style="list-style-type: none"> • UPS • Industrial machines • Building • Mining, oil, gas power generation • Shipping/Rail  |
| GaN | GaN / SiC | | SiC | |

Low to Medium Voltages

Medium to High Voltages

SiC in Automotive : Main Inverter as the Major Market Opportunity



Higher efficiency =

- ✓ Battery size reduction
- ✓ Cost savings
- ✓ Range extension

| Component | Power (kW) | Fraction 6" wafer* | Comment |
|-------------------------------|------------|--------------------|---|
| Main inverter | 20 ~ 150 | 0.1 ~ 0.5 | Brings energy from battery to the electric motor |
| DC-DC Converter | 1 ~ 3 | <0.01 | Brings energy from battery for car electronics |
| On Board Charger (OBC) | 5 ~ 30 | 0.01 | Brings 240 V AC energy from wall plug to battery |
| (Quick) Charging Pole | 30 ~ 300 | 0.1 ~ 1 | Brings 1–3 kV DC energy directly from grid to battery |

* Back-of-the-envelope order-of-magnitude estimates

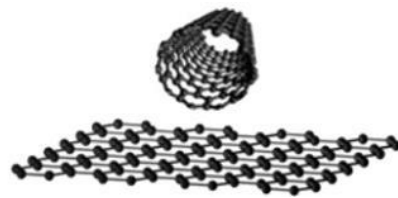
Carbon Nanomaterials – PECVD

Graphene and Carbon Nanotube Deposition Systems

- Proprietary thermal and plasma enhanced chemical vapor deposition technology
- Excellent uniformity and reproducibility with fast turnaround cycle times
- BM platform: BM R&D (2-inch), BM Pro (4-inch and 6-inch), BM GB (4-inch glovebox), BM HT (high temperature, 1,700C), BM300T (300mm)
- Graphene and carbon nanotube films for electronics, energy storage, thermal management, sensors and flexible/transparent applications

Product features

- Fast response heater and turnaround
 - Thermal CVD
 - Substrate and top heating
-
- Closed loop infrared wafer temperature control
 - Plasma enhanced CVD with frequency control
 - Flexible processing for different applications
-
- Low cost of ownership
 - Easy maintenance and cleaning
 - User management features and growth library



Graphene (2D) and Carbon nanotube (1D)
 Unique combination of high electrical/thermal conductivity, mobility, flexibility and transparency



Serving R&D market today
 AIXTRON BM Pro

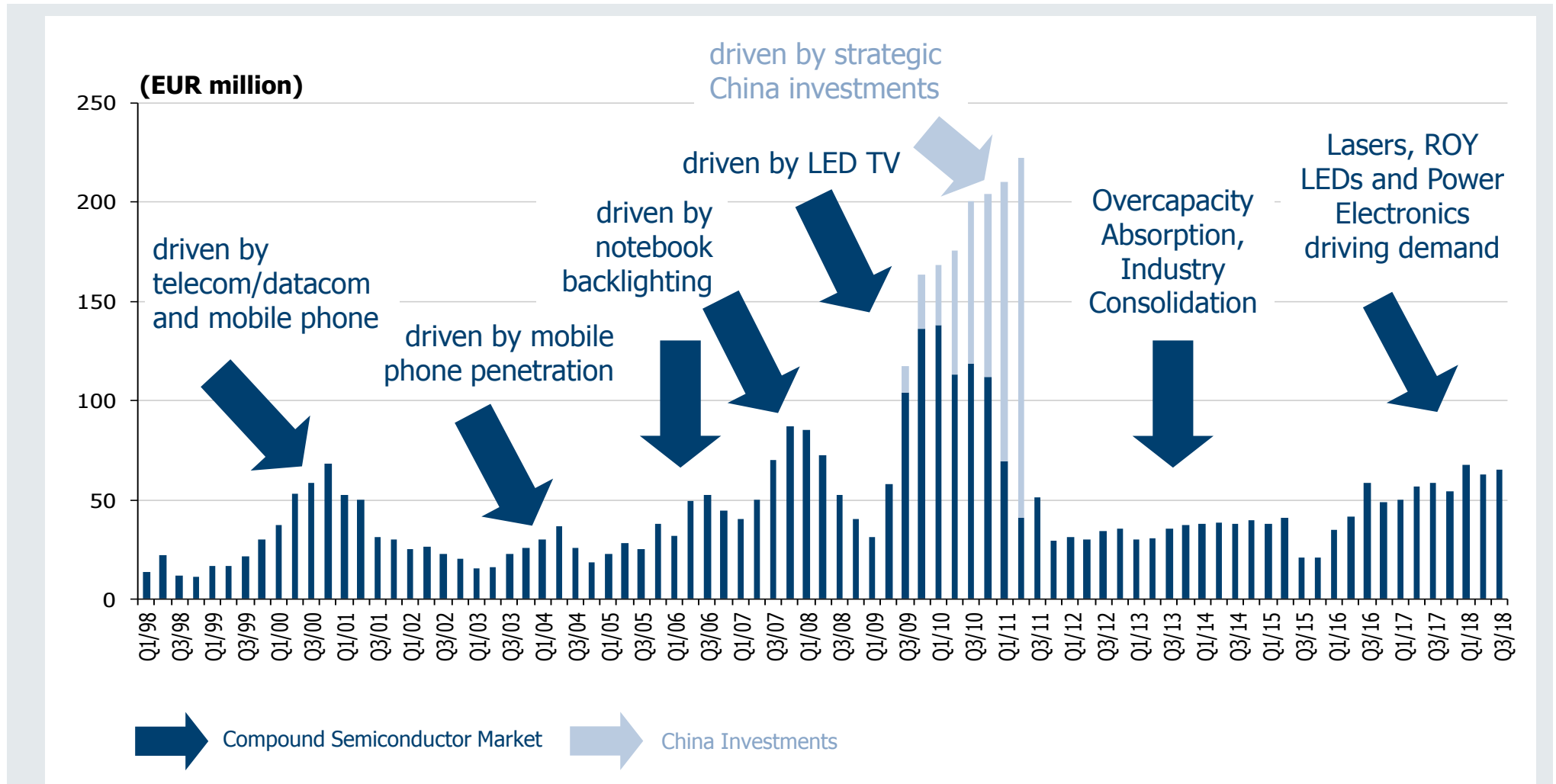


Production ready for tomorrow
 AIXTRON BM Pro 300

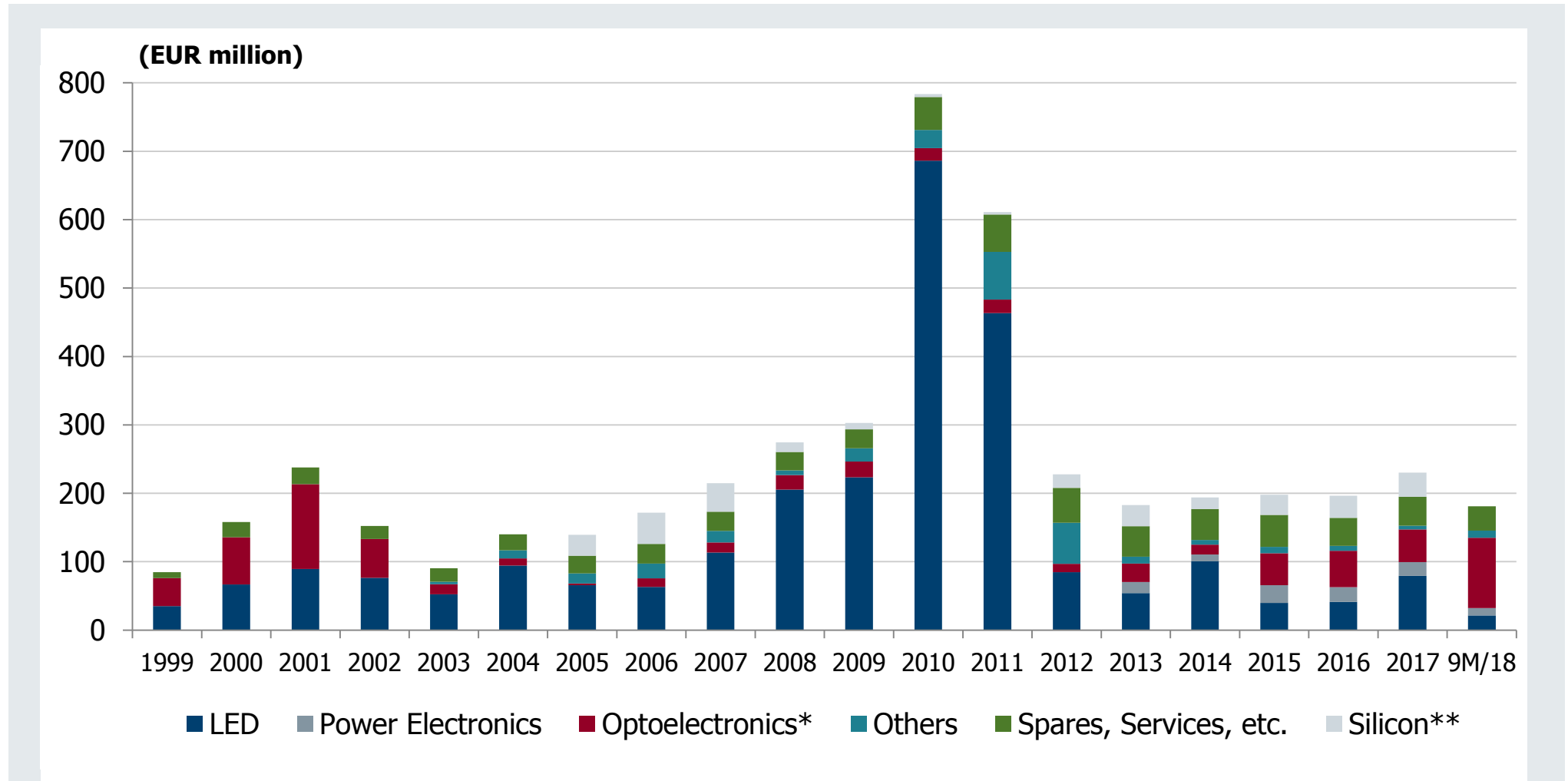


Our *technology*. YOUR FUTURE.

Equipment Order Intake per Quarter





Annual Total Revenues by Application (including spares)



* Optoelectronics includes applications in Consumer Optoelectronics, Telecom/Datacom and Solar

** Silicon: ALD/CVD product line sold in 2017

AIXTRON Competitive Landscape

| | | USA | Europe | China | Korea | Japan |
|-------|-----------------------------------|--|---|--|--|---|
| Opto | GaAs/InP Optoelectronics, ROY LED |  | | | |  |
| | GaN LED |  | |   | |  |
| Power | GaN Power |  | | | |  |
| | SiC Power | |  | | |   |
| OLED | |  | | |      |  CANON TOKKI CORPORATION  |

Consolidated Income Statement*

* Rounded figures; may not add up

| (€ million) | 2017 | 2016 | 2015 |
|----------------------------|-------|-------|-------|
| Revenues | 230.4 | 196.5 | 197.8 |
| Cost of sales | 156.4 | 140.2 | 147.9 |
| Gross profit | 74.0 | 56.3 | 49.8 |
| % | 32 % | 29 % | 25 % |
| Selling expenses | 10.2 | 13.8 | 11.5 |
| General & admin expenses | 17.1 | 17.1 | 16.3 |
| R&D | 68.8 | 53.9 | 55.4 |
| Net other operating income | 27.0 | 7.2 | 6.7 |
| EBIT | 4.9 | -21.4 | -26.7 |
| % | 2 % | -11 % | -14 % |
| Result before tax | 5.5 | -21.0 | -26.0 |
| % | 2 % | -11 % | -13 % |
| Net result | 6.5 | -24.0 | -29.2 |
| % | 3 % | -12 % | -15 % |

Balance Sheet*

* Rounded figures; may not add up

| (€ million) | 31/12/17 | 31/12/16 | 31/12/15 |
|---------------------------------|--------------|--------------|--------------|
| Property, plant & equipment | 64.3 | 74.2 | 81.3 |
| Goodwill | 71.2 | 74.6 | 75.9 |
| Other intangible assets | 1.8 | 5.4 | 6.4 |
| Others | 4.0 | 2.4 | 3.9 |
| Non-current assets | 141.3 | 156.5 | 167.6 |
| Inventories | 43.0 | 54.2 | 70.8 |
| Trade receivables | 19.3 | 60.2 | 26.0 |
| Others | 5.0 | 5.3 | 8.2 |
| Cash & Cash Deposits | 246.5 | 160.1 | 209.4 |
| Current Assets | 313.8 | 279.7 | 314.4 |
| Shareholders' equity | 368.9 | 369.7 | 396.5 |
| Non-current liabilities | 2.0 | 4.2 | 3.6 |
| Trade payables | 14.3 | 14.6 | 9.8 |
| Advance payments from customers | 30.3 | 26.1 | 24.0 |
| Others | 39.7 | 21.6 | 48.0 |
| Current liabilities | 84.2 | 62.3 | 81.8 |
| Balance Sheet total | 455.1 | 436.2 | 482.0 |

Consolidated Statement of Cash Flows*

* Rounded figures; may not add up

| (€ million) | 2017 | 2016 | 2015 |
|---|-------|-------|-------|
| Cash Flow from operating activities | 70.1 | -37.7 | -45.7 |
| Cash Flow from investing activities | 40.7 | 43.4 | 41.2 |
| Cash Flow from financing activities | 1.2 | 0.3 | -0.1 |
| Exchange rate changes | -5.5 | -2.3 | 4.3 |
| Net change in Cash & Cash Equivalents | 106.5 | 3.7 | -0.3 |
| Cash & Cash Equivalents (beginning of period) | 120.0 | 116.3 | 116.6 |
| Cash & Cash Equivalents (end of period) | 226.5 | 120.0 | 116.3 |
| Change in Cash deposits | -19.5 | -52.8 | -60.5 |
| Free Cash Flow** | 91.4 | -42.9 | -57.3 |
| Capex | 9.7 | 5.3 | 13.3 |

**) Operating CF + Investing CF + Changes in Cash Deposits, adjusted for acquisition effects

Financial Calendar & Contact Data

- February 26, 2019 FY/2018 Results, Conference Call
- April 30, 2019 Q1/2019 Results, Conference Call
- May 15, 2019 Annual General Meeting, Aachen (Germany)
- July 25, 2019 H1/2019 Results, Conference Call
- October 24, 2019 9M/2019 Results, Conference Call

For further information please contact:

Investor Relations & Corporate Communications

AIXTRON SE ▪ Dornkaulstr. 2 ▪ 52134 Herzogenrath, Germany ▪ E-Mail: invest@aixtron.com

IR Team Europe

Phone: +49 (2407) 9030-444

IR Contact USA (California) – Andrea Su

Phone: +1 (669) 228-3895

Technology. Materials. Performance.

AIXTRON SE
Dornkaulstr. 2
52134 Herzogenrath
Germany
Phone +49 (2407) 9030-0
Fax +49 (2407) 9030-40
E-Mail invest@aixtron.com



AIXTRON