

AIXTRON Investor Presentation

5G
Networks

Energy
Storage

Renewable
Energy

**AIXTRON
ENABLES
INNOVATION**

Autonomous
Driving

Internet
of Things

NextGen
Displays

IR Presentation – H1/2018

(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®
APEVA

Carbon – PECVD

NANO: Innovation Pool



Photonics
(e.g. VCSEL for 3D Sensing, Lasers for CE, Datacom)



GaN Power
(e.g. Wireless Charging; RF, Fast Charging)



Specialty LED
(MicroLED-, Fine Pitch Displays; Horticulture; Purification; IR & UV LEDs)



SiC Power
(e.g. EVs, Charging Stations, Infrastructure)

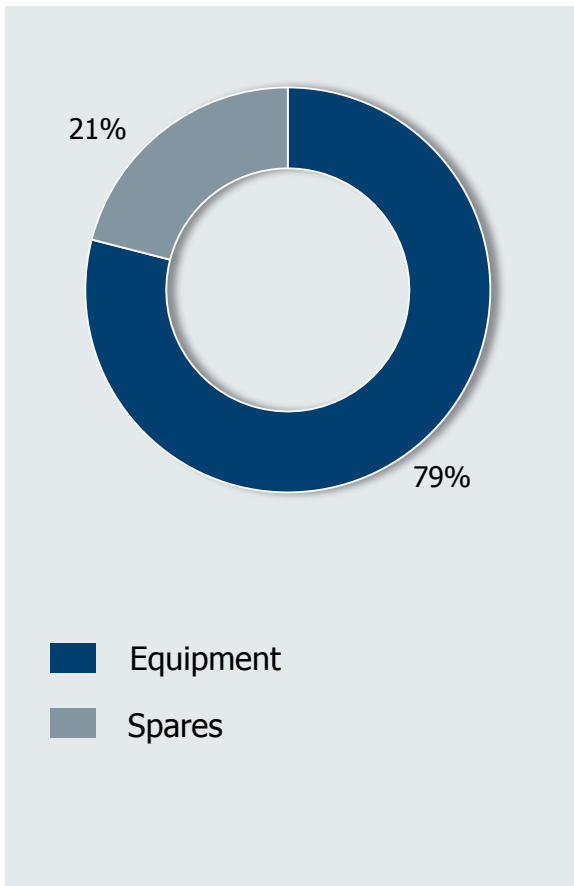
AIXTRON
Our technology. Your future.

MOCVD Core Technology

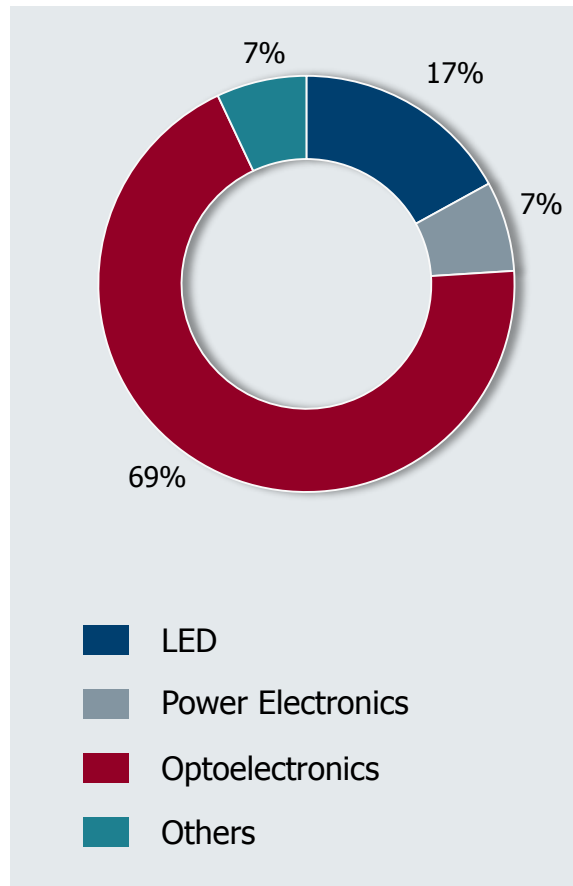
Revenue Analysis*

* Rounded figures; may not add up

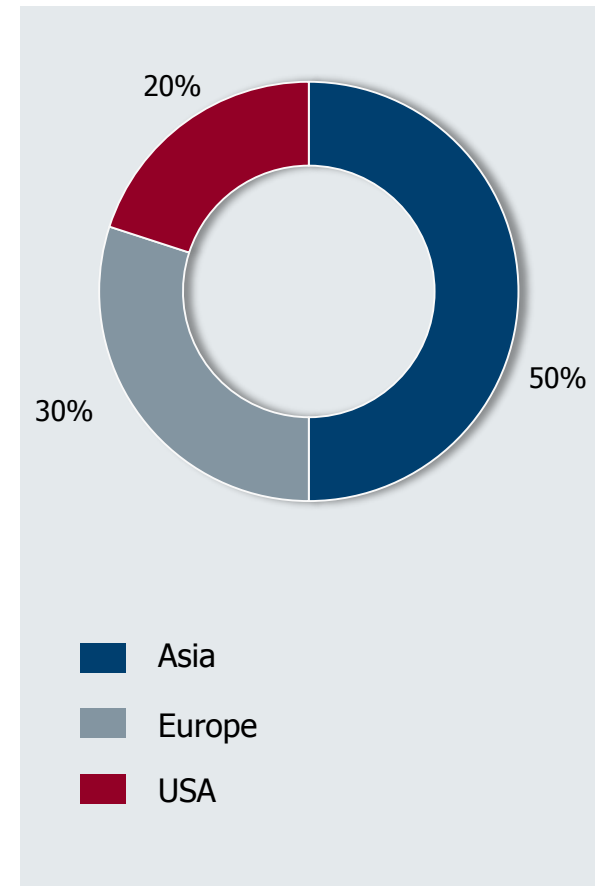
H1/2018:
by equipment & spares



H1/2018:
by end application
(equipment only)



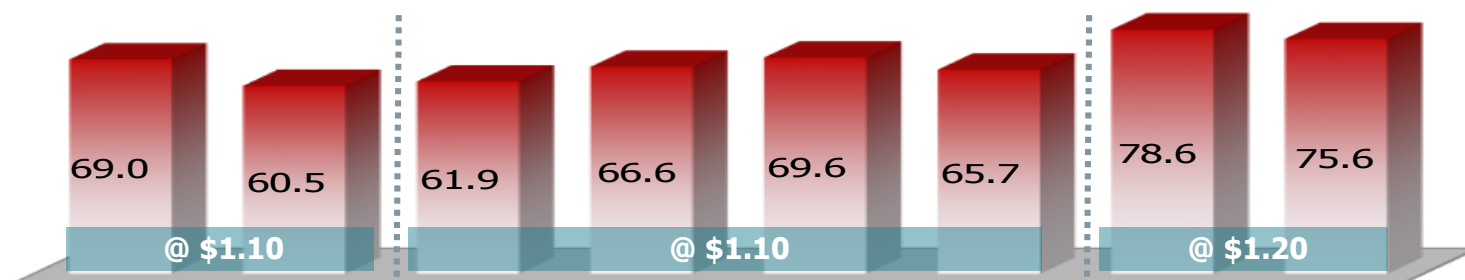
H1/2018:
by region



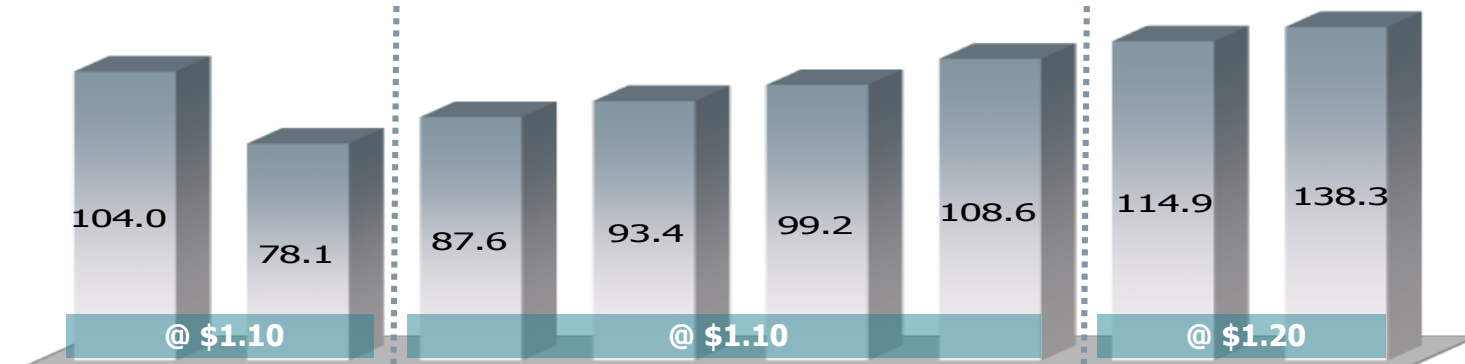
24 - Month Business Development

(€ million)

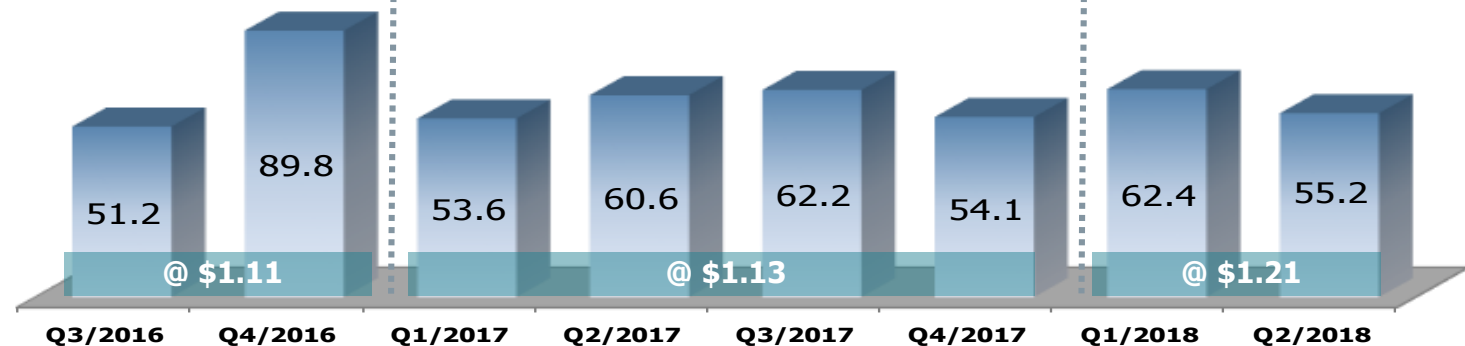
Order Intake
(incl. equipment,
service, spare parts)



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: \$1.21/€)

Consolidated Income Statement*

* Rounded figures; may not add up

(€ million)	H1/18	H1/17	+/- %	Q2/18	Q1/18	+/- %
Revenues	117.6	114.1	3	55.2	62.4	-12
Cost of sales	66.9	85.8	-22	31.3	35.6	-12
Gross profit	50.6	28.3	79	23.8	26.8	-11
%	43	25	18 pp	43	43	0 pp
Selling expenses	4.6	5.3	-13	2.3	2.3	-
General & admin expenses	8.7	9.4	-7	4.4	4.3	2
R&D	27.0	39.5	-32	13.2	13.7	-4
Net other operating income	-1.6	-1.7	-6	-0.3	-1.4	79
EBIT	12.0	-24.1	150	4.1	7.9	-48
%	10	-21	31 pp	7	13	-6 pp
Net result	16.0	-24.9	164	3.7	12.3	-70
%	14	-22	36 pp	7	20	-13 pp

Balance Sheet*

* Rounded figures; may not add up

(€ million)	30/06/18	31/03/18	31/12/17
Property, plant & equipment	64.4	63.8	64.3
Goodwill	71.6	71.1	71.2
Other intangible assets	1.7	1.6	1.8
Others	9.0	9.1	4.0
Non-current assets	146.7	145.7	141.3
Inventories	60.1	46.2	43.0
Trade receivables	37.7	30.0	19.3
Others	7.4	7.5	5.0
Cash & Cash Deposits	234.7	223.2	246.5
Current Assets	339.9	306.9	313.8
Shareholders' equity	388.0	380.7	368.9
Non-current liabilities	1.5	1.5	2.0
Trade payables	18.9	14.3	14.3
Advance payments from customers	53.2	28.5	30.3
Others	25.0	27.5	39.7
Current liabilities	97.1	70.3	84.2
Balance Sheet total	486.6	452.6	455.1

Consolidated Statement of Cash Flows*

* Rounded figures; may not add up

(€ million)	H1/18	H1/17	Q2/18	Q1/18
Net Result	16.0	-24.9	3.7	12.3
Adjust for				
Non Cash Items	-0.1	14.1	2.9	-3.0
Changes in Working Capital	-24.5	54.1	5.9	-30.4
Cash Flow from Operating Activities	-8.5	43.3	12.5	-21.1
Capital Expenditures	-4.5	-3.6	-2.9	-1.6
Fixed Asset disposals/FX/Other	1.2	-3.3	1.7	-0.5
Total Cash Flow	-11.8	37.0	11.4	-23.2
Cash & Deposits	234.7	197.1	234.7	223.2

AIXTRON – 2018 Guidance: Upward Adjustments

- ✓ **Order Intake: EUR 260 ~ 290 million (from EUR 230 ~ 260 million)**
- ✓ **H2/2018 Revenues > H1/2018 Revenues**
- ✓ **Upper-end of Guidance Range to be reached for:**
 - **Revenues: Around EUR 260m (Original Range: EUR 230 ~ 260 million)**
 - **Gross Margin: Around 40% (Original Range: 35% ~ 40%)**
 - **EBIT Margin: Around 10% (Original Range: 5% ~ 10%)**
- ✓ **Positive Operating Cash Flow for Full Year 2018**

* Based on 1.20 USD/EUR Budget Rate; please refer to "Expected Results of Operations and Financial Position" in the AIXTRON 2017 Annual Report for further information

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.

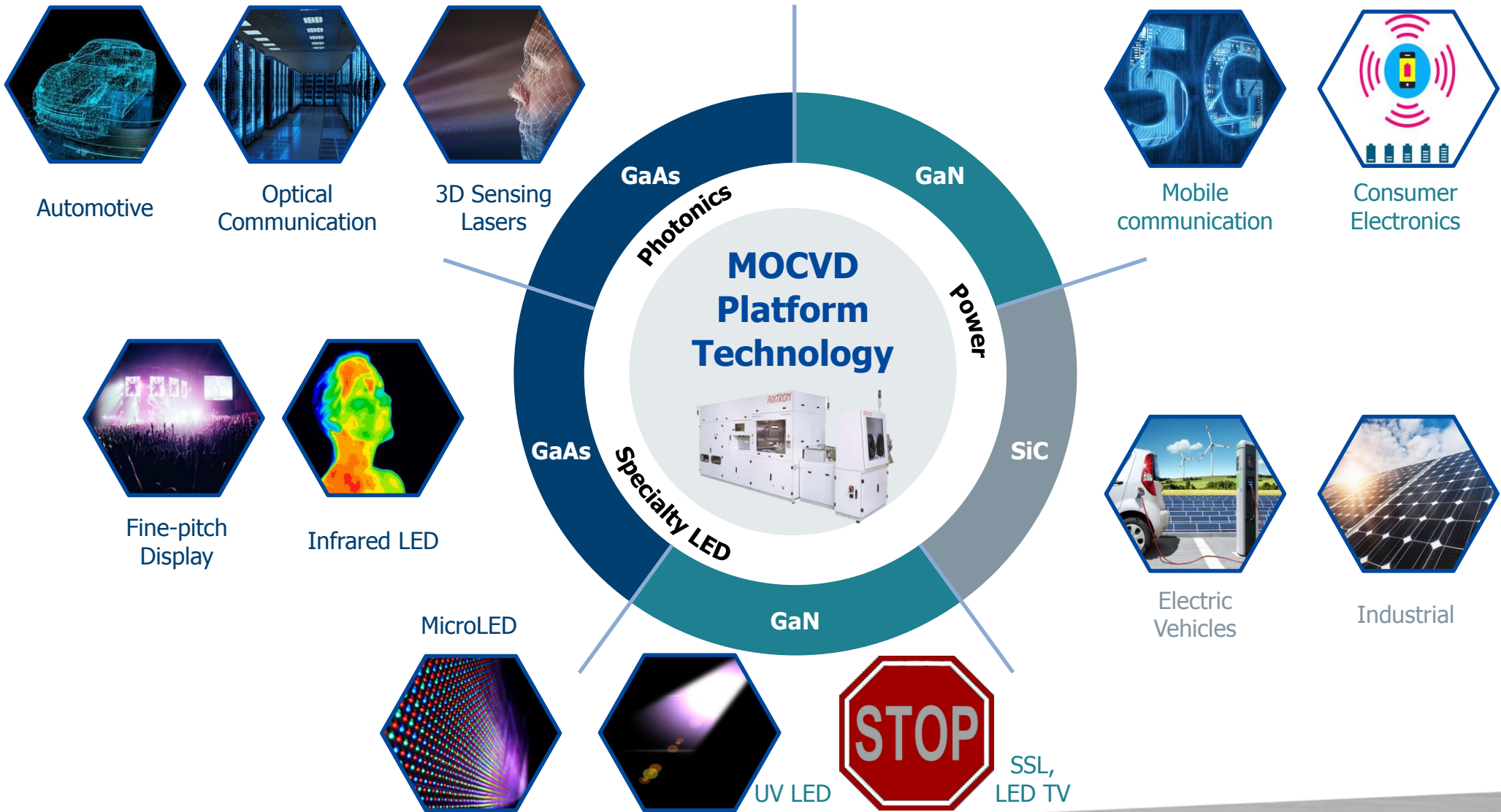
Long-Term

- 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.

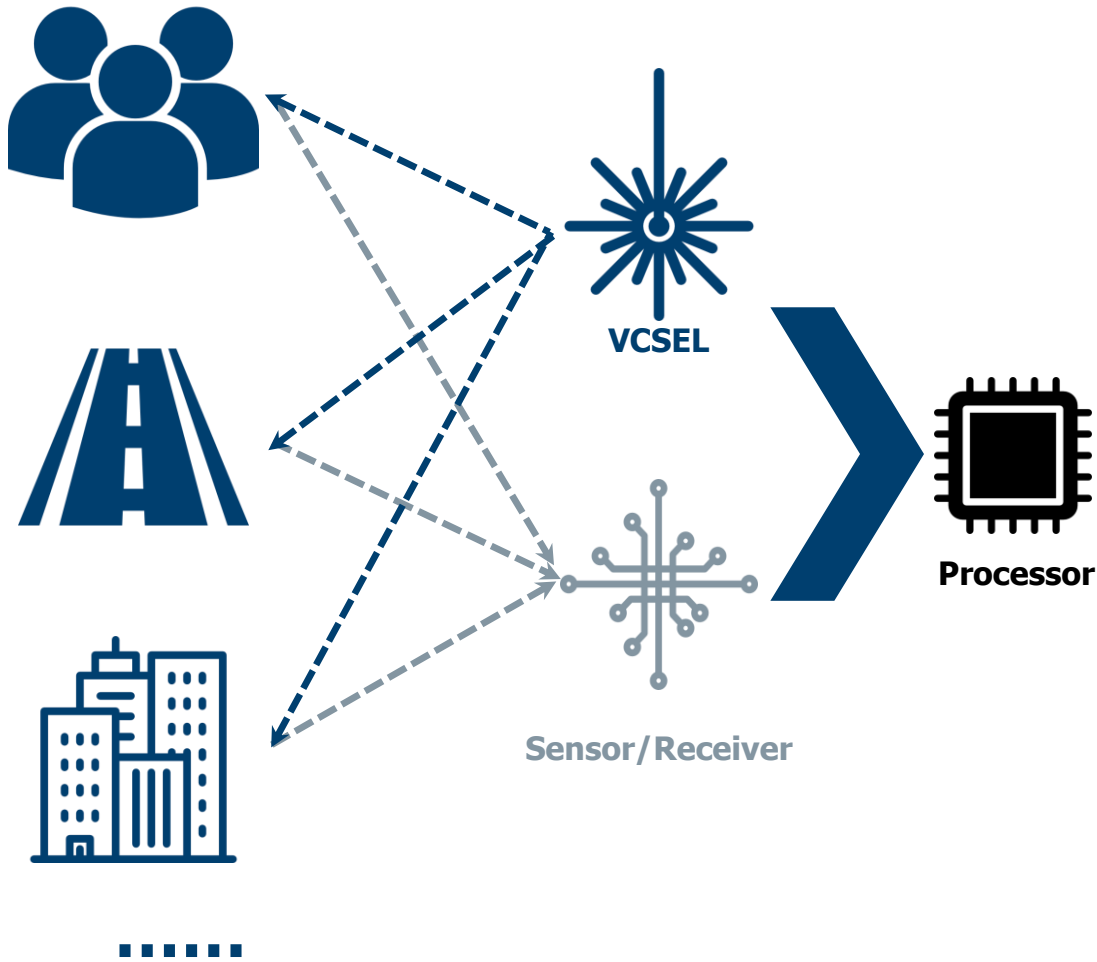
AIXTRON – Enabling Emerging Global Mega Trends



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

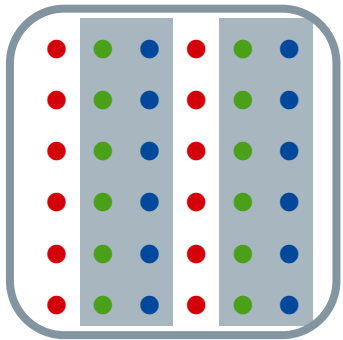


Industry 4.0

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

Source: LEDinside

ROY LED

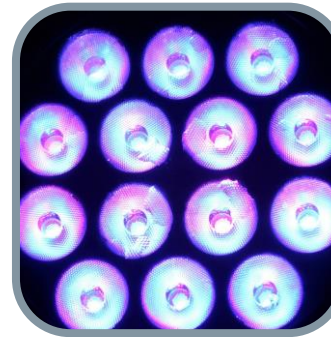


RGB Fine-Pitch Indoor Display
(Pixel Pitch $\leq 2.5\text{mm}$)



RGB Stadium Outdoor Display
(Pixel Pitch $\geq 10\text{mm}$)

UV LED



Curing



Water Disinfection



Air Purifier

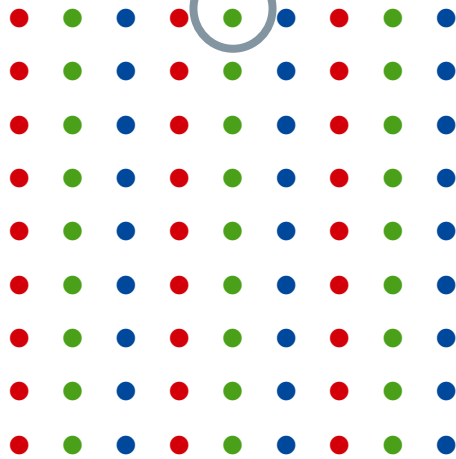
Devices: MiniLED & MicroLED – The Perfect Future Display Technology

RGB
MicroLED
Display



1

100



RGB
LED
Display



Self-Emissive

Low Power
Consumption

Perfect
Contrast

High
Brightness

Fast
Response



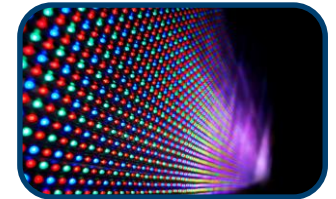
Source: LEDinside



Wearables



AR/VR



Signage



Smartphones/Tablets/TVs

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





Our *technology*. YOUR FUTURE.

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	

Volume segment

Niche segment

Devices: GaN/SiC Power Electronics – Superior Performance

Source: icons from www.flaticon.com



More Efficient



Energy Saving

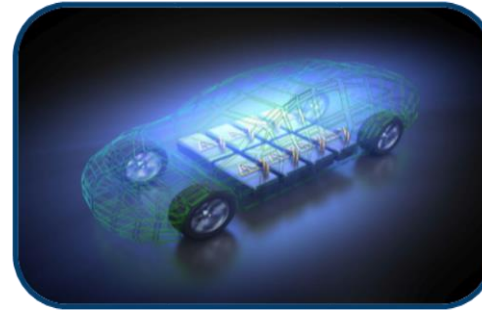
Less Heat

Light Weight

Lower System Cost



Smaller



Electric Vehicles



EV-charging



Data Centers



Renewable Energy

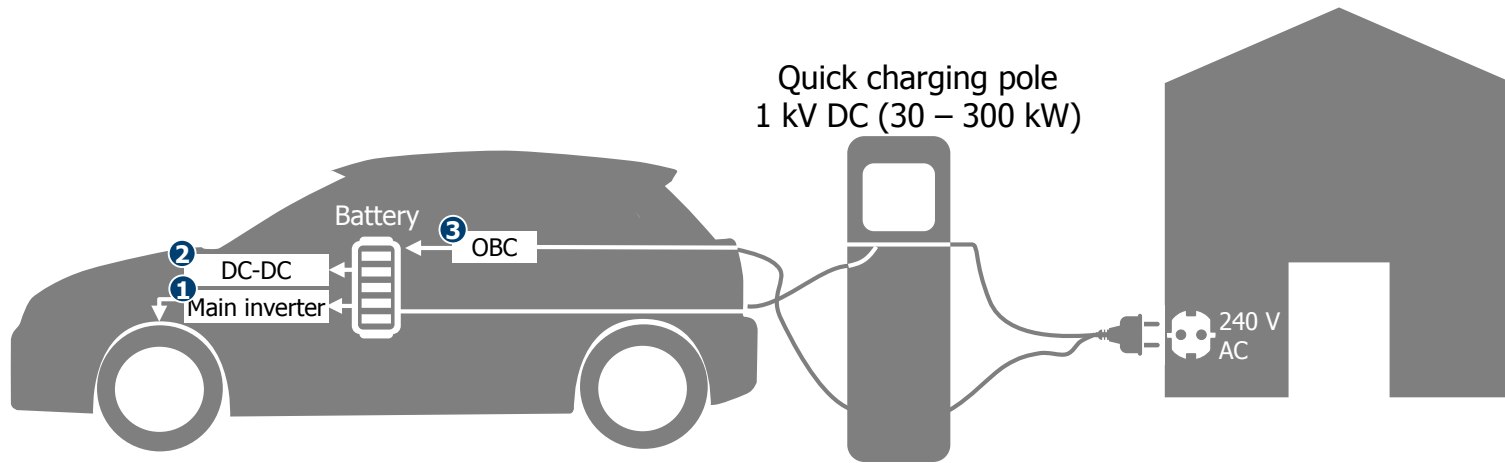


Wireless Charging



Fast Charging

SiC in Automotive : Main Inverter as the Major Market Opportunity



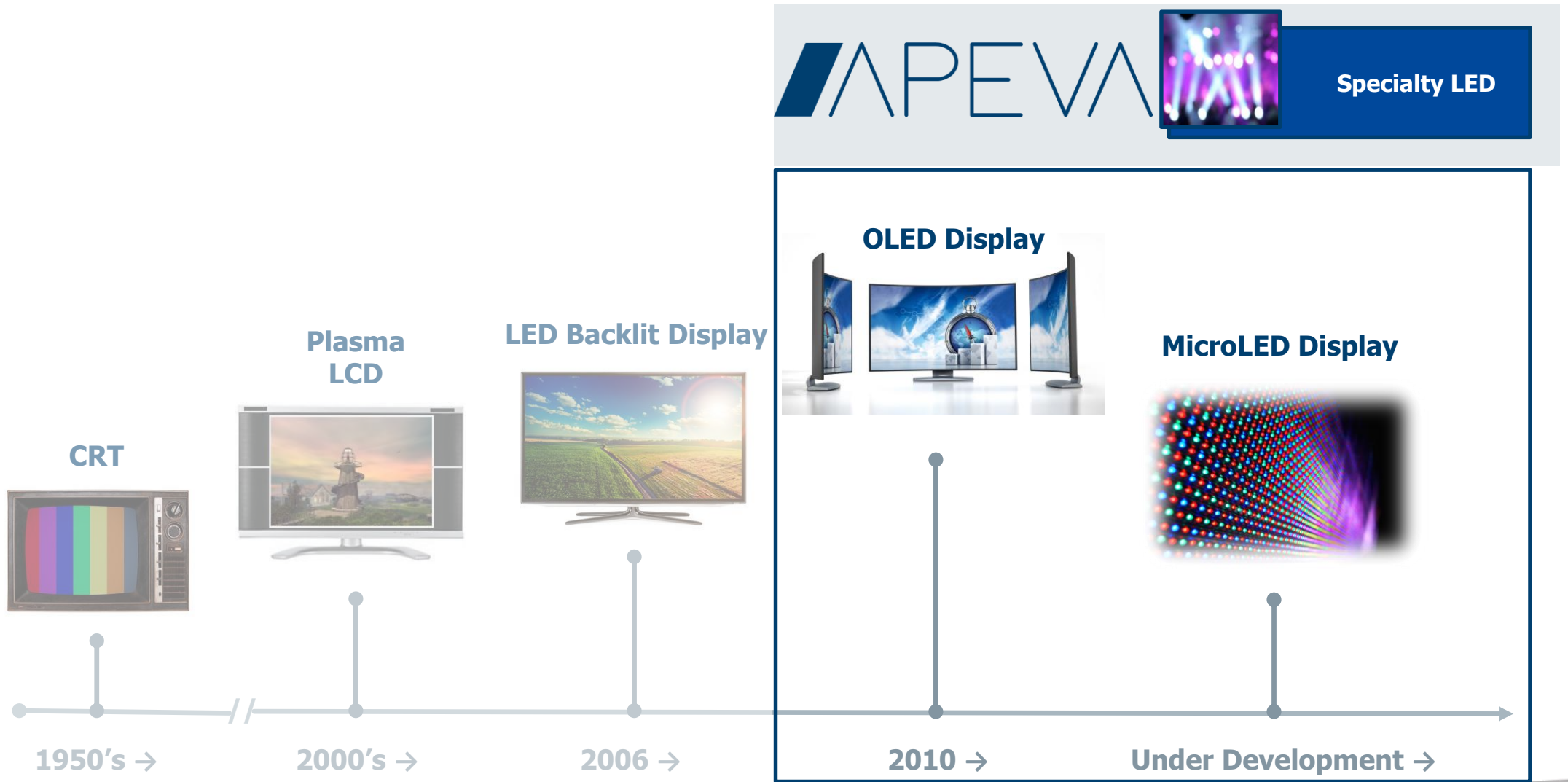
Higher efficiency =

- ✓ 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

AIXTRON – Instrumental in Evolving Display Technologies

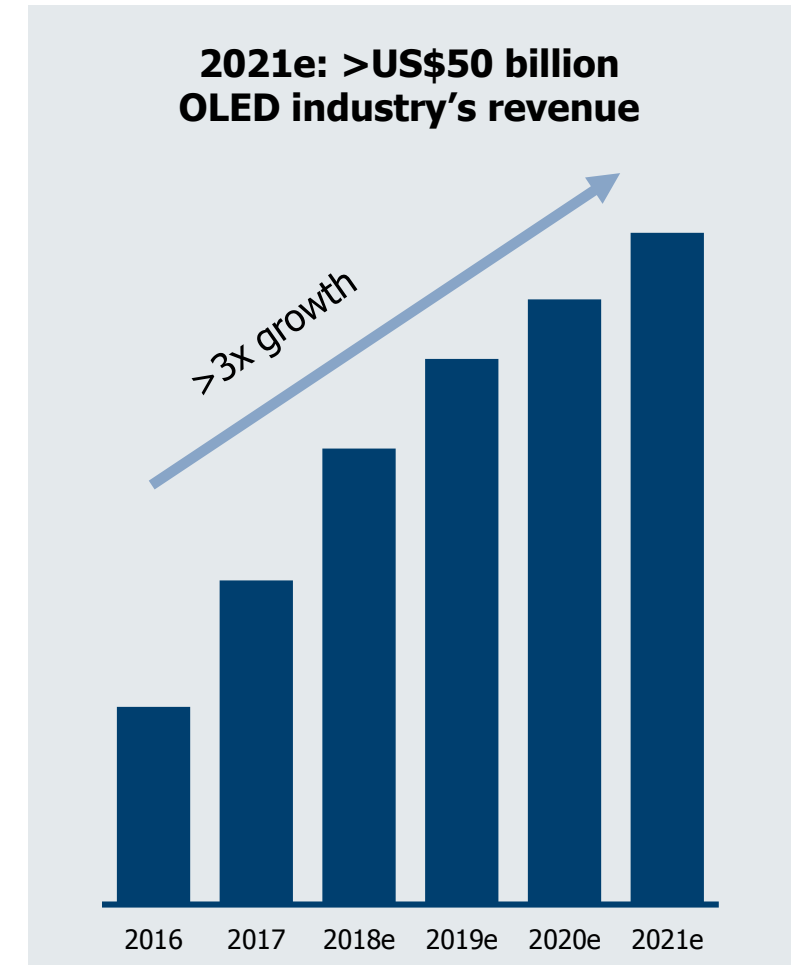


OVPD[®] – APEVA: Disruptive OLED Manufacturing Technology

Source: UBI Research, Display Supply Chain

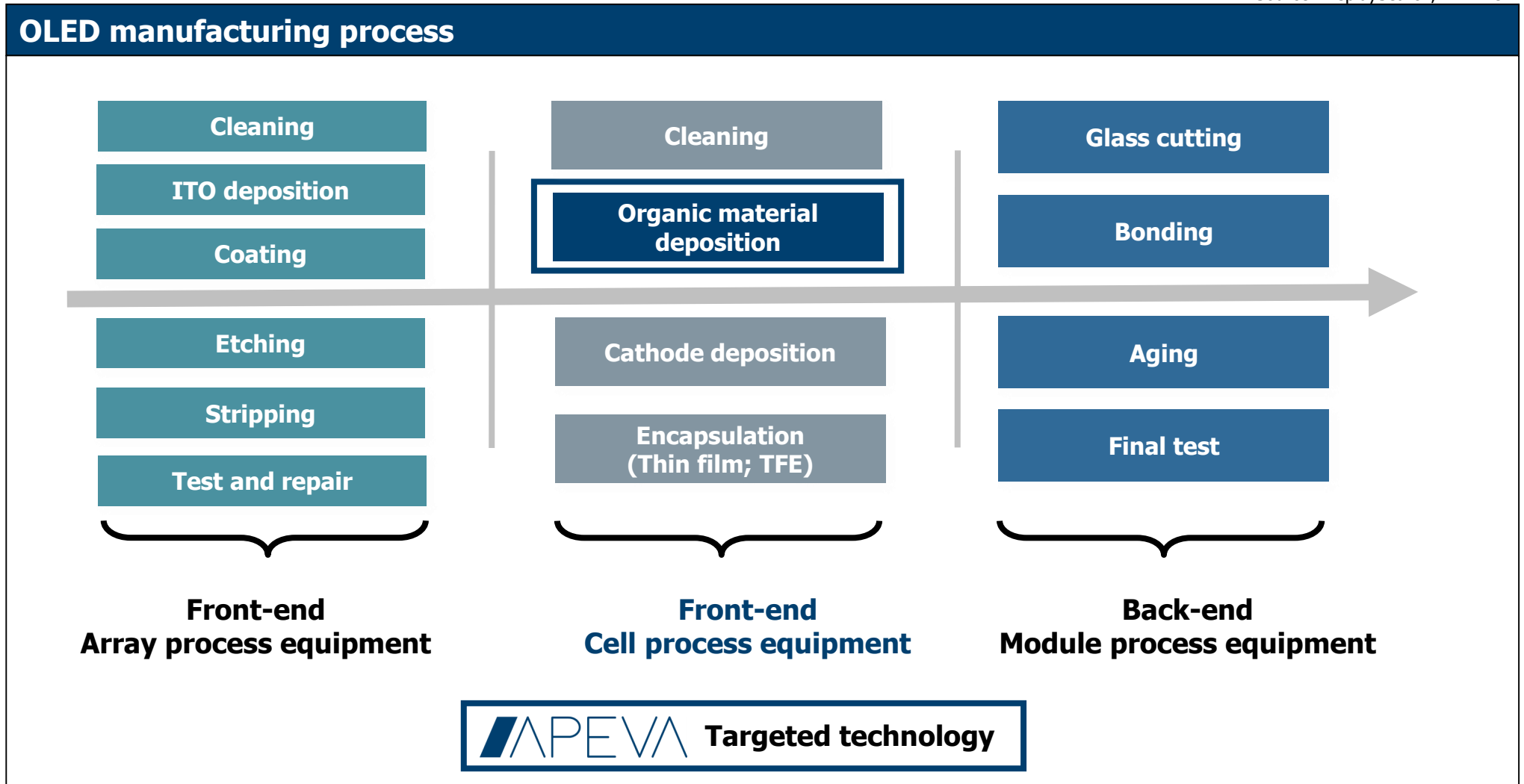
OVPD[®] enables production of next generation displays

- ✓ Higher quality displays
- ✓ High material utilization efficiency
- ✓ Lower production cost and smaller footprint
- ✓ Free scalability



Organic Electronics – OVPD[®] – APEVA

Source: DisplaySearch, AIXTRON



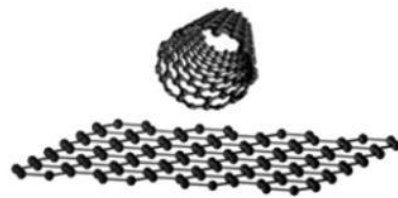
Carbon Nanomaterials – PECVD

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

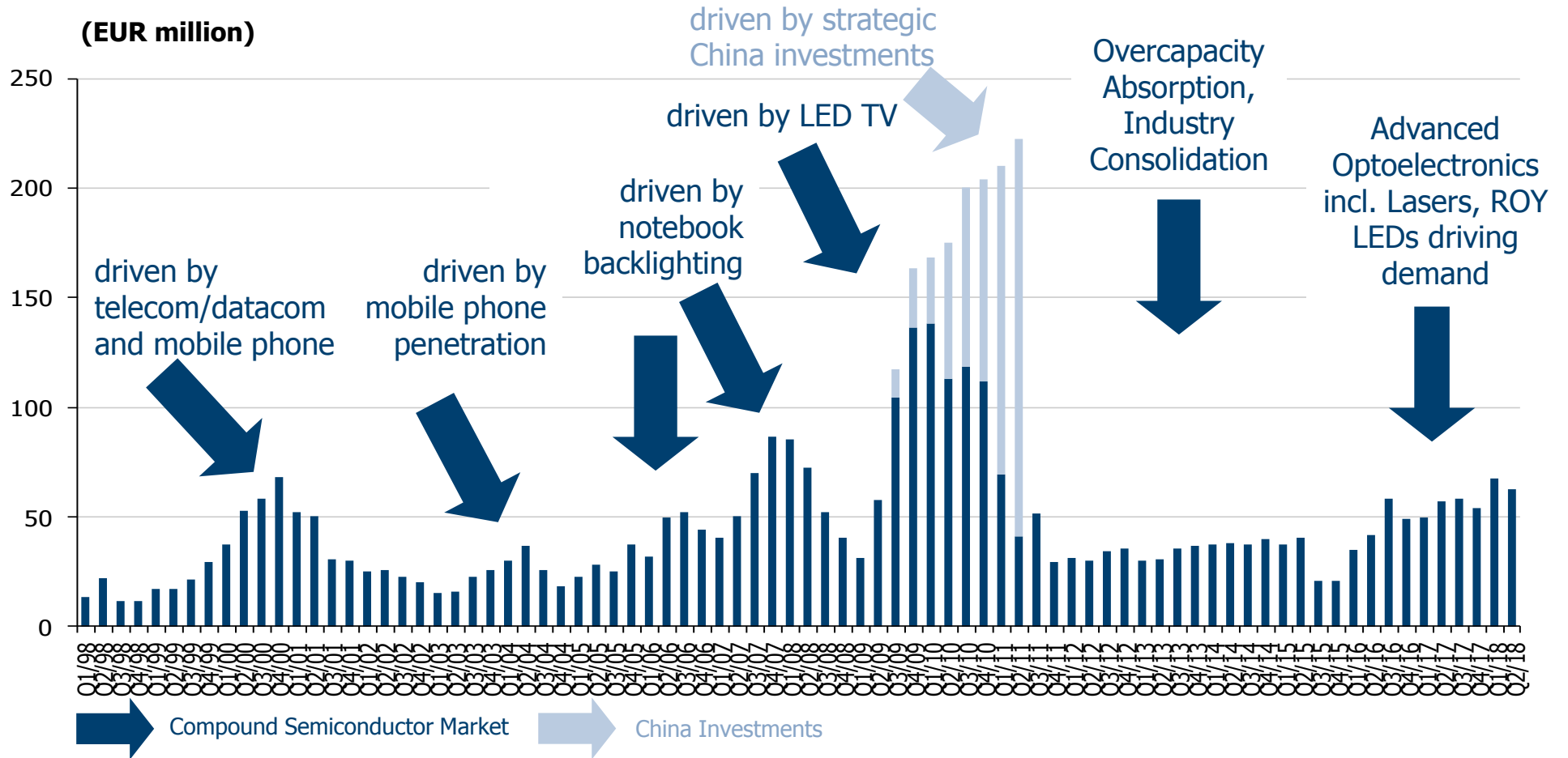


Serving R&D market today
 AIXTRON BM Pro

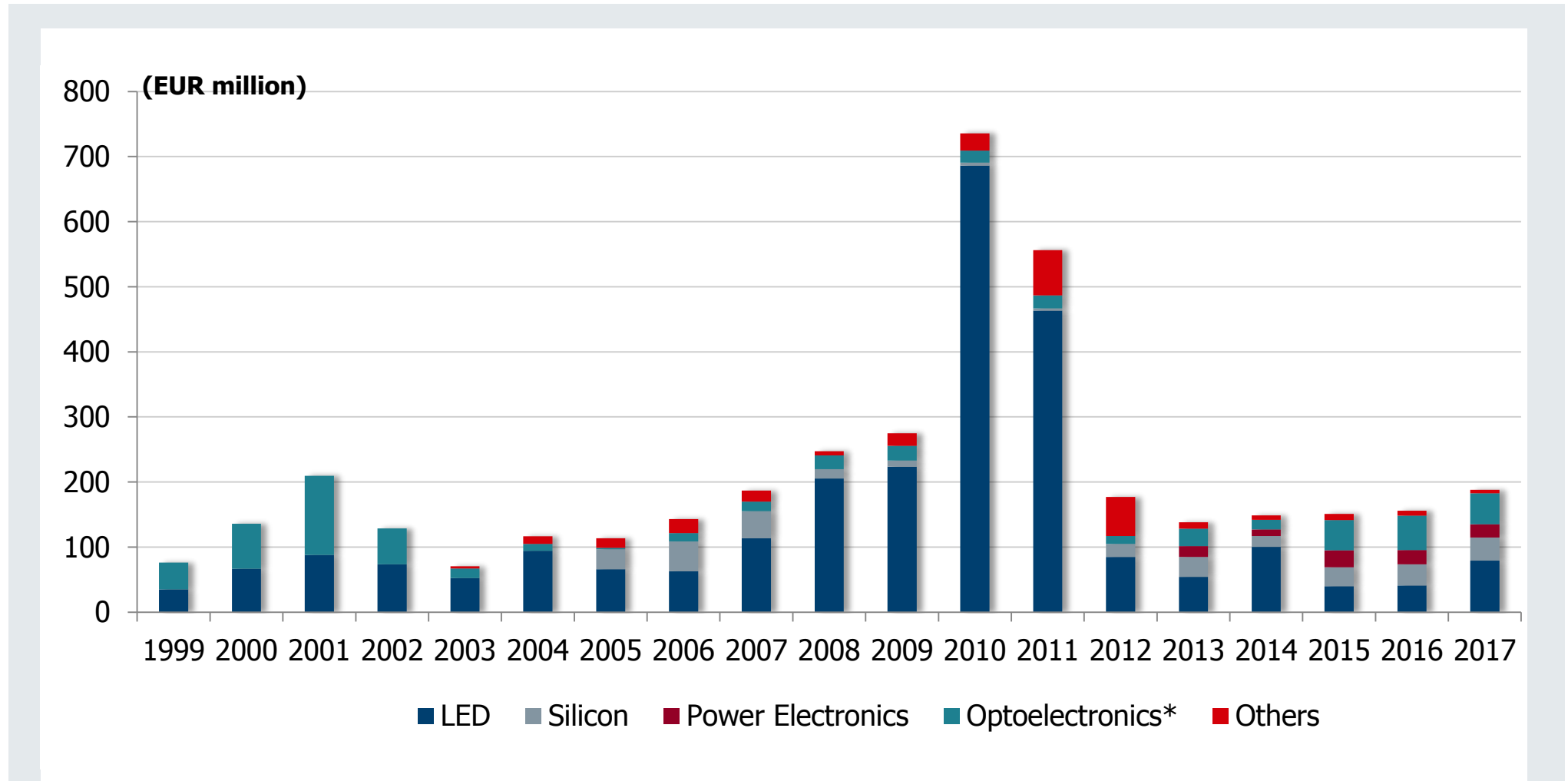


Production ready for tomorrow
 AIXTRON BM Pro 300

Equipment Order Intake per Quarter




Annual Equipment Revenues by Application (excl. spares)



* Optoelectronics includes applications in Consumer Optoelectronics, Telecom/Datacom, Solar, etc.

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

- October 30, 2018 Q3/2018 Results, Conference Call
- February 2019 FY/2018 Results, Conference Call
- April 2019 Q1/2019 Results, Conference Call
- July 2019 H1/2019 Results, Conference Call

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