

Organic Electronics
Next Generation Displays
Flexible Electronics
Wearables

AIXTRON Investor Presentation

Opto & Power Electronics

Next Generation Displays
SSL Adoption · UV-C
Renewable Energy
Power Management
E-Mobility · Connectivity

Our technology.
Your future.

Memory & Logic

High Performance Computing
Memory / Big Data
Sensors · Smart Devices

Graphene & Nanomaterials

Flexible Electronics
Sensors · Energy Storage
High Performance Computing
Composites

IR Presentation – H1/2017

(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 our current assessments, expectations and assumptions, of which many are beyond control of AIXTRON, and are 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 actual customer orders received by AIXTRON, the level of demand for deposition technology in the market, the timing of final acceptance of products by customers, the condition of financial markets and access to financing for AIXTRON, general conditions in the market for deposition plants and macroeconomic conditions, cancellations, rescheduling or delays in product shipments, production capacity constraints, extended sales and qualification cycles, difficulties in the production process, the general development in the semi-conductor industry, increased competition, fluctuations in exchange rates, availability of public funding, fluctuations and/or changes in interest rates, delays in developing and marketing new products, a deterioration of the general economic situation and any other factors discussed in any reports or other announcements, in particular in the chapter Risks in the Annual Report, filed by AIXTRON. Any forward-looking statements contained in this document are based on current expectations and projections of the executive board based on information available the date hereof. 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 presentation 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[®], Atomic Level SolutionS[®], Close Coupled Showerhead[®], CRIUS[®], Gas Foil Rotation[®], OVPD[®], Planetary Reactor[®], PVPD[®], TriJet[®], Optacap[™]

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.

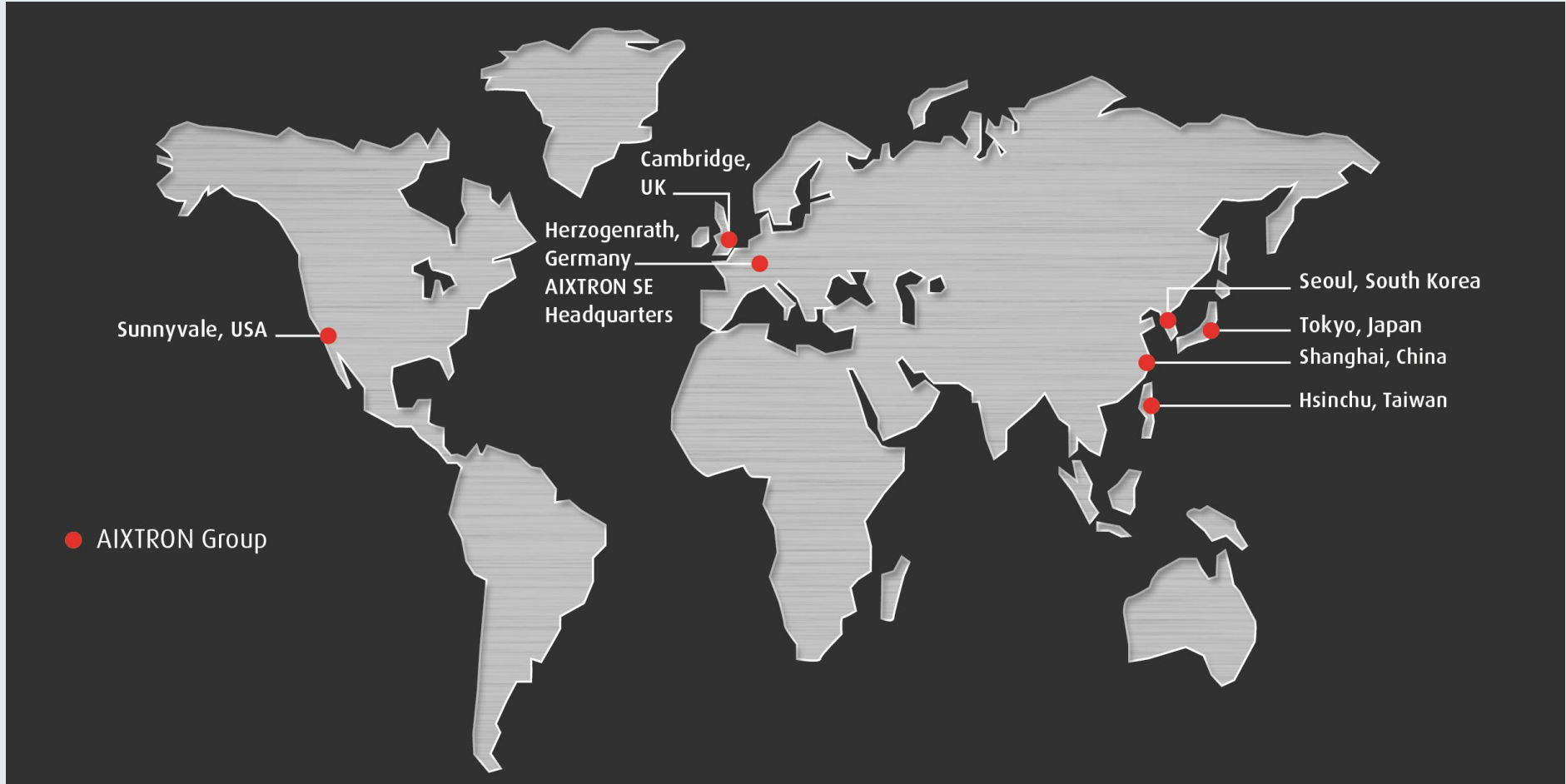
We **deliver the performance** driving **economic success** through our expertise, our employees and the quality of our products.

Who we are

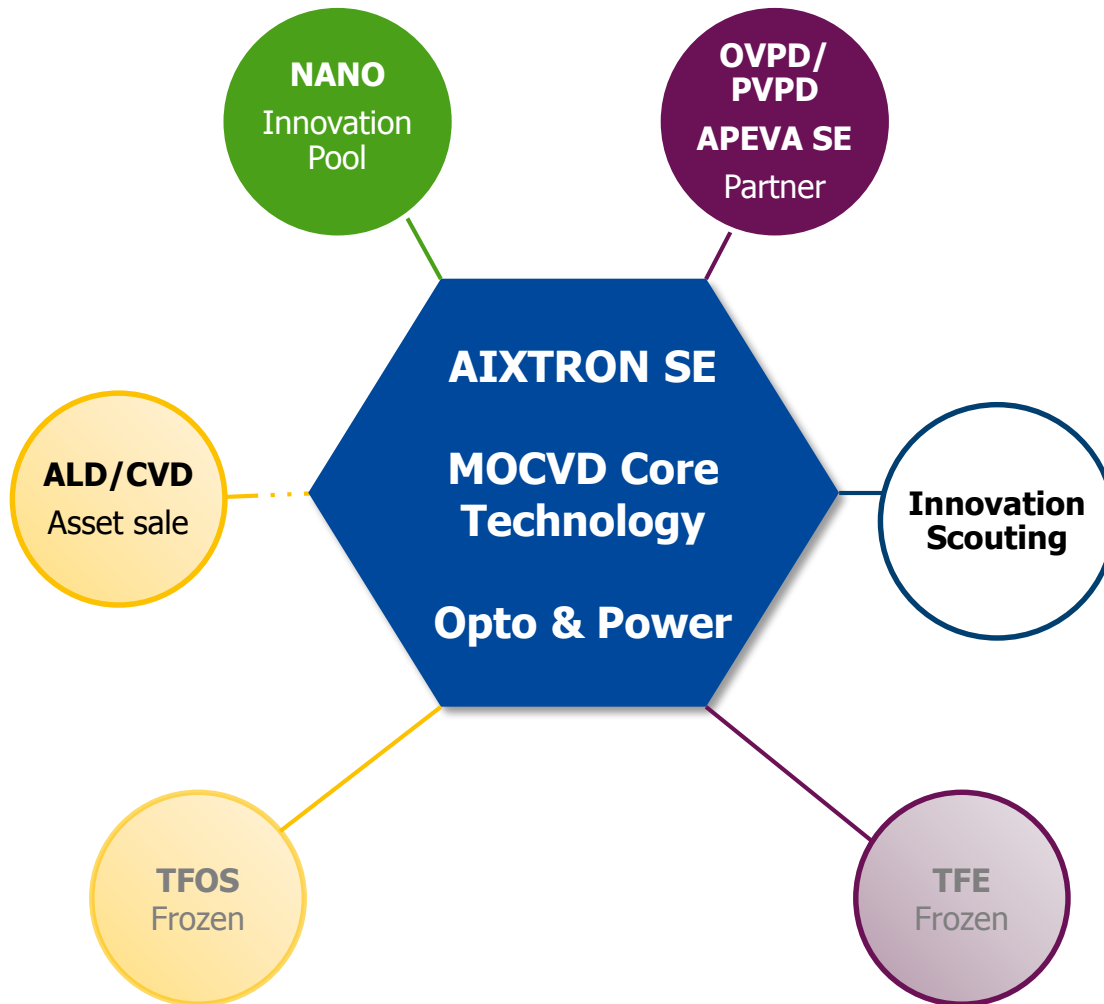


- Headquarters based in Herzogenrath, Germany
- Worldwide presence with 13 sales/representatives offices and production facilities
- Company founded in 1983 – over 30 years of experience
- ~ 700 employees
- Technology leader in deposition systems
- More than 3,000 deposition systems delivered all over the world
- State of the art R&D center and demo facilities

Global Presence



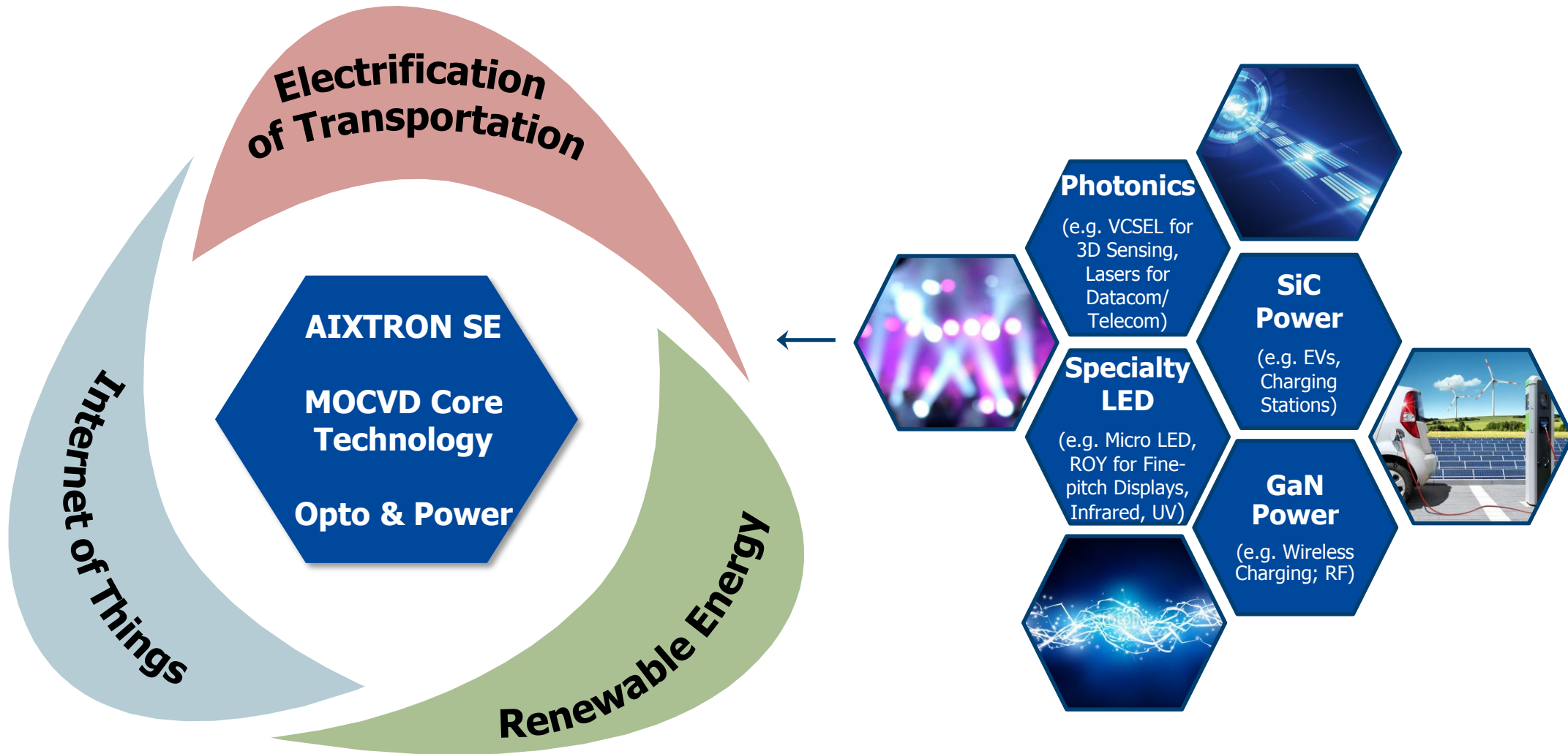
Technology Portfolio – Strategy



Executing Strategic Plans:

- ✓ Partner: OLED deposition
 - Establishing APEVA SE, a 100% subsidiary of AIXTRON; Joint Venture discussions in progress
- ✓ Freezing R&D: TFOS & TFE
 - Q1/2017: freezing III-V on Silicon (TFOS) R&D activities
 - Q2/2017: freezing Thin Film Encapsulation (TFE) R&D activities
- ✓ Asset sale: ALD/CVD
 - Selling ALD/CVD Memory product line to Eugene Technology in South Korea; Transaction expected to close in 2017

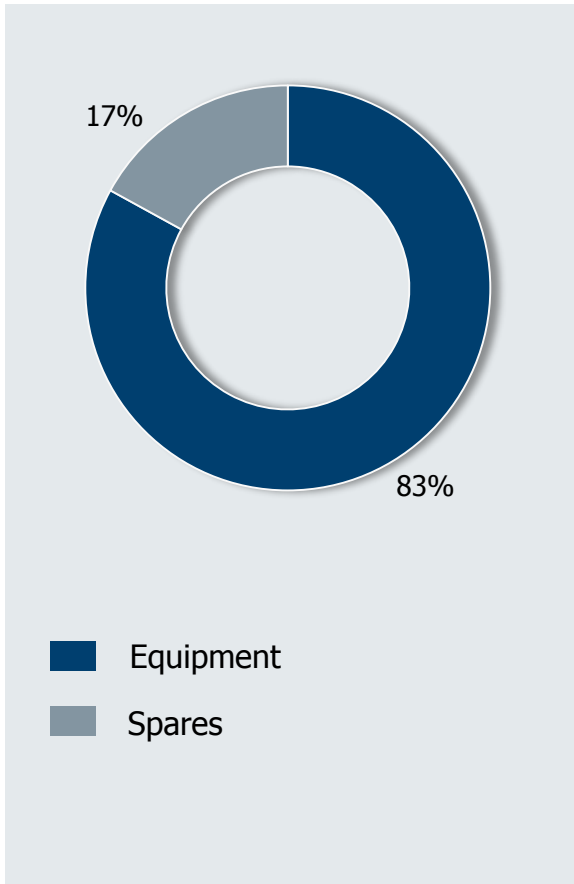
Technology Portfolio



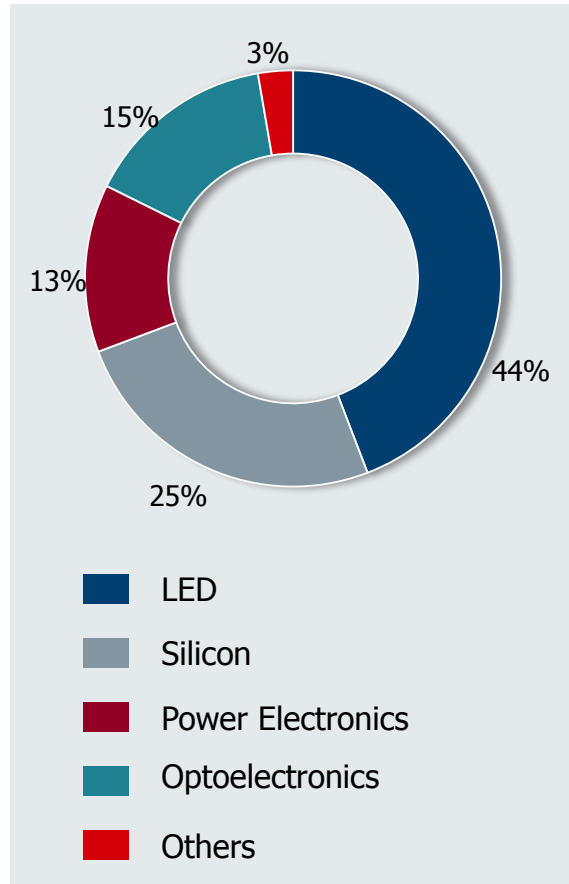
Revenue Analysis*

* Rounded figures; may not add up

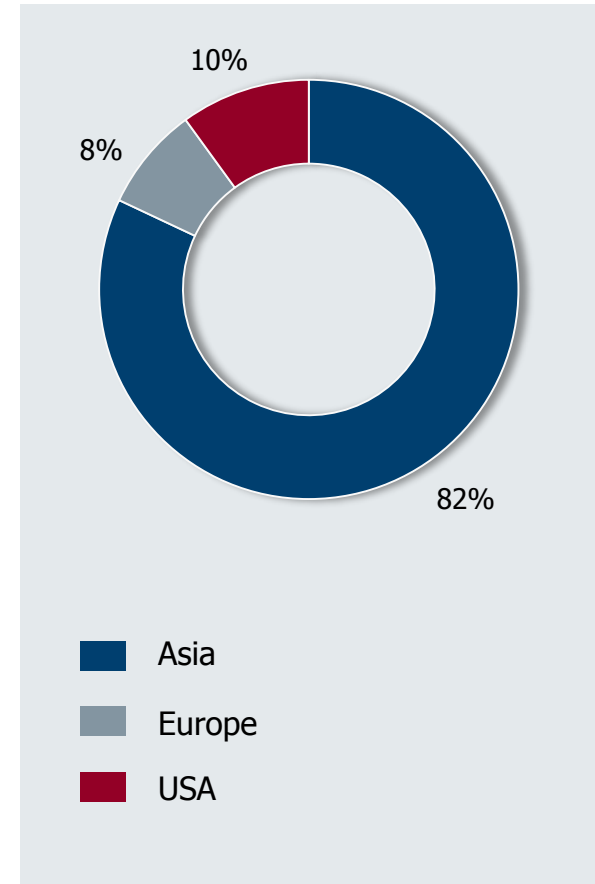
H1/2017:
by equipment & spares



H1/2017:
by end application
(equipment only)



H1/2017:
by region



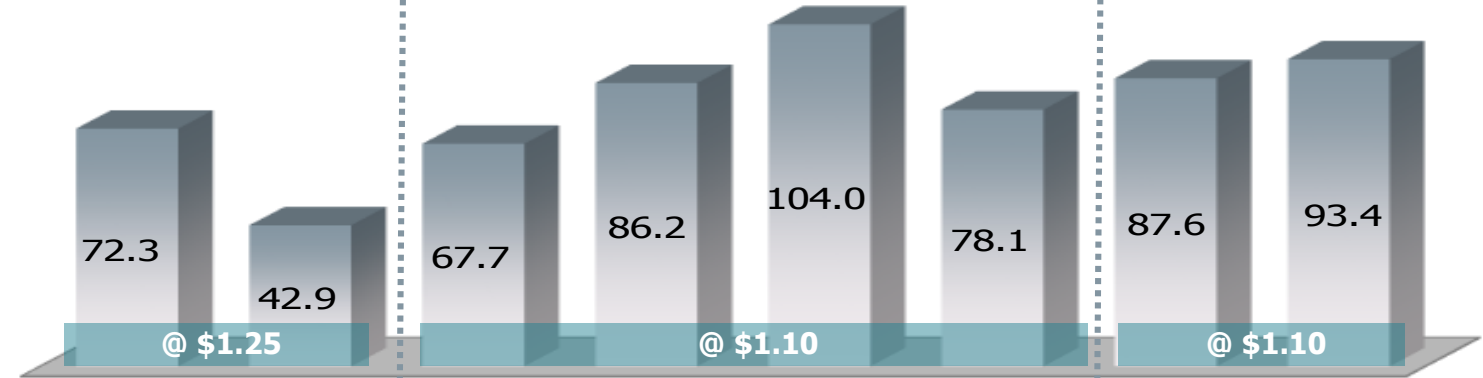
24 - Month Business Development

(€ million)

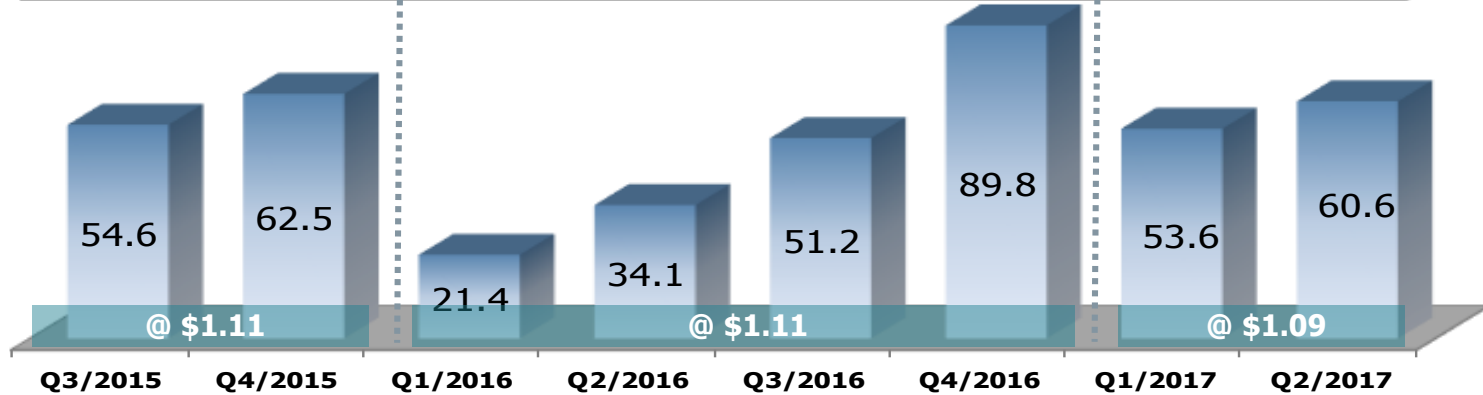
Order Intake
(incl. equipment,
service, spare parts)



Order Backlog
(equipment only)



Total Revenues
(incl. equipment,
service, spare parts)



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

USD revenues were converted at the actual period average FX rate (H1/2017: \$1.09/€)

Consolidated Income Statement*

* Rounded figures; may not add up

(€ million)	Q2/17			Q1/17			+/- %
	Adjusted	Restructuring	Actual	Adjusted	Restructuring	Actual	
Revenues	60.6		60.6	53.6		53.6	13
Cost of sales	45.9		45.9	40.0		40.0	15
Gross profit	16.0	1.3	14.7	14.7	1.1	13.6	9
%	26		24	27		25	1pp
Selling expenses	2.7		2.7	2.6		2.6	3
General & admin expenses	3.8	-1.3	5.1	4.1	-0.2	4.3	-7
R&D	14.8	-5.0	19.8	14.1	-5.6	19.7	5
Net other operating income & expenses	-1.6		-1.6	-0.2		-0.2	—
EBITDA	-1.3	3.0	-4.2	-2.7	3.3	-6.0	52
EBIT	-3.6	7.7	-11.3	-5.9	6.8	-12.7	39
%	-6		-19	11.1		-24	5pp
Net result	-3.7	7.7	-11.4	-6.7	6.8	-13.5	45
%	-6		-19			-25	6pp

Consolidated Income Statement*

* Rounded figures; may not add up

(€ million)	H1/17			H1/16	+/- %
	Adjusted	Restructuring	Actual	Actual	
Revenues	114.1		114.1	55.5	106
Cost of sales	85.8		85.5	45.5	89
Gross profit	30.6	2.3	28.3	10.0	n.m.
%	27		25	18	9 pp
Selling expenses	5.3		5.3	5.8	-10
General & admin expenses	7.9	-1.5	9.4	8.3	-5
R&D	28.9	-10.6	39.5	26.0	11
Net other operating income & expenses	-1.7		-1.7	-4.2	-58
EBITDA	-4.0	6.2	-10.2	-20.0	80
EBIT	-9.6	14.5	-24.1	-25.9	63
%	-8		-21	-47	39 pp
Net result	-10.4	14.5	-24.9	-26.6	61
%	-9		-22	-48	39 pp

Balance Sheet*

* Rounded figures; may not add up

(€ million)	30/06/17	31/03/17	31/12/16
Property, plant & equipment	65.3	68.9	74.2
Goodwill	68.7	74.5	74.6
Other intangible assets	1.5	5.2	5.4
Others	2.1	2.1	2.4
Non-current assets	137.5	150.6	156.5
Inventories	36.4	49.9	54.2
Trade receivables	22.0	29.6	60.2
Others	6.0	5.6	5.3
Assets classified as held for sale	16.0	0.0	0.0
Cash & Cash Deposits	197.1	193.6	160.1
Current Assets	277.6	278.6	279.7
Shareholders' equity	339.8	356.7	369.7
Non-current liabilities	2.5	4.2	4.2
Trade payables	13.9	15.2	14.6
Advance payments from customers	33.6	30.5	26.1
Others	25.3	22.6	21.6
Current liabilities	72.7	68.3	62.3
Balance Sheet total	415.0	429.2	436.2

*) rounded figures; may not add up

Consolidated Statement of Cash Flows*

* Rounded figures; may not add up

(€ million)	H1/17	H1/16	Q2/17	Q1/17
Net Result	-24.9	-26.6	-11.4	-13.5
Adjust for				
Non Cash Items	14.1	6.8	6.8	7.3
Changes in Working Capital	54.1	-19.4	13.3	40.8
Cash Flow from Operating Activities	43.3	-39.3	8.7	34.6
Capital Expenditures	-3.0	-5.9	-1.7	-1.3
FX effects / Other	-3.3	-2.9	-3.6	0.3
Total Cash Flow	37.0	-48.1	3.5	33.6
Cash & Deposits	197.1	161.3	197.1	193.6

Market Prospects

Short-Term

- Further increasing emergence of compound semiconductor based laser devices such as VCSELs for sensors in automotive and mobile applications.
- Further increasing emergence of compound semiconductor based laser devices for ultrafast Telecom and Datacom infrastructure and data center applications.
- Further increasing adoption of LEDs and specialty LEDs (in particular Red-Orange-Yellow, UV or IR) for Sensor, Fine Pitch Display and other applications.
- Increased emergence of wide band gap SiC based devices for energy efficient power management in automotive, consumer electronics and mobile applications.

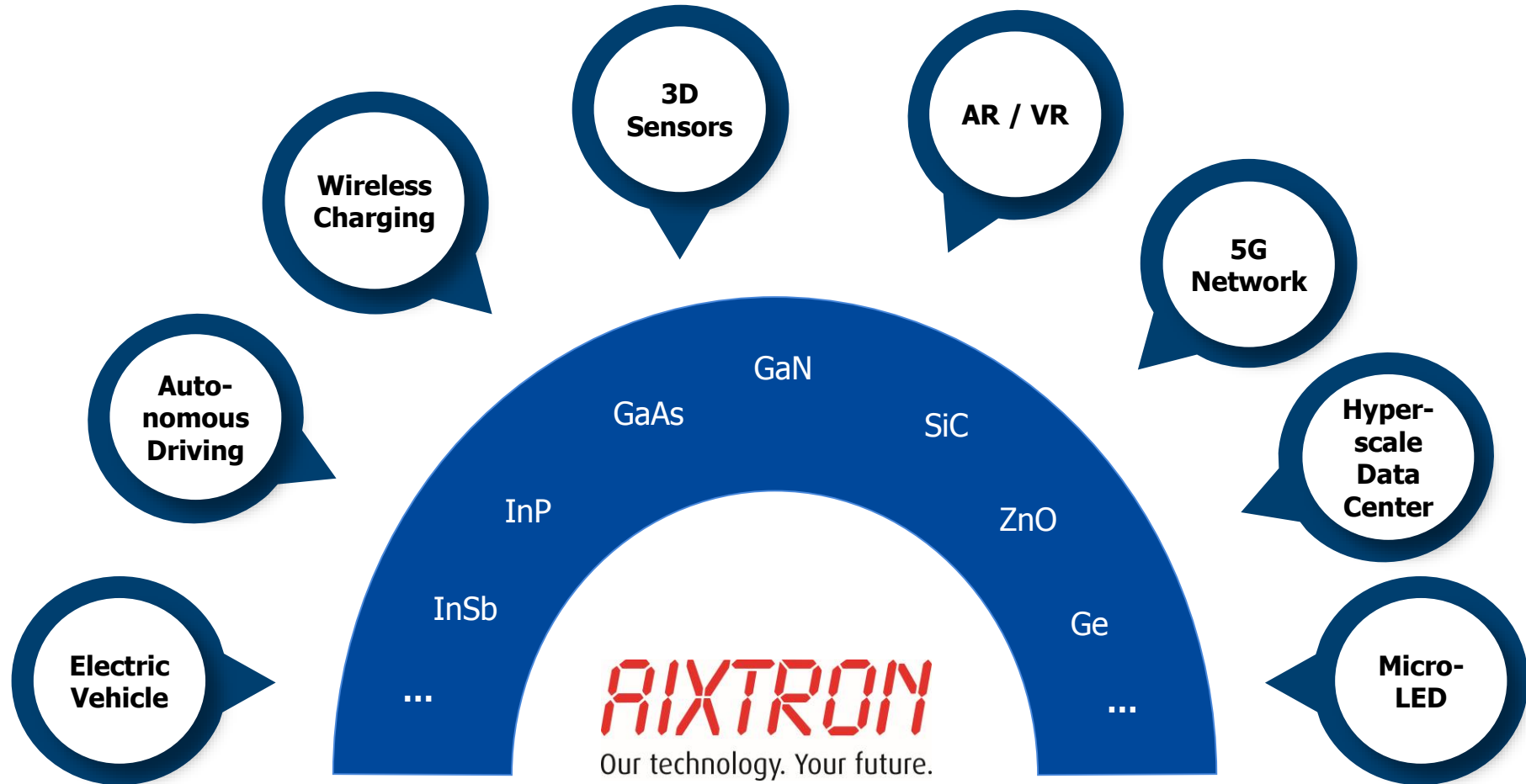
Mid- to Long-Term

- Increased emergence of wide band gap GaN based devices for energy efficient power management and communications in automotive, consumer electronics and mobile applications.
- Increasing emergence of compound semiconductor based sensor devices for autonomous driving.
- Further progress in the development of GaN-on-Silicon LEDs and Wafer Level Packaging.
- Development of new wide band gap applications such as RF and System-on-Chip with integrated power management.
- Progress in the development of large area OLED displays requiring efficient deposition technologies such as OVPD.
- Increased development activity for specialized compound solar cell applications.
- Development of applications using Carbon Nanostructures (Carbon Nanotubes, Carbon Nanowires, Graphene, 2D-Materials).
- Development of alternative LED applications such as Visual Light Communication technology or Micro-LED Displays.



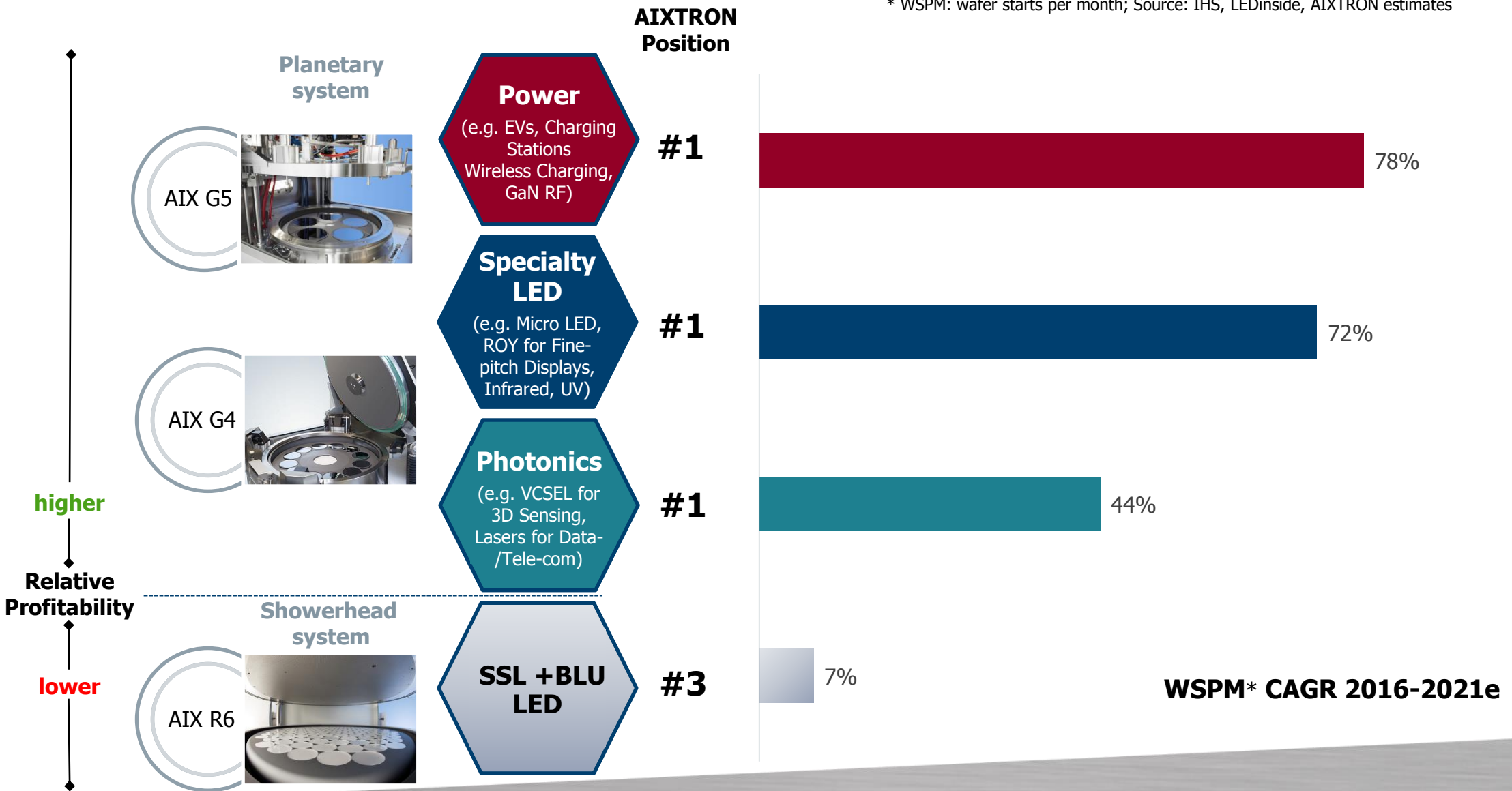
Our *technology*. YOUR FUTURE.

AIXTRON – Enabling Emerging Global Mega Trends



AIXTRON Opto & Power – Positioned for Profitable Growth

* WSPM: wafer starts per month; Source: IHS, LEDinside, AIXTRON estimates

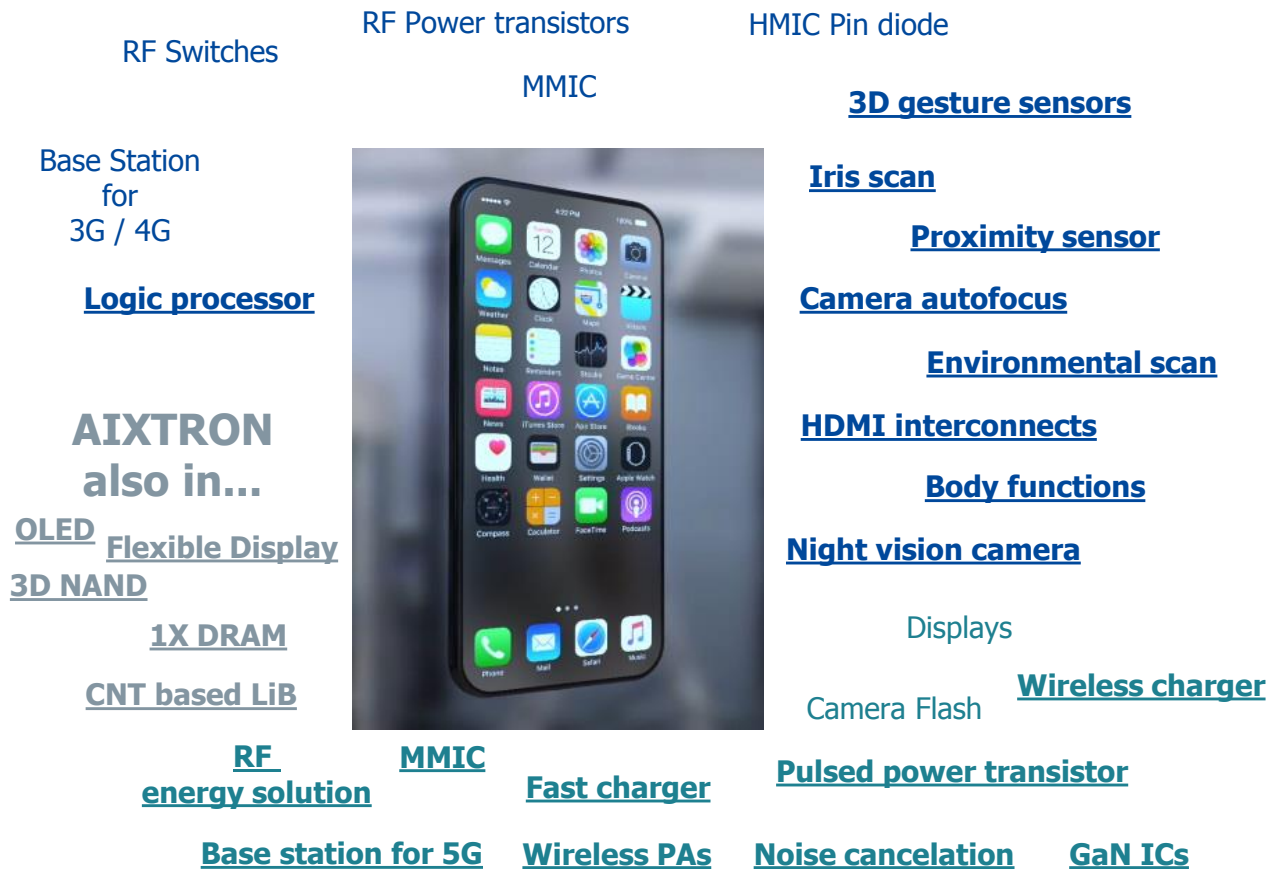


WSPM* CAGR 2016-2021e

Short Term: Compound Semiconductors in Next-Gen CE Applications

Source: Gartner; Credit Suisse, Deutsche Bank, Stifel

AIXTRON Enables GaAs Applications



- **Potential CE markets (2017e)**
~3bn units
 - Smartphones: 1.55 bn units
 - Laptops: 0.18 bn units
 - Tablets: 0.3 bn units
 - Smartwatches: 0.1 bn units
 - Wearables: 0.3 bn units
 - TV: 0.25 bn units
 - Others (DSC, Game consoles): 0.1bn
- **Customer profiles:**
 - Fragmented and global
 - IDMs, PDM, foundries and start ups
 - GaN MOCVD: 100+ players with epi capability
 - GaAs MOCVD: 60+ players with epi capability
 - CNT PECVD: shift toward commercial customers

AIXTRON Enables GaN Applications

Mid Term: Compound Semiconductors in Connected Vehicles

Source: Gartner; Baader, Bernstein, Deutsche Bank, Stifel

AIXTRON Enables GaAs Applications

Vehicle speed sensing (IR)

Night vision IR

Emergency break assist (IR)

Adaptive cruise control (IR)

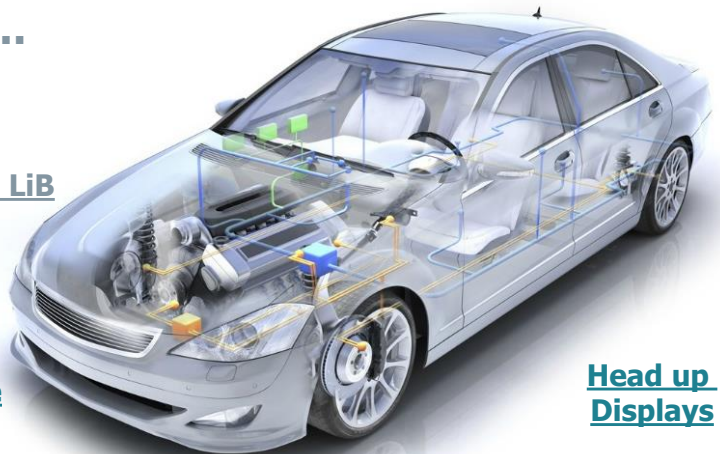
Pedestrian detection (IR)

AIXTRON
also in...

Driver condition monitoring (VCSEL)

OLED

CNT based LiB



Interior Lighting
LED

Exterior Lighting
LED

Head up
Displays

48V system

Charging
infrastructure

Lidar

Wireless charger

On board battery charger

DC/DC conversion

Headlights

Infotainment

Main inverter

AIXTRON Enables SiC Applications

AIXTRON Enables GaN Applications

- **Potential EV, BEV and PHEV**
~ 4m units in 2020e
 - Power Semiconductor content per car internal combustion engine: \$50
 - Power Semiconductor content per car electrical vehicle: \$350

- **Potential ADAS**
~ 25m units in 2019e
 - Semiconductor content partially automated: sub \$100 per car
 - Semiconductor content fully automated: \$580 per car

- **Customer profiles:**
 - Fragmented and global
 - IDMs, PDM, foundries and start ups
 - GaN MOCVD: 100+ players with epi capability
 - GaAs MOCVD: 60+ players with epi capability
 - CNT PECVD: shift toward commercial customers

Long Term: Compound Semiconductors in Smart Homes

AIXTRON also in... AIXTRON Enables GaAs Applications

Source: Gartner; Credit Suisse, Deutsche Bank, Stifel

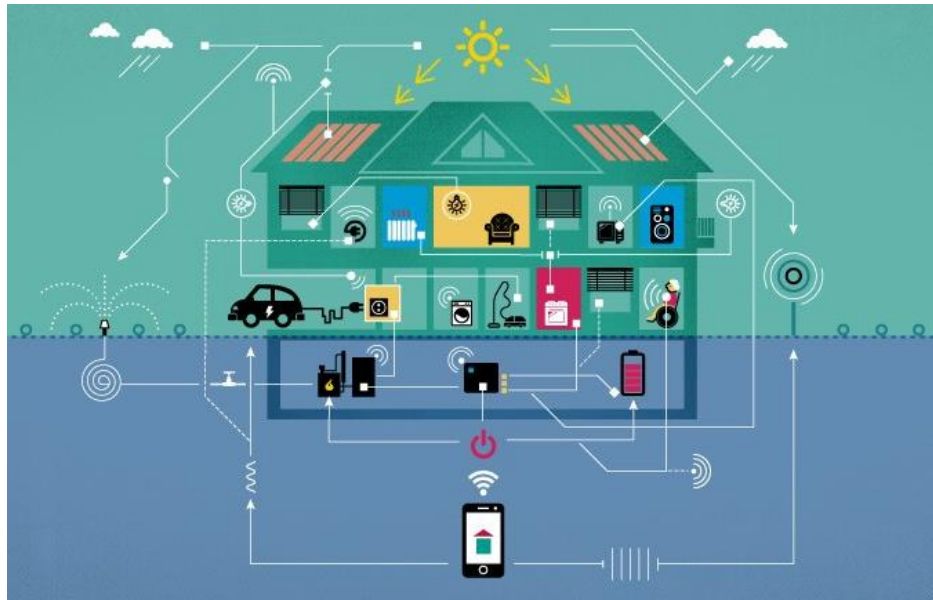
OLED

CNT based
LiB

Night vision IR

Terrestrial CPV

FTTH



3D gesture
sensors

Motion sensors

Environmental
sensors

Fast charger

5G Home Internet

Smart Lighting
LED

Wireless PAs

Charging
infrastructure

LiDAR
AR Gaming

Med-Tech
wearables

Main inverter

DC/DC conversion

Infotainment

Wireless charger

Smart homes: Self-sufficient, environmentally friendly and connected

- Smart sensing: motion, environmental sensors, microphones
- Processing: low power, high performance, microcontroller
- Connectivity: Sub-GHz, Bluetooth, WiFi
- Energy management: digital power, energy harvesting

Applications:

- appliances, home control, household robots, smart lighting, home multimedia, smart door locks, EV chargers, smart meters, improved security

AIXTRON Enables SiC Applications

AIXTRON Enables GaN Applications

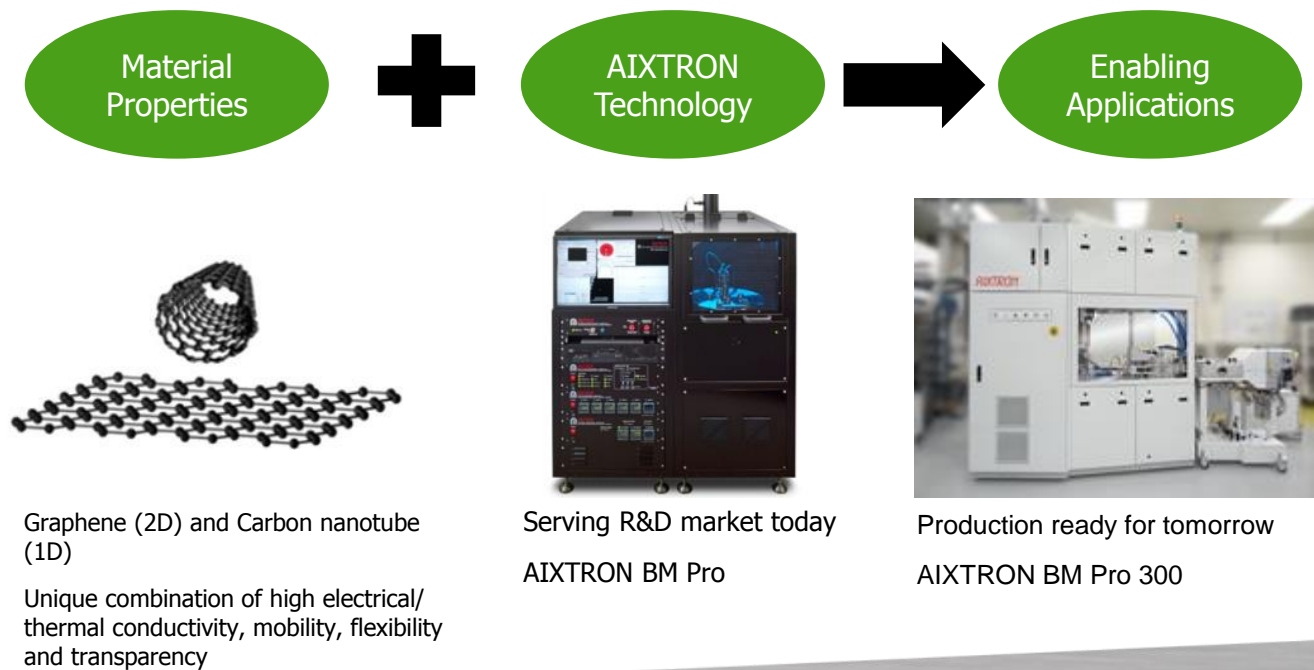
Carbon Nanomaterials – PECVD

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



Compound Semiconductors – Wide Band Gap (WBG) Power Electronics

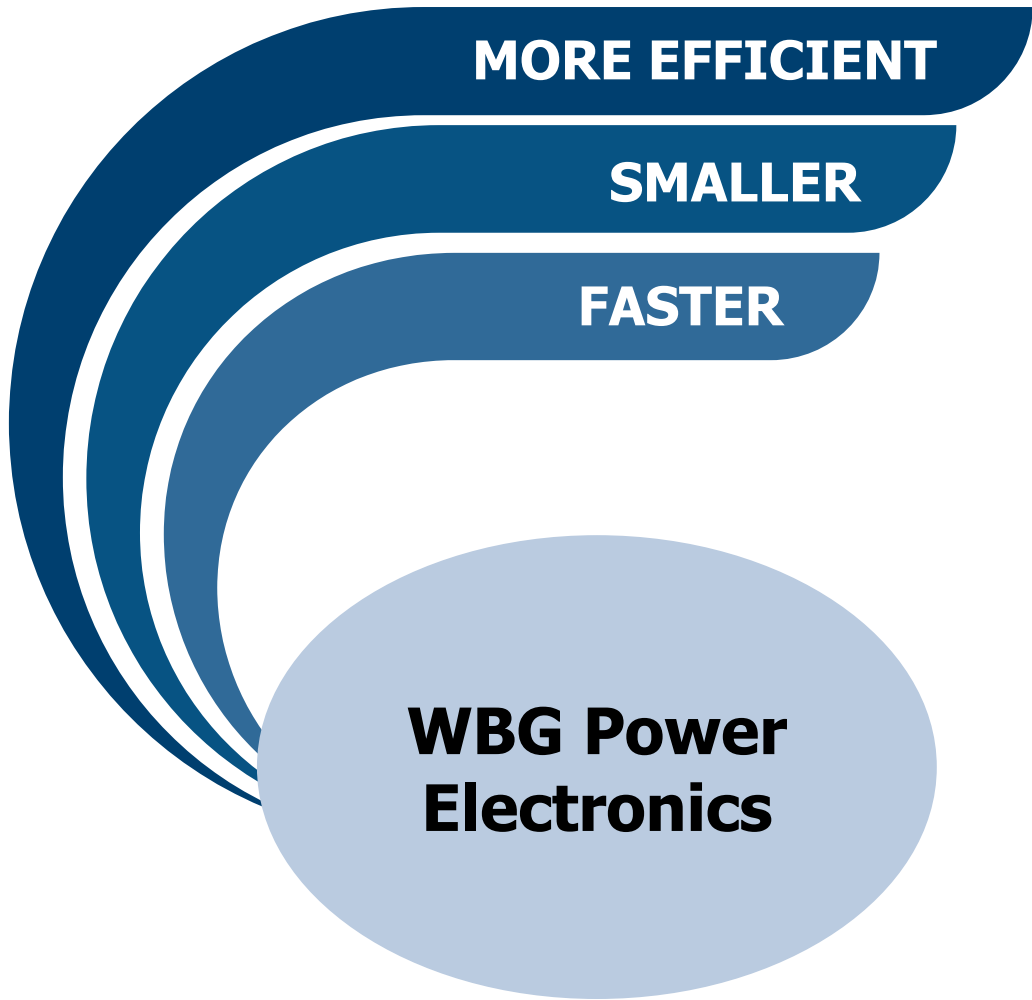
Consumer Electronics & IT		Automotive	Energy	Industrial
Power Management		Power Switching		
30V	600V	1.2 kV	≥2kV	
<ul style="list-style-type: none"> • Electronic appliances • Computing • Wireless charging • Power supplies • PFC 	<ul style="list-style-type: none"> • Infotainment • GPS • Connected car • 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

Compound Semiconductors – Wide Band Gap (WBG) Power Electronics

Source: Dell, DOE, Toyota



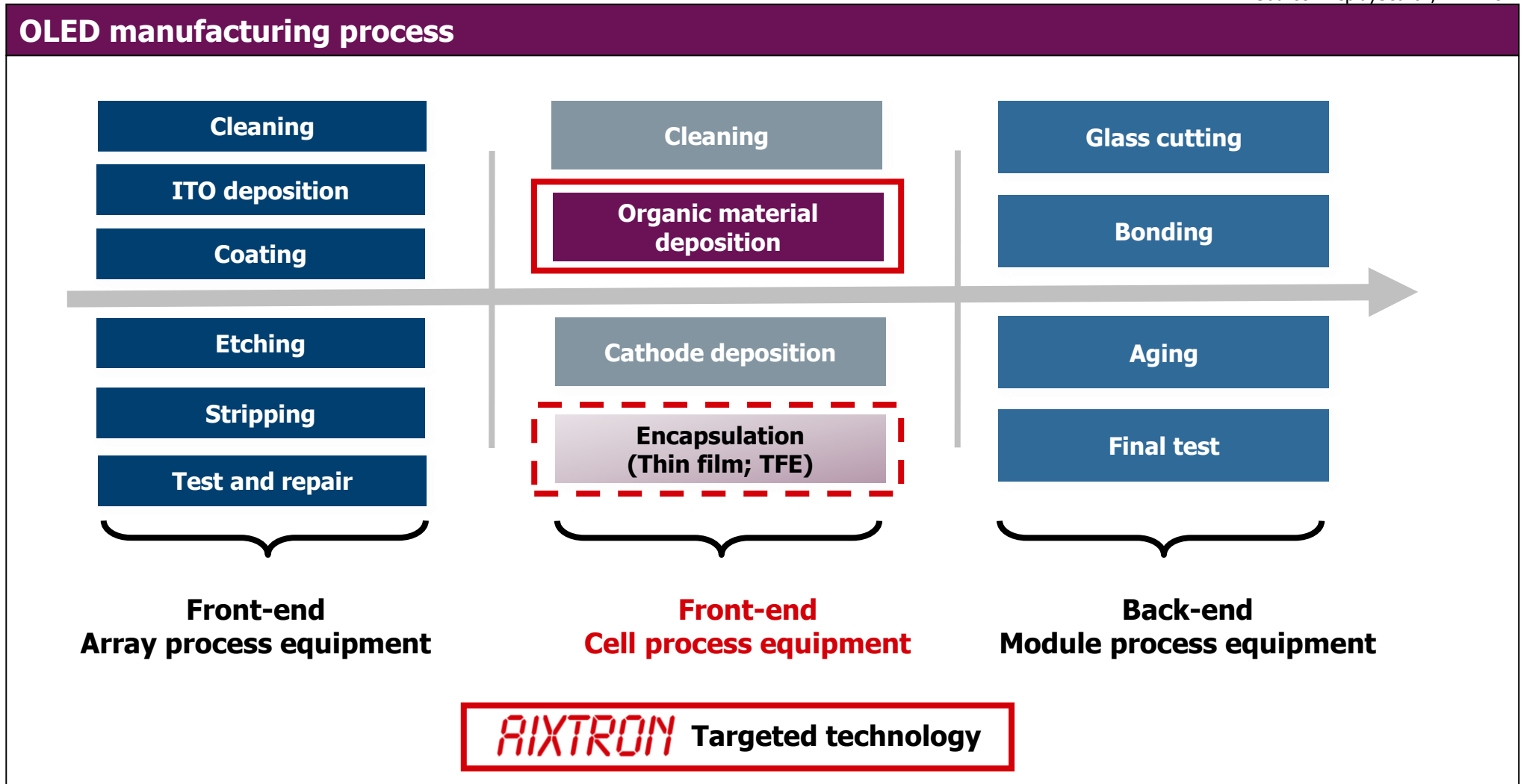
Example Applications in Pipeline





Organic Electronics – OVPD[®] – APEVA SE

Source: DisplaySearch, AIXTRON



Organic Electronics – OVPD[®] – APEVA SE

Product Description – OVPD

- Proprietary carrier-gas enhanced gas phase deposition approach for organic thin films
- Based on AIXTRON's core competence of carrier gas enhanced vapor phase deposition
- Free scalability: suitable for all relevant substrate generations
- Manufacturing technology applicable for OLED displays, OLED lighting, organic semiconductors, and organic photovoltaic
- Proprietary STExS[™] evaporation source technology: low thermal stress, high rates, continuous operation

"Disruptive deposition technology for cost efficient OLED manufacturing"

Product Features

- High deposition rates for high throughput
 - Reduced thermal stress for organic materials
-
- High material utilization efficiency
 - Flexible process control
-
- Simplified scaling due to
 - Close Coupled Showerhead and
 - Decoupled source technology
-
- Flexible integration solutions batch and inline
 - Reduced number of deposition chamber and footprint
 - Scalable: Available for substrate sizes up to Gen8.5 (=2.3 x 2.5 m²)



OVPD demonstrator OLAD (Organic Large Area Demonstrator)
(optimized for Generation 8.5 substrate sizes)

Silicon Semiconductors – ALD (Sales Transaction in Process)

Product Description – ALD

- 300mm ALD Technology
- QXP-8300 Mini-batch system
- High throughput : 2 Process Chambers – 8 Stations
- Up to 3 patented TriJet vaporizers and one bubbler
- Applications: DRAM, Logic and Flash High k Dielectric
- Metal electrode : ReRAM and PCRAM Active elements
- Proven in HVM with >40% lower CoO and >90% Uptime in DRAM and Flash Fabs

Product Features

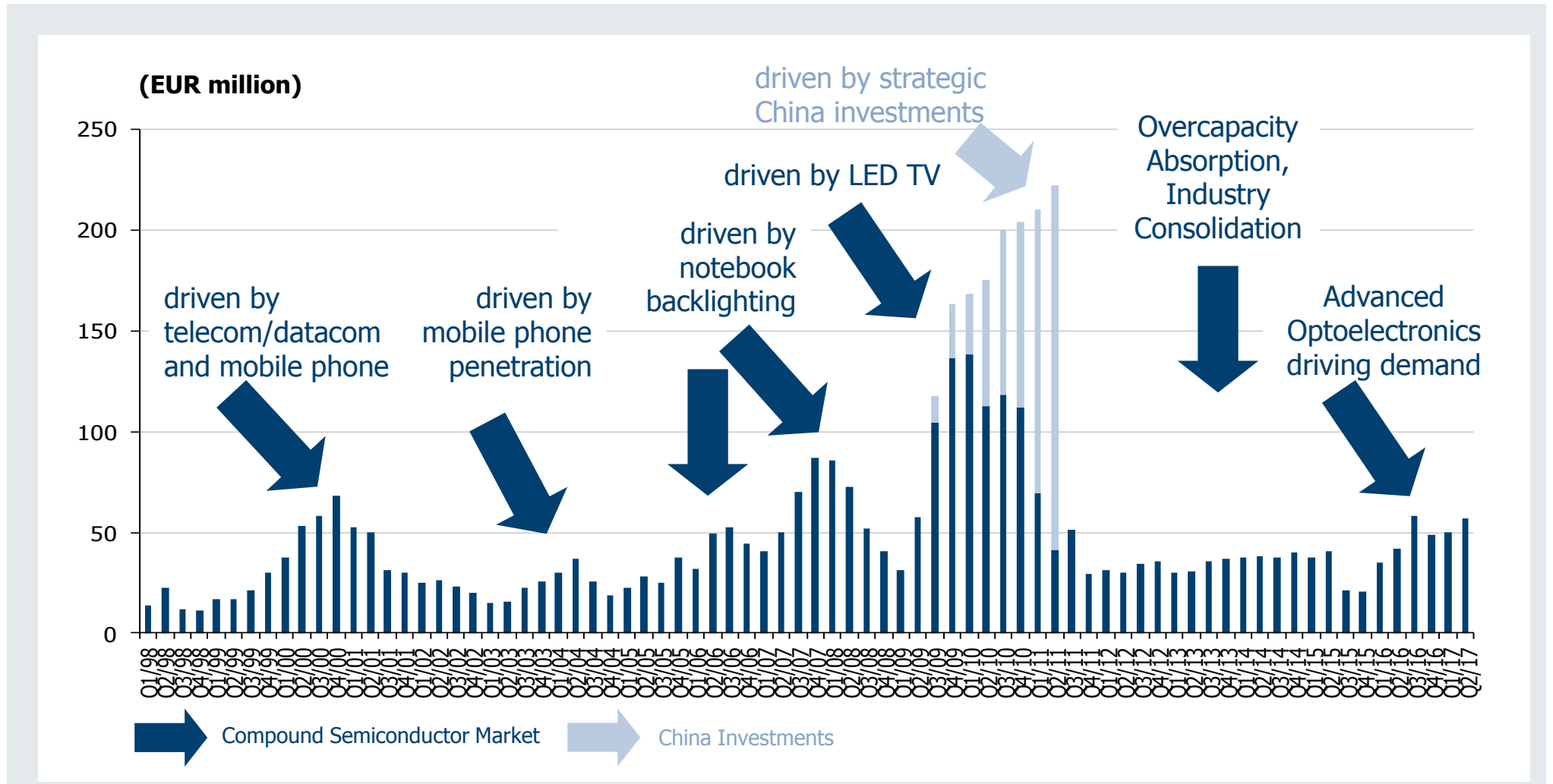
- Small volume confined process space ensure short ALD cycle time
- > 40 % less precursor consumption
- Efficient purge
- Isolated multi wafer processing with > 40% higher throughput
- Close Coupled Showerhead for uniform distribution
- Flexibility and ease of maintenance



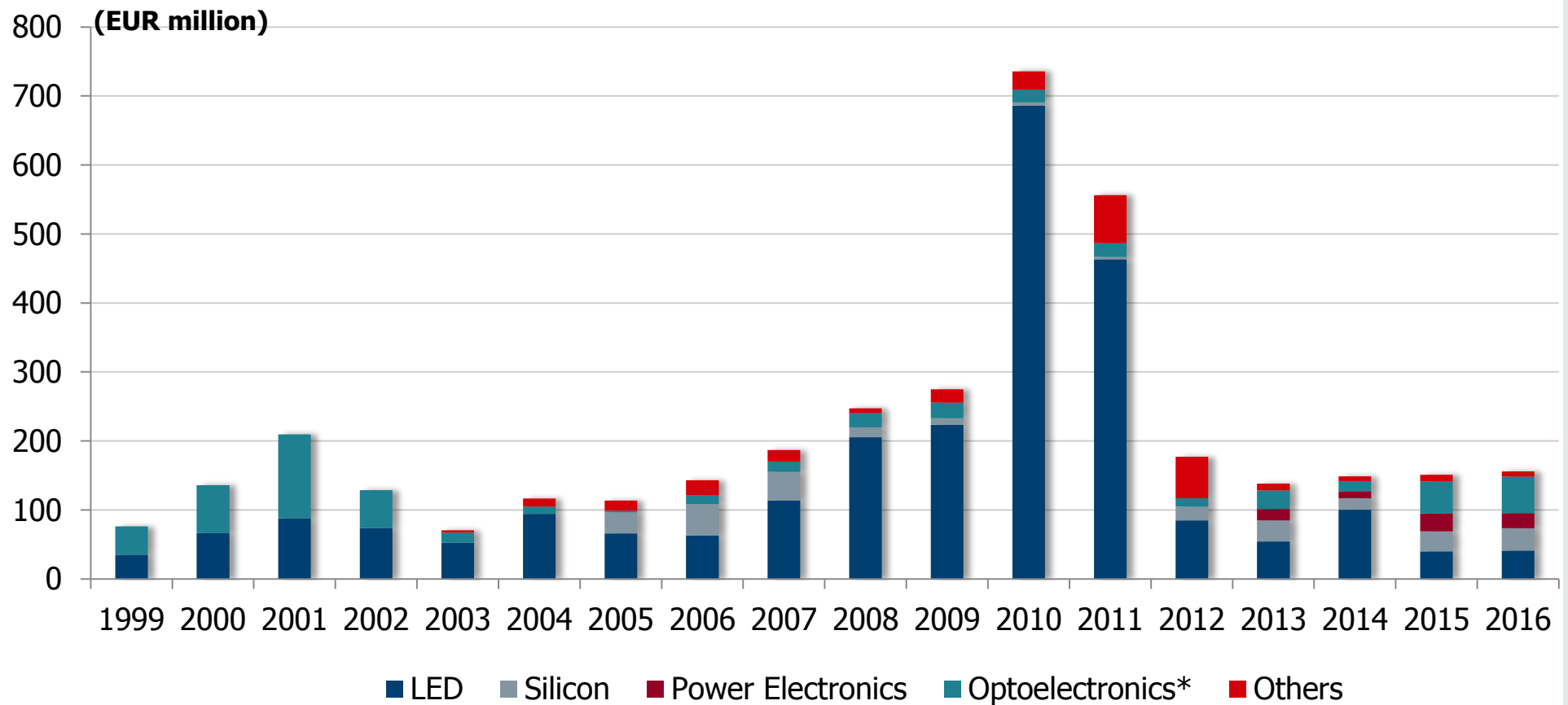
AIXTRON Competitive Landscape

		USA	Europe	China	Korea	Japan
Compound	GaAs/InP Optoelectronics, ROY LED					
	GaN LED			 		
	GaN Power					
	SiC Power					 TOKYO ELECTRON 
Silicon					 	 TOKYO ELECTRON 
Organics					   	 CANON TOKKI CORPORATION 

Equipment Order Intake per Quarter



Annual Equipment Revenues by Application (excl. spares)



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

Consolidated Income Statement*

* Rounded figures; may not add up

(€ million)	2016	2015	2014
Revenues	196.5	197.8	193.8
Cost of sales	140.2	147.9	154.1**
Gross profit	56.3	49.8	39.7**
Gross Margin	29%	25%	20%
Selling expenses	13.8	11.5	14.1**
General & admin expenses	17.1	16.3	19.3
R&D	53.9	55.4	66.7
Net other operating income & expenses	-7.2	-6.7	-2.2
EBITDA	-7.9	-16.4	-41.3
EBIT	-21.4	-26.7	-58.3
EBIT Margin	-11%	-14%	-30%
Result before tax	-21.0	-26.0	-57.1
Pre-Tax Margin	-11%	-13%	-29%
Net result	-24.0	-29.2	-62.5
Net Return on Sales	-12%	-15%	-32%

**) 2014 figures adjusted to be comparable

Balance Sheet*

* Rounded figures; may not add up

(€ million)	31/12/16	31/12/15	31/12/14
Property, plant & equipment	74.2	81.3	77.3
Goodwill	74.6	75.9	64.8
Other intangible assets	5.4	6.4	2.5
Others	2.4	3.9	4.6
Non-current assets	156.5	167.6	149.2
Inventories, WIP & Finished Goods	54.2	70.8	81.7
Trade receivables	60.2	26.0	26.3
Others	5.3	8.2	8.3
Cash & Cash Equivalents incl. CD	160.1	209.4	268.1
Current Assets	279.7	314.4	384.4
Shareholders' equity	369.7	396.5	415.7
Non-current liabilities	4.2	3.6	1.3
Trade payables	14.6	9.8	16.4
Advance payments from customers	26.1	24.0	66.9
Others	21.6	48.0	33.2
Current liabilities	62.3	81.8	116.5
Balance Sheet total	436.2	482.0	533.5

Consolidated Statement of Cash Flows*

* Rounded figures; may not add up

(€ million)	2016	2015	2014
Cash Flow from operating activities	-37.7	-45.7	-33.8
Cash Flow from investing activities	43.4	41.2	-23.2
Cash Flow from financing activities	0.3	-0.1	0.2
Exchange rate changes	-2.3	4.3	5.9
Net change in Cash & Cash Equivalents	3.7	-0.3	-50.9
Cash & Cash Equivalents (beginning of period)	116.3	116.6	167.5
Cash & Cash Equivalents (end of period)	120.0	116.3	116.6
Change in Cash deposits	-52.8	-60.5	9.9
Free Cash Flow**	-42.9	-57.3	-47.0
Capex	5.3	13.3	13.4

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

Global Presence



AIXTRON SE Headquarters
Herzogenrath, Germany

Core of AIXTRON's activities is the Technology and R&D Center near Aachen.

Focus on engineering and process development in MOCVD and organic semiconductors.



AIXTRON Ltd.
Cambridge, United Kingdom

Focus on key MOCVD reactor component technology, carbon-based nanotechnology systems, state of the art innovation and production of R&D tools.



AIXTRON Inc.
Sunnyvale, California, USA

Focus on silicon applications for leading suppliers of DRAM and CMOS.

Financial Calendar & Contact Data

- October 26, 2017 9M/2017 Results, Conference Call
- February 2018 FY/2017 Results, Conference Call
- April 2018 Q1/2018 Results, Conference Call
- May 2018 Annual General Meeting, Aachen

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Technology. Materials. Performance.

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