

Sensing is life

amul OSRAM

Update on strategy & Second quarter results 2023

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July 2023

Focus on profitability and on monetizing innovation, benefitting from structural growth and our strong position in our key markets

Strategy & business outlook reassessed by new management team

Key challenges of previous business model

- Strong focus on disruptive, custom technologies for high volume opportunities in the Consumer device arena is risky when it comes to industrialization, execution and market adoption
- ‘Home-made’ execution issues, partly due to unclear ownership in current matrix organization
- Uptake of new markets or adoption of new, disruptive technologies have not always happened as quickly as planned
- De-prioritization of some structural growth opportunities in sticky core markets such as Automotive, Industrial and Medical
- High sensitivity to macro-economic shocks such as pandemic and geopolitical crises

Adjusted business model

- Focus semiconductor portfolio on differentiated, intelligent sensors and emitter components
- Expand leading positions in relevant Automotive, Industrial, Medical markets with strengthened investments into structural growth opportunities
- Exit non-core semiconductor businesses with revenue run-rate of EUR 300 – 400 million
- Continue to pursue specific opportunities in Consumer markets where we sustainably differentiate
- Invest selectively in disruptive innovation such as microLED technology
- ‘Re-establish the Base’ program adjusting semiconductor portfolio, company over-head, infrastructure and organization to new adjusted business model
- Streamline organizational set-up within Semiconductor segment by going from 3 to 2 Business Units with full end-to-end ownership & responsibility
- Portfolio streamlining and efficiency measures target savings of EUR 150 million by end-of-2025 and improving Cash Flow of the Group

Laying the foundation for 6 – 10% revenue CAGR from new base and ~15% adj. EBIT by 2026

Benefitting from structural growth and our strong position in Automotive, Industrial, Medical markets

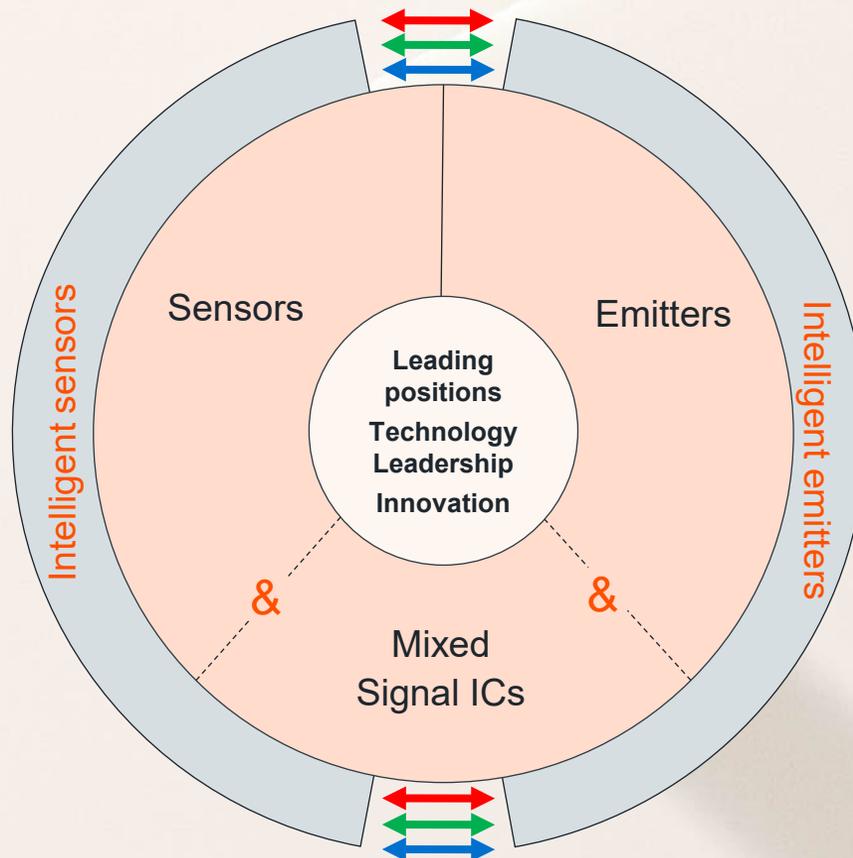
Growing from the core of sensor & emitter components by increasingly adding intelligence to drive system performance

Semiconductor Addressable Markets*

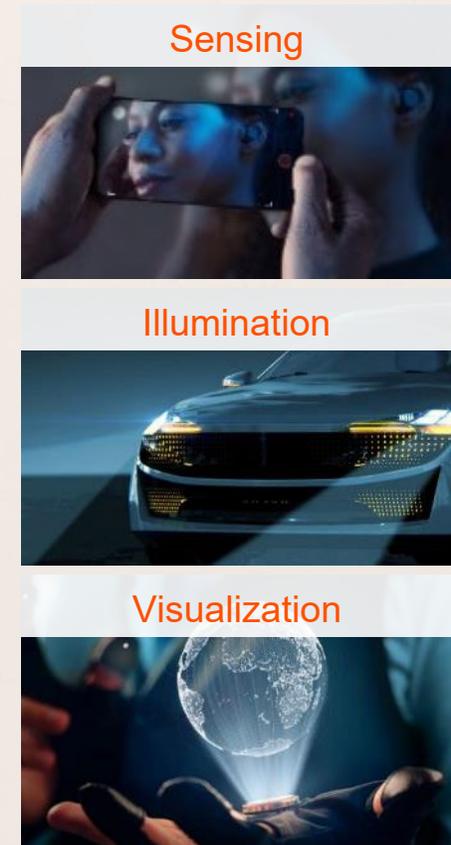
- application view -
2022 / CAGR**



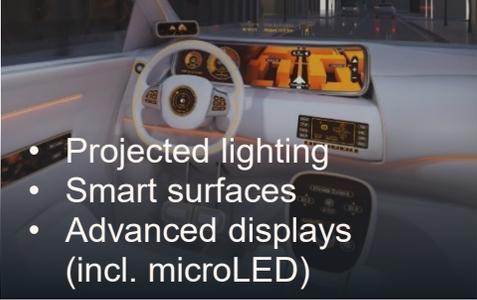
Core Semiconductor Portfolio



Functional Applications

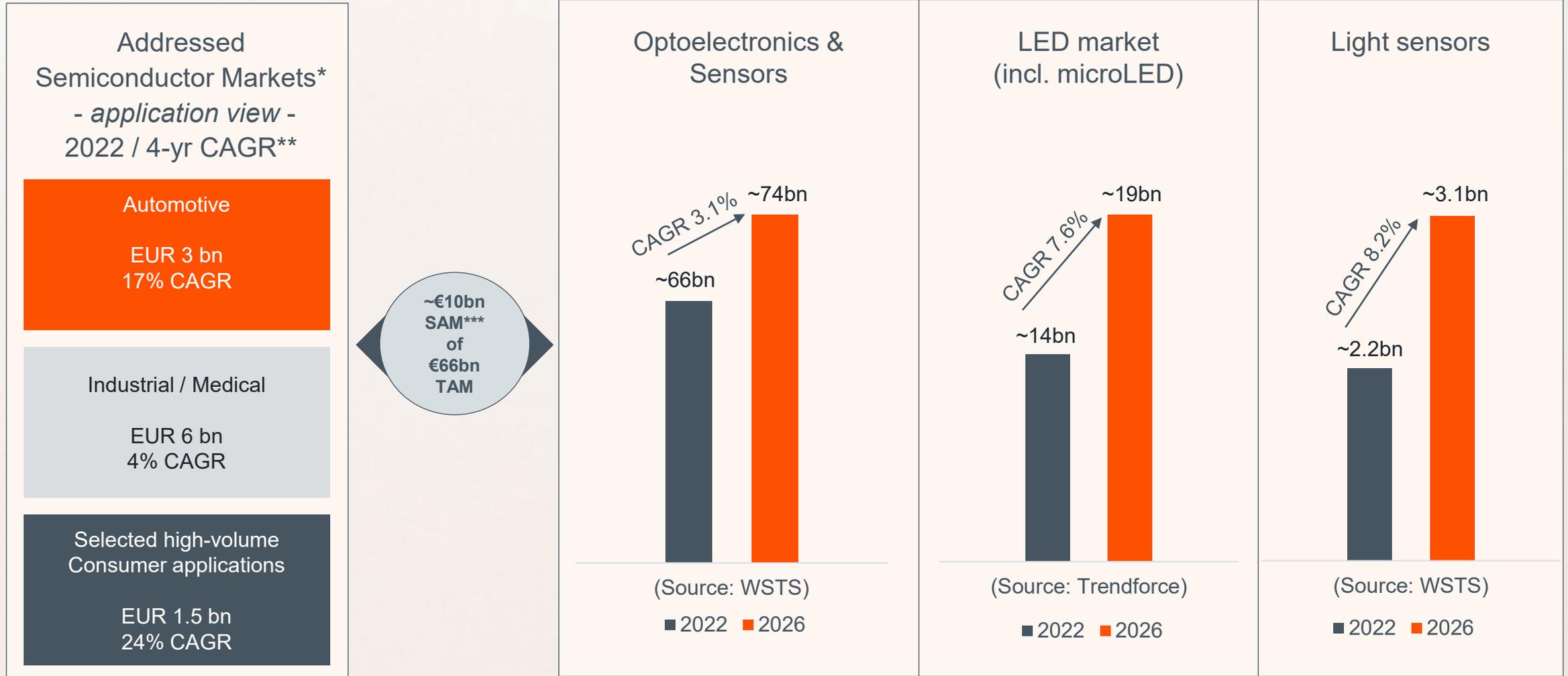


Growth in core portfolio is driven by secular megatrends

	Automotive	Industrial	Medical	Consumer
Digitalization	 <ul style="list-style-type: none">• Projected lighting• Smart surfaces• Advanced displays (incl. microLED)	 <ul style="list-style-type: none">• Industrial automation• Robotics	 <ul style="list-style-type: none">• Medical imaging	 <ul style="list-style-type: none">• Camera enhancement• Spectral & light sensing
Smart Living (IoT)	 <ul style="list-style-type: none">• Dynamic forward & signal lighting• In-cabin sensing• ADAS/AD (LIDAR)	 <ul style="list-style-type: none">• Home Automation• Building Automation• Outdoor lighting• Industrial lighting	 <ul style="list-style-type: none">• Personal & home care	 <ul style="list-style-type: none">• AR/VR glasses sensing & visualization• Vital signs monitoring
Energy efficiency & sustainability	 <ul style="list-style-type: none">• Ambient lighting, UV-C* disinfection	 <ul style="list-style-type: none">• Horticulture• LED + laser projection• UV-C* disinfection	 <ul style="list-style-type: none">• UV-C* disinfection	 <ul style="list-style-type: none">• Enhanced display management• Next generation displays (microLED)

Addressed application segments grow faster than the overall market

Semiconductor focus markets – product category view vs addressed application segment view



*ams OSRAM market model due to lack of suitable external market models

** 2022 – 2026 CAGR due to 2022 was last full year actuals, and cyclical dip in 2023

*** Serviceable Addressed Market => no dedicated, only partial market reports for ams OSRAM addressed application segments available

ams OSRAM holds leading positions in its core Semiconductor & Lamps markets

Leverage strong positions with focused core portfolio and commitment to Automotive, Industrial, Medical markets

#2 in LED

LED Suppliers by 2022 market share
(Total market USD ~12bn; TrendForce)

1.	Nichia	15%
2.	ams OSRAM	13%
3.	Seoul Semiconductors	7%
4.	Samsung LED	7%
5.	Lumileds	6%



#2 in Light Sensors

Light Sensor Suppliers by 2021 market share
(Total market USD ~1.3bn; OMDIA)

1.	STMicroelectronics	30%
2.	ams OSRAM	25%
3.	Maxim	8%
4.	Sensortek (Sitronix)	8%
5.	Lite-On	4%



#1 in traditional Auto lamps/bulbs

Bulb Suppliers by 2022 market shares
(Total market USD ~1.5bn; own market model due to lack of external research)

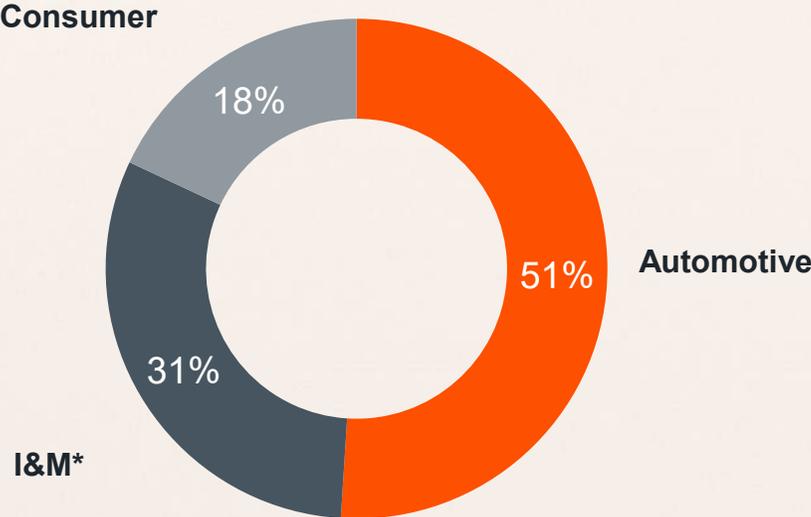
- 1. ams OSRAM
- 2. Lumileds
- 3. Others (incl. Asian suppliers)



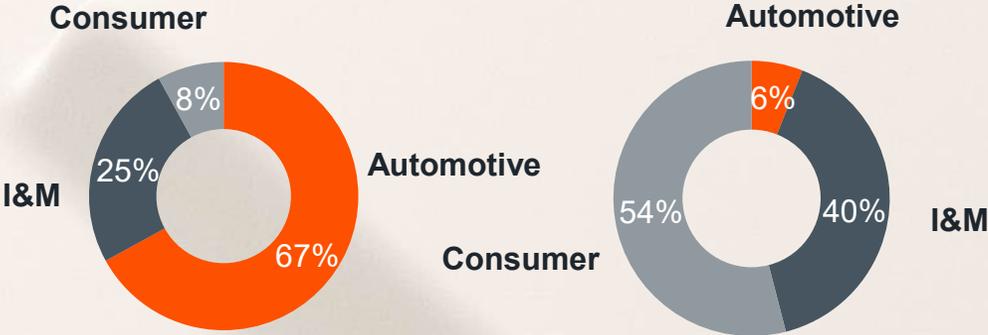
Automotive & Industrial/Medical contribute already today ~80% of revenues

Revenue split H1 2023 for group and by segments

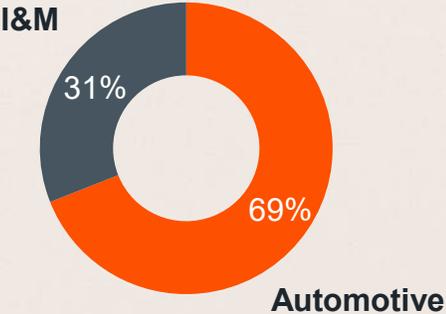
ams OSRAM Group



Semiconductors



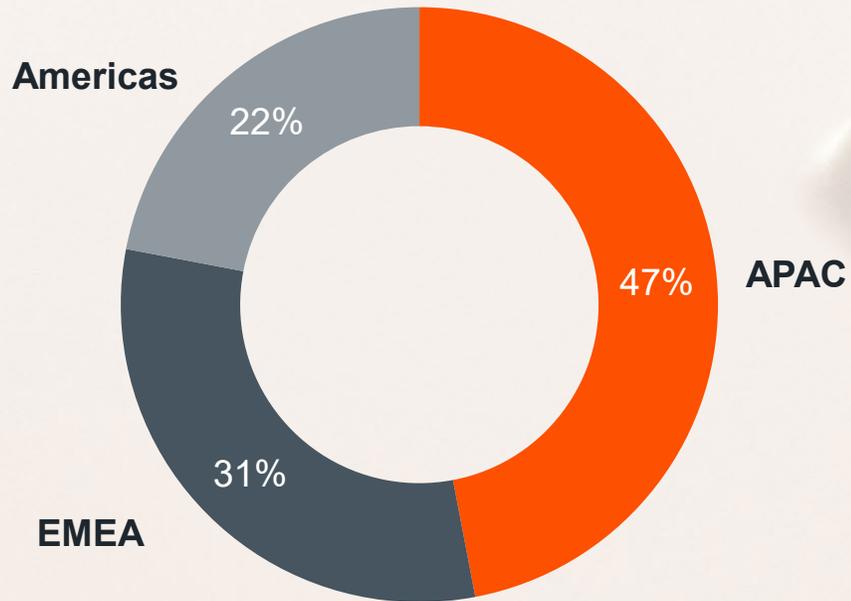
Lamps & Systems



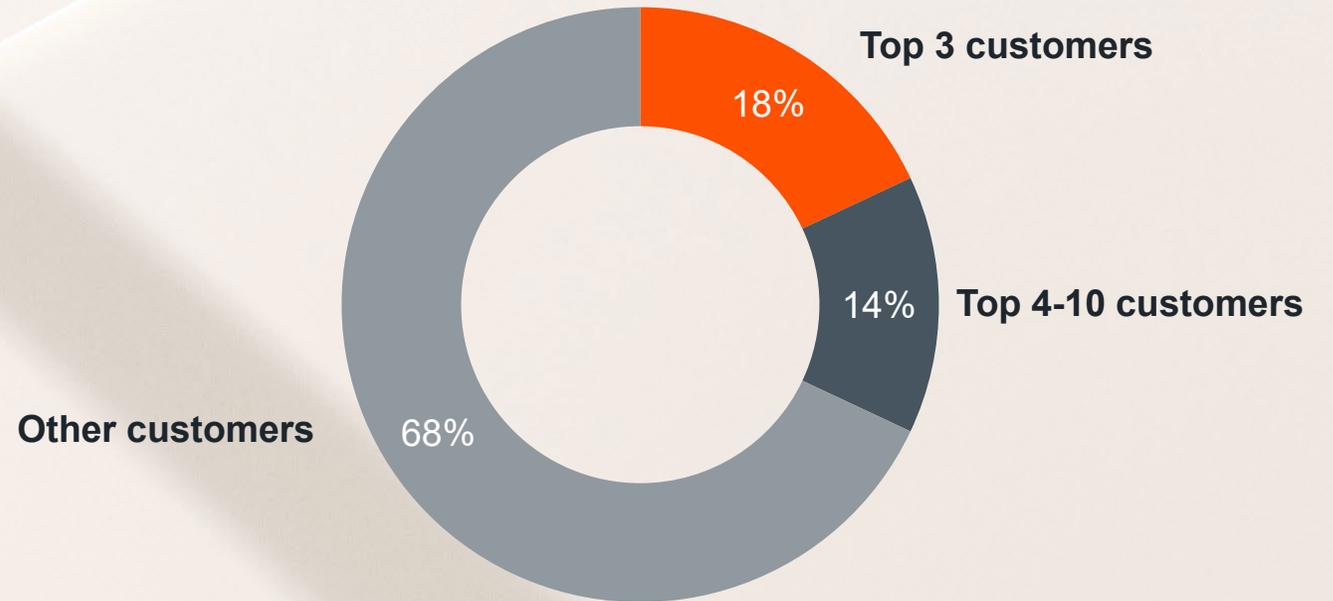
Benefitting from balanced regional set-up and healthy customer split

Strong regional presence and very balanced customer portfolio

Revenues by region (H1 2023)

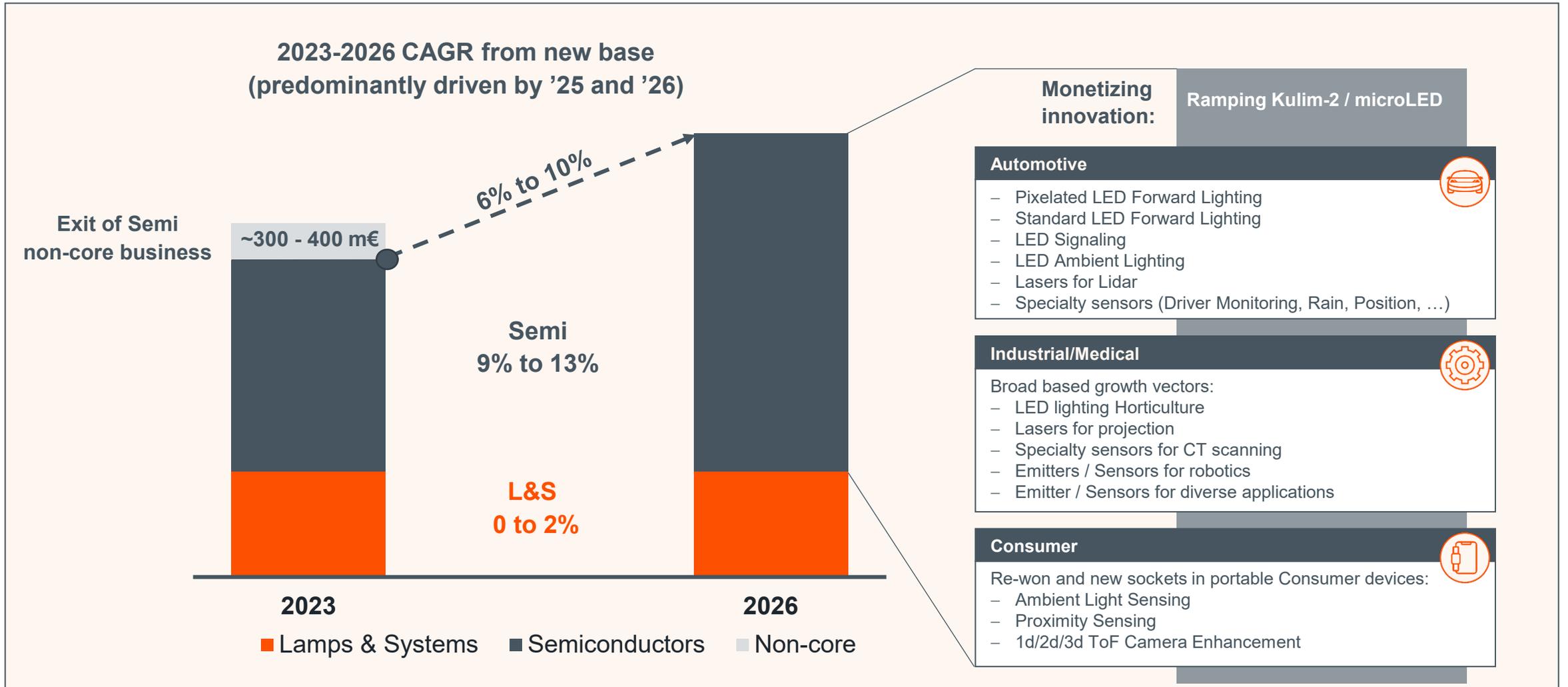


Top customers split (H1 2023)



Semiconductors core portfolio in Automotive, Industrial, Medical drives significant future growth

Strong design win base enables meaningful growth from new core portfolio in Semiconductors



Re-establish the Base program

Focusing on our core as the new base for sustainable, profitable growth



Portfolio

Exit non-core semiconductor portfolio of ~300 to 400 m€ run-rate



Set-up & Infrastructure

Adjusting the organization and the infrastructure to the new base



Monetizing Innovation

Streamlining the organization for stronger accountability with end-to-end responsibility

Objectives:

1. Focus the portfolio on the core with the highest profitability and the best growth perspective
2. Center mindset and accountability on “monetizing innovation” and overall profitability
3. Make the company lean and efficient by having the appropriate size, infrastructure and agility
4. Bottom-line improvements from portfolio-measures and savings (75m€ run-rate by end-2024, 150m€ run-rate by end-2025) for improved profitability in 2024 and ~15% adj. EBIT by 2026 onwards

First L&S, now Semiconductors: Focused portfolio for improved profitability

Development of L&S segment revenues and EBIT margin (adj.) since 2021, figures in EUR million

- ✓ Proven track record of successful portfolio re-alignment with focus on sustainable and profitable businesses
- ✓ Reduction of revenue base while markedly increasing profitability
- ✓ Focus on attractive core business areas, similar approach now applied to Semiconductors segment



Re-assessment of portfolio and market outlook leads to an updated mid-term target financial model

Focus on profitability and structural growth from the new core portfolio in Semiconductors

Over-the-cycle mid-term target financial model

 Revenue growth CAGR	6% - 10%*
 Adjusted EBIT	~15% (2026+)
 CAPEX	10%

*>2x WSTS opto-electronics F99 & sensors H99 = 3.1% CAGR '22 to '26 due to addressed segments

Long-term target leverage

 Long-term leverage	Net Debt / (adj.) EBITDA < 2
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Assumptions:

- Starting base is CY 2023 revenues, less EUR ~300m to 400m of non-core semiconductor portfolio to be exited
- Target Financial Model is valid for new Semiconductor Segment + Lamps & Systems Segment combined

No clear upswing signal for next 12 month, long-term growth drivers remain sound

Macro headwinds expected to prevail throughout next 12 months – afterwards, back to growth track towards 2026

	next 12 months		3 years outlook	
Macro sentiment	<ul style="list-style-type: none"> – June Eurozone and US PMIs weaken further into contraction territory. China weaker but still above 50. – GDP consensus expectations 2023/24 have stabilized at Eurozone 0.6% / 1.0%, US 1.3% / 0.7% and China 5.5% / 4.8%. – 2023 and 2024 semiconductor forecast w/o memory reduced to -3% yoy and +5.7% y-o-y. 		<ul style="list-style-type: none"> – GDP consensus forecast 2025 shows moderately improving growth in Eurozone (1.6%) and US (1.9%). – China growth expected slightly lower (4.7%). 	
Automotive sentiment	<ul style="list-style-type: none"> – Light vehicle production in H2/2023 benefits from inventory restocking and still existing pent-up demand after improved supply chain conditions; +5.3% y-o-y in 2023. – H1/2024 reflects lowered demand due to expected macroeconomic headwinds; +1.4% y-o-y in 2024. 	 	<ul style="list-style-type: none"> – Light vehicle production expected to grow +2.9% y-o-y in 2025 to 90.5m and +2.0% y-o-y in 2026 to 92.3m units. – Significant growth in EVs (CAGR 30% over next 3 years; S&P Global Mobility) that usually also have come with additional emitter & sensor enabled innovations 	
Consumer sentiment	<ul style="list-style-type: none"> – Global smartphone forecast 2023/24 reduced to 1.144m / 1.170m units implying -5.2% / +2.3% growth. – Despite an expected rebound in 4Q23, global smartphone shipments in 2023 lower than 2022. – Wearable forecast 2023/24 reduced to 504 / 545m units implying +2.4% / +8.2% growth y-o-y. 		<ul style="list-style-type: none"> – Global smartphone forecast 2025 shows growth increasing to 4.7% y-o-y to 1.224m units. – Wearable forecast shows 6.3% y-o-y growth in 2025 to 580m units. – MicroLED display shipments to increase to 51.7m units in 2030 (1.3% of FPD shipments) 	
Industry and Medical sentiment	<ul style="list-style-type: none"> – China's Industrial Laser Market shows recovery, China high-tech manufacturing industries grew 7.4% y-o-y. – German Robotic & Automation sector to grow +13% y-o-y in 2023. – Global LED Lighting shipment forecast for 2023 reduced to +3.6% y-o-y. 		<ul style="list-style-type: none"> – Steady growth of 5-7% p.a. for global industrial robot market until 2027 – Horticulture: growing importance of hyper-red lighting for additional yields of almost one-fifth in tomatoes – China UV disinfection market expected to reach a market size of US \$2.8 bn by 2030 (CAGR 16.2%) 	

Sources: WSTS Semiconductor Market Forecast Spring 2023
IHS Light Vehicle Production Forecast July 2023
OMDIA Micro LED Display Market Tracker 2Q23
OMDIA Smartphone Model Market Tracker 1Q23

IDC Quarterly Wearable Device Tracker Forecast 1Q23
TrendForce 2023 Global LED Lighting Market Analysis 1H23
VDMA Robotics Automation Market Update
S&P Global, Bloomberg, Hortidaily.com

In Summary: sharpening the profile & the set up for maximum result

Focus on profitability and monetizing innovation, benefitting from structural growth in Automotive, Industrial, Medical

-  New management with holistic value creation mindset and proven track record
-  Focusing the Semiconductor portfolio on its profitable core in differentiated, intelligent sensor and emitter components
-  Strong commitment to structural growth opportunities in AIM backed by secular mega-trends
-  Continue selected investments into high-volume Consumer opportunities where ams OSRAM can provide sustainable differentiation with cutting-edge technology
-  Exit non-core business with revenue run-rate of EUR 300 – 400m, e.g. passive Optical Components
-  Impairment charge of EUR 1,313m due to market re-assessment
-  Automotive & specialty lamps (Lamps & Systems Segment) will continue to contribute meaningfully to Group results
-  “Re-establish the Base” efficiency program & portfolio focus target together EUR 150m savings by end of 2025
-  Centering our organizational set-up on “Monetizing Innovation” with clear end-to-end ownership
-  Pursuing selected, disruptive innovation such as microLED

Mid-term Target Financial Model: 6 – 10% revenue CAGR from new base, ~15% adj. EBIT 2026+

Overview of Q2 - Financials

Figures in EUR million (for details refer to “Financial results in detail Q2 2023 and H1 2023”)

EUR millions (except per share data)	Q2 2023	Q1 2023	QoQ	Q2 2022	YoY
Revenues	851	927	-8%	1,183	-28%
Gross margin adj. ¹⁾	27.8%	29.3%	-150 bps	31.6%	-380 bps
Results from operations (EBIT) adj. ¹⁾	50	50	0%	104	-52%
EBIT margin adj. ¹⁾	5.9%	5.4%	+50 bps	8.8%	-290 bps
Net result adj. ¹⁾	31	6	464%	-54	N/A
Diluted EPS adj. ¹⁾	0.12	0.02		-0.21	
Diluted EPS adj. (in CHF) ¹⁾²⁾	0.12	0.02		-0.21	
Operating Cash Flow	232	162	43%	100	133%
Net debt	2,034	1,940	5%	1,727	18%

¹⁾ Excluding M&A-related, transformation and share-based compensation costs, results from investments in associates and sale of businesses

15 ²⁾ Earnings per share in CHF were converted using the average currency exchange rate for the respective periods

Short term outlook and FY 2024 comments

Q3 2023 guidance

Revenues*: EUR 840 - 940 million

(adj.) EBIT margin: 5 – 8%

*EUR ~120m YOY deconsolidation effects vs. Q3 2022

Q4 2023 comments

Semiconductors:

- High uncertainty in end-markets persisting
- Especially Industrial and Consumer end-markets are challenged
- Automotive revenues should continue to stabilize with normalizing supply chain and new products ramping

Lamps & Systems:

- Robust revenues expected due to seasonally strong Automotive aftermarket

FY 2024 comments

- Absolute Group revenues expected to decline compared to 2023 due to portfolio decisions
- Semiconductor core business expected to outgrow target markets - assuming end-markets stabilize
- Group targets slightly positive Free Cash Flow assuming end-markets stabilize. Significantly reduced CAPEX compared to 2023.
- Focus on improving profitability

Expected and based on current information and exchange rates

16 Adjusted figures exclude M&A-related, transformation and share-based compensation costs as well as results from investments in associates and sale of businesses

Semiconductors: Automotive Growth Drivers

Offering full technology range and innovation leadership in automotive emitters and light sensors

Leading Positions in Automotive Semiconductor Sub-Segments

#1 in Automotive Emitters

Auto LED suppliers by 2022 market share
(Total market USD ~3.2bn; TrendForce)

1.	ams OSRAM	35%
2.	Nichia	25%
3.	Lumileds	9%
4.	Dominant	7%
5.	Seoul Semiconductor	6%
6.	Samsung LED	6%
7.	Stanley	5%
8.	Everlight	2%
9.	Cree LED	1%
10.	Jufei	1%



#1 in Automotive Light Sensors

Auto Light Sensor suppliers by 2021 market share
(Total market USD ~68m; OMDIA)

1.	ams OSRAM	34%
2.	Elmos	18%
3.	Vishay	15%
4.	Melexis	6%
5.	Hamamatsu	4%
6.	Rohm	1%



#16 in Automotive Semiconductors

Automotive semiconductor suppliers by 2022 market share
(Total market USD ~64bn; OMDIA)

1.	NXP	11%
2.	Infineon	11%
3.	STMicro	8%
...
15.	Toshiba	1.5%
16.	ams OSRAM	1.5%
17.	Melexis	1.2%
18.	Sanken	1.1%
19.	Fuji Electric	1.0%
20.	Nichia	0.9%



ams OSRAM can build on a strong track record as trusted innovation partner

ams OSRAM's long history of driving innovation in the Automotive semiconductor world



Rain sensor

1991



1st full color head up display for BMW

2003



1st daytime running LED light with Audi

2007



Ice-blue backlighting color theme with Ford



1st full LED front lighting

2009



capacitive sensor for Airbag - Child Seat Suppression System

2012



1st standard scalable LED forward lighting with BMW, VW

2014



Eviyos 1.0 with microstructured LEDs



LED matrix headlights

2017+



1st VCSEL for Driver Monitoring

2021

1980

1st radial LED in VW



1997

1st LED brand color program with VW



2005

1st ambient light sensor reproducing human eye behavior



2008

1st headlamp products with GM



2010

1st IR laser for emergency braking for Volvo



1st RGB ambient



2013

1st ADB



2017

Tailgate sensor (capacitive) for 1st touchless trunk opener



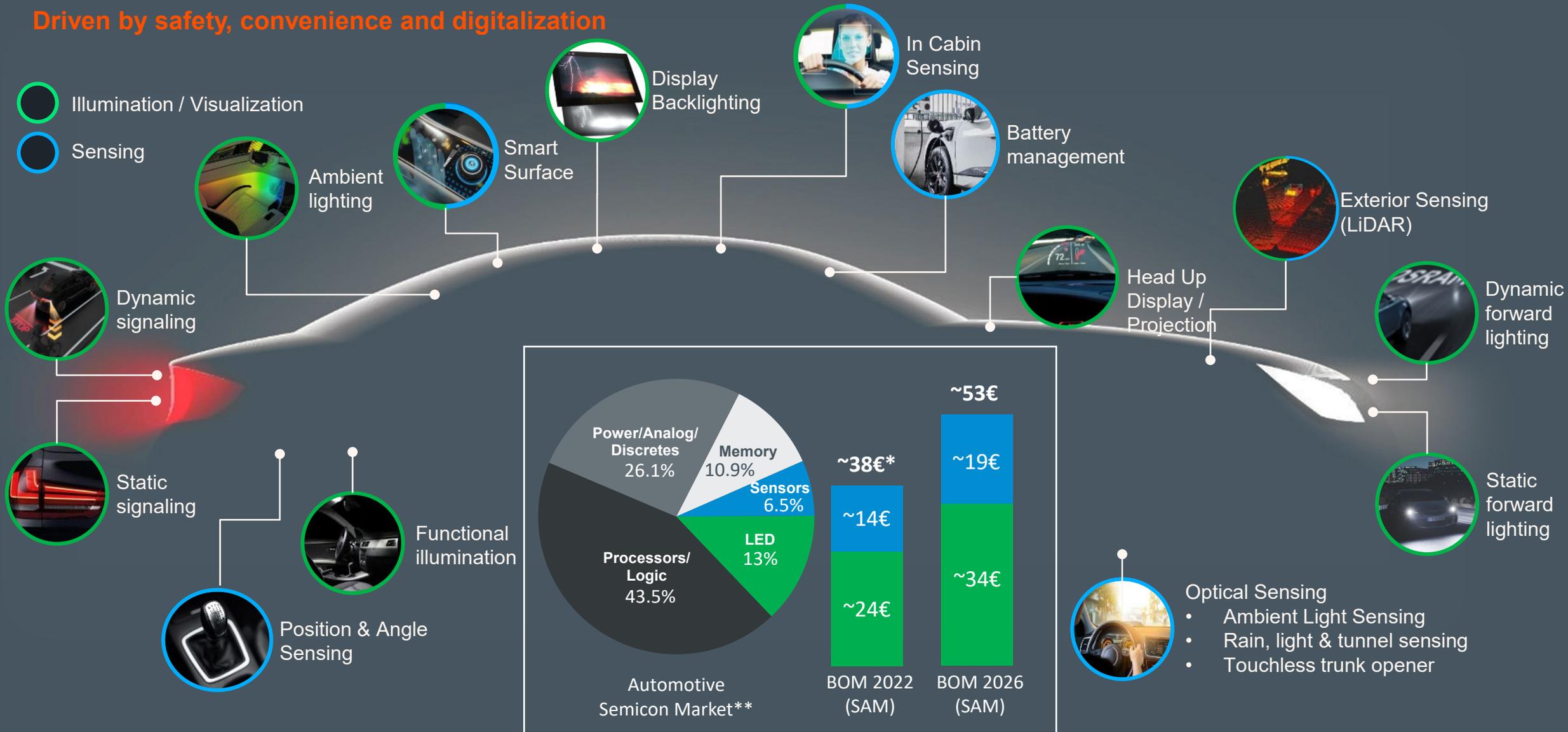
2020

1st 12V battery with high precision current aO sensor



ams OSRAM Automotive and Mobility

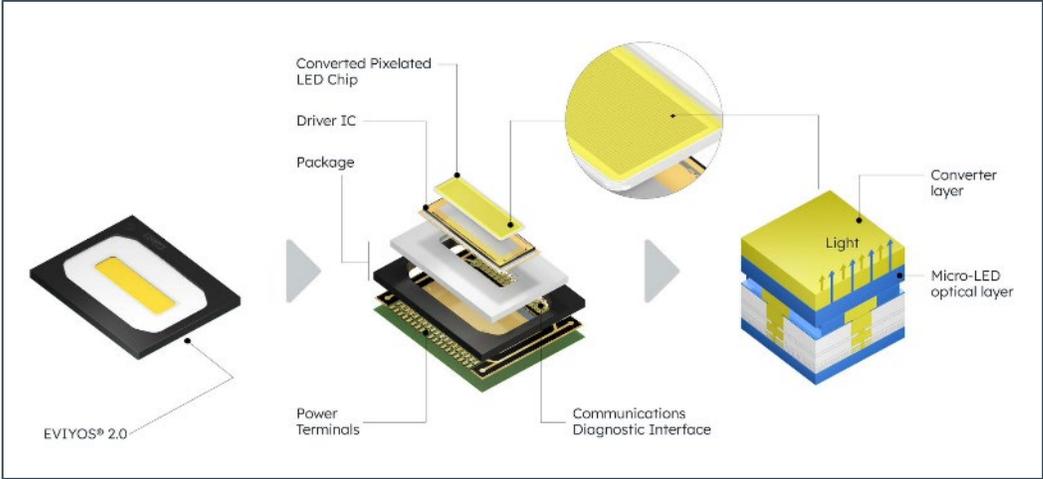
Driven by safety, convenience and digitalization



Safe Mobility – High Pixelated Forward Lighting (Eviyos)

Increasing ams OSRAM semiconductor BoM per car with a strong design-win base

Example applications



2023	2024	2025+
1 OEM	7 OEMs	> 12 OEMs



>150 m€
Design-wins to date
(lifetime value)

Safe & Autonomous Mobility – InCabin Sensing

Increasing ams OSRAM semiconductor BoM per car with a strong design-win base driven by regulation & comfort



Driver safety & assistance

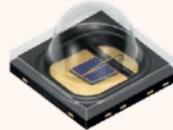
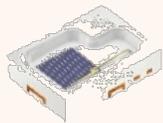


Cabin & Occupant safety

On-going business relationships with all global OEMs and Tier-1

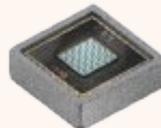
Product portfolio

Infrared LEDs



IR LEDs are preferred by most OEMs due to better cost efficiency for high-volume 2D Driver Monitoring applications

Infrared VCSELs



Mid-term, VCSEL growth will be accelerated by use cases related to autonomous driving that require 3D capability

both technologies in-house

>250 m€

Design-wins to date (lifetime value)

Semiconductors: Medical / Industrial Growth Drivers

ams OSRAM has been a trusted partner for decades in Industrial / Medical

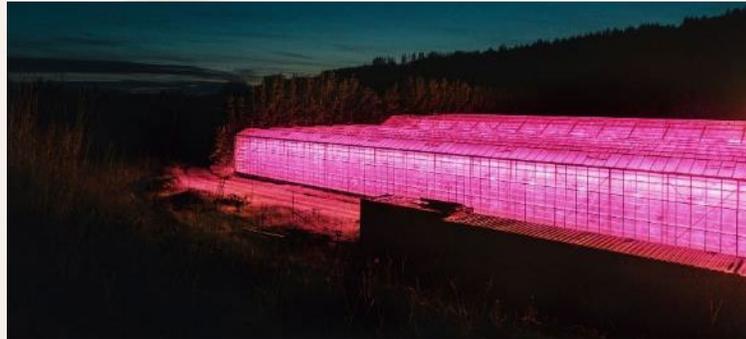
Leading by system defining component performance, innovation & IP portfolio and deep customer relationships

Value proposition for our customers

- System defining component performance: Differentiating LED and laser technologies with leading performance - know-how across the entire value chain
- Innovation leadership & broad IP portfolio - recognition of strong technology know-how by our customers
- In all focus applications, we have deep relationships with the leading customers and innovation drivers across all regions



- Broad portfolio of high-performance light and other optical sensors as discrete components elements or integrated module



- Best in Class LED emitters reinforcing market leadership and unrivaled performance, e.g. in horticulture lighting with hyper red innovation



- Supply security: European-based specialty analog mixed-signal CMOS fab (Austria)
- Worldwide regional presence and technical support

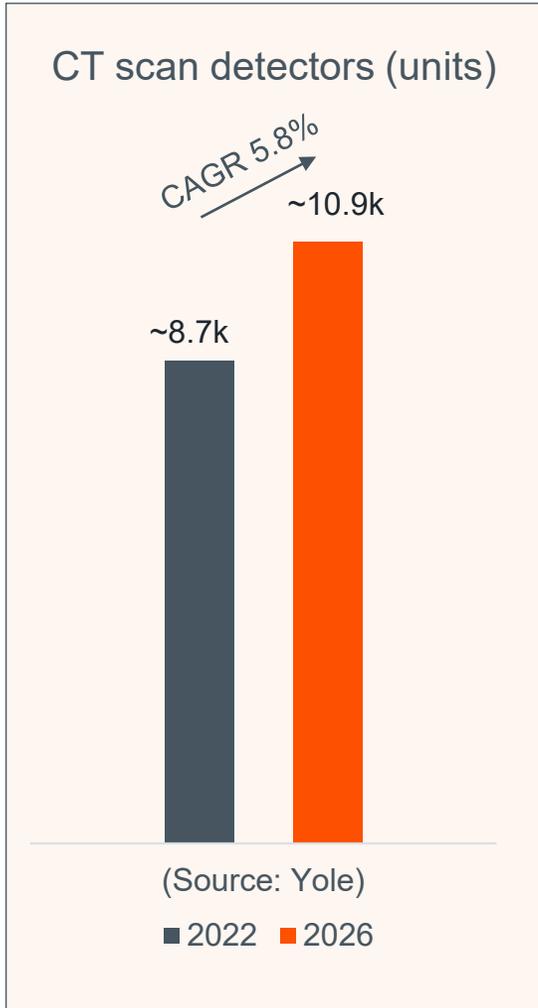
Addressing Industrial / Medical applications with key to system performance

Leveraging differentiated technology base into multi niches where we are key for the system performance

Selected applications	Structural growth drivers	Typical ams OSRAM BoM potential
 Medical Imaging & Diagnostics	<ul style="list-style-type: none"> – Aging population – Lower radiation dosage – Higher specificity 	<p>~ 25 – several ten k € (from image sensor to module for high end CT scanner)</p>
 Horticulture & Smart Farming	<ul style="list-style-type: none"> – HPS lamp replacement – Focus on near-shoring and freshness – Yield improvement through optimized illumination – Project business: subject to energy & financing cost 	<p>~100 – 200 € per luminaire*</p>
 Robotics	<ul style="list-style-type: none"> – Automation, productivity – Contextual Awareness 	<p>~20+ €</p>
 LED & laser projection	<ul style="list-style-type: none"> – Home entertainment, lifestyle – Replacement of traditional lamps – Trickle-down from premium to mid-range 	<p>~5 – 190 € (from simple LED projector to high power material processing)</p>
 Outdoor / Industrial lighting	<ul style="list-style-type: none"> – Aging and growing population – Urbanization – HID replacement 	<p>~5 – 50 € per luminaire* (from small LED street luminaire to high power stadium light)</p>
 UV-C disinfection	<ul style="list-style-type: none"> – Growth opportunity >2026 – Regulation & Hg Lamp replacement once LEDs reach >15% WPE 	<p>~20 – 2.500 € (from consumer device to industry scale water reactor disinfection)</p>

Example of leading position in niche – Medical Imaging CT scan sensors/ICs

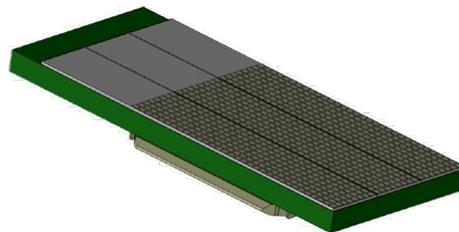
8 out of 10 OEMs employ ams OSRAM products – solid revenue growth 2x market growth projected



Top 10 CT Players ams OSRAM Customer Engagement

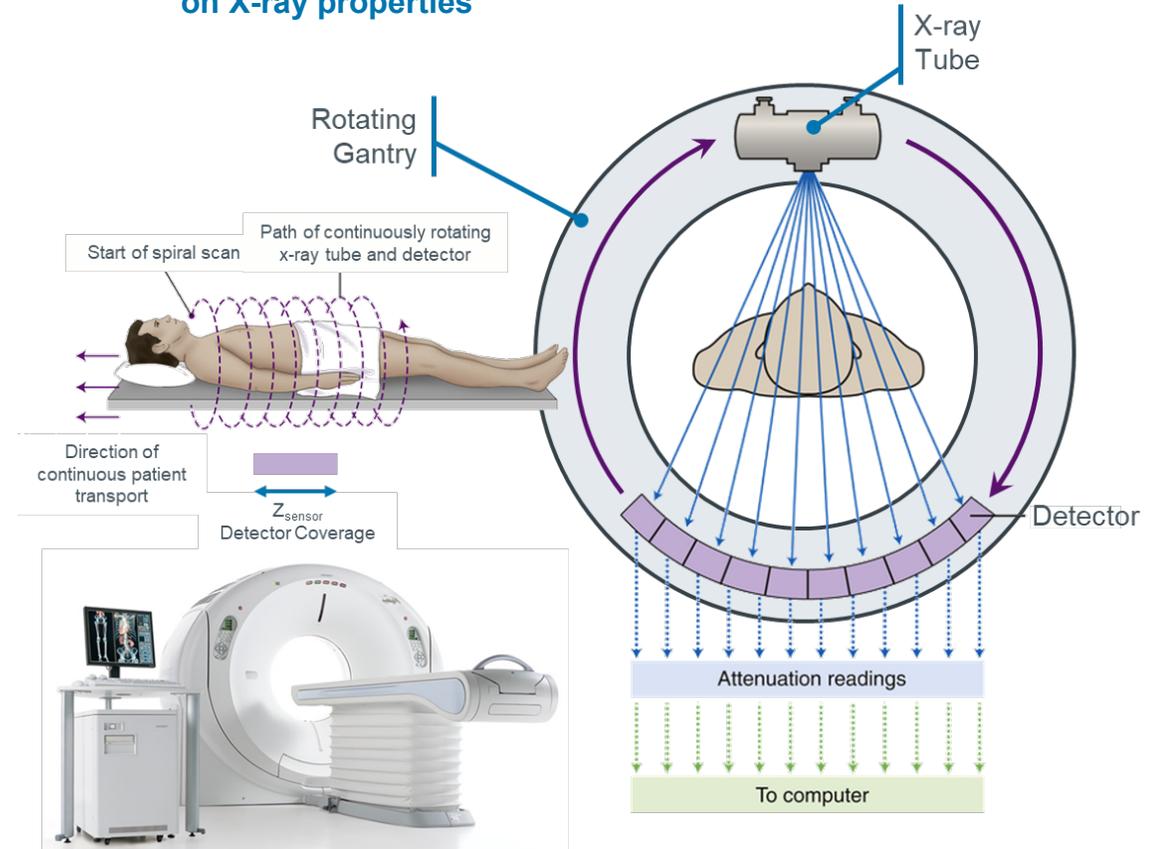
#1 CT Player
#2 CT Player
#3 CT Player
#4 CT Player
#5 CT Player
#6 CT Player
#7 CT Player
#8 CT Player
#9 CT Player
#10 CT Player

engaged
no engagement



ams OSRAM 64-Slice CT Detector Module

Generation of 3D images based on X-ray properties



Semiconductors: Opportunities & growth drivers in Consumer portable devices

ams OSRAM offering full technology range and best value in focus applications

Strong Positions in Consumer Semiconductor Sub-Segments

#2 Light Sensor Supplier in Smartphones

Light Sensor suppliers by 2021 market share (Total market USD ~1bn; Omdia)

1.	STMicroelectronics	36%
2.	ams OSRAM	26%
3.	Sensortek	9%
4.	Maxim	7%
5.	Lumentum	5%
6.	Lite-On	5%
7.	Broadcom	3%
8.	TXC	2%
9.	Elan	2%
10.	Dyna Image	1%



#3 Sensor & Actuator Supplier in Wearables

Sensor & Actuator suppliers by 2022 market share (Total market USD ~864m; Yole)

1.	Bosch	25%
2.	ST Micro	19%
3.	ams OSRAM	7%
4.	Goermicro	7%
5.	Knowles	5%
6.	OMRON	5%
7.	TDK	3%
8.	Zilltek	2%



We are present at all Top 15+ Smartphone OEMs globally

Shipments 2021>>	% of smartphones with ams OSRAM content
1. Smartphone OEM 1	60%
2. Smartphone OEM 2	100%
3. Smartphone OEM 3	20%
4. Smartphone OEM 4	20%
5. Smartphone OEM 5	30%
6. Smartphone OEM 6	20%
7. Smartphone OEM 7	100%
8. Smartphone OEM 8	20%
9. Smartphone OEM 9	90%
10. Smartphone OEM 10	40%
TOTAL (all OEMs)	50%

- ams OSRAM is present in **50% of smartphones** shipped in 2021
- The addressed OEMs have a **unit market share of >80%**

Addressing relevant, system defining functions in portable consumer devices

Focus on significant growth opportunities in camera enhance, 3D AR, body tracking, microLED & smart glasses

Focus applications	Addressed Functionalities	ams OSRAM BOM Potential
 <p>Smartphone</p>	<ul style="list-style-type: none"> – Camera enhancement (Flicker, Spectral Color Sensors, ToF) – 3D AR sensing – 3D Authentication – Display Management / BOLED sensing – MicroLED display 	<p>Mobile BOM: €1-25¹⁾</p>
 <p>Tablets</p>	<ul style="list-style-type: none"> – 3D AR sensing – 3D Authentication – Display Management / BOLED sensing – MicroLED display 	<p>Tablet BOM: €3-40¹⁾</p>
 <p>Smartwatch</p>	<ul style="list-style-type: none"> – Display Management / BOLED sensing – MicroLED display – User Interaction (Rotary Encoder) – Vital Sign Monitoring 	<p>Watch BOM: €2+ ¹⁾</p>
 <p>AR / VR</p>	<ul style="list-style-type: none"> – Display Management – Vital Sign Monitoring – Face / Hand / Body Tracking – Eye Tracking / Authentication – 2D/3D sensing – Visualization (Light engine, microLED display, Optical coupling) 	<p>AR/VR Glasses BOM: €5-100¹⁾</p>

ams OSRAM's Display Management and Camera Enhancement are leading

Our technologies and products are relevant or key for system performance



Display Proximity sensing

Intensity or ToF-based sensors for touch display on/off.



Flicker Detection

Elimination of artificial light modulation bands



Spectral Ambient Light Sensing

Auto White Balancing to improve contrast & low light performance. Light source identification (TL, LED, sun) for better colors. Multi-zone for segmented analysis.



Depth Sensing for Auto Focus & Bokeh

Single and Multi-zone dToF-based depth sensing for depth-of-field effects and sharp images, also in low light situations



AR Support

Social media (SnapChat, TikTok), room scanning, navigation, gaming, E-Commerce

ams OSRAM's Spectral Ambient Light Sensing makes the difference

8 out of the top 10 smartphones by camera score use ams OSRAM sensors for superior camera performance



Autofocus:

“Fast and accurate autofocus, even in challenging light conditions”*

AWB & Flicker:

“Excellent for photographing family and friends, thanks to accurate skin tones and high details”*

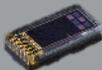
Camera Enhancement: Light, Color, Flicker & Range sensors



TMF882x
Mutizone dToF



TSL2585
ALS/UV/Flicker



TCS3410
RGB/Flicker

Winning combination: Spectral + ALS

Top Smartphones by Camera score

Smartphone Model	Launch Date	Camera score
1. Huawei P60 Pro	Mar 2023	156
2. Oppo Find X6 Pro	Mar 2023	153
3. Honor Magic5 Pro	Feb 2023	152
4. Oppo Find X6	Mar 2023	150
5. Huawei Mate 50 Pro	Sep 2022	149
6. Google Pixel 7 Pro	Oct 2022	147
7. Honor Magic4 Ultimate	Mar 2022	147
8. Apple iPhone 14 Pro Max	Sep 2022	146
9. Apple iPhone 14 Pro	Sep 2022	146
10. Huawei P50 Pro	Jul 2021	143

source: <https://www.dxomark.com/smartphones/>

Lamps & Systems: Lamps for Automotive, Industrial and Entertainment

Strong and stable profit contributor with excellent position in lamps business

AMSP is covering automotive, entertainment and industry applications

Automotive



LED retrofits



Fixtures & car accessories



Traditional lamps



LED & Laser modules (e.g. XLS)

Automotive Aftermarket (AFTM)

Automotive OEM

Entertainment and Industry



Semiconductors



Entertainment



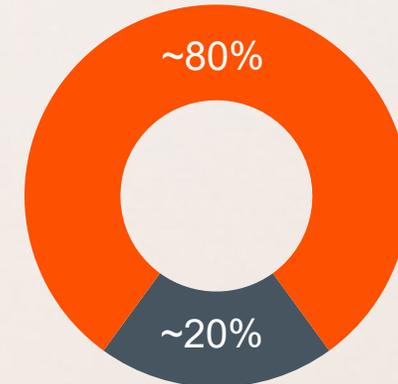
Cinema



Medical

End market split in AMSP lamps

Automotive lamps



Entertainment & Industry lamps

- Large installed base globally
- Expanding our leading market position softens slowly declining market volume
- LEDr and XLS with positive market growth in declining lamps business
- New opportunities beyond lamps with fixtures & car accessories using our strong brand and channel position.

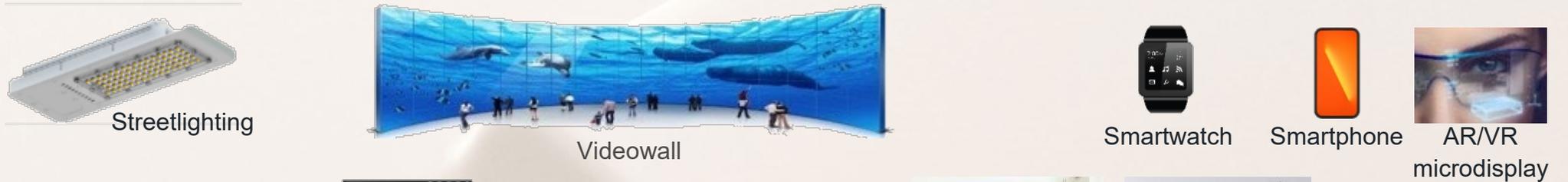
Monetizing innovation: Next generation (micro)LED and 8" manufacturing

Extremely small microLED are required to enable disruptive mass adoption



→ Strongly increasing technological challenge →

Applications



Displays:



Automotive:



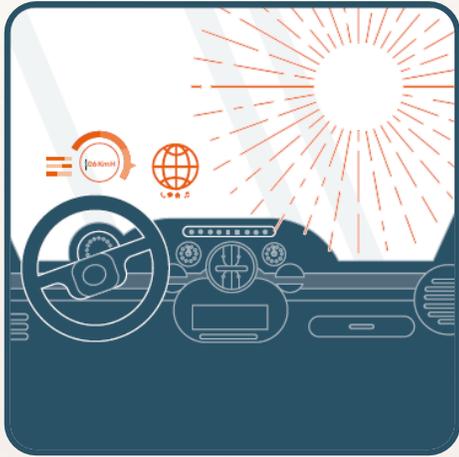
Older “microLED” products are actually based on miniLED

microLED demo products shown

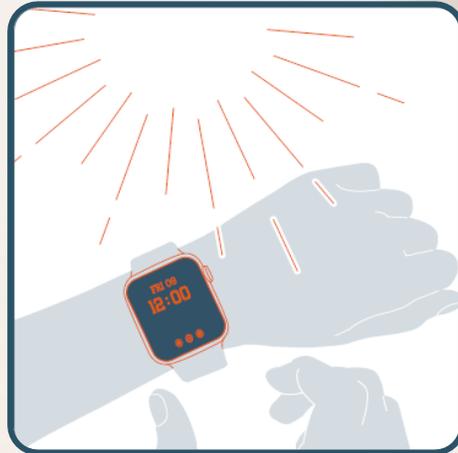
ams OSRAM microLED focus

microLED displays promise a new and unique user experience

Ready to combine some of the really important features that the industry is looking for



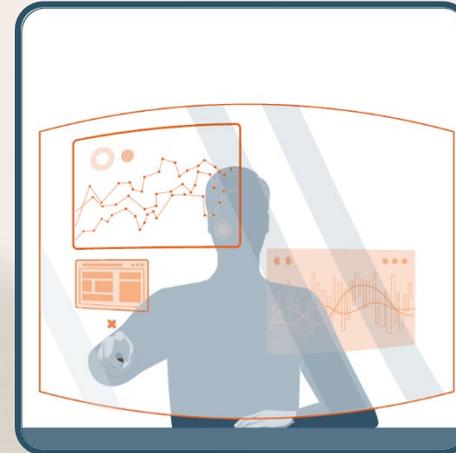
Highest brightness
(e.g. for head-up displays),
and robustness to temperature
and sunlight



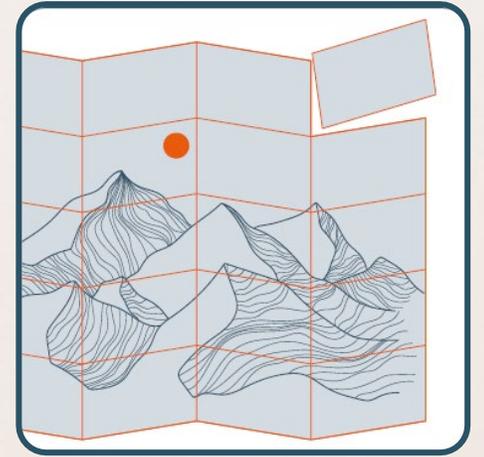
No burn-in even
for fixed image patterns
in bright sunlight



**Wide viewing
angles**



Transparent or
curved displays



Seamless stitching
and **bezel-free screens**

Next-generation LED production is key enabler for significant microLED shrink

Shrink required to reach acceptable cost level for high-volume applications



Status today: Die sizes in existing products typically in the range of $35 \times 60 \mu\text{m}^2$ to $15 \times 30 \mu\text{m}^2$



1 wafer per color



1 to 4

4k displays

Chip cost too high for market breakthrough of microLED technology

Massive die shrink required for mass adoption

Key enabler: 8" LED manufacturing

Modern state-of-the art and first 8" fab for advanced LED technologies

Fully automated material handling system and factory control, advanced process control and material scheduling and fault detection (FDC) technologies

SMIF concept that allows lowest defect densities required for advanced (μ)LED manufacturing

Fab built in industry record time: 1 year from start of construction to first wafer starts



ams OSRAM focus: Die sizes of $10 \times 10 \mu\text{m}$ and below



1 wafer per color



25 to >80

4k displays

Acceptable LED cost for high-volume applications

Sustainability commitments

Creating sustainable value and improving lives with optical solutions

ESG update: Sustainability Strategy, Carbon Neutrality Goal, ESG Committee

ESG ACHIEVEMENTS

- Second group sustainability report published, demonstrating our commitment to transparency and accountability (GRI compliant)
- Development and implementation of a comprehensive group sustainability strategy including climate strategy, aligned with the Paris Climate Agreement' 1.5° C target
- Comprehensive reporting of CO₂ emissions, including our own activities (Scope 1 + 2) and significant progress in reporting emissions along the value chain (Scope 3)
- Establishment of the ESG Committee, driving our sustainability efforts and ensuring focused decision-making
- Release of our Sustainability Policy and internal Sustainability Guideline, guiding our actions towards a more sustainable future

ESG GOAL

Carbon neutrality by 2030

- Group to be carbon neutral (Scope 1 & 2) by 2030, endeavor towards net zero ambition
- Near and long-term targets for science-based reductions of Scope 3 emissions (purchased goods/services)
- Strategy based on principle “avoid, reduce, compensate”, reduction path developed
- 100% green electricity at production sites in Germany and Austria
- Reducing emissions via energy efficiency measures at several locations, plan established to compensate for inevitable CO₂ emissions
- CO₂ saving of 9% compared to basis year 2021



At ams OSRAM, we are highly committed to sustainability

External recognitions confirm our engagement within ESG (actual status per rating)

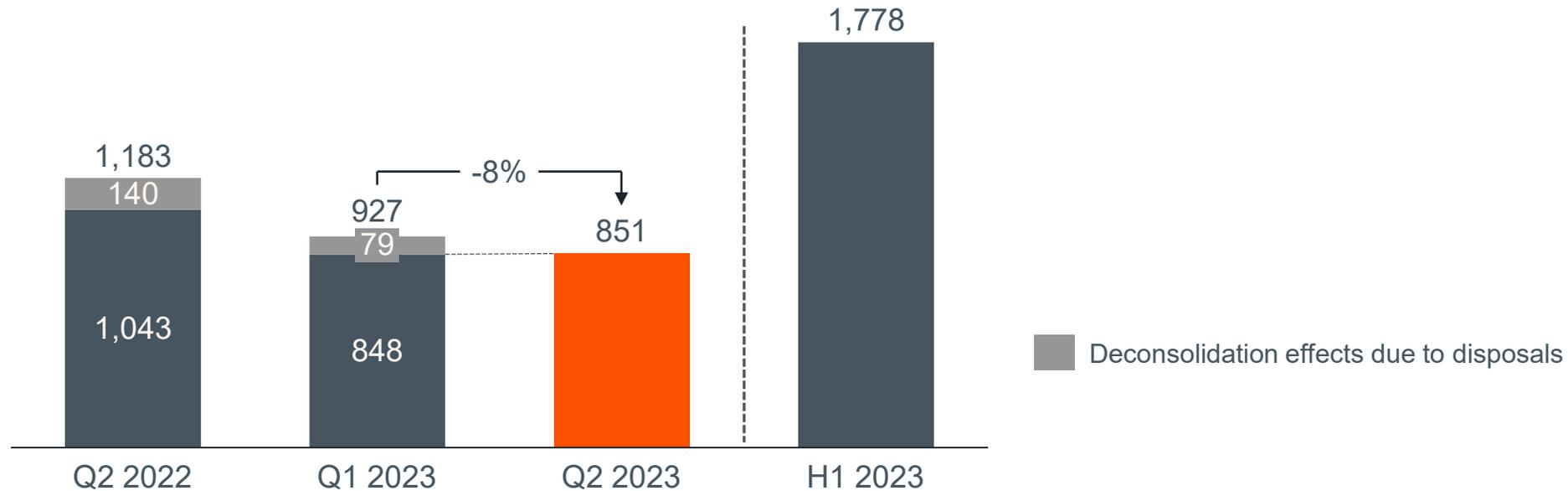
Institution	Rating	Comment
  CDP 	C B-	Climate Change Water Security
  ecovadis 	Silver	within best 5% of sector
  SUSTAINALYTICS 	Score 21	low medium risk, improvement +30%
  ISS 	Score C	improvement from C-
  MSCI 	BBB	
  S&P Global CSA 	Score 72	improvement +18%, scored #13 within sector, Yearbook listed

Financial results in detail Q2 2023 and H1 2023

Group revenues slightly up sequentially (excluding deconsolidation effect in Q1)

All figures in EURm / % of revenues

Total revenues

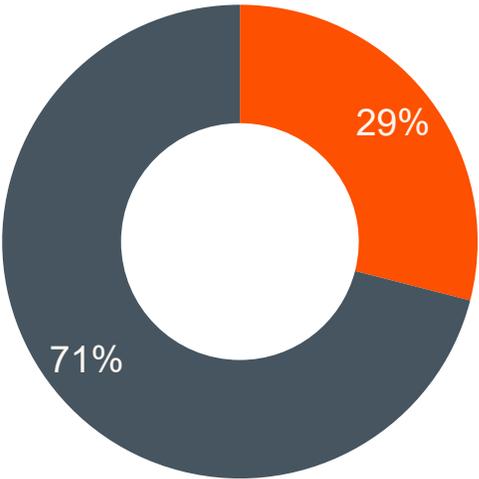


- Revenues at midpoint of guidance range, challenging market environment continued in Q2 as expected
- Slight revenue growth sequentially on like-for-like basis (excl. deconsolidation effects)
- Year-on-year comparison reflects de-consolidation effects of around EUR 140m from several disposals, including former OSRAM Continental JV business AMLS, Digital System business and others

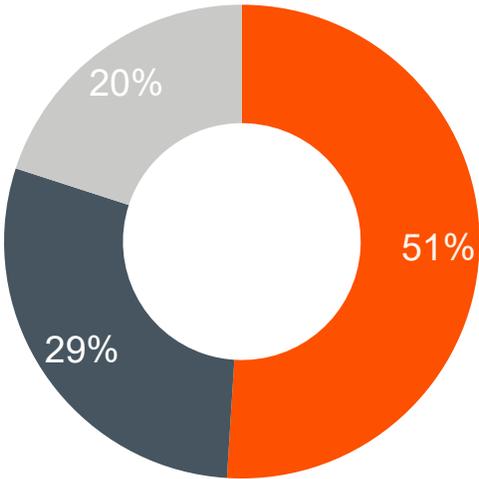
Automotive, Industrial, Medical represent ~80% of revenues

APAC most important sales region and semiconductors contribute ~70% of revenues

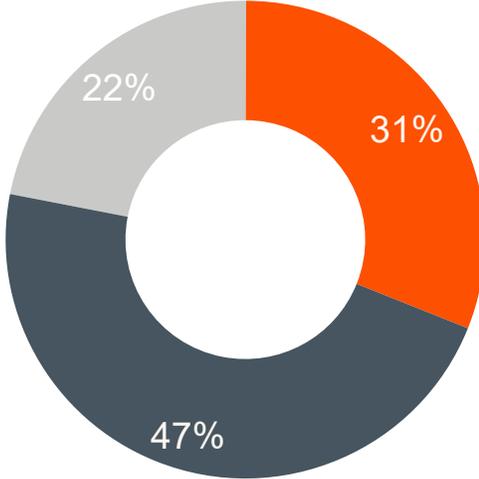
Revenues by segment (Q2 2023)



Revenues by end market (Q2 2023)



Revenues by region (H1 2023)



Semiconductors
 Lamps & Systems
 Automotive
 Industrial & Medical
 Consumer
 Americas
 EMEA
 APAC

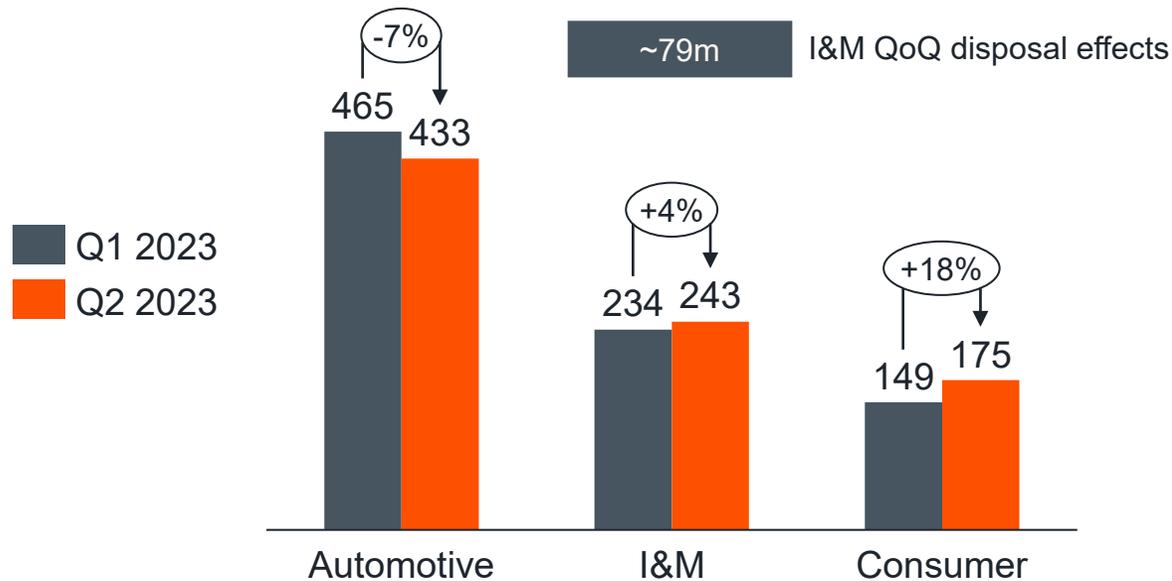
- Lower sequential Lamps & Systems contribution, due to seasonal effects + meaningful deconsolidation (disposal)
- Automotive: Stabilization and first signs of improved inventory situation and more normalized order pattern
- Industrial & Medical: Mixed industrial development, inventory correction in certain areas / strong medical business
- Consumer: Muted demand environment continued with typical seasonality, sequential improvements in some areas

Note: Revenues by region are updated on a half-yearly basis

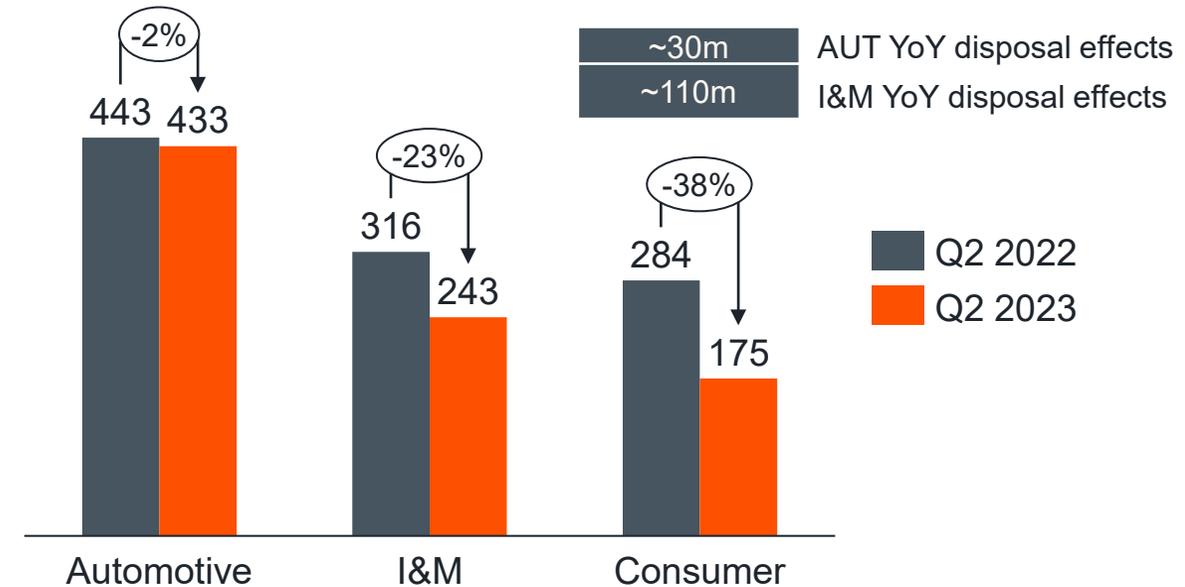
Group revenue development: I&M, Consumer up sequentially

Like-for-like Q2 development QoQ & YoY (excl. disposal effects), figures in EURm

QoQ revenue development



YoY revenue development



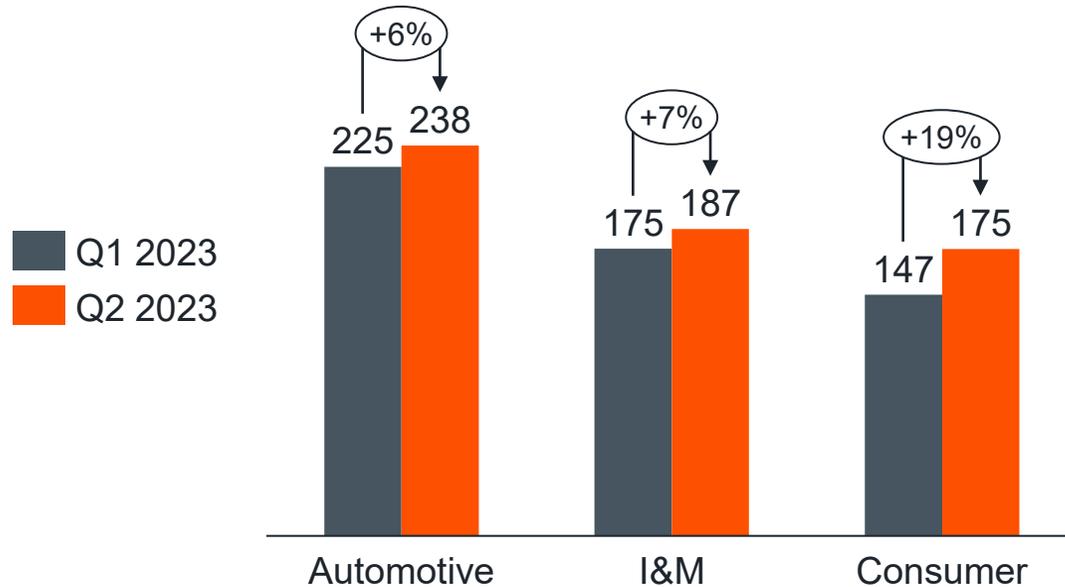
- Automotive: Stabilizing and positive trends in order patterns, seasonal effects in aftermarket business
- I&M: Strong medical, mixed industrial business depending on sub-market business trends
- Consumer: Positive development across business areas after challenging Q1

- Automotive: Stable YoY development with normalizing supply chain in Q2 2023 and seasonality in aftermarket auto lamps
- I&M: Challenging environment in several industrial sub-markets
- Consumer: Muted demand across device classes and expected end-of-life of certain volume projects

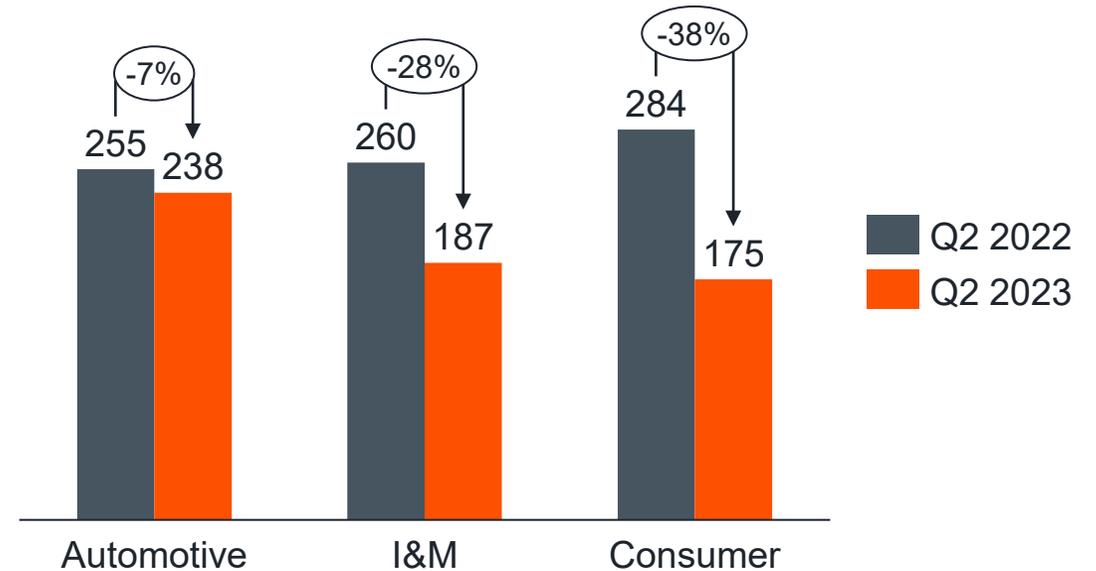
Semiconductors: Positive sequential development across markets

Semiconductors segment, like-for-like Q2 development QoQ & YoY (excl. disposal effects), figures in EURm

QoQ revenue development



YoY revenue development



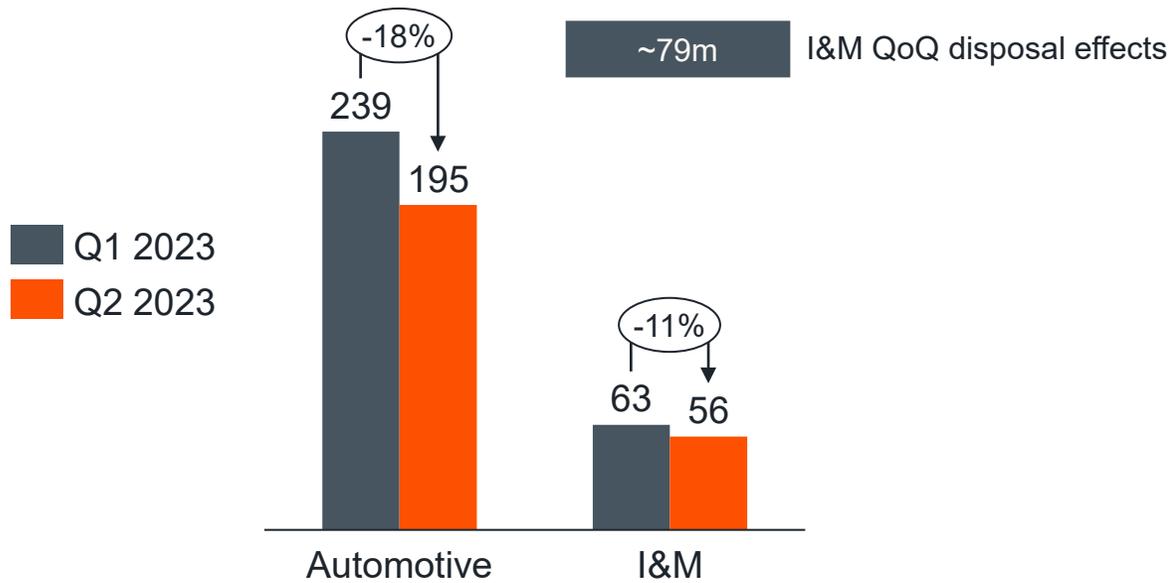
- Automotive: Stabilizing inventory situation and order pattern, positive trend towards end of quarter
- I&M: Strong medical business, mixed industrial business depending on sub-market trends
- Consumer: Strong sequential improvement in existing sockets

- Automotive: Global demand still muted in spite of stabilizing supply chain
- I&M: YoY decline reflects overall weak macro economics in many areas, such as industrial lighting
- Consumer: YoY reflects some big sockets approaching End-of-Life, before new designs will kick-in

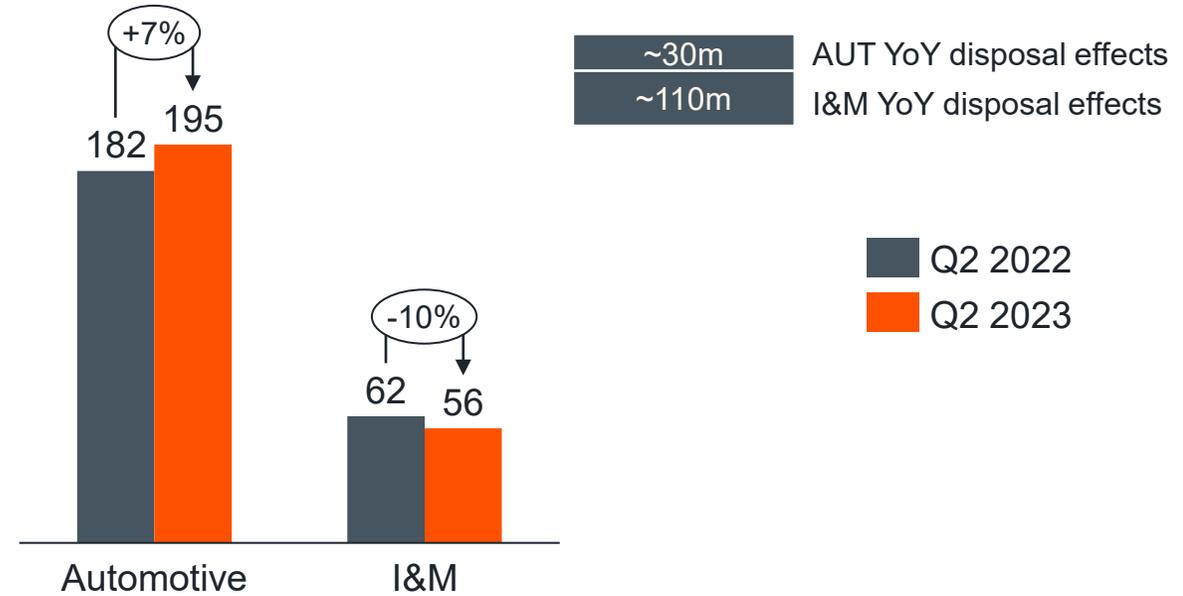
Lamps & Systems: Seasonal effects in Q2, stable YoY development

Lamps & Systems segment: Like-for-like Q2 development QoQ & YoY (excl. disposal effects), figures in EURm

QoQ revenue development



YoY revenue development



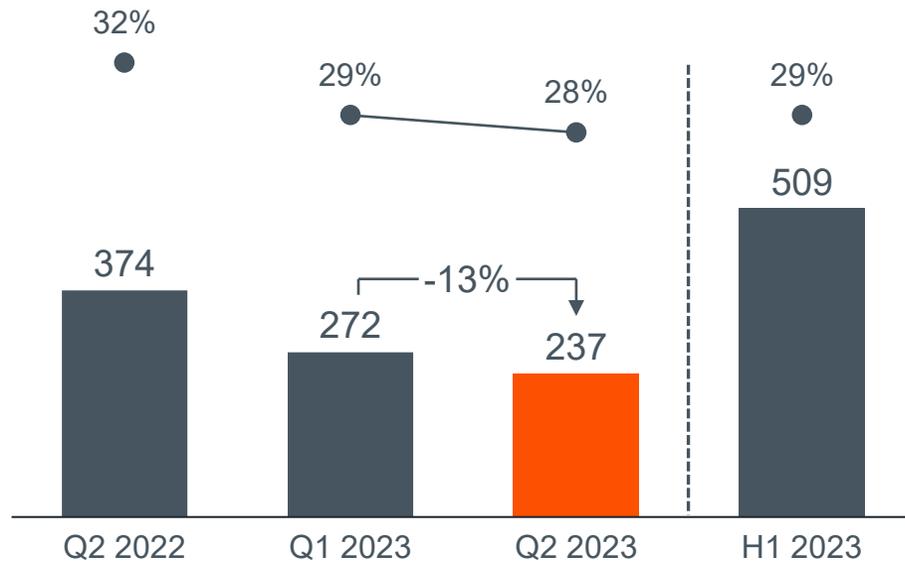
- Automotive: Seasonality in automotive lamps business drives sequential development
- I&M: Reflects substantial disposals effects, remaining business focuses on specialized entertainment and industry lamps

- Automotive: Strong YoY development, further expanding leading market position, also driven by strong “LED replacement lamps” portfolio
- I&M: Remaining business driven by certain industrial trends, such as softer demand for specialty lamps for semiconductor manufacturing equipment

Group profitability – adj. EBIT margin improved sequentially

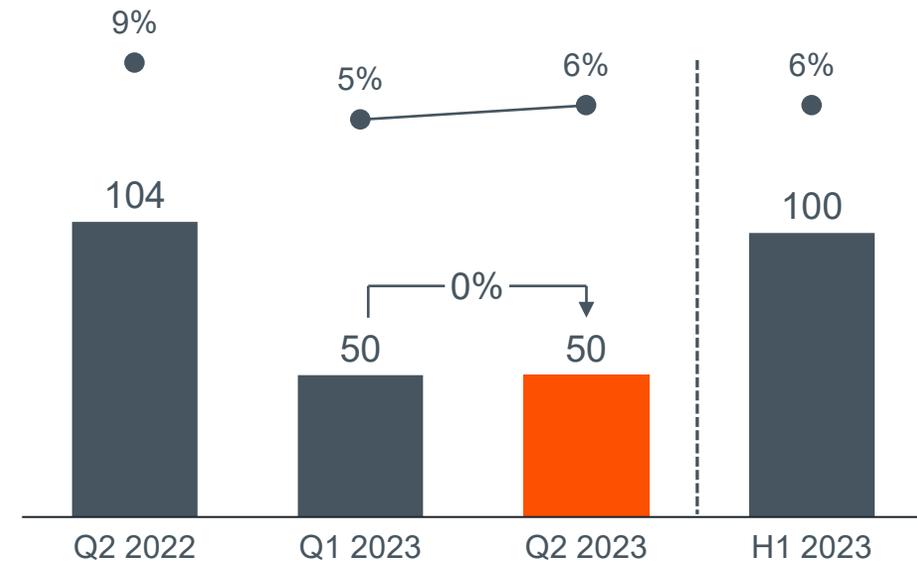
All figures in EURm / % of revenues

Gross profit, gross margin (adj.)¹⁾



- Gross profit in-line with company expectations
- Continued to be impacted by meaningful underutilization effects in manufacturing

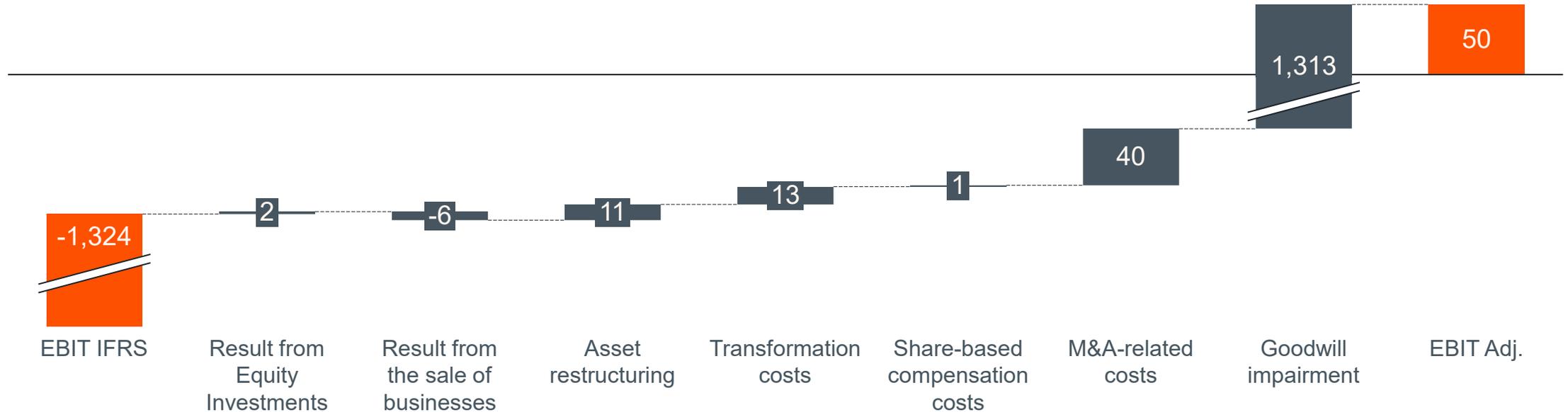
EBIT, EBIT margin (adj.)¹⁾



- Adj. EBIT margin at top end of guidance range
- Reduced adj. operating expenses support improved profitability sequentially
- Clear target to increase profitability

Reconciliation from EBIT IFRS reported to EBIT adjusted figures

Q2 2023, All figures in EURm

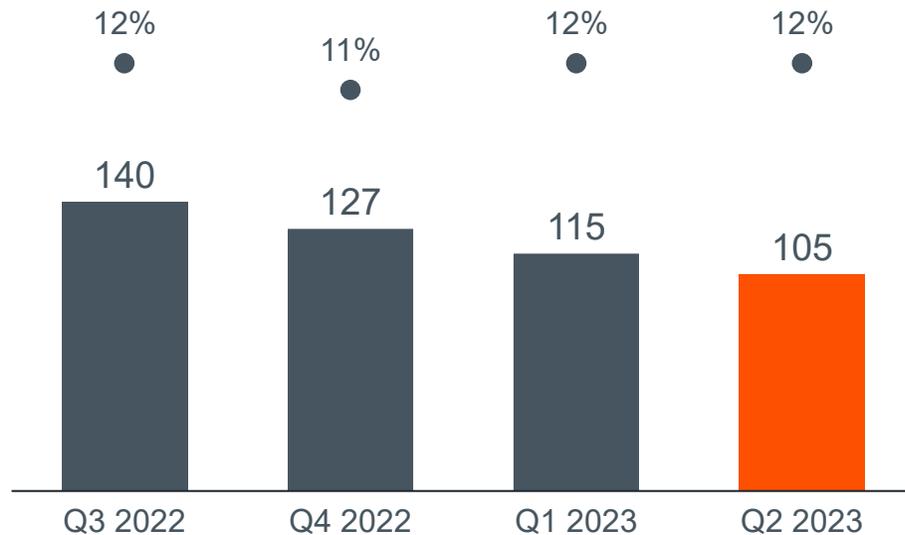


- EBIT Adj. best reflects underlying profitability of business and overall group development
- Historic M&A transactions (e.g. OSRAM) result in significant purchase price allocation expenses (non-cash, resulting in D&A), heavily impacting EBIT IFRS
- One-time integration costs (part of M&A-related costs) as well as transformation costs for personnel restructuring programs affect short-term profitability and mask true business development
- One-time impairment charges overshadow operating business development including profitability
- Book gain / losses of disposals + results from smaller historic equity investments are not part of operating business model

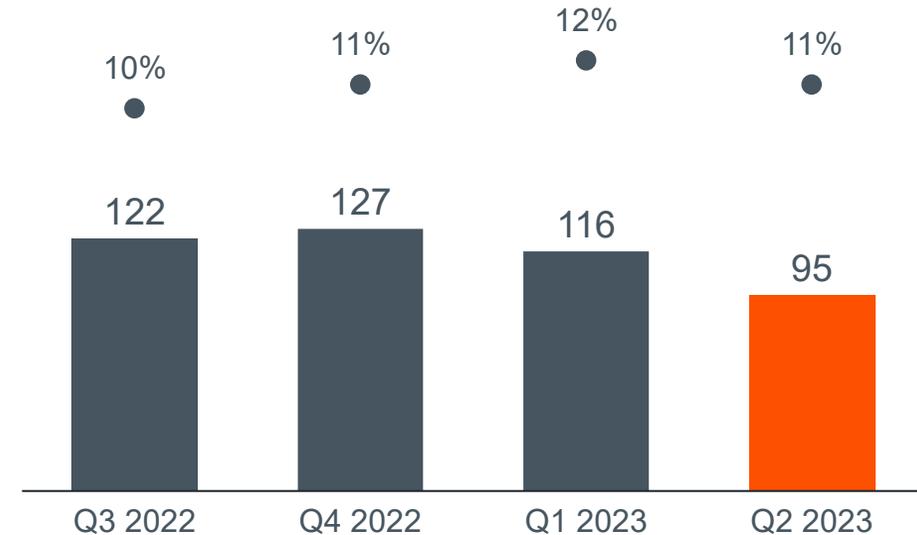
Operating expenses – adj. R&D and SG&A expenses reduced sequentially

All figures in EURm / % of revenues

R&D expenses (adj.)¹⁾



SG&A expenses (adj.)¹⁾

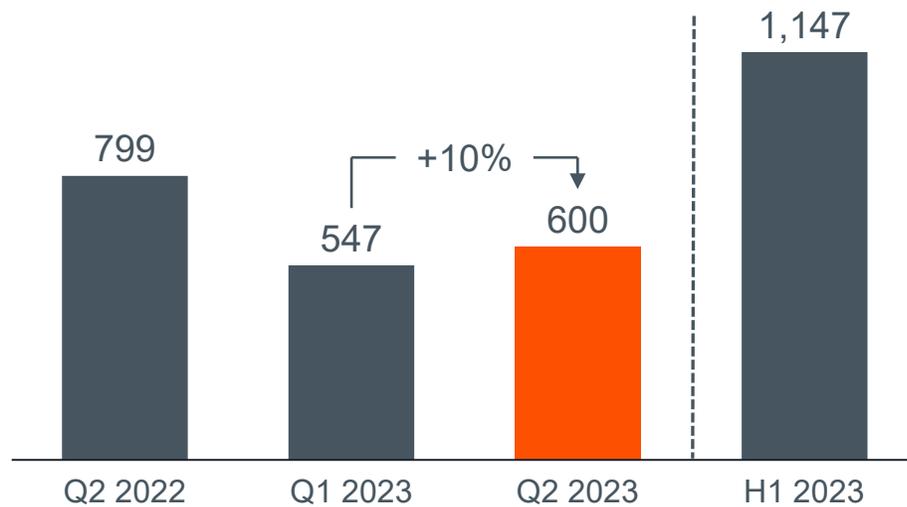


- Strong decrease in adj. operating expenses on absolute basis over last quarters
- R&D development reflects ongoing stream-lining and efficiency programs, majority of R&D in Semiconductors segment
- Clear SG&A base-line reduction from efficiency programs and synergies over last 12 months

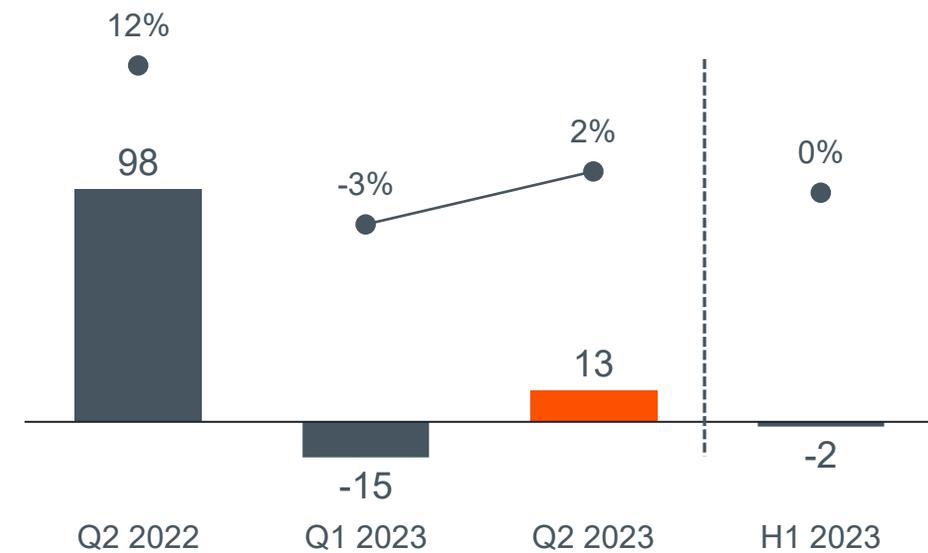
Semiconductors segment: revenues up and return to profitability

All figures in EURm / % of revenues

Total revenues



EBIT, EBIT margin (adj.)¹⁾

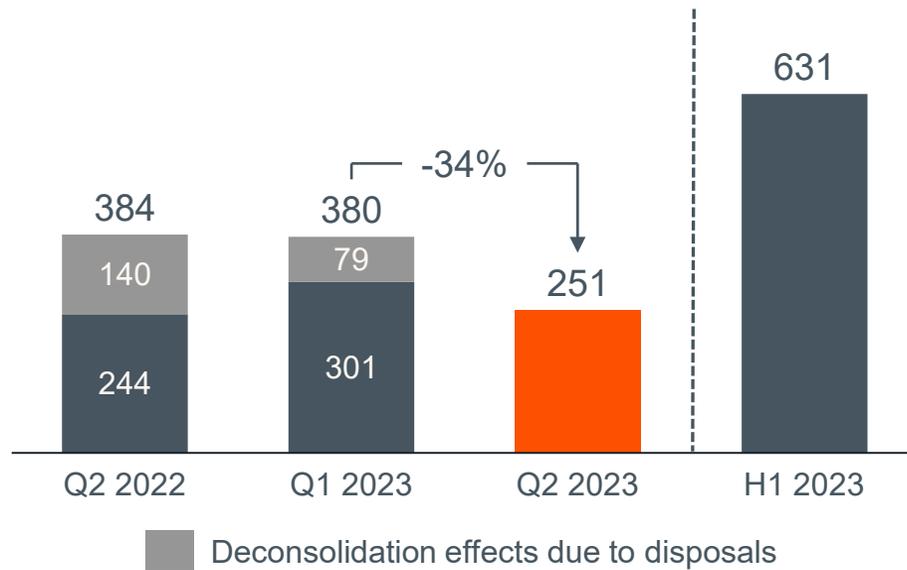


- Double-digit sequential increase driven by stabilization in some Consumer and certain Industrial areas
- Automotive business still impacted by inventory correction while showing signs of improved order patterns
- Mixed development in Industrial markets, strong Medical business
- Profitability still impacted by lower production volumes and underutilization, noticeable improvement sequentially

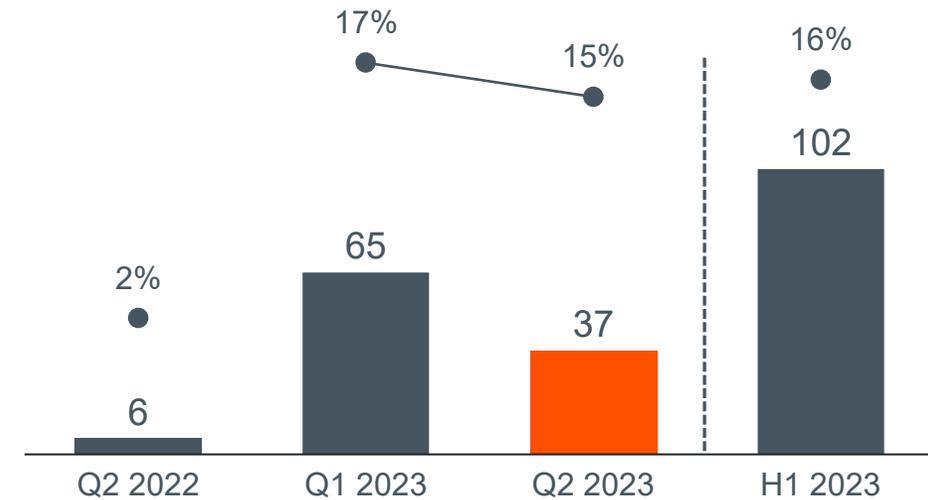
Lamps & Systems: strong profitability in spite of seasonal revenues decline

All figures in EURm / % of revenues

Total revenues



EBIT, EBIT margin (adj.)¹⁾

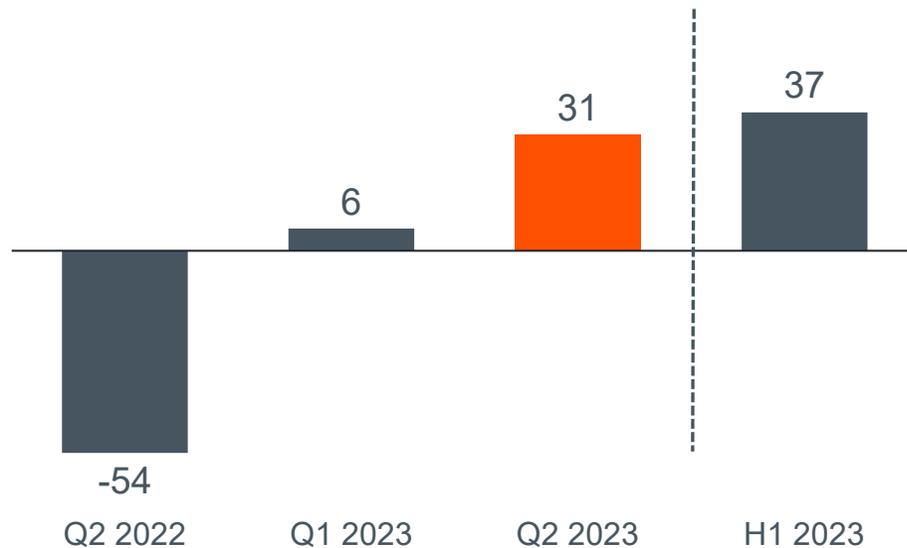


- Significant deconsolidation effects due to disposal of Digital Systems business
- Seasonal effects in L&S automotive business (~80% of remaining L&S business)
- Substantially and structurally improved profitability reflecting positive disposal-related and portfolio streamlining effects

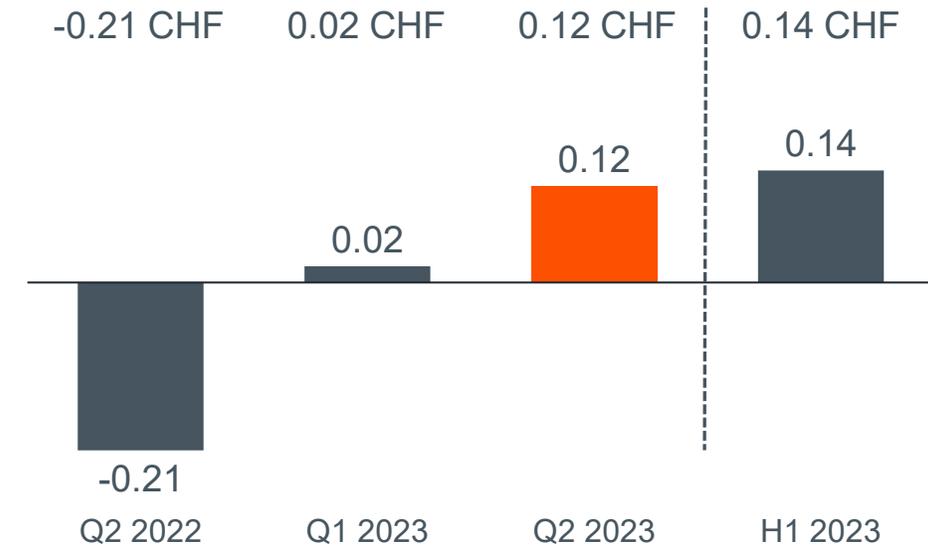
Adj. net result / Adj. EPS – strong improvement sequentially to 0.12 CHF EPS

All figures in EURm / EUR / CHF per share

Net result (adj.)¹⁾



EPS diluted (adj.)¹⁾

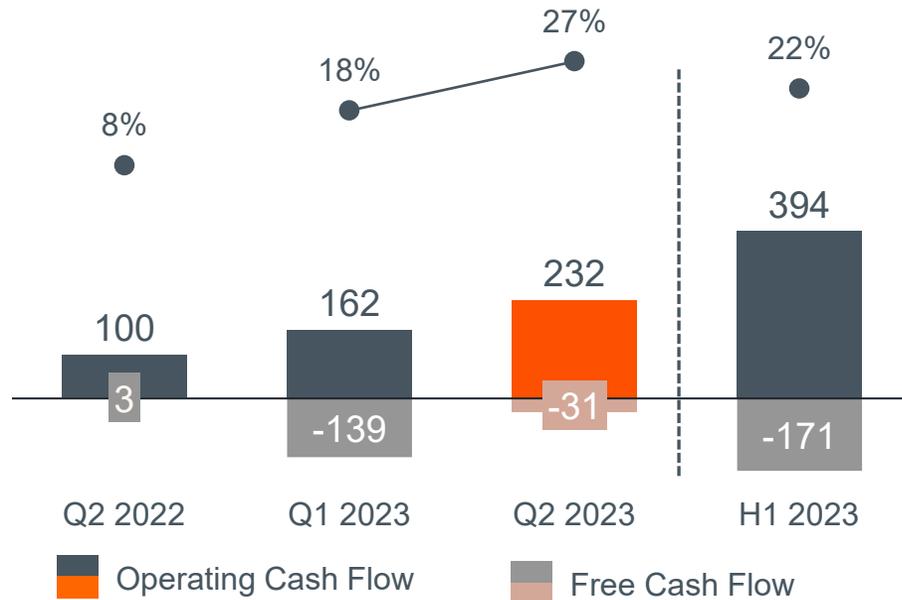


- Financial result Q2 EUR -25m (Q1 EUR -50m), due to positive FX effects and adjustments to the yearly compensation payment to the OSRAM Licht AG minority shareholders (reduced amount of outstanding shares)
- Positive income tax result Q2 EUR 7m based on reduction of deferred tax liabilities
- Q2 IFRS reported net result EUR -1,342m, impacted by impairment charge / IFRS EPS diluted EUR -5.14 / CHF -5.02

Cash Flow – Strong Operating CF at EUR 232 million in Q2

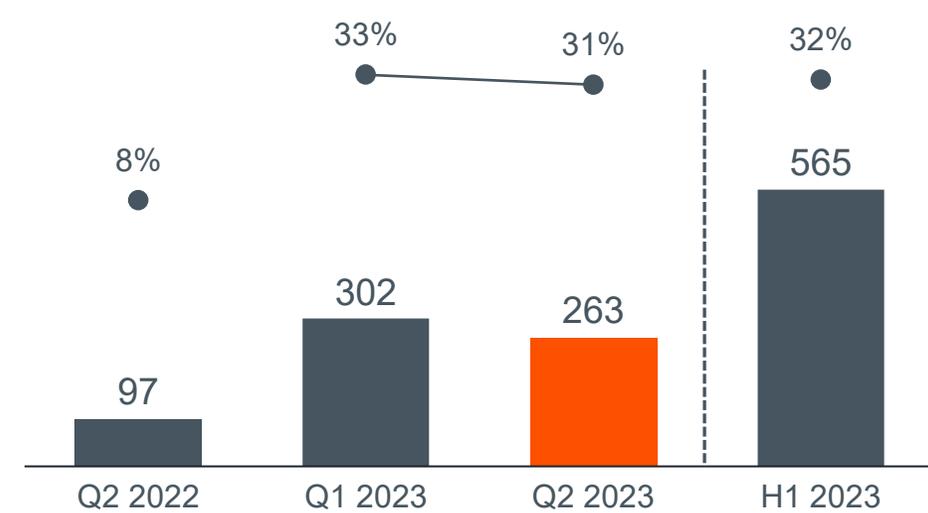
All figures in EURm / Operating Cash Flow % of revenues

Operating / Free Cash Flow (FCF)



- Very strong operating cash flow generation, up year-on-year and sequentially (27% of revenues)
- Free cash flow (FCF) development as expected given substantial capital expenditures

Capital expenditures



- Continued meaningful CAPEX driven by industry-first 8" LED front-end fab, in line with plans
- Focused investments in European manufacturing footprint (Austria and Germany)

More conservative approach on long-term view leads to non-cash impairment

Assessment and impairment testing

Periodic impairment testing in line with IFRS requirements and regulations

Approach

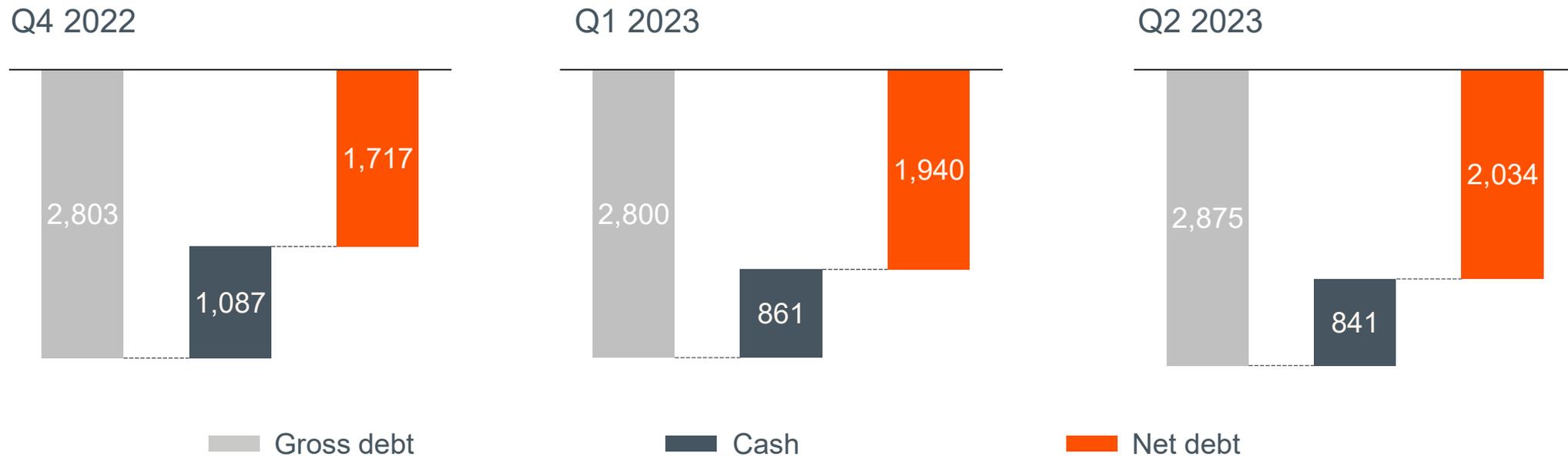
- New management re-assessed the business outlook of each business line of the Group
- Meaningfully more conservative view in light of current macro-economic environment
- Applied across all businesses and segments

Effect and outcome

- Updated internal outlook and external parameters lead to decreased fair value of certain goodwill assets, triggering impairment charge
- Non-cash, one-time impairment charge of EUR 1.3 billion related to goodwill
- Related to “Semiconductors” segment
- No impact on liquidity

Cash and debt overview – leverage slightly up as expected

All figures in EURm



- Expected uptick in group leverage to 2.9x net debt/adjusted¹⁾ EBITDA driven by CAPEX and trailing EBITDA trend
- EUR ~930 million undrawn multi-year lines (incl. EUR 800m revolving facility)
- ~90% of outstanding debt on fixed rate basis
- Adj. EBITDA¹⁾ LTM EUR 693m (based on adj. EBIT + D&A not related to adjustments)
- Considerations and detailed planning incl. potential instruments for refinancing 2025 maturities ongoing

Short term outlook and FY 2024 comments

Q3 2023 guidance

Revenues*: EUR 840 - 940 million

(adj.) EBIT margin: 5 – 8%

*EUR ~120m YOY deconsolidation effects vs. Q3 2022

Q4 2023 comments

Semiconductors:

- High uncertainty in end-markets persisting
- Especially Industrial and Consumer end-markets are challenged
- Automotive revenues should continue to stabilize with normalizing supply chain and new products ramping

Lamps & Systems:

- Robust revenues expected due to seasonally strong Automotive aftermarket

FY 2024 comments

- Absolute Group revenues expected to decline compared to 2023 due to portfolio decisions
- Semiconductor core business expected to outgrow target markets - assuming end-markets stabilize
- Group targets slightly positive Free Cash Flow assuming end-markets stabilize. Significantly reduced CAPEX compared to 2023.
- Focus on improving profitability

Sensing is life

am  OSRAM

Profit and loss statement

IFRS reported figures, all figures in EURm

	Q2 2023	Q2 2022	H1 2023	HY 2022
Revenues	851	1,183	1,778	2,429
Gross profit	201	348	411	733
– Gross margin (IFRS reported)	24%	29%	23%	30%
– Gross margin (adjusted ¹⁾)	28%	32%	29%	32%
Research and development	-118	-151	-265	-313
Selling, general and administrative	-108	-157	-250	-313
Other operating income	27	160	42	163
Other operating expenses	-1,324	17	-1,341	-14
Results from investments in associates	-2	-1	-10	-1
Result from operations (EBIT)	-1,324	216	-1,413	256
– EBIT margin (IFRS reported)	-155%	18%	-79%	11%
– EBIT margin (adjusted ¹⁾)	6%	9%	6%	9%
Net financing result	-25	-50	-57	-100
Result before tax	-1,349	166	-1,471	156
Income tax result	7	-108	-5	-82
Net result (IFRS reported)	-1,342	58	-1,476	74
Net result (adjusted ¹⁾)	31	-54	37	48

Balance sheet

All figures in EURm

Assets	Jun 30, 2023	Dec 31, 2022	Liabilities and equity	Jun 30, 2023	Dec 31, 2022
Cash and cash equivalents	841	1,087	Current interest-bearing loans	275	169
Current financial investments	19	21	Trade payables	686	811
Trade receivables	435	533	Income tax payables	89	87
Inventories	804	864	Current provisions	199	256
Other current receivables and assets	209	223	Other current liabilities	1,384	1,345
Assets held for sale	77	157	Liabilities held for sale	23	50
Total current assets	2,385	2,884	Total current liabilities	2,656	2,717
Property, plant and equipment	2,008	1,856	Non-current interest-bearing loans	2,600	2,635
Intangible assets	2,272	3,645	Employee benefits	168	179
Right-of-use assets	216	230	Deferred tax liabilities	72	105
Investments in associates	24	35	Non-current provisions	44	45
Deferred tax assets	68	69	Other non-current liabilities	262	318
Other non-current assets	50	54			
Non-current financial assets	36	59			
Total non-current assets	4,674	5,948	Total non-current liabilities	3,146	3,281
			Shareholders' equity ams-OSRAM AG	1,251	2,826
			Non-controlling interests	6	7
Total assets	7,059	8,832	Total liabilities and equity	7,059	8,832

Cash flow

Selected cash flow items, all figures in EURm

	Q2 2023	Q2 2022	H1 2023	H1 2022
Net result	-1,342	58	-1,476	74
Amortization, depreciation and impairment	1,446	141	1,618	298
Cash flows from operating activities	232	100	394	247
Capital expenditures	-263	-97	-565	-210
Acquisitions of subsidiaries, net of cash acquired	-64	-7	-95	-7
Proceeds from sale of businesses, net of cash disposed	78	251	89	251
Cash flows from investing activities	-245	148	-551	39
Proceeds from loans	151	0	151	0
Repayment of loans	-83	-5	-85	-67
Repayment of lease liabilities	-14	-39	-29	-56
Interest paid	-30	-16	-76	-62
Dividends paid to shareholders of OSRAM Licht AG	-37	-53	-37	-53
Cash flows from financing activities	-13	-112	-76	-239
Net change in cash and cash equivalents (incl. FX effects)	-30	200	-255	111
Cash and cash equivalents at end of the period	841	1,413	841	1,413