

Sensing is life

amul OSRAM

Fourth Quarter and Fiscal Year 2023 results

Aldo Kamper, CEO

Rainer Irle, CFO

Dr Juergen Rebel, SVP Investor Relations

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Chapter 1 – Our Story

Investment Hypothesis

Our path to 15% adjusted EBIT and strong positive cash flow

- Strong technology & innovation leader in its field of semiconductor emitters (led and lasers) and sensors; undisputed leader in auto lamps
- Leading market positions in structurally growing semi-markets (~17bn EUR TAM) in automotive, industrial, medical and selected consumer applications driven by the mega-trends *digitalization*, *energy efficiency*, *sustainability* and *smart living*.
- Globally diversified business (50% Asia, 29% EMEA, 21% Americas), balanced customer exposure with top 10 customers representing ~34% of the business (~80% automotive customers amongst top 10) and top-3 19%
- Traditional Lamps & Systems segment (~80% automotive halogen lamps) at target margin of around 15% adj. EBIT generating strong cash flow and pursuing 'last-man-standing' strategy
- Semiconductor segment (~40% automotive, ~30% industrial/medical, ~30% consumer) currently at low single digit adj. EBIT margin due to a few non-core business with low margin, cyclical underutilization, and pre-investment in disruptive microLED technology
- 'Re-establish-the-Base' turnaround program to exit non-core semiconductor business and adjust infrastructure & overhead to lower base, delivering EUR ~150m run-rate savings by end of 2025 bringing semiconductor segment to double-digit adj. EBIT margin
- Structural growth model of 6 – 10% CAGR (relative to 2023 w/o non-core portfolio) primarily based on BoM expansion and some cyclical recovery in end-markets, underpinned by very strong design-win basis in automotive, industrial, medical and selected consumer projects will deliver further improvement to profitability for delivering ~15% adj. EBIT by 2026
- Strongest growth from automotive, then mobile phone sensors, Kulim-8-inch products, and broad applications in industrial & medical
- After completion of pre-investment into world's first 8-inch led facility, return to around 10% CAPEX-to-sales
- Strengthened balance sheet after EUR 2.25 bn re-financing completed in Q4/2023
- Fully committed to sustainability - carbon-neutrality targeted by 2030

ams OSRAM at a glance

A company in transition to structural growth in automotive, industrial/medical & selected consumer applications with 110+ years of combined company history

Our segments & technologies

Semiconductors

Sensors & ICs LED & lasers



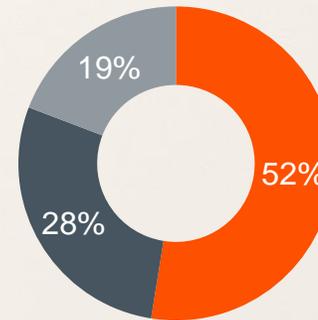
~2.4 bn€

Automotive & Specialty Lamps



~1.1 bn€

Revenues by application¹ & Market positions



Automotive:

- #1 Auto LED & lasers
- #1 in traditional lamps

Industrial & medical:

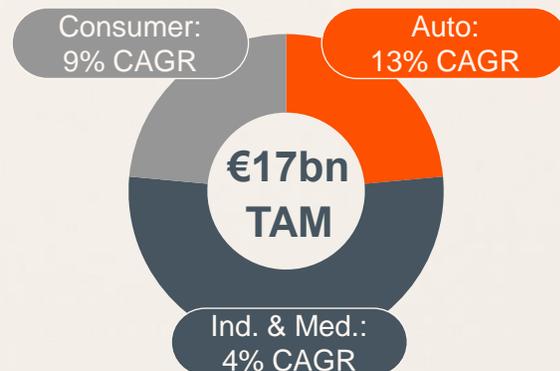
- #1 horticulture led lighting
- #1 in CT medical imaging

Consumer:

- #2 in light sensors

Key Figures¹ & Semiconductor TAM

Revenues	3.6 bn€
Adj. EBIT	233 m€ / 6.5%
Customers:	>10k
Employees:	~20k
Engineers;	~5k
Patents:	>15k



Return to structural growth – value proposition

- **Target operating model 2026:**
6-10% revenue CAGR, ~15% adj. EBIT, ~10% CAPEX to sales
- **‘Re-establish the base’ program** to achieve profit improvement of ~150m€ by E-2025
- **Positive Free Cash Flow²** starting in 2024

Our segments - overview of business units and applications

AUT = Automotive, I&M = Industrial & Medical, CON = Consumer



Emitters (LED & laser)

~1.4 bn€



Forward Lighting (FWL)



High pixelated FWL



Signaling



Display & HUD



Hyper-red LEDs



Industrial & Outdoor



Sensing illumination

AUT

I&M

CON



Sensors + ICs

~1.0 bn€



In-Cabin Sensing



Medical imaging
(e.g. CT Sensors)



1D/2D/3D sensing



Flicker Detection



Camera enhancement
Spectral & Ambient Light
Sensing



Display Proximity Sensing

AUT

I&M

CON

Automotive & Specialty Lamps

~1.1 bn€



Classic halogen & Xenon lamps



LED replacement lamps



LED standard lamps



Semiconductors



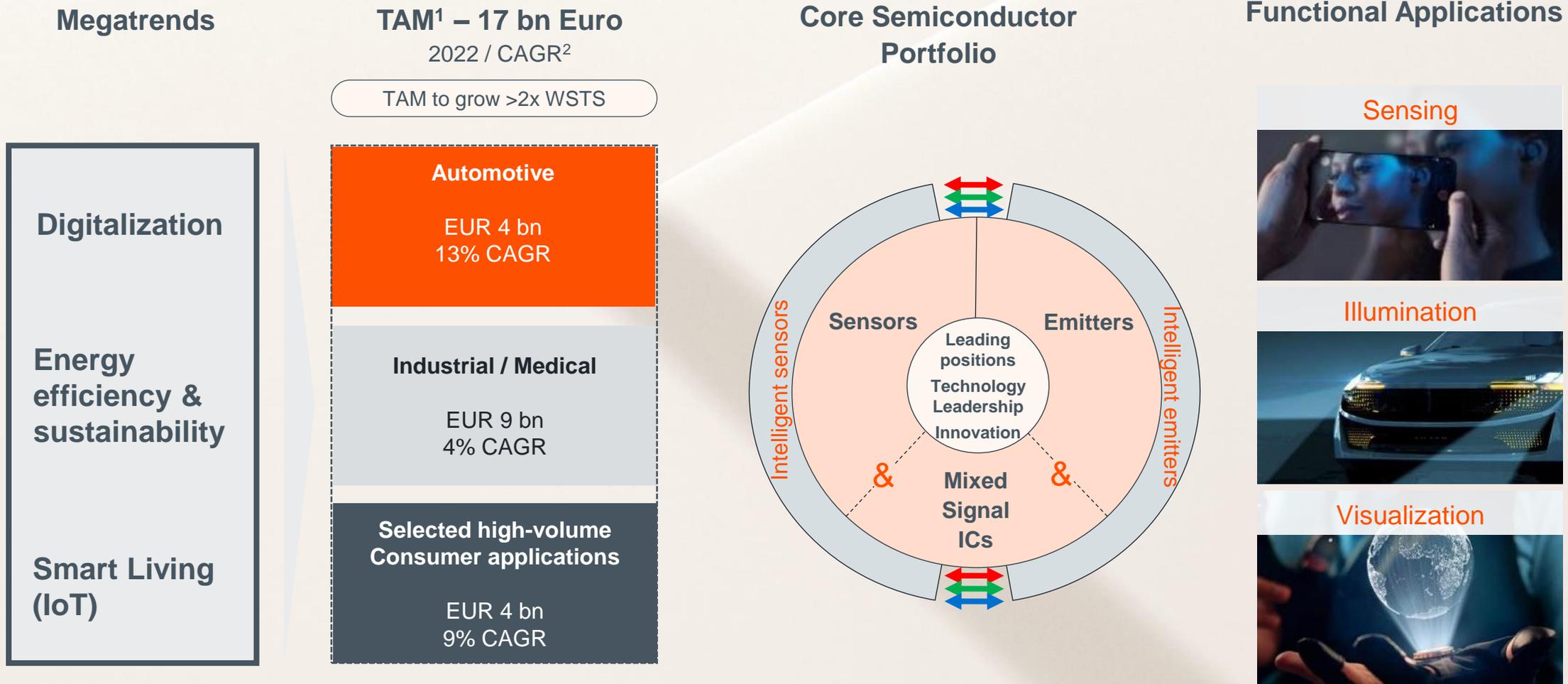
Cinema

AUT

I&M

Structural growth in semiconductor core portfolio is driven by mega-trends and leading market positions

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



¹ ams OSRAM market model due to lack of suitable external market models

² 2022 – 2026 CAGR due to 2022 was last full year actuals, and cyclical dip in 2023

=> No dedicated 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 2023(E) market share
(Total market USD ~11bn; TrendForce)

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



#1 in Light Sensors

Light Sensor Suppliers by 2022 market share
(Total market USD ~1.1bn; OMDIA)

1.	ams OSRAM	29.2%
2.	STMicroelectronics	28.5%
3.	Sensortek (Sitronix)	8.3%
4.	ADI (includes Maxim).	5%
5.	Capella/Vishay	3.5%



#1 in traditional Auto lamps/bulbs

Bulb Suppliers by 2023 market shares
(Total market USD ~1.4bn; own market model due to lack of external research)

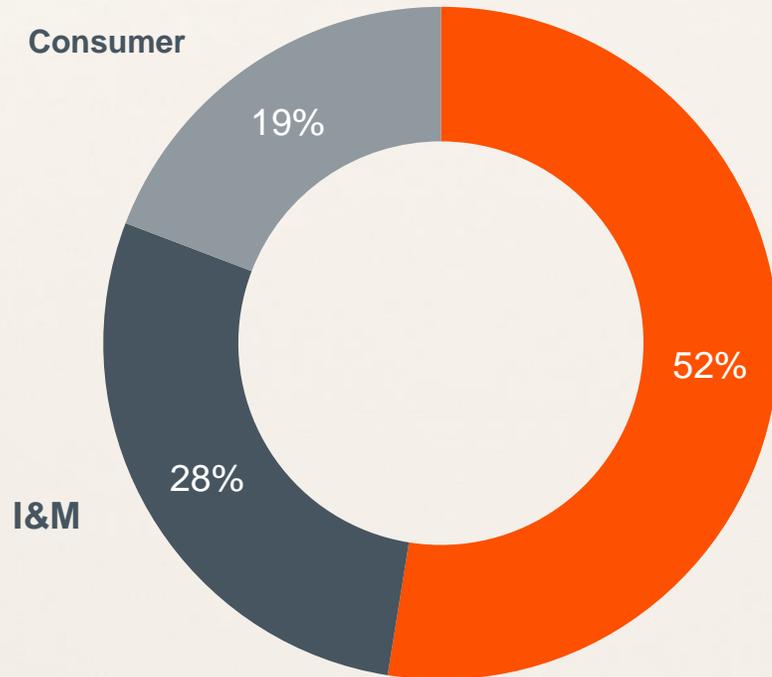
1.	ams OSRAM
2.	Lumileds
3.	Others (incl. Asian suppliers)



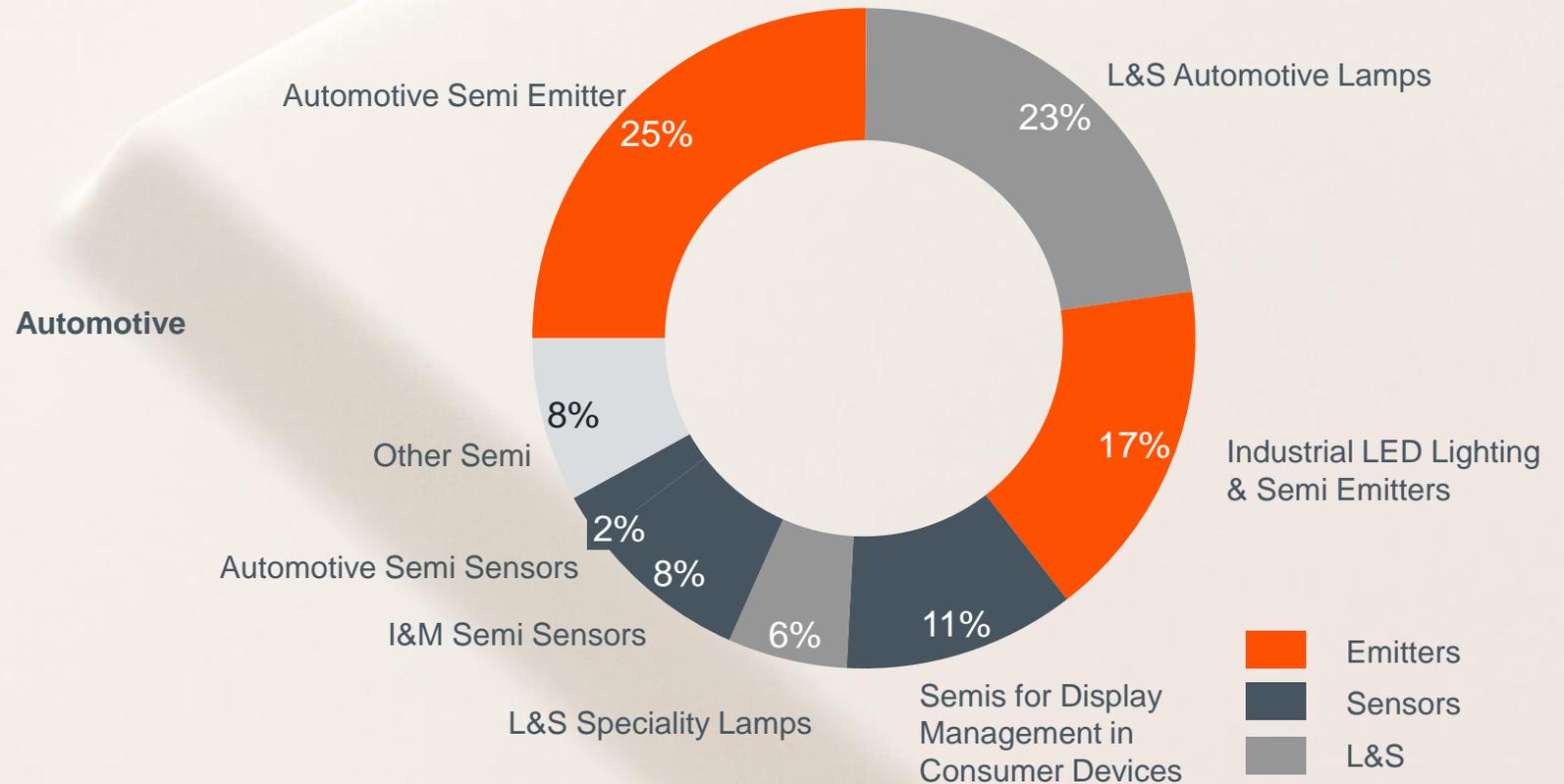
Very broad based and diversified revenue streams

Strong exposure to structural growth markets in automotive, industrial, medical and selected consumer applications

End market split
(FY 2023)



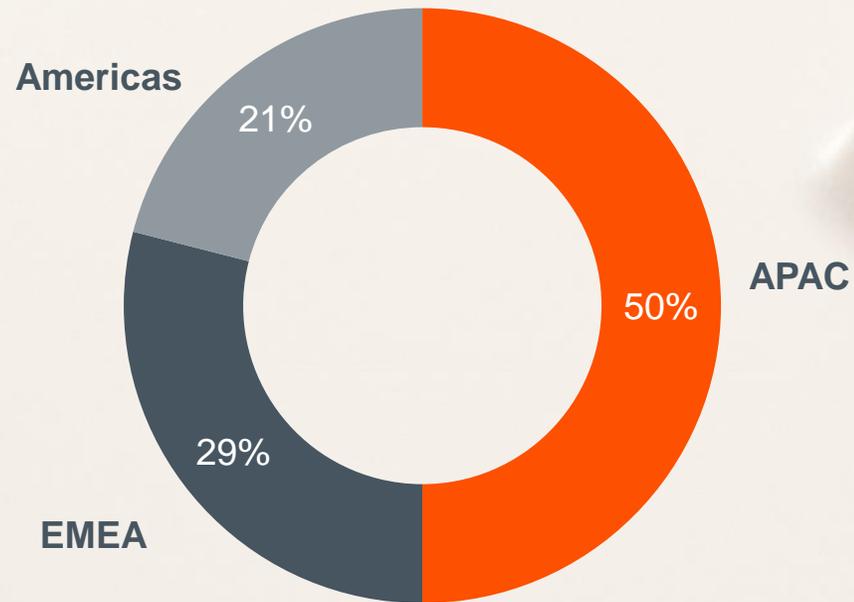
Application split (estimates)
(FY 2022/23, core portfolio*)



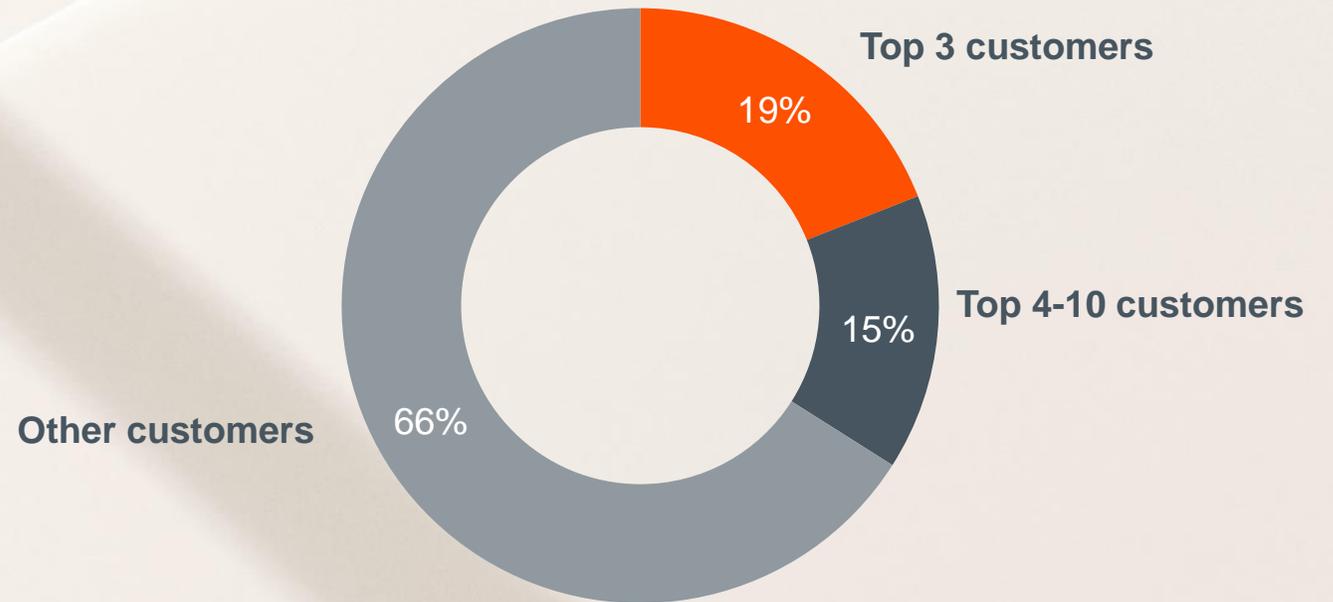
Benefitting from globally balanced revenue base and healthy customer split

Strong regional presence and very balanced customer portfolio

Revenues by region (FY 2023)



Top customers split (FY 2023)



Total: more than 10k customers

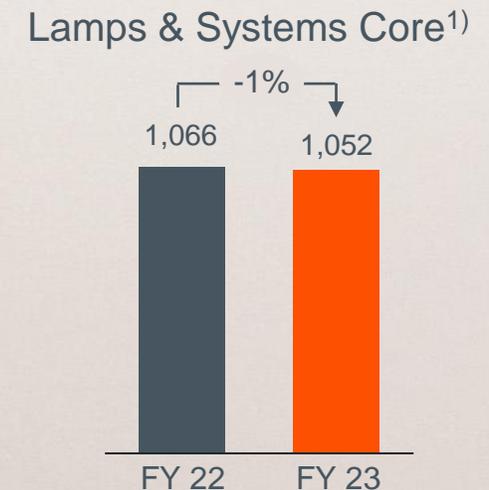
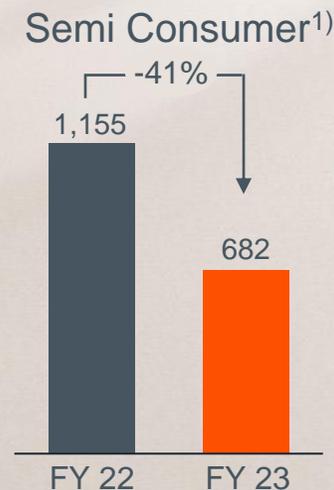
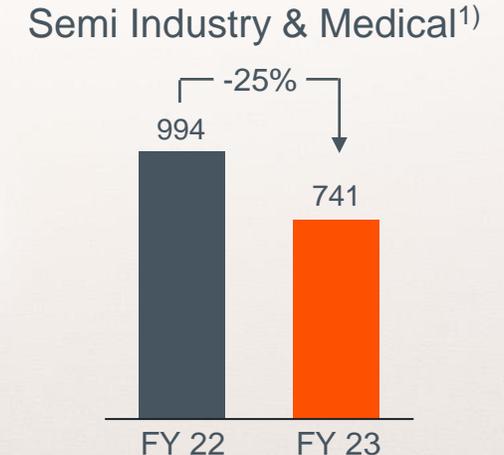
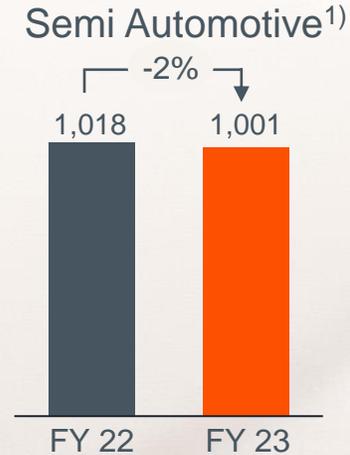
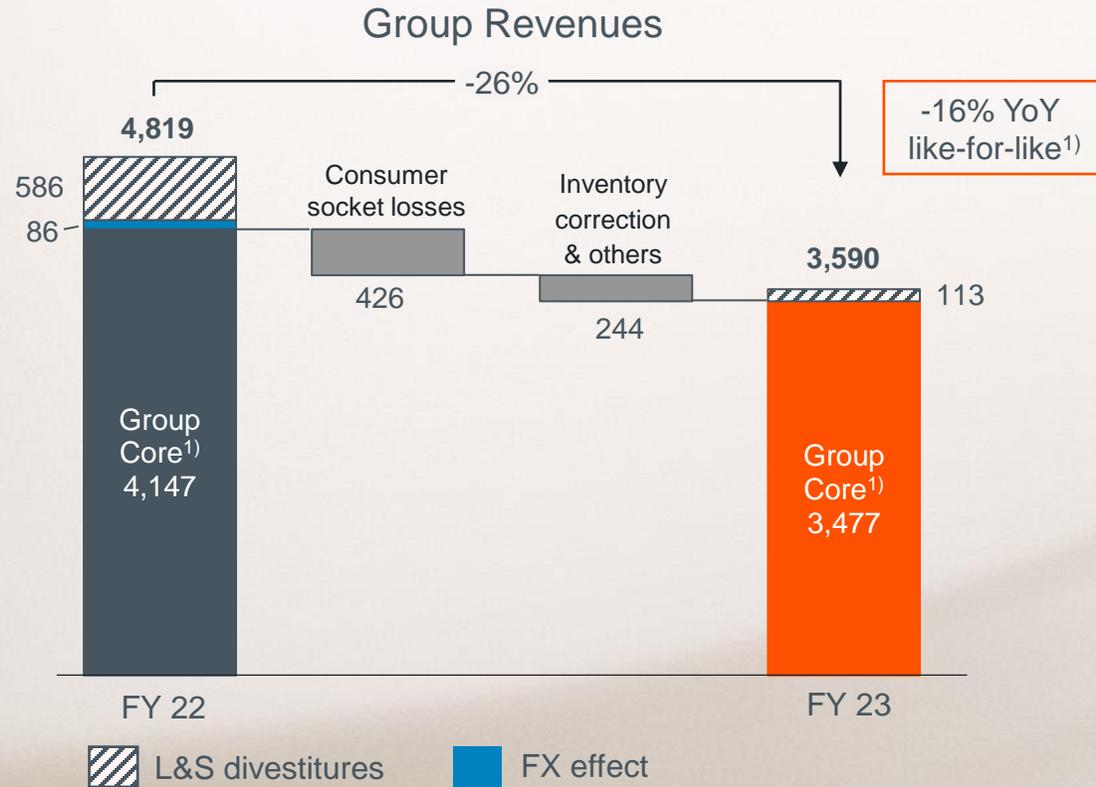
Our customers are innovation leaders in their field

Global companies who set the benchmark for innovation



FY23 – like-for-like revenue decline mainly due to known consumer socket losses

Portfolio divestitures, inventory correction and phase out of specific consumer programs drove revenue decline



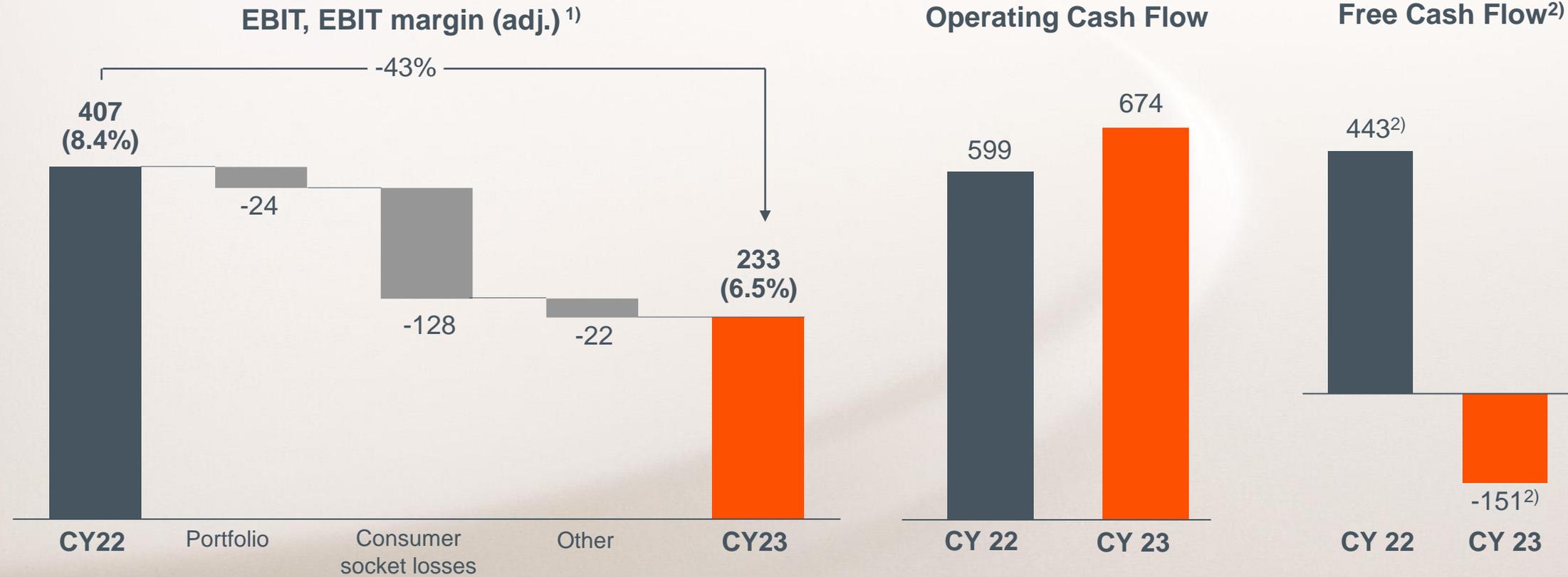
Main developments:

- L&S: portfolio divestitures (EUR ~586m total since FY22)
- Semi: stabilized automotive business, ongoing inventory correction in industrial/medical and phase-out of major programs in consumer

¹⁾ Excluding L&S portfolio divestitures, including FX effect

FY23 – adj. EBIT reduction essentially driven by known consumer socket losses

Adjusted EBIT and Free Cash Flow



Main developments:

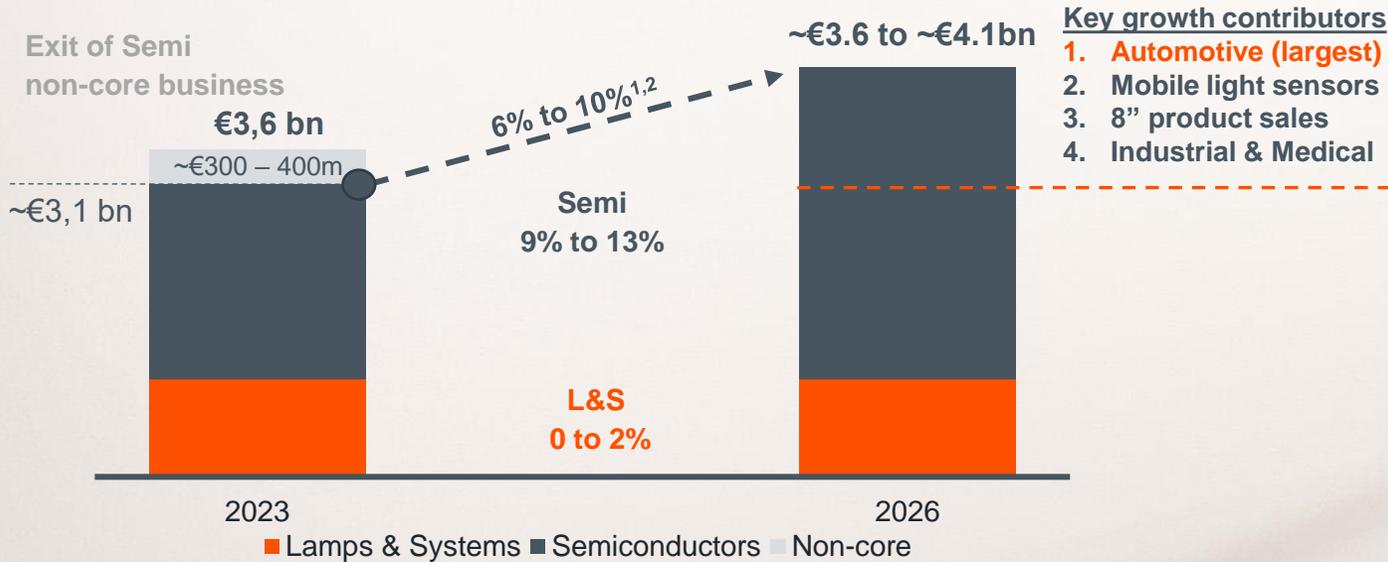
- Drop in adjusted EBIT driven by underutilization cost in the semiconductor businesses for non-core consumer products, inventory corrections for products in industrial and automotive applications, and by high R&D spendings for microLED technology
- Significant improvement of operating cash flow
- Strong decline in FCF mainly driven by extraordinary investment into the 8-inch based microLED technology for next generation of displays

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

2) FCF including divestments, excl. interest

FY2023: mid-term target growth model, strong design-win base & 're-establish-base' drive structural growth & adj. EBIT improvement until 2026+ for turn-around

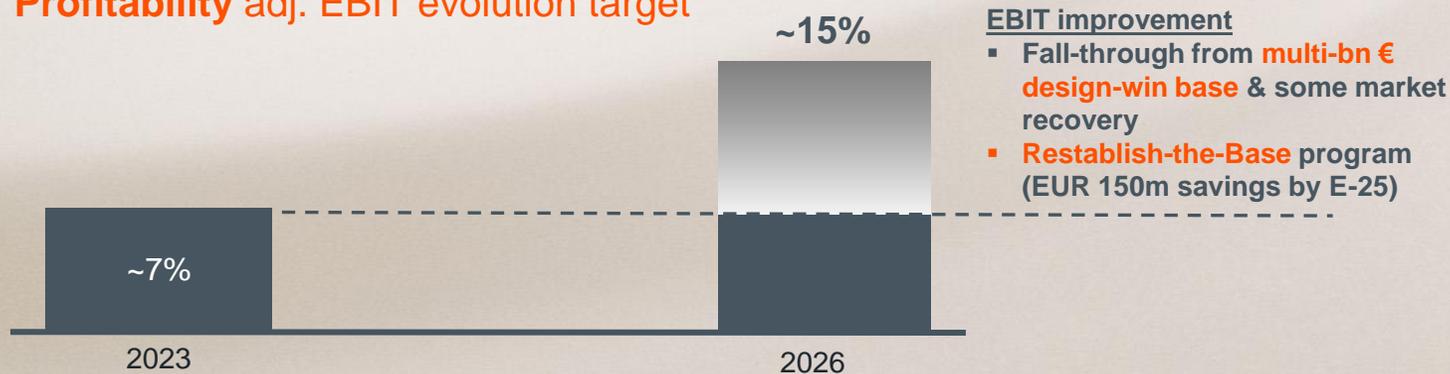
Portfolio re-adjustment revenue target



Over-the-cycle mid-term targets

Revenues
6 - 10% CAGR ¹
Adjusted EBIT Margin
~15%
CAPEX
~10% of Sales ³
Free Cash Flow ⁴
Positive <u>after</u> interest payment
Leverage
Net Debt / (adj.) EBITDA < 2x

Profitability adj. EBIT evolution target



Notes:

1. Driven from new base following disposal of "non-core" semiconductor assets
2. >2x WSTS opto-electronics F99 & sensors H99 = 3.1% CAGR '22 to '26 due to addressed segments
3. FY2024 still above 10%
4. FY2024: slightly positive, including proceeds from divestments, before interest payments

'Re-establish the Base' program

With Q2/23, the new management team announced a new strategy and an efficiency program 'Re-establish the Base'. It aims to strengthen profitability with targeted run-rate savings of EUR ~150m by end of 2025 and adj. EBIT margin target of ~15% in the mid-term



Set-up & Infrastructure

- *Make the company lean and efficient by having the appropriate size, infrastructure and agility*



Portfolio

- *Focus the semiconductor portfolio on the core of differentiated, intelligent sensor and emitter components with the highest profitability and the best growth perspective*
- *Expand leading positions in relevant Automotive, Industrial, Medical markets*
- *Continue to pursue specific opportunities in Consumer markets where we sustainably differentiate*
- *Exit non-core Semiconductor business with a 2023 revenue run-rate of EUR 300-400m*



Refinancing

- *Reduction of total debt & balanced maturity profile*
- *Strengthened balance sheet*
- *Completed in 2023*



Monetizing Innovation

- *Center mindset and accountability on "monetizing innovation" and overall profitability*
- *Invest selectively in disruptive innovation such as microLED technology*

FY 2023 – strong design-win traction underpinning structural growth model

Majority in automotive, industrial & medical and consumer very strong



Continued strong design-win traction – Q4 2023 examples

Winning new business across the board



LIDAR (Automotive)



Traditional Forward LED lighting
(Automotive)



Material treatment
(Industrial)



Laser projection
(Consumer)



dToF sensors
(Consumer)

LTV estimates*

>100 m€ to date

+100 m€ in Q4

~150m€ in FY23

*cumulated, estimated project life-time values

ams OSRAM - 'Outstanding Partner' award by BYD

The world's leading EV maker in 2023

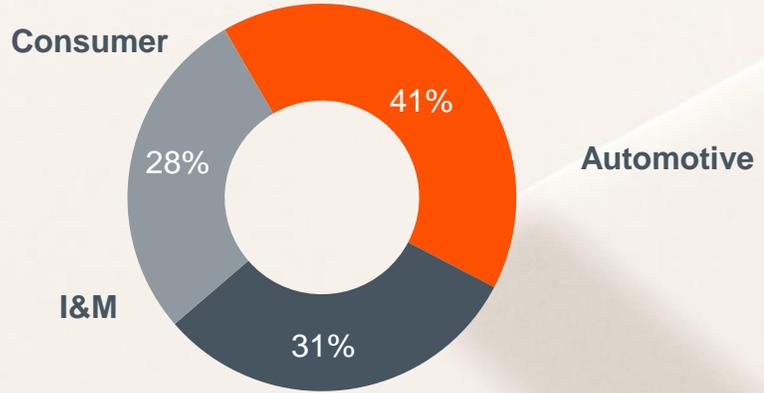


Balanced end market mix within segments

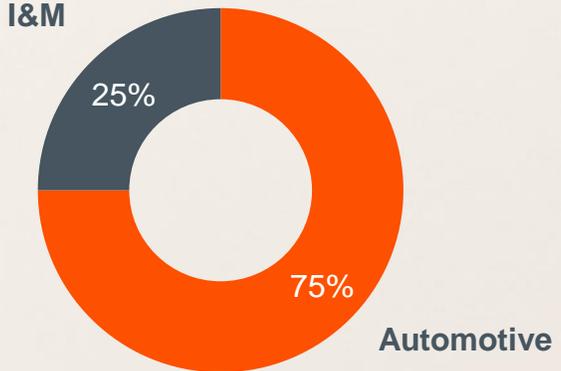
Revenue split FY2023 by segments

Semiconductors

(overall / technology split below)



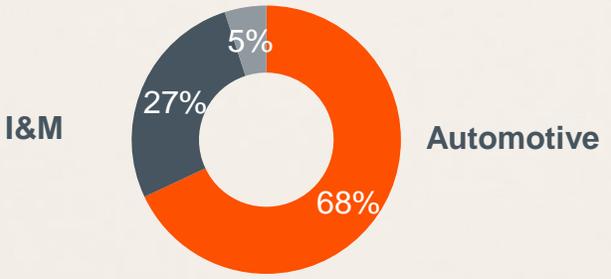
Lamps & Systems



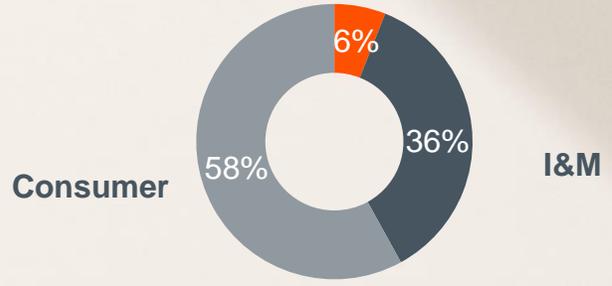
Emitters  ~57%

Sensors + ICs  ~43%

Consumer



Automotive



Overview of Q4 - financials

Figures in EUR million (for details refer to “Financial results in detail”)

EUR millions (except per share data)	Q4 2023	Q3 2023	QoQ	Q4 2022	YoY
Revenues	908	904	+0%	1,177	-23%
Gross margin adj. ¹⁾	28.7%	29.0%	-30 bps	28.5%	+20 bps
Results from operations (EBIT) adj. ¹⁾	62	71	-12%	86	-28%
EBIT margin adj. ¹⁾	6.9%	7.9%	-100 bps	7.3%	-40 bps
Net result adj. ¹⁾	-16	29	-154%	29	-154%
Diluted EPS adj. ¹⁾	-0,03	0.11	-131%	0,11	-131%
Diluted EPS adj. (in CHF) ¹⁾²⁾	-0,03	0.10	-133%	0,11	-130%
Net Result (IFRS reported)	-82	-55	-49%	-147	+44%
Diluted EPS (IFRS reported)	-0,18	-0.21	+14%	-0,56	+68%
Operating Cash Flow	80	199	-60%	201	-60%
Cash Flow from CAPEX ³⁾	-222	-262	-15%	-233	-5%
Free Cash Flow ⁴⁾	-142	-63	-125%	-32	-349%
Net debt	1,312	2,269	-100%	1,717	-24%
Net debt (incl. SLB) ⁵⁾	1,696	2,269	-25%	1,717	-1%

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

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

³⁾ Cash flow from investments in property, plant, and equipment and intangibles (such as capitalized R&D)

⁴⁾ Free Cash Flow is defined as Operating Cash Flow minus CAPEX

⁵⁾ Incl. EUR 384m equivalent from SLB Malaysia transaction closed in December 2023

Overview of FY23 - financials

Figures in EUR million (for details refer to “Financial results in detail”)

EUR millions (except per share data)	2023	2022	YoY
Revenues	3,590	4,819	-25%
Gross margin adj. ¹⁾	28.7%	30.5%	-180bps
Results from operations (EBIT) adj. ¹⁾	233	407	-43%
EBIT margin adj. ¹⁾	6.5%	8.4%	-190bps
Net result adj. ¹⁾	50	124	-59%
Diluted EPS adj. ¹⁾	0,16	0,47	-66%
Diluted EPS adj. (in CHF) ¹⁾²⁾	0,15	0,47	-68%
Net Result (IFRS reported)	-1,613	-444	-263%
Diluted EPS (IFRS reported)	-5,20	-1.70	-206%
Operating Cash Flow	674	599	+13%
Cash Flow from CAPEX ³⁾	-1,049	-537	-95%
Free Cash Flow ⁴⁾	-375	62	-705%
Net debt	1,312	1,717	-24%
Net debt (incl. SLB) ⁵⁾	1,696	1,717	-1%

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

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

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

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

Outlook next 12 months		Long-term outlook	
Macro sentiment	<ul style="list-style-type: none"> – Dec Eurozone PMI still weak in contraction while US PMI bouncing up and down slightly below 50 level. China slightly above 50. – GDP consensus expectations 2024 weaker in Eurozone (0.6%), China unchanged (4.5%), US higher (1.3%). – 2024 semiconductor forecast w/o memory slightly higher at 6.5% y-o-y. 	<ul style="list-style-type: none"> – GDP consensus forecast shows moderately improving growth in Eurozone (1.4%) and US (1.7%). – China consensus growth is expected to fall below 2024 level (4.3%). 	 
Automotive sentiment	<ul style="list-style-type: none"> – Light vehicle production is on pre-pandemic level with 89.6m units for the full year, -0.5% below 2023 as a result of the relative production strength esp. in H2/2023 – 2024 is seen as a transitional year towards a more demand-driven model with H1 production volume expected to grow +1.4% y-o-y, and H2 production volume -2.3% y-o-y / +2.8% over H1 sequentially 	<ul style="list-style-type: none"> – Light vehicle production expected to grow with +2.1% y-o-y in 2025 to 91.5m and +1.8% y-o-y in 2026 to 93.2m units. – Growth in EVs softens but still expected to reach >30% of global production within the next 3 years, that usually also have come with additional emitter & sensor enabled innovations 	
Consumer sentiment	<ul style="list-style-type: none"> – Global smartphone forecast 2023/24 increased to 1,171m / 1,179m units implying -0,3% / +1.8% growth. – Initial signs of rebound seen in 4Q24, however global smartphone shipments in 2023 remain lower than 2022. – Wearable forecast 2023 slightly increased to 543 / 570m units implying +6,4% / +4.7% growth y-o-y. 	<ul style="list-style-type: none"> – Global smartphone forecast 2025 shows growth increasing to 2.8% y-o-y to 1,212m units. – Wearable forecast shows 4.3% y-o-y growth in 2025 to 596m units. – MicroLED display shipments expected to increase to 50m units in 2030 	
Industry & Medical sentiment	<ul style="list-style-type: none"> – Further deterioration of end market expected; follows a similar correction pattern like Consumer in 2023 – German production of engineering products to decline -4% y-o-y in 2024 – Global LED lighting market growth expectation downward adjusted. 	<ul style="list-style-type: none"> – Global market for high power laser units to grow at +14% CAGR by 2030 – Worldwide projector market to increase annually by +10% over next 3 years 	 

Business outlook

Q1 2024 Guidance

2024 comments

- Revenue 800 m€ - 900 m€
- Adj. EBIT 4% - 7%

- Based on assumption
EUR/USD 1.08

- Divesting/exiting non-core semiconductor portfolio (2023 run-rate: 300 to 400 m€)
- H1/24 with continued macro weakness, H2/24 improving (ramp of design-wins and expected market recovery)
- ~75 m€ savings run-rate at year-end from 'Re-establish-the-Base' program
- Some cost headwinds e.g. personnel cost, 8" ramp-up cost
- CAPEX in PPE of slightly above 500 m€ (incl. ~50m delayed PPE from 2023)
- Accounts Payable roll-over from Q4/23 and cap. R&D, combined ~200m€
- FCF positive (including divestments proceeds, before interest payments)

Summary Q4 & FY23

Summary

Q4/23:

- Solid Q4 revenue and adj. EBIT performance above mid-point
- Strong Design-Win traction continuing
- Implementation of Re-establish-the-Base program well on track

FY/23:

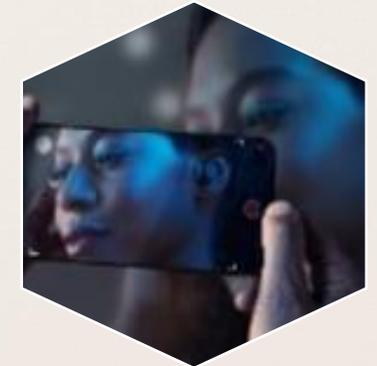
- Strategic re-alignment & revised mid-term financial model
- Re-financing completed ahead of schedule

Outlook Q1/24:

- Seasonal decline of revenue and adj. EBIT pronounced by inventory correction in industrial & medical

Comments FY/24:

- Executing 'Re-establish-the-Base' to benefit from structural growth



Chapter 2 – Structural Growth Driver

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 2023(E) market share
(Total market USD ~3.3bn; TrendForce)

1.	ams OSRAM	34%
2.	Nichia	25%
3.	Lumileds	10%
4.	Seoul Semiconductor	7%
5.	Samsung LED	7%
6.	Dominant	6%
7.	Stanley	4%
8.	Everlight	2%
9.	Jufei	1%
10.	Lextar	1%



#1 in Automotive Light Sensors

Auto Light Sensor suppliers by 2022 market share
(Total market USD ~71m; OMDIA)

1.	ams OSRAM	34%
2.	Elmos	22%
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

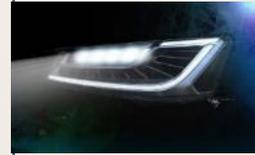


1st standard scalable LED forward lighting with BMW, VW

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



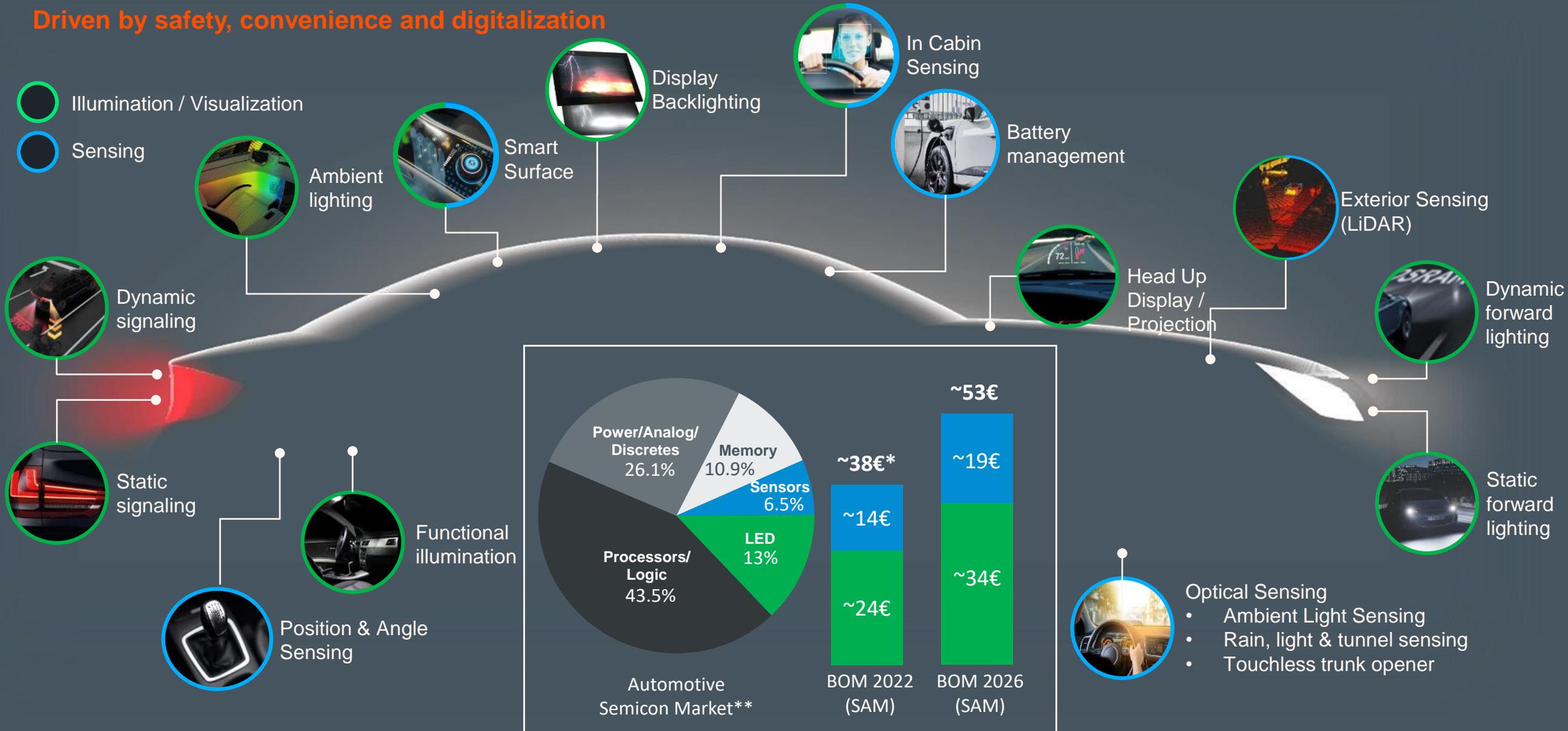
2020

1st 12V battery with high precision current aO sensor



ams OSRAM Automotive and Mobility

Driven by safety, convenience and digitalization



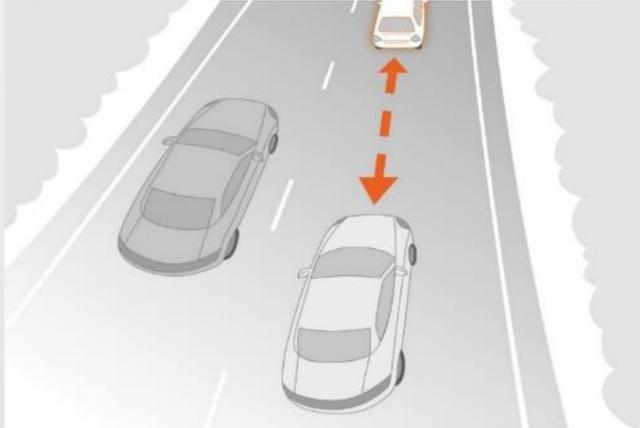
28 *premium cars >50€ already today

**Source: Yole Overview of the Semiconductor Devices Industry 2023

average € across all vehicle classes

ams OSRAM is at the forefront of developing the LiDAR automotive market

Several key design wins for EEL and for VCSEL demonstrating our leading position



Since 2000

>14 car models

ams OSRAM's 905nm laser used for laser based automated emergency braking systems

2023

>10 car models

L2 autonomous driving driven mainly out of APAC market

2025+

> 7 car models

L3 autonomous driving systems for global market & mobility as a service

>100 m€

5-year design-win volume to date

Key Trends:

- Autonomous driving
- Safety
- Traffic jam assistant
- Highway pilot emerging
- Mobility as a service

Pioneer Role and Proven Track Record:

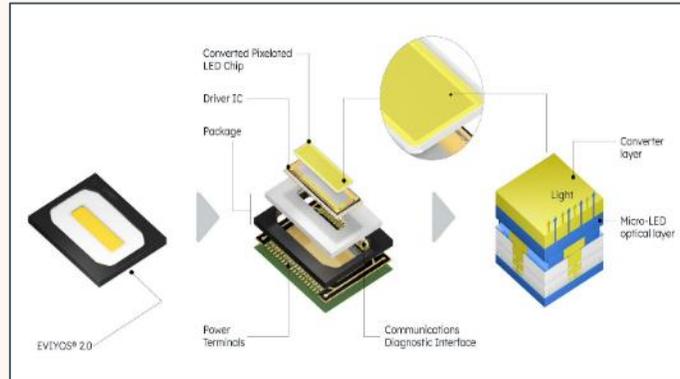
- > 20 Mio LiDAR lasers in the field without chip failures
- > 300 Bn kilometers covered in autonomous driving with OS lasers



Safe Mobility – high pixelated forward lighting (Eviyos)

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

Example applications



2023

1 OEM

2024

7 OEMs

2025+

>12 OEMs

>250 m€
Design-wins to date
over lifetime



Implemented in the new
VW Touareg (top version)

Image courtesy of Volkswagen AG

Car as a 3rd living room – Colored ambient lighting

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



2023
Market
introduction

2024
3 OEMs

2025+
> 8 OEMs

>100 m€
5-year design-win
volume to date

>240 m€
market potential
2028



Integrated RGB products:

- Dynamic Illumination with many LEDs
- High flexibility in function and system architecture
- ams OSRAM open system protocol

Safe & autonomous mobility – in-cabin sensing

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



Driver safety & assistance

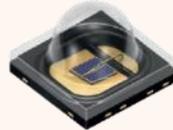


Cabin & Occupant safety

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€

LTV design-win volume to date

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>

Medical imaging – 4-side tileable sensor IC for computed tomography

Extending lifetime of ams OSRAM solutions at market leading medical customers



2022 – 2025+

annual revenue at
high single digit to high teens m€



4-side tileable Sensor IC :

- Stacked CMOS wafer and Photodiode wafer using TSV technology
- ams OSRAM proprietary technology

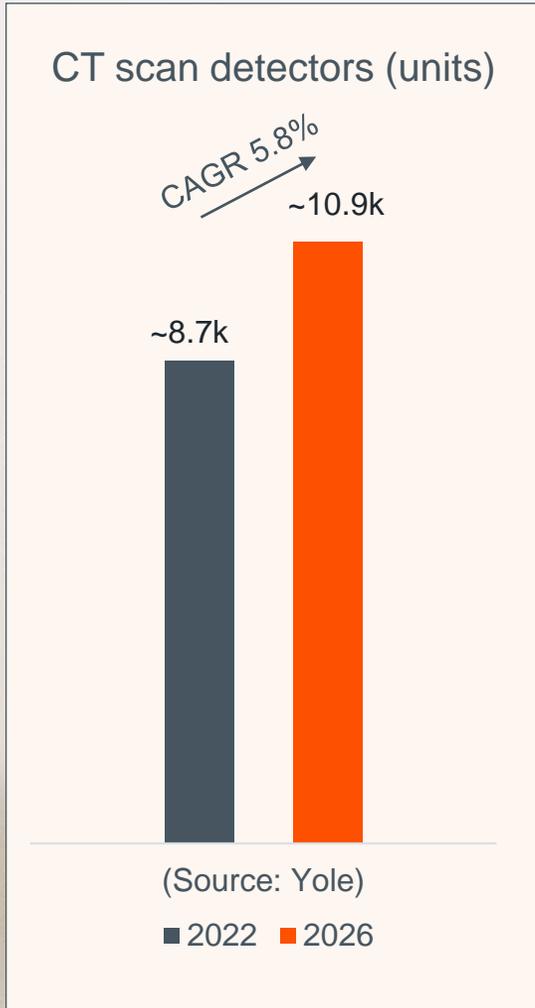


>50 m€

5-year design-win
volume to date

Example of leading position in niche – medical imaging CT scan sensors/ICs

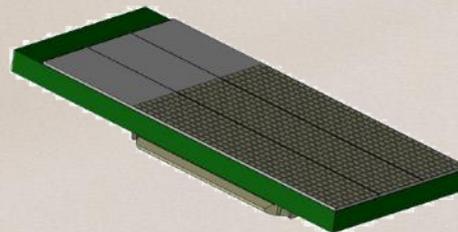
8 out of 10 OEMs employ ams OSRAM products – solid revenue growth 2x market growth projected



Top 10 CT Players ams OSRAM Customer Engagement

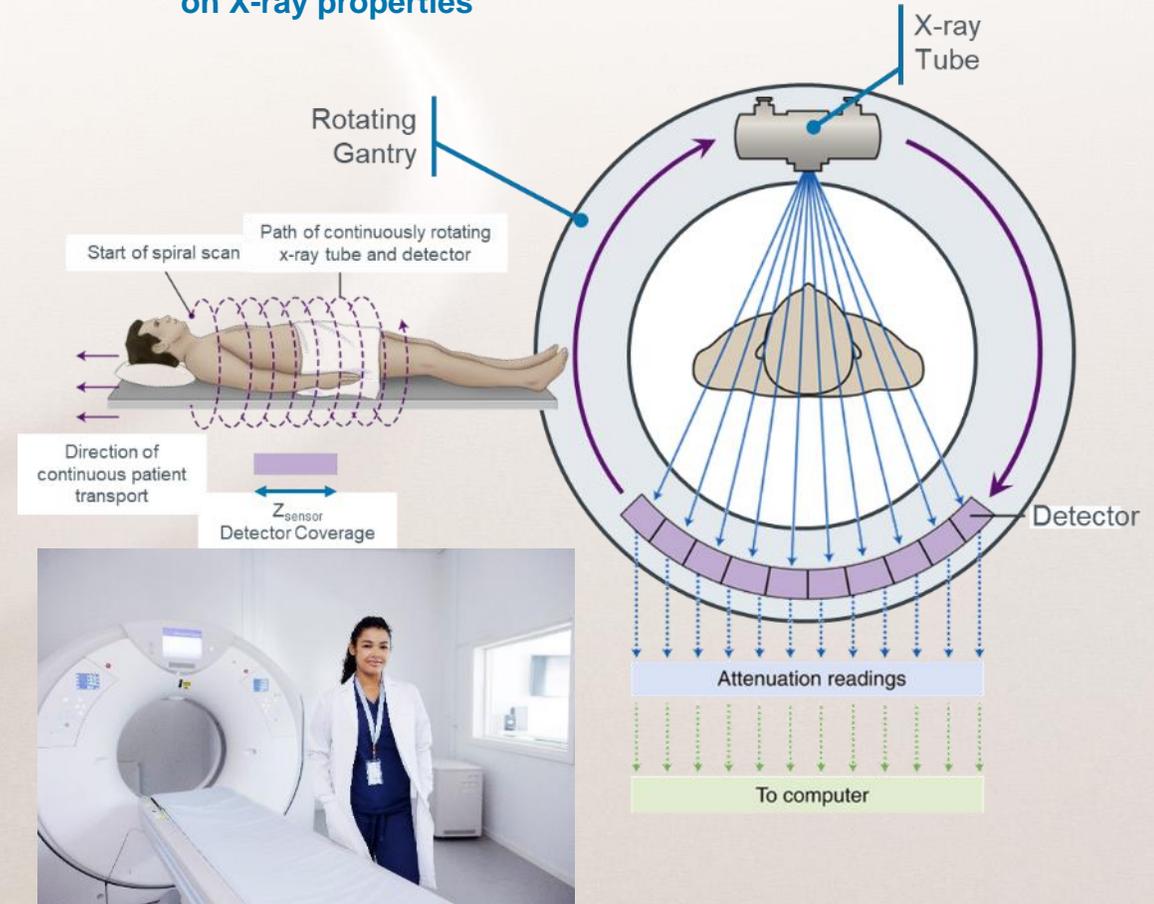
- #1 CT Player
- #2 CT Player
- #3 CT Player
- #4 CT Player
- #5 CT Player
- #6 CT Player
- #7 CT Player
- #8 CT Player
- #9 CT Player
- #10 CT Player

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 2022 market share (Total market USD ~800m; Omdia)

1.	STMicroelectronics	39%
2.	ams OSRAM	30%
3.	Sensortek	11%
4.	Lite-On	4%
5.	TXC	3%
6.	Broadcom	2%
7.	Elan	2%
8.	Sharp	2%
9.	Capella/Vishay	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 2022>>	% of smartphones with ams OSRAM content
1. Smartphone OEM 1	62%
2. Smartphone OEM 2	91%
3. Smartphone OEM 3	22%
4. Smartphone OEM 4	27%
5. Smartphone OEM 5	45%
6. Smartphone OEM 6	50%
7. Smartphone OEM 7	55%
8. Smartphone OEM 8	24%
9. Smartphone OEM 9	45%
10. Smartphone OEM 10	47%
TOTAL (all OEMs)	50%

- ams OSRAM is present in **50% of smartphones** shipped in 2022
- 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”*

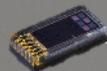
Camera Enhancement: Light, Color, Flicker & Range sensors



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/>

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

Extremely small microLED are required to enable disruptive mass adoption



→ Strongly increasing technological challenge →

Applications



Streetlighting



Videowall



Smartwatch



Smartphone



AR/VR microdisplay

Displays:



Direct backlight



Luxury TV



4k TV 8k TV

Automotive:



Headlamp



Rear light



External displays



Door display



Dashboard

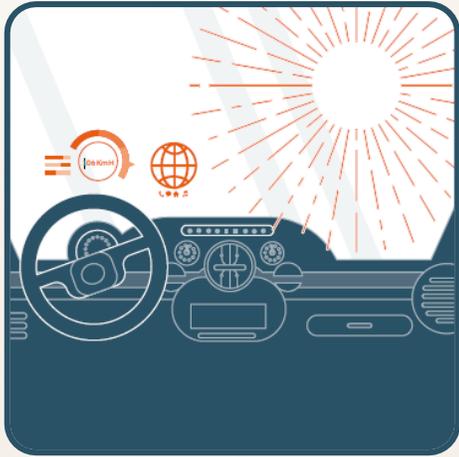
Older 'microLED' products are actually based on miniLED

microLED demo products shown

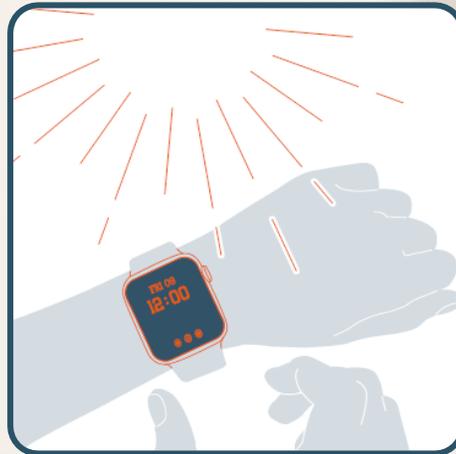
ams OSRAM microLED focus

Micro-LED displays promise a new and unique user experience

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



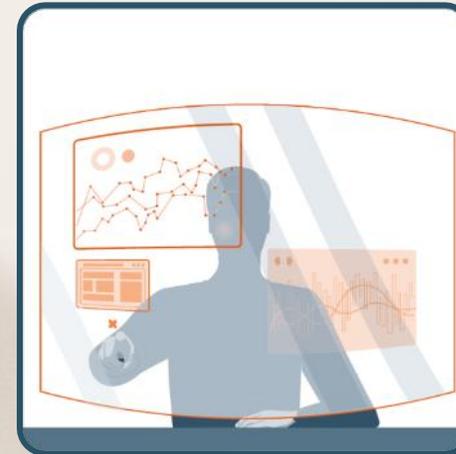
Highest brightness
(e.g. for head-up displays),
and robustness to temperature
and sunlight



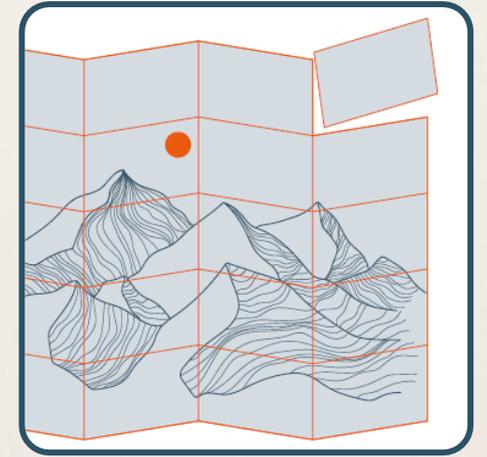
No burn-in even
for fixed image patterns
in bright sunlight



**Wide viewing
angles**



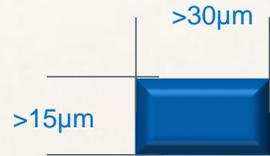
Transparent or
curved displays



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-inch 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:
Very small die sizes



1 wafer per color



25 to >80

4k displays

Acceptable LED cost for high-volume applications



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

~80%

~20%

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.

ams OSRAM is at the forefront of LED retrofits in automotive

Increasing potential of retrofit solutions for on-road and off-road applications



Key benefits of LED retrofit solutions:

- Easy upgrade to LED
- Earlier detection of signs and obstacles
- Optimized light distribution with reduced glare
- Stylish and modern look

2020	2022	2023	Way forward
<p>1st ever on-road¹ LED headlamp retrofit in Europe NIGHT BREAKER LED H7</p>  <p>NIGHT BREAKER LED H7</p>	<p>First leading player launching a “socket-design” solution for easier replacement</p>  <p>LEDriving HL EASY</p>	<p>Further expansion of on-road and off-road portfolio for headlights and signal lights</p>  <p>Product launches (selection): NIGHT BREAKER LED H1, W5W, H4 (motorcycle) LEDriving HL EASY H1, H3 HLT BRIGHT 24V in H1, H4, H7 (trucks)</p>	<p>Expand global leadership position in LEDr with our brands OSRAM and SYLVANIA</p>  <p>SYLVANIA OSRAM</p>



Exemplary

1) Approved LED light source - only applies to the respective countries in which there is approval or to which an equivalent approval applies, and the vehicle models and light functions currently listed in the compatibility list. For more details see www.osram.com/nb-led

Chapter 3 – Our Sustainability Commitments

ESG update: climate strategy, carbon neutrality goal, ESG committee

ams OSRAM group-wide ESG focus

ESG achievements

- Development and ongoing implementation of a comprehensive group climate strategy, aligning our actions with global climate goals.
- Annual sustainability reporting, demonstrating our commitment to transparency and accountability (GRI compliant)
- Comprehensive reporting of CO₂ emissions, including our own activities (Scope 1 + 2) and significant progress in reporting emissions along the value chain (Scope 3).
- ESG Committee, driving our sustainability efforts and ensuring focused decision-making.
- Sustainability Policy and internal Sustainability Guideline in place, guiding our actions towards a more sustainable future.
- All production sites exceeding a defined threshold are certified to ISO 14001.
- High rankings in ESG ratings.

ESG goal: Carbon neutrality by 2030

- Group to be carbon neutral (Scope 1+2) by 2030, endeavor towards net zero ambition
- 100% green electricity at production sites in Germany + Austria
- Started to self-generate electricity
 - First solar energy production 2022 at sites e.g. in Austria, China
 - Large-scale solar energy production planned for new 8" manufacturing facility in Malaysia
- Strategy based on principle "avoid, reduce, compensate", reduction path developed
- Reducing emissions via energy efficiency measures at several locations, plan established to compensate for inevitable CO₂ emissions



At ams OSRAM, we are highly committed to sustainability

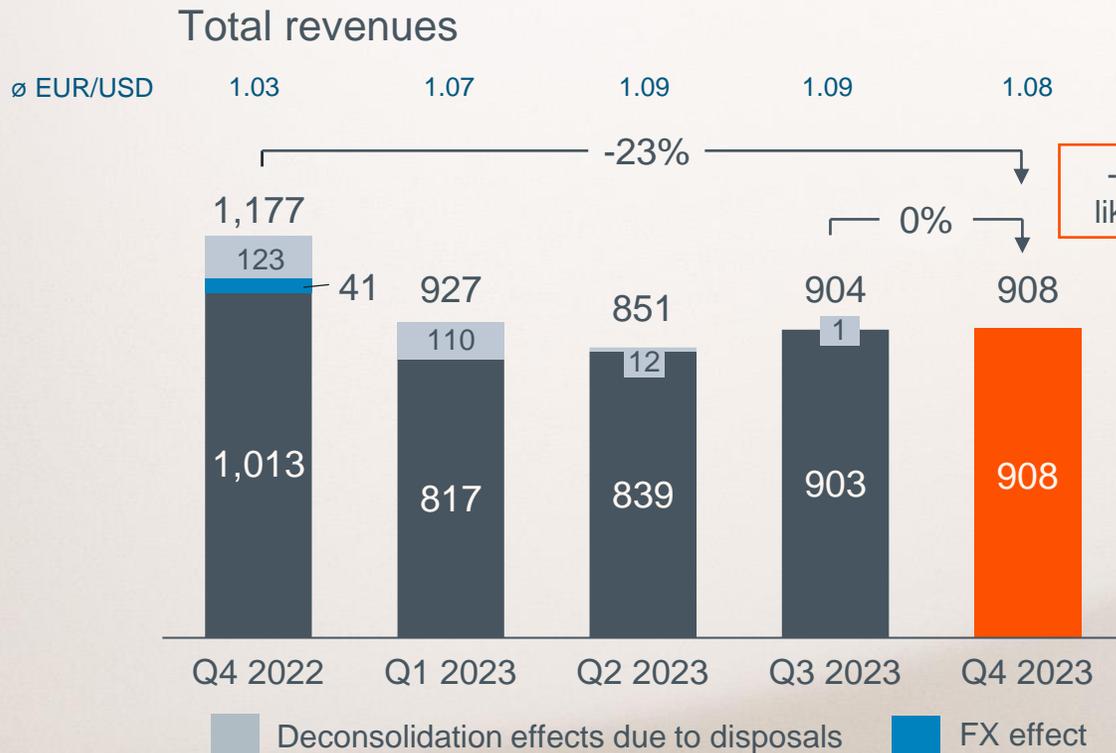
External recognitions confirm our engagement within ESG (actual status per rating)

INSTITUTION		RATING	COMMENT
 CDP		C B-	Climate Change Water Security
 ecovadis		Gold	Improvement from silver to gold
 SUSTAINALYTICS		21.0 66.1	ESG Risk Rating <i>low medium risk</i> , +30% “Strong” ESG Risk Management
 ISS		Score B-	improvement +25%, PRIME 
 MSCI		BBB	Average in managing the most significant ESG risks and opportunities
 S&P Global CSA		Score 67	Corporate Sustainability Assessment, positioning in 1 st Quartile

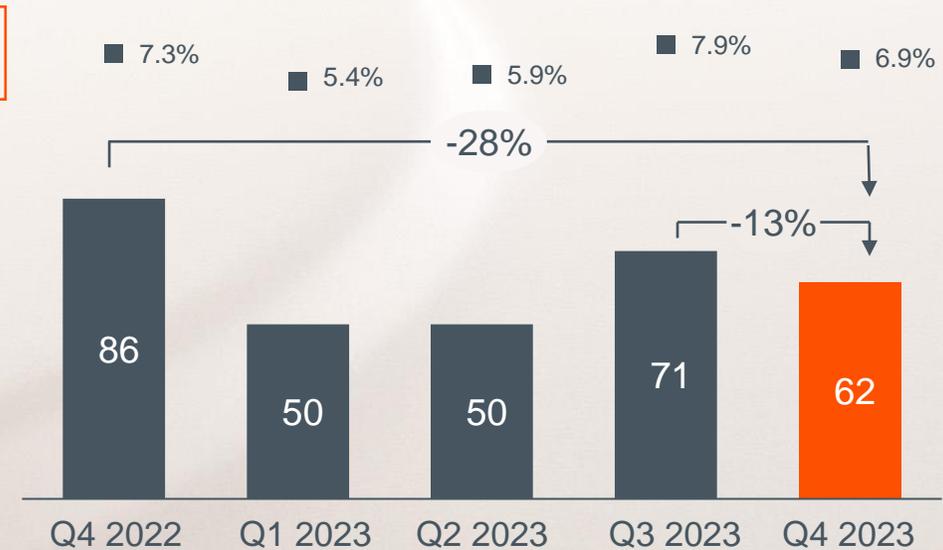
Chapter 4 – Selected Details of Financials

Group revenues and adjusted EBIT above mid-point of the guided range

All figures in EURm / % of revenues



EBIT, EBIT margin (adj.)²⁾



- Revenue slightly above mid-point of the guided range of EUR 850m to 950m
- YoY: Like-for-like decline mainly driven by ramp-down of previous high-runner mobile-phone components

- Adj. EBIT margin 6.9%, above mid-point of the guided range of 5% to 8%
- QoQ decline due to one-time positive effect in Q3

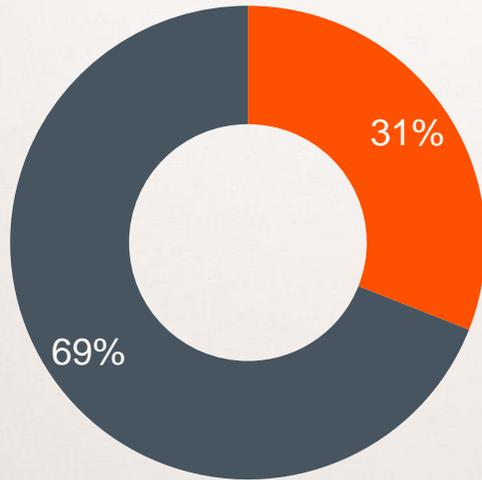
¹⁾ Based on like-for-like portfolio comparison basis and constant currencies

²⁾ Excluding M&A-related, transformation and share-based compensation costs as well as results from investments in associates and sale of businesses

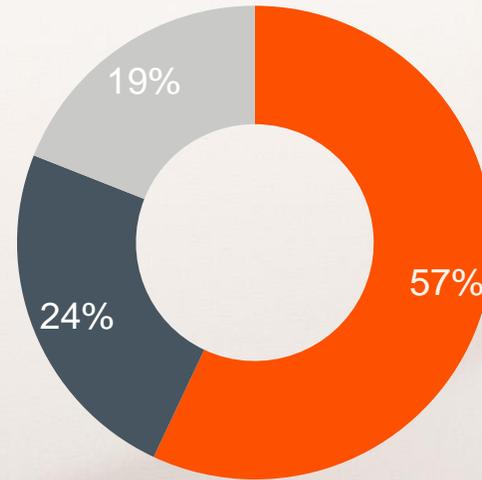
Automotive, industrial, medical represent ~80% of revenues

APAC most important sales region, semiconductor segment contributes ~70% of revenues

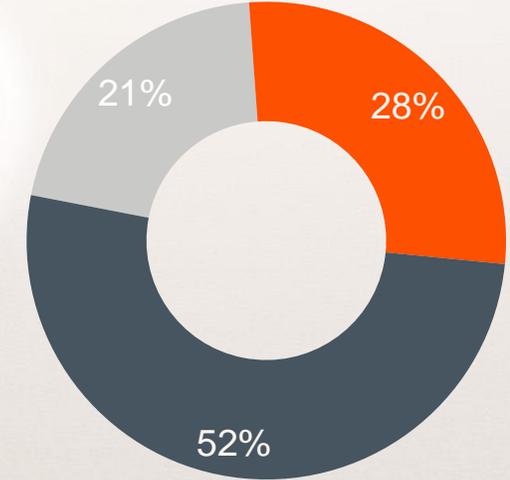
Revenues by segment (Q4 2023)



Revenues by end market (Q4 2023)



Revenues by region (H2 2023)

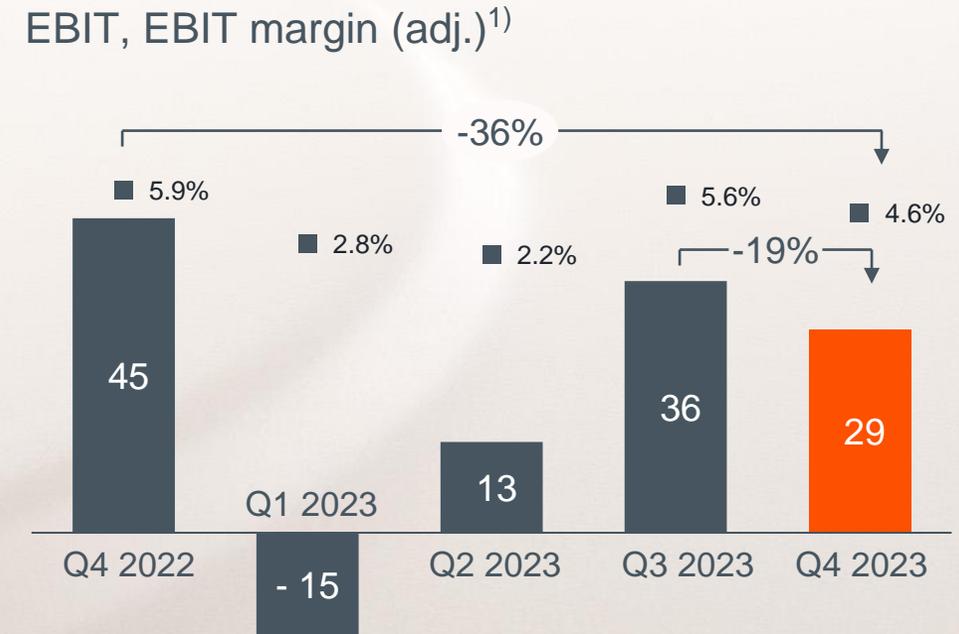
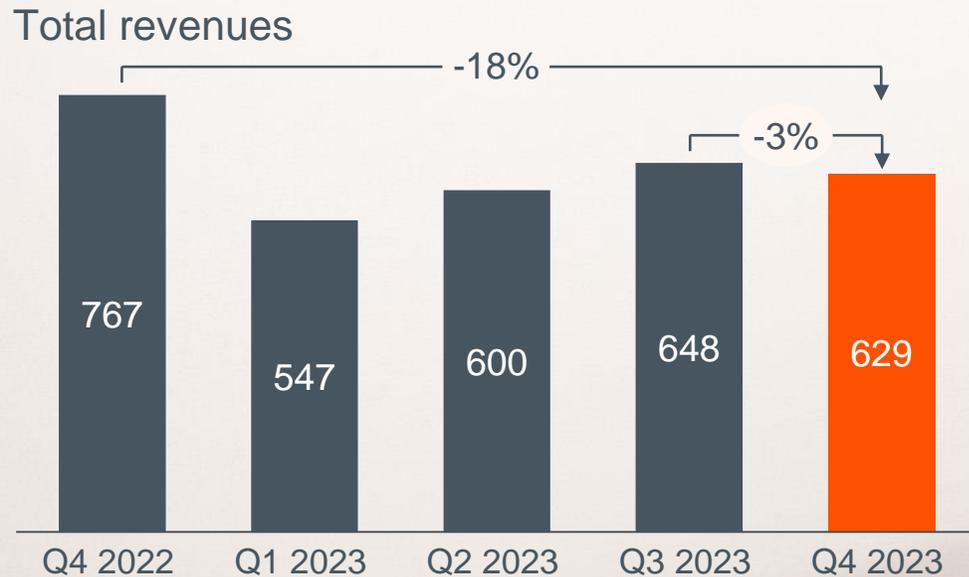


■ Semiconductors ■ Lamps & Systems ■ Automotive ■ Industrial & Medical ■ Consumer ■ Americas ■ EMEA ■ APAC

- Stable end market split as all end markets supported sequential growth
- Automotive: Stabilization, strong demand from China, improved inventory situation and more normalized order pattern
- Industrial & Medical: Stable q-o-q, mixed development overall, strong macro-economic pressure y-o-y
- Consumer: Seasonal upswing, y-o-y subdued also due to macro economic pressure

Semiconductors: decline driven by consumer and I&M, all-time-high in automotive

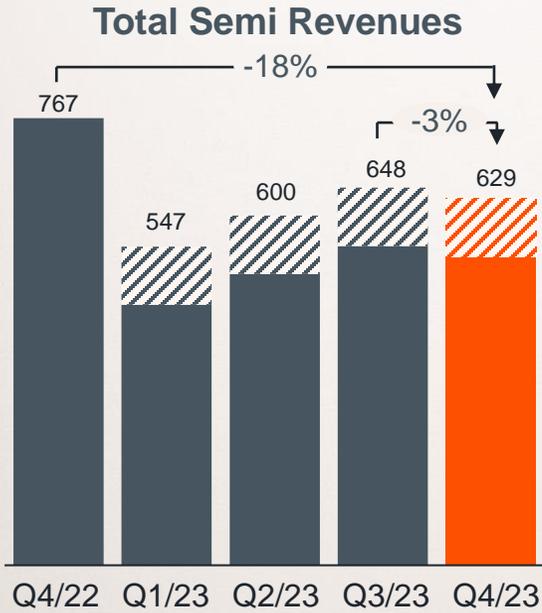
All figures in EURm / % of revenues



- Revenues/YoY: decline mainly driven by ramp down of previous high-runner custom products for mobile phones after socket losses and weakness in industrial markets
- Revenues/QoQ: decline driven by Consumer & I&M, whilst automotive increased to record level
- EBIT/YoY: decline due to lower run-rate causing high underutilization cost especially in Consumer related products
- EBIT/QoQ: decline due to positive one-time effect in Q3 (funding catch-up of ~10m€), like-for-like QoQ improvement

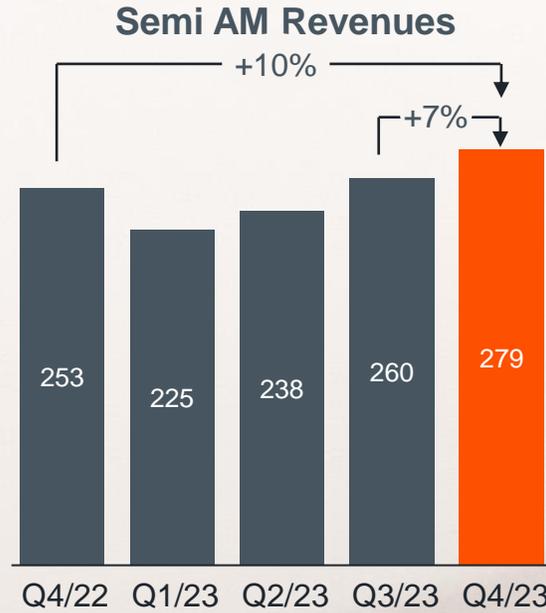
Semiconductors segment in Q4: auto strong, I&M and consumer weak

Semiconductors segment, Q4 development QoQ & YoY, figures in EURm



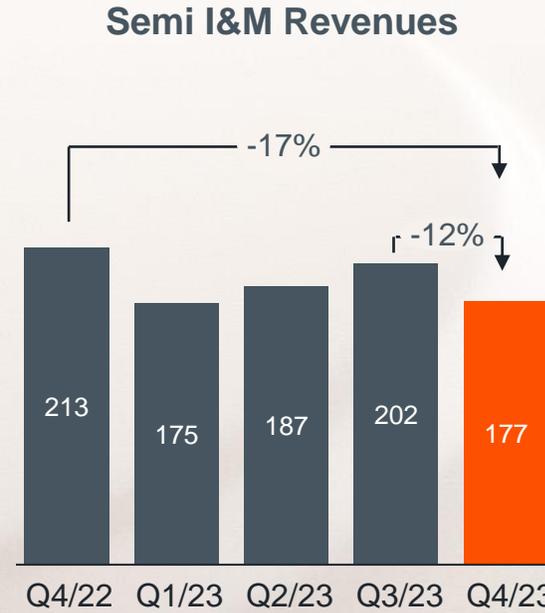
Total Semiconductors

- Non-core portfolio: ~100m per quarter



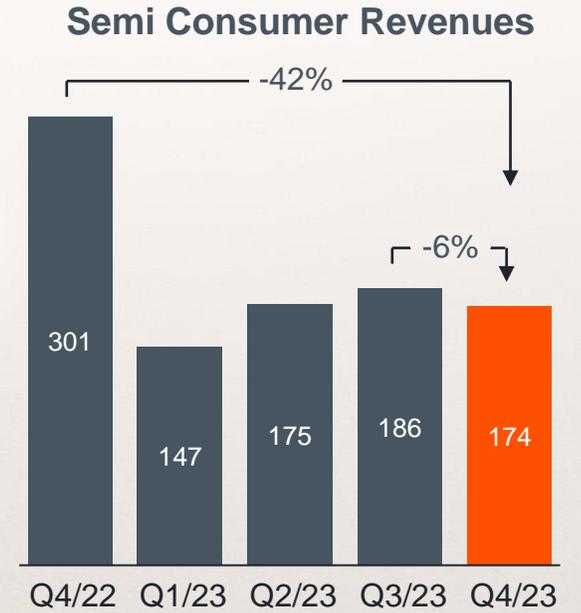
Automotive

- Highest ever automotive semiconductor revenue
- Strong demand from China
- YoY growth, driven by content growth in highly digitized platforms (e.g. EVs)



Industrial & Medical

- Sequential decrease due to macro economic pressure in all verticals
- YoY decline reflects overall weak macro economics in many areas, such as industrial lighting and horticulture, in line with LED market development



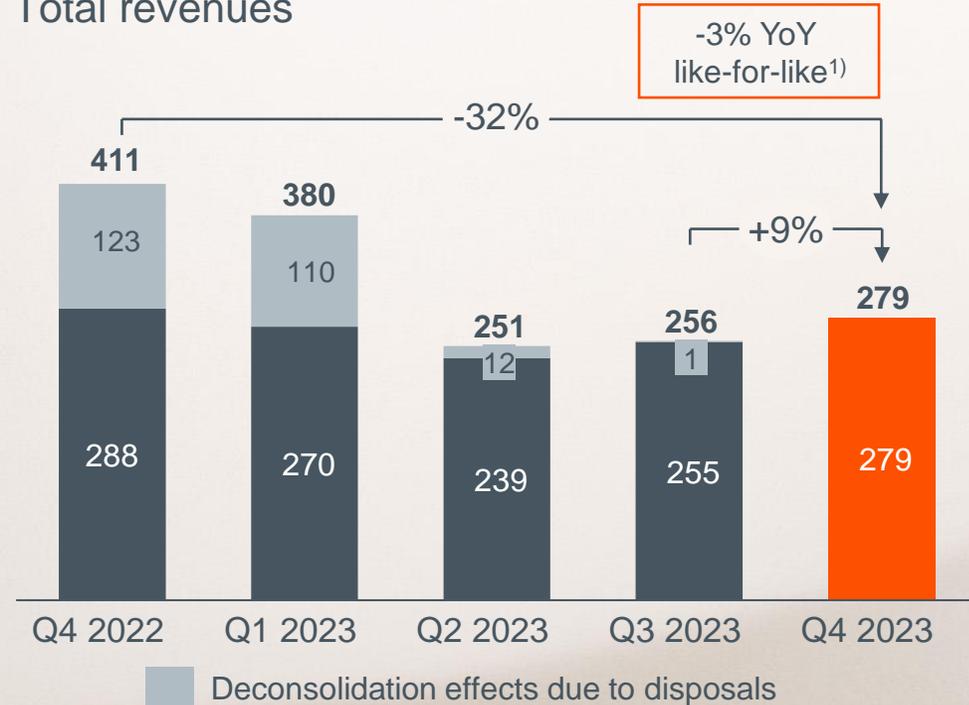
Consumer

- QoQ upswing in Android overshadowed by ramp-down due to design-loss in high-runner phone
- YoY reflects design-loss in high-runner phone, slowdown of Android market and weak macro economy

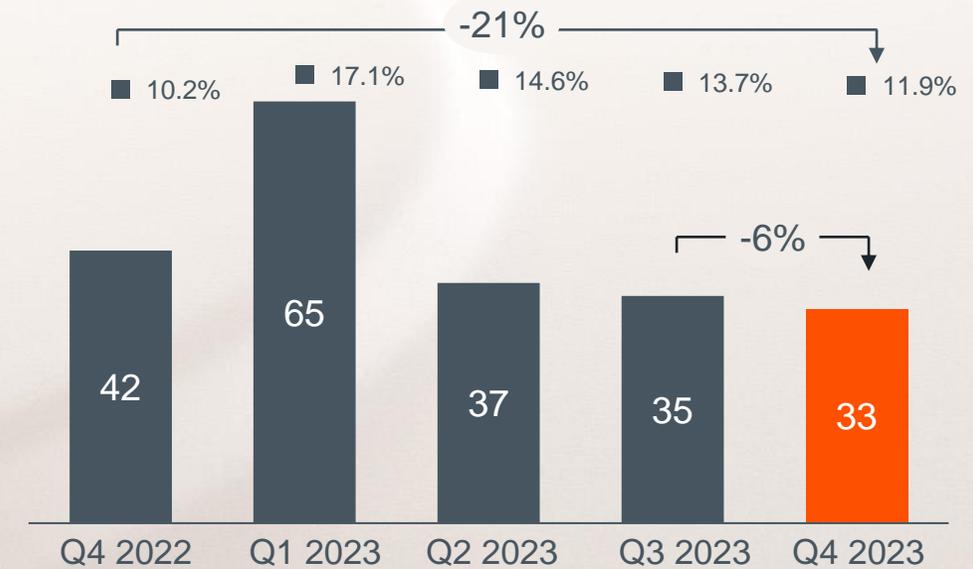
Lamps & Systems: seasonally strong Q4, continued weakness in industrial

All figures in EURm / % of revenues

Total revenues



EBIT, EBIT margin (adj.)²⁾



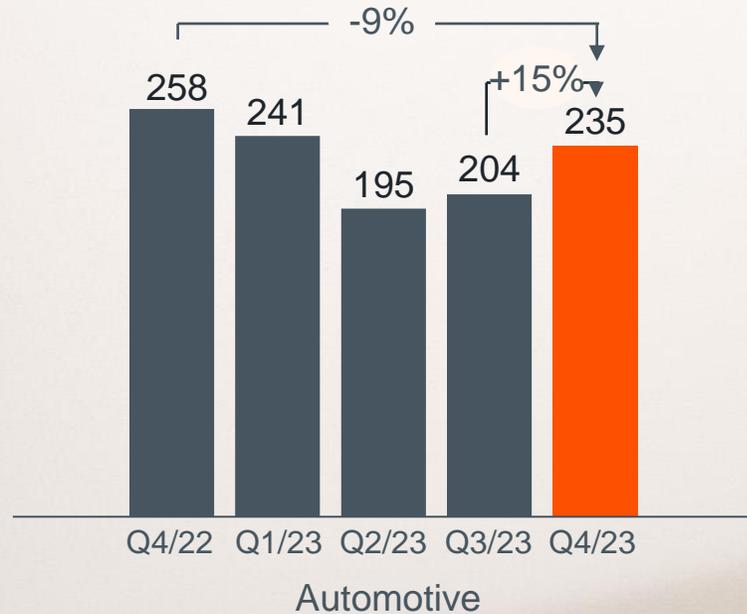
- Revenues/Q4: strong seasonal aftermarket business
- Revenues/YoY: like-for-like decline due to weakness in industrial lamps business
- EBIT/Q4: negative one-time effect due to raw-material value correction

¹⁾ Based on like-for-like portfolio comparison basis

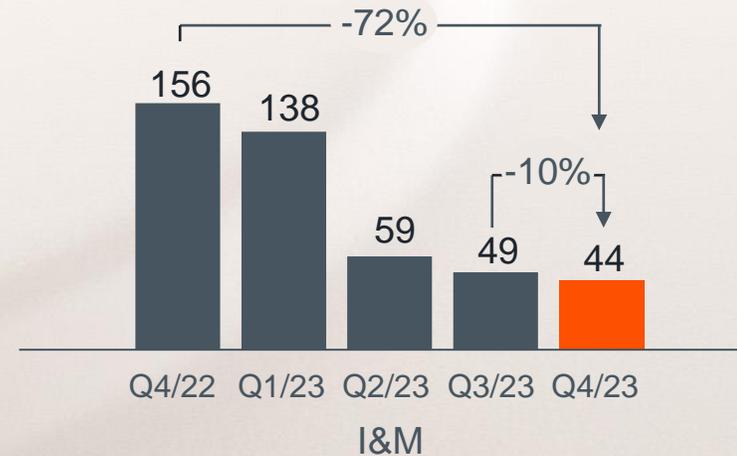
²⁾ Excluding M&A-related, transformation and share-based compensation costs as well as results from investments in associates and sale of businesses

Lamps & Systems: Seasonal effects in Q4, soft yoy development

Lamps & Systems segment: Q4 development QoQ & YoY, figures in EURm



- Strong QoQ in automotive mainly reflecting seasonality in aftermarket
- YoY impacted by negative effects from FX and portfolio (divestment of site Treviso)

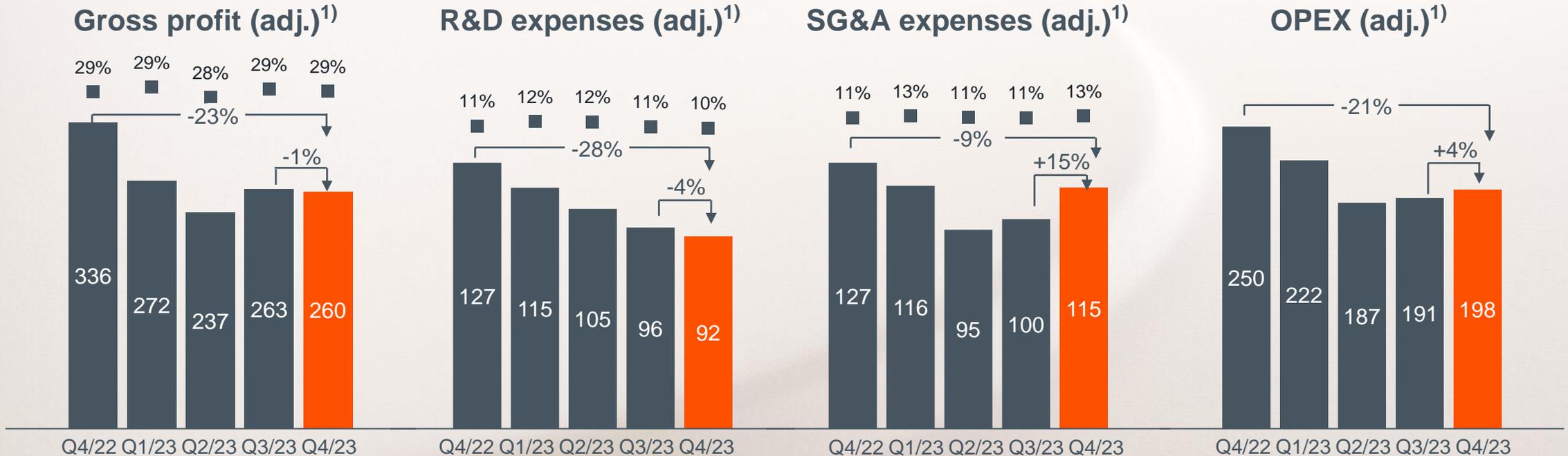


- I&M mainly impacted by softer demand for specialty lamps for semiconductor manufacturing

~123m
I&M YoY disposal effects

Group: Gross Profit and OPEX sequentially flat, R&D further down

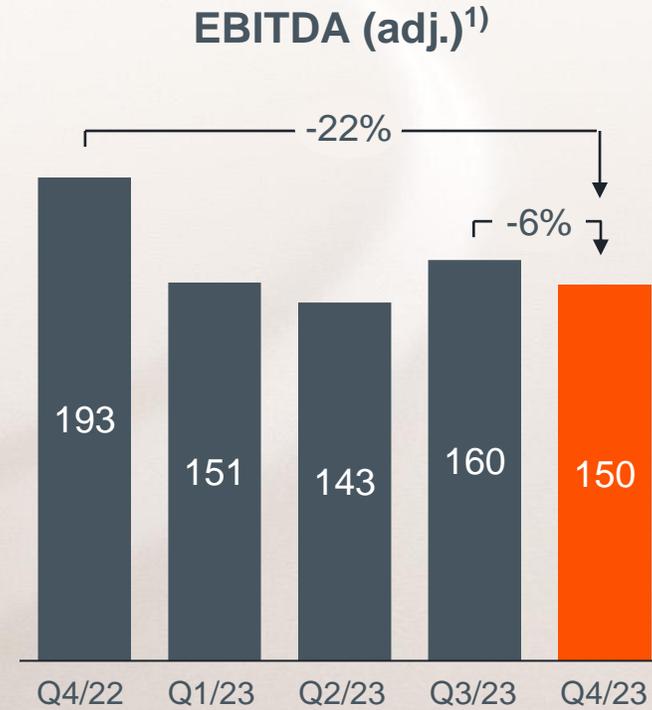
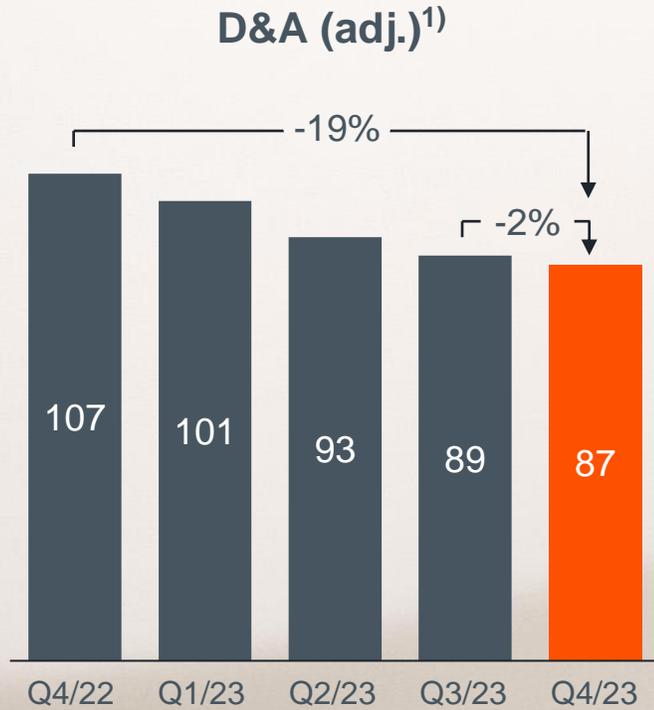
All figures in EURm / % of revenues



- Gross profit/QoQ flat, still impacted by underutilization effects mainly in consumer and industrial related manufacturing and a one-time raw material value correction in L&S
- R&D expenses QoQ decline reflects capitalization effect, besides continuous stream-lining and efficiency programs
- General sales overheads increased QoQ due to seasonal effects and bonus provisions. SG&A shows YoY a clear base-line reduction

Group adj. Depreciation & Amortization and adj. EBITDA

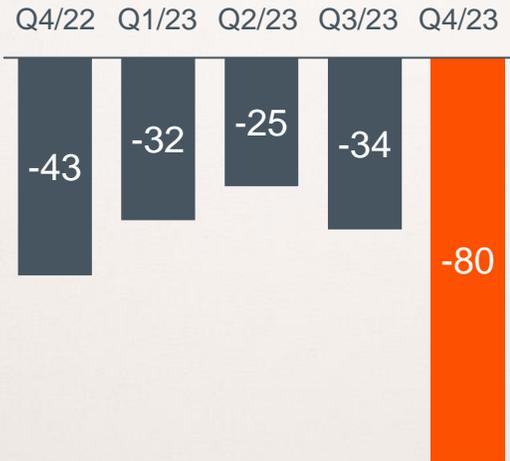
All figures in EURm



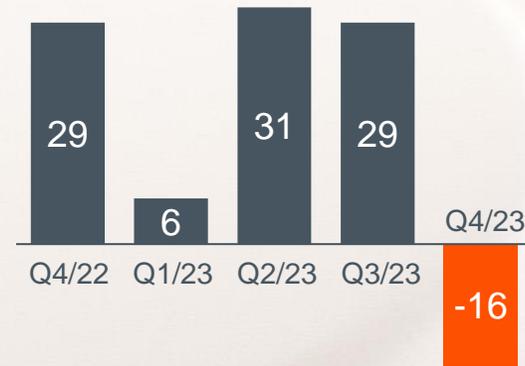
Adj. net result / Adj. EPS impacted by re-financing

All figures in EURm / EUR per share

Net financing result (adj.)¹⁾



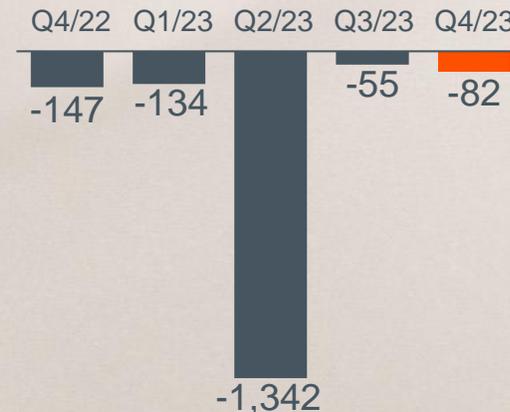
Net results (adj.)¹⁾



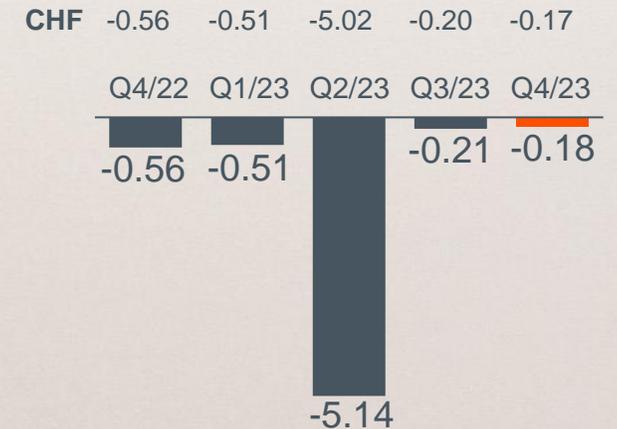
EPS diluted (adj.)¹⁾



Net results IFRS



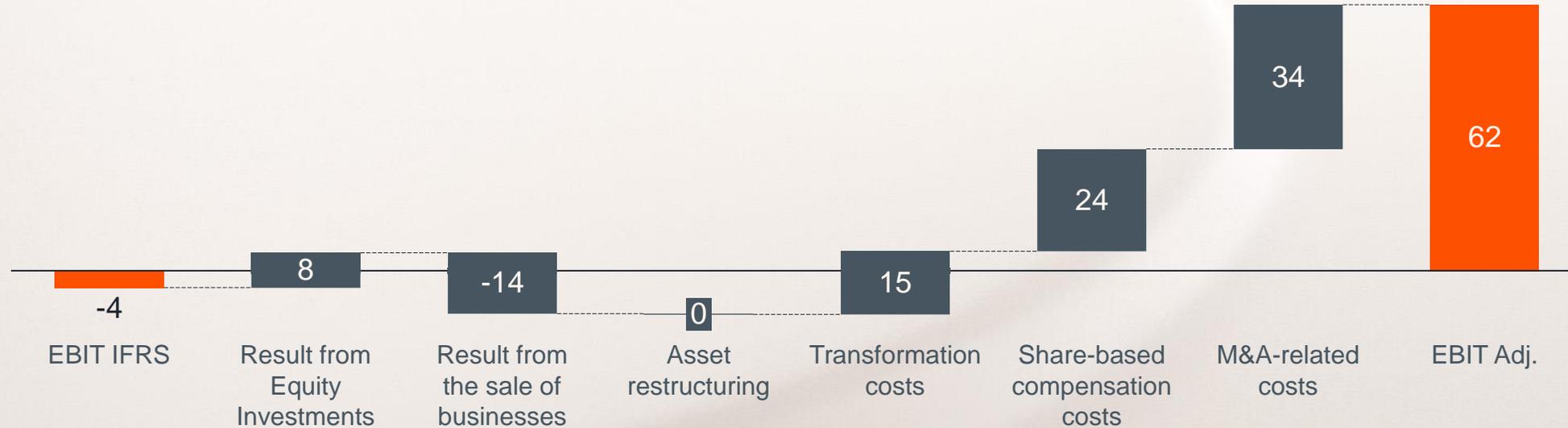
EPS diluted IFRS



- Adjusted net financing result includes EUR 38m of re-financing related expenditures as a consequence of the EUR 2.25 bn re-financing, which leads to an adjusted net result of minus EUR 16m compared to the previous quarter
- **Change in share count: 274,289,910 increased to 998,443,942 as of Dec 7th, 2023**
- **Q4/23 average share count at 456,490,225**

Reconciliation from EBIT IFRS reported to EBIT adjusted figures

Q4 2023, All figures in EURm

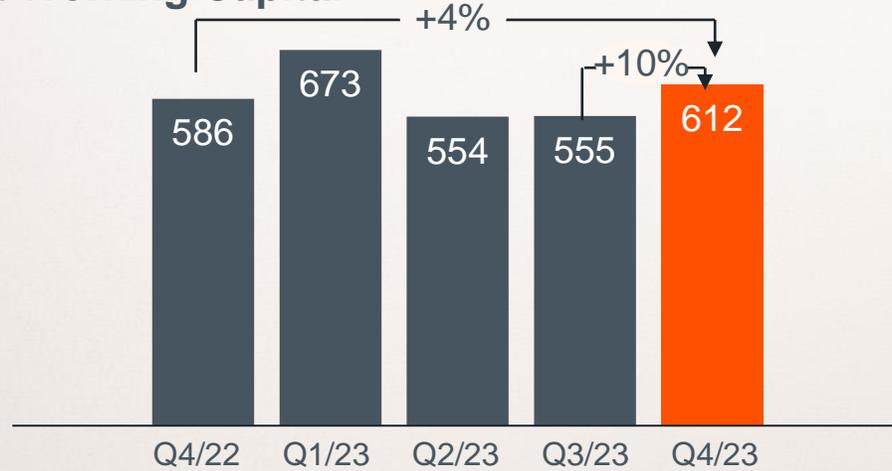


- EBIT Adj. best reflects underlying profitability of business and overall group development
- Historic M&A transactions (e.g. OSRAM) result in significant purchase price allocation expenses (non-cash, resulting in D&A), heavily impacting EBIT IFRS
- Transformation costs for personnel restructuring programs affect short-term profitability
- 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

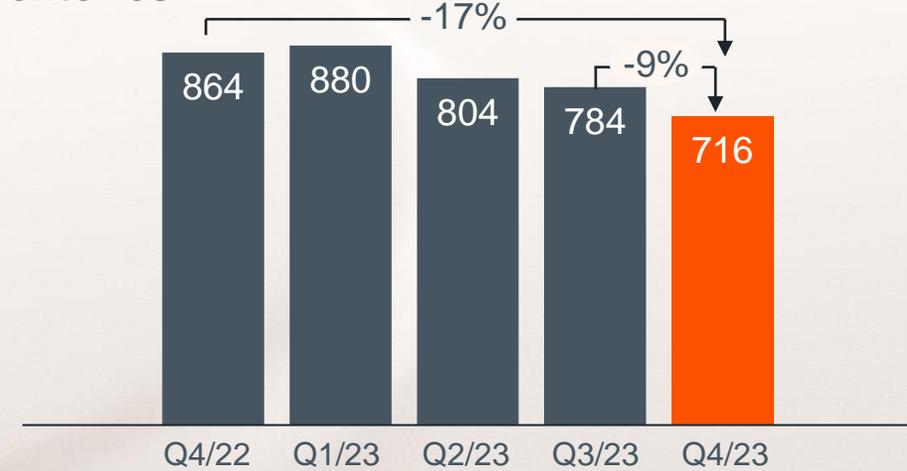
Net Working Capital

All figures in EURm

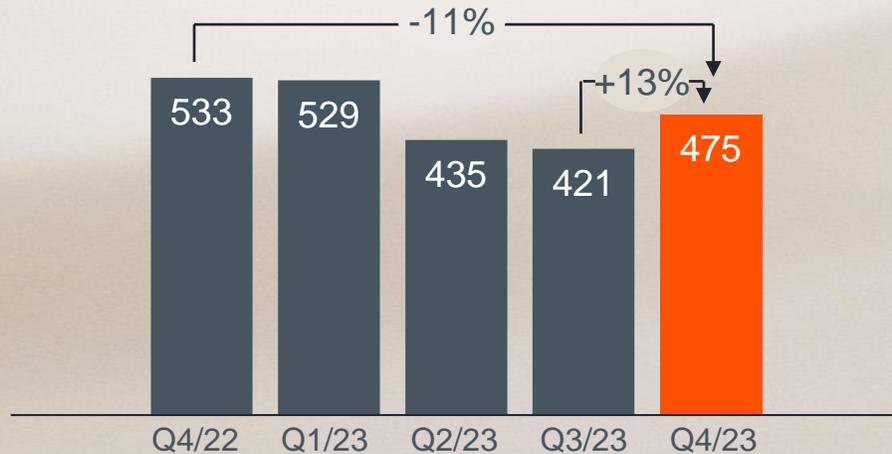
Net Working Capital



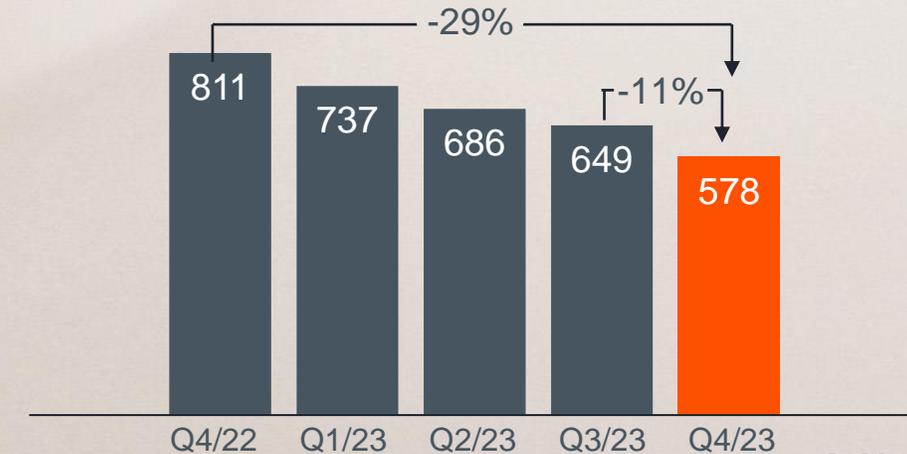
Inventories



Trade & Other Receivables

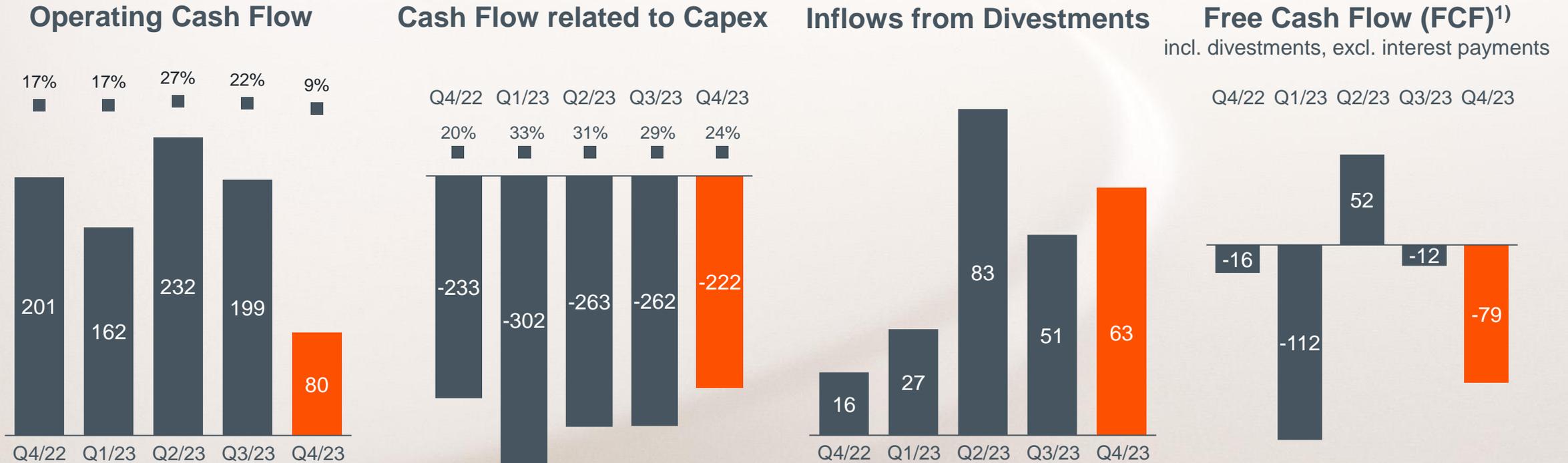


Trade Payables



Drop in operating cash flow and elevated capex put pressure on the FCF

All figures in EURm / % of revenues

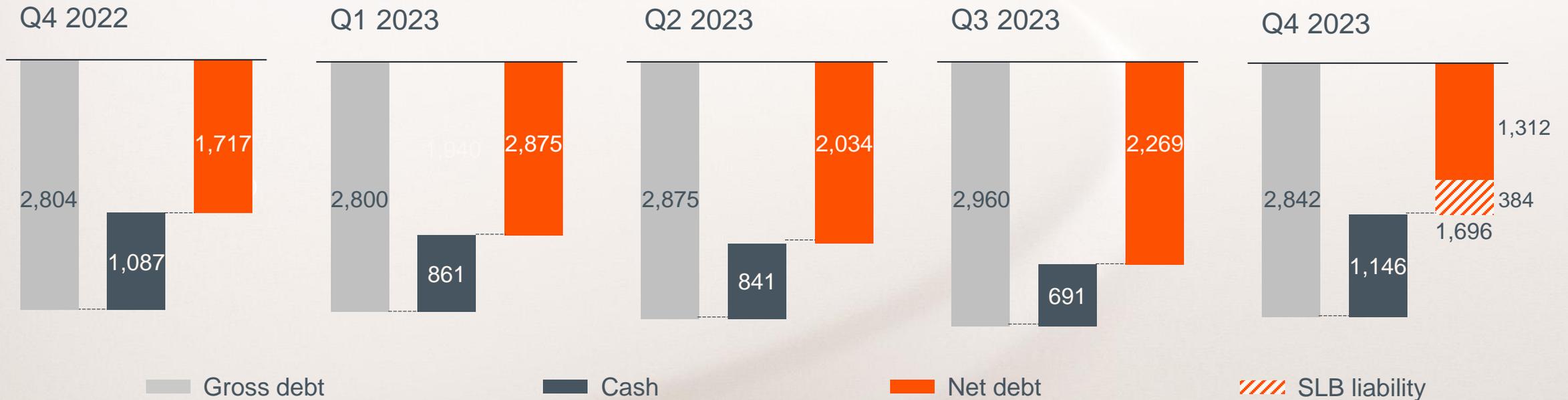


- Significant drop in Operating CF due to EUR 77m reduction in accounts payable and seasonal increase of accounts receivables
- Still elevated Capex driven by tool installation in the 8-inch Kulim LED facility – in-line with expectations.

¹⁾ Free Cashflow (FCF) defined as Operating CF – Capex + proceeds from divestments

Cash and debt overview – strong deleveraging in Q4 2023

All figures in EURm



- Expected decrease of group leverage to 2.8x net debt/adjusted¹⁾ EBITDA driven by EUR 800m gross proceeds from rights issue completed in Q4-23
- Adj. EBITDA¹⁾ LTM EUR 603m (based on adj. EBIT + D&A not related to adjustments)
- EUR 800m undrawn RCF with core banking group successfully extended to September 2026
- Holistic refinancing plan released in Sep-23 successfully completed in Q4-23 (in particular EUR 850m and USD 450m former senior notes already refinanced by new senior notes of EUR 625m and USD 400m due in March 2029)

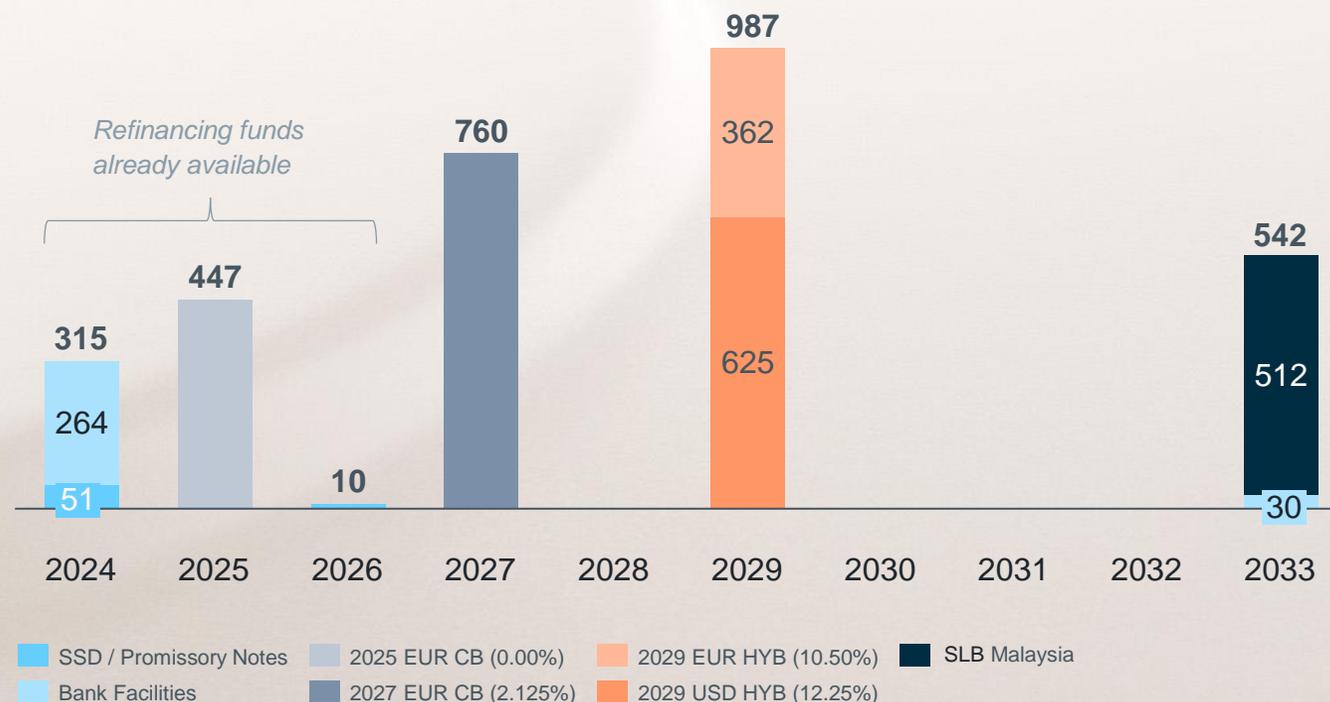
Well balanced maturity profile with diversified funding mix post refinancing Q4/23

Current capitalization

IFRS book values	December-23
	EUR million
Cash	(1,146)
Other Financial Debt ^{1), 2)}	355
2025 EUR Convertible Bond (0.00%) ¹⁾	436
2027 EUR Convertible Bond (2.125%) ¹⁾	669
2029 EUR Senior Unsecured Note (10.50%) ¹⁾	630
2029 USD Senior Unsecured Note (12.25%) ¹⁾	368
Revolving Credit Facility (EUR 800m undrawn)	0
SLB Malaysia transaction	384
Total debt	2,842
Total net debt ³⁾	1,696
Outstanding OSRAM Licht AG – Put Options	611
Available Liquidity ⁴⁾	2,152

Current debt maturity profile

EUR m, repayment amounts as of December 2023



Notes:

- Amounts reflect carrying amounts / book values For 2025CB - Nominal Amount: EUR 447.4m (formerly EUR 600m; reduced by 2 Buybacks in the meantime) / Book Value under Debt (IFRS per 31-Dec-23): EUR 434m. For 2027CB - Nominal Amount: EUR 760m / Book Value under Debt (IFRS per 31-Dec-23): EUR 668m
- Includes R&D loans, Bank Facilities and Promissory Notes
- Includes EUR 384m equivalent Sale-and-Lease back Malaysia transaction
- Includes EUR 1145m Cash, EUR 800m RCF (undrawn) and EUR 206m bilateral bank facilities (undrawn)

ams OSRAM Investor Relations



Dr. Jürgen Rebel
SVP & Head of Investor Relations
juergen.rebel@ams-osram.com
+ 43 3136 500-0



Juliana Baron
Senior Director Investor Relations
juliana.baron@ams-osram.com
+ 49 941 850 3000

Investor Relations contact	
Premstaetten Office	+ 43 3136 500-0
Internet	https://ams-osram.com/about-us/investor-relations
Email	investor@ams-osram.com

Upcoming events	
▪ February 13-14, 2024 Non-Deal Roadshow London	▪ March 8, 2024 ODDO BHF TMT Forum, virtual
▪ February 21, 2024 Non-Deal Roadshow Zurich	▪ March 11-15, 2024 Non-Deal Roadshow USA/Canada
▪ February 22, 2024 Non-Deal-Roadshow Frankfurt	▪ March 21-22, 2024 Jefferies Mid Cap TMT London