

Imaging & Sensing Solutions Segment

Senior Executive Vice President
Sony Group Corporation

Representative Director, President and CEO,
Sony Semiconductor Solutions Corporation

Terushi Shimizu

FY21 Sales : 1,076.4 billion yen
OI : 155.6 billion yen

**Decentralization / expansion of customer base
for mobile image sensors, recovery of volume share**

Expansion of models for sensing applications

(SPAD ToF Depth Sensor, Event-based Vision Sensor (EVS), UV Image Sensor, Large-sized GS* Image Sensor etc.)

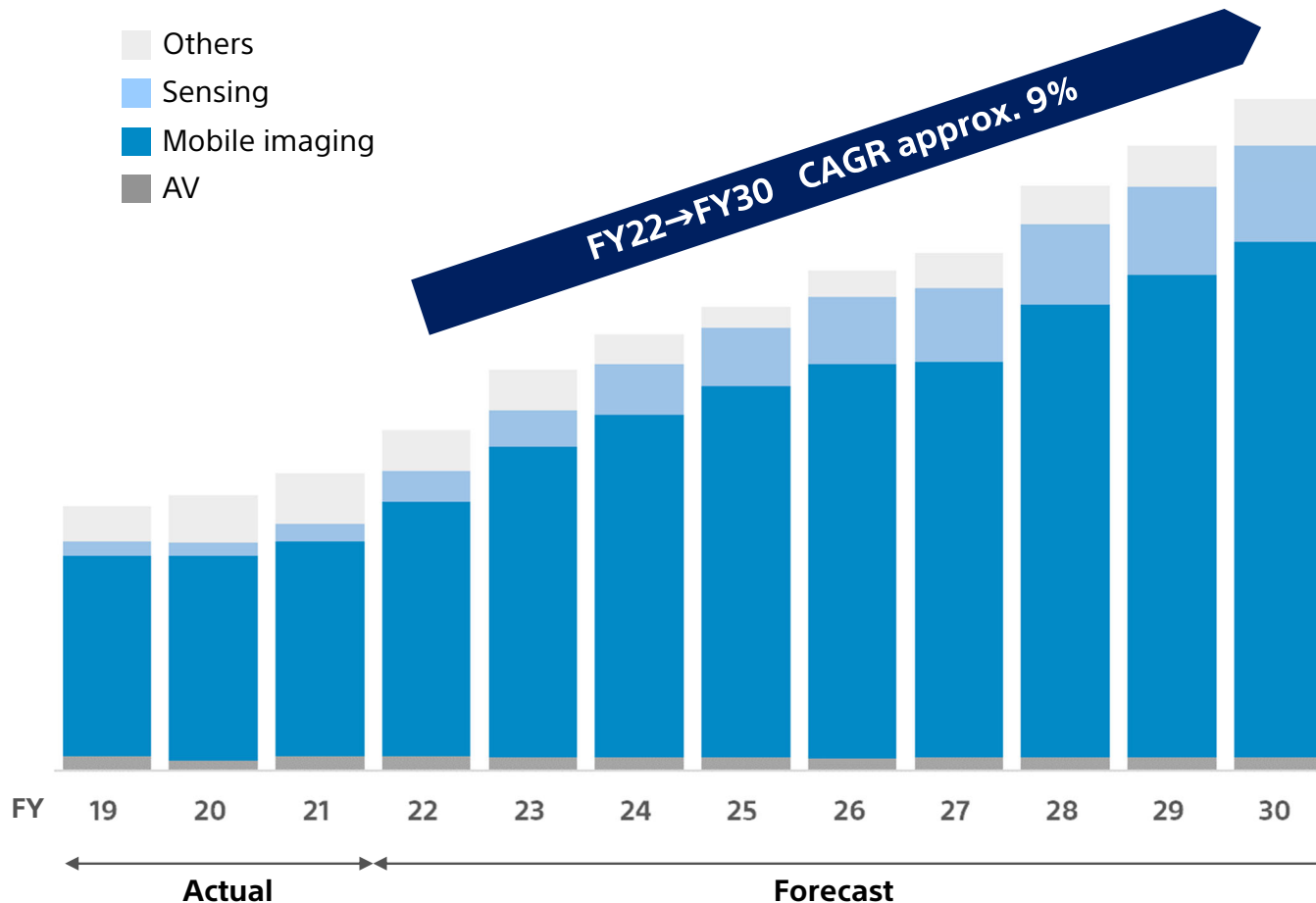
Launch of Edge AI Sensing Platform Service "AITRIOS™"

Operation start of Nagasaki Technology Center's Fab5

Equity investment in Japan Advanced Semiconductor Manufacturing (JASM)

Image Sensor Market Outlook (Revenue Basis)

I&SS Segment



Sensing

Mobile:

Full-scale market expansion will take a few years due to a lack of applications.

Automotive:

ADAS*1 which requires installation of many cameras is expected to expand. Market for AD*2 will take time to increase.

*1 ADAS : Advanced Driving Assistance System
*2 AD : Autonomous Driving

Industrial Applications:

The market is growing due to continued labor savings and automation needs.

Security:

The high value-added market is expanding due to growing demand for multi pixels and combination with AI.

Mobile Imaging

Despite the increase in multi-cameras being mature, sensor size is getting larger and continues to drive market growth.

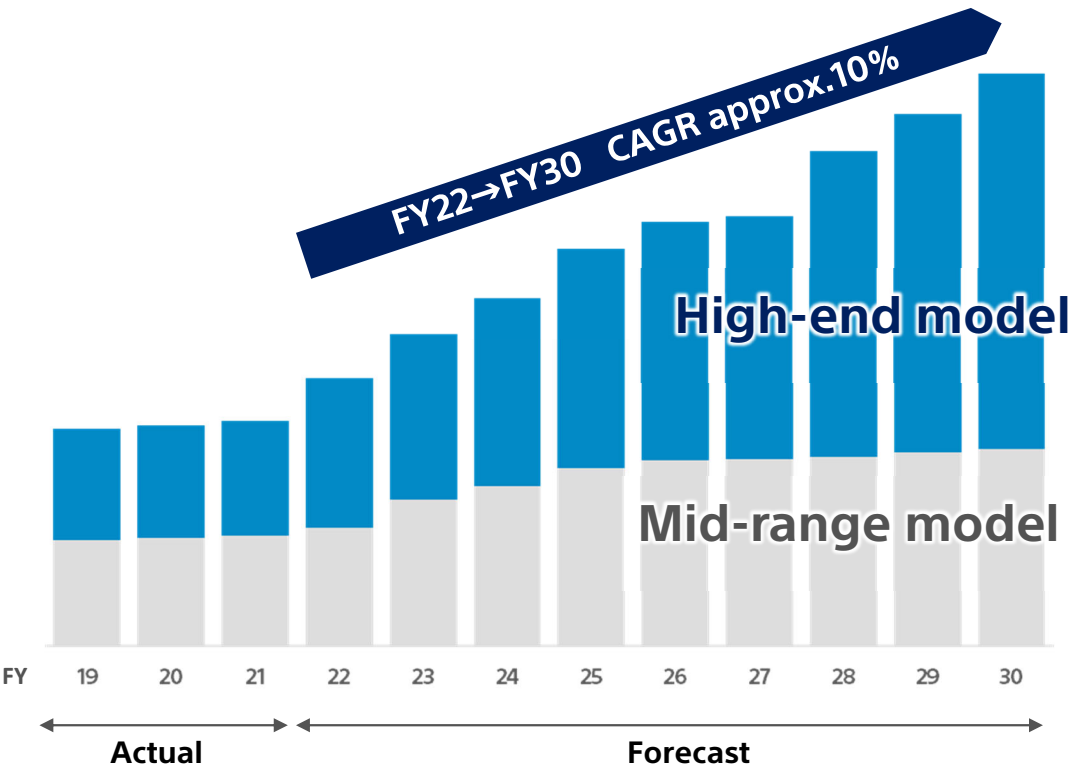
AV

The market keeps the same level.

※Source: Sony

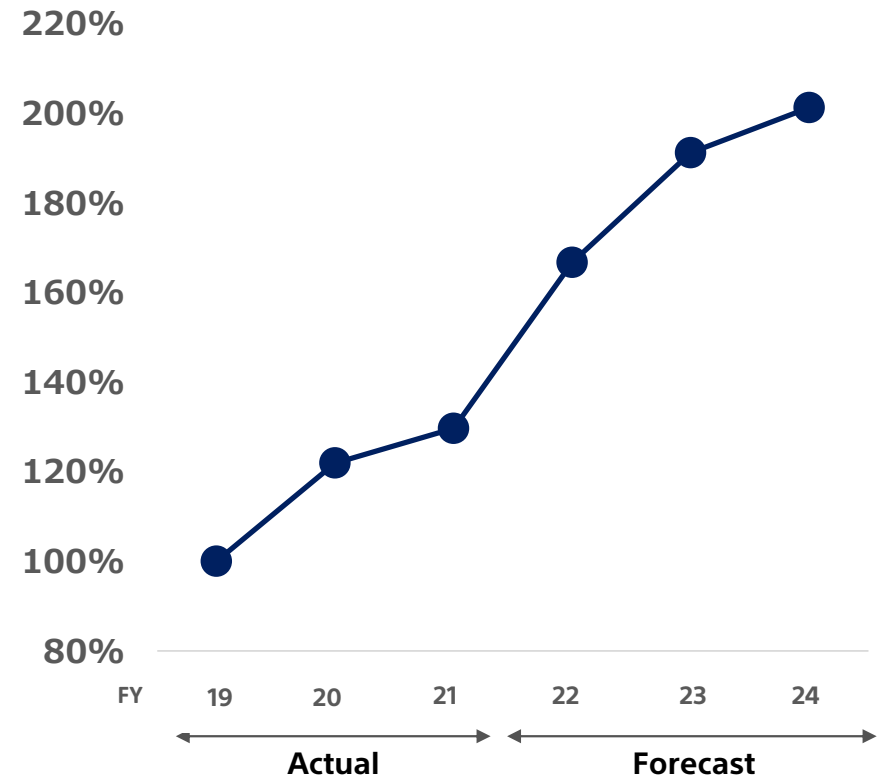
Continued Growth in Mobile Imaging

Image sensor market outlook by smartphone price range (revenue)



※Source: Sony

Sensor size trend in the image sensor market (only for high-end model)

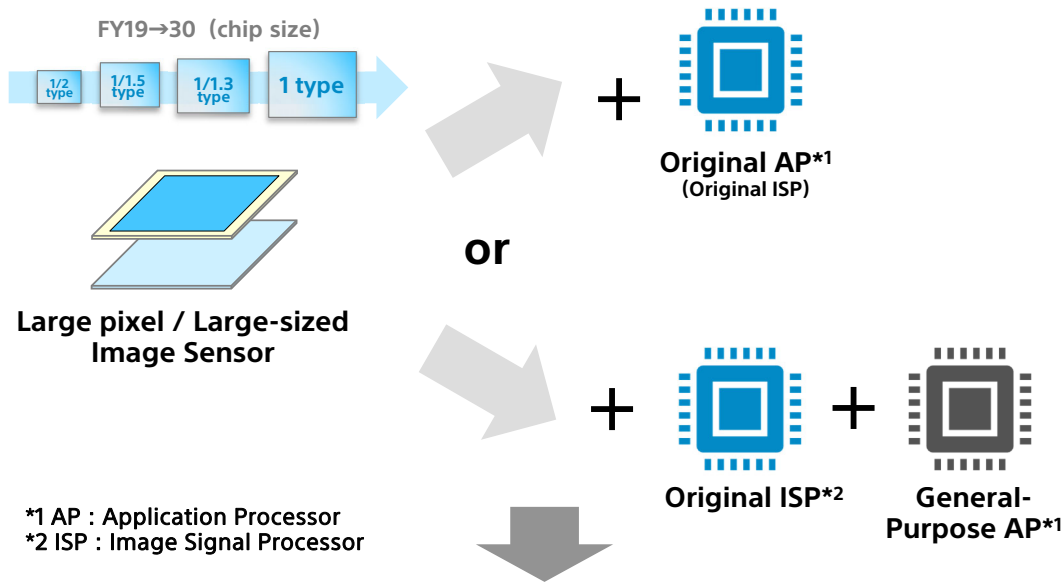


※ Source: Sony. Calculated using the average chip size of FY19 is 100%.

Smartphone Camera Market Trends and Our Strategies

High-end model

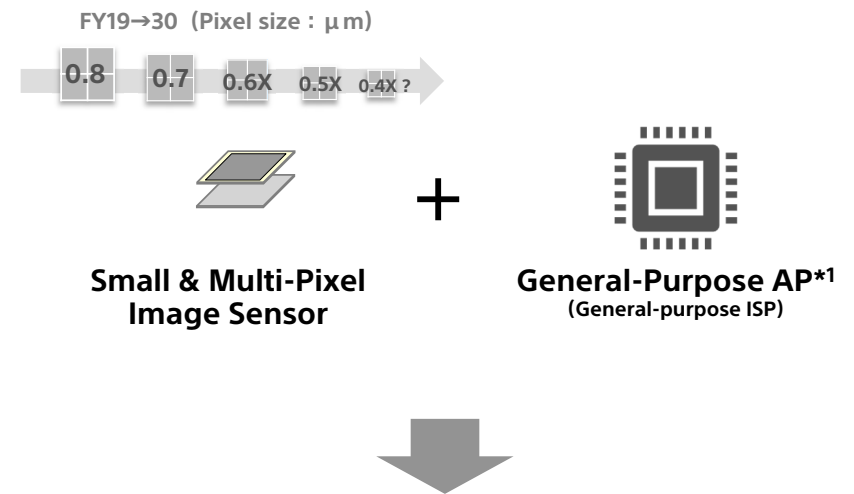
Pursue a high-performance camera system by developing technology that realizes a new imaging experience



Develop high value-added image sensor which contributes to high image quality and multi-functionality of cameras

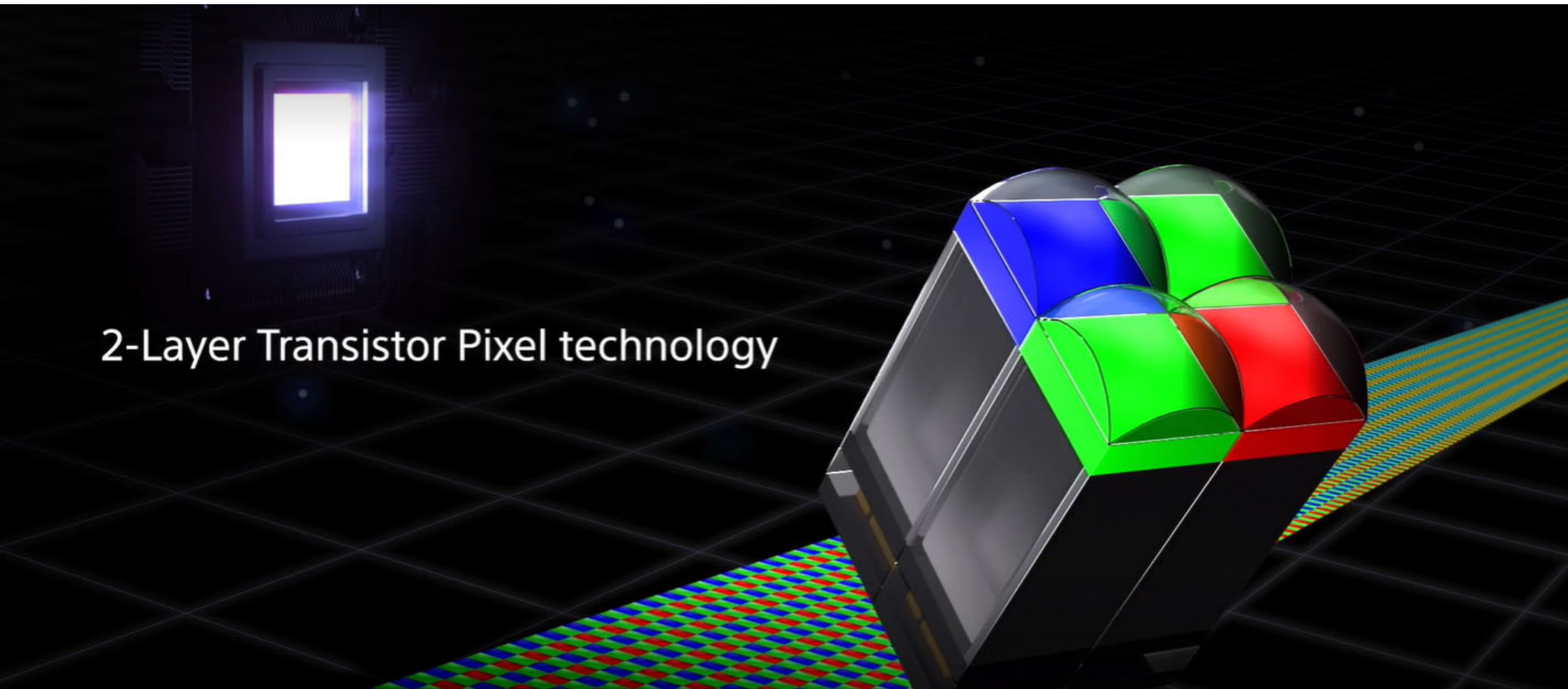
Mid-range model

Pursue a balance of adopting small pixels and camera performance



Differentiate with enhancement of small pixel development and performance improvement through new signal processing / algorithm

2-Layer Transistor Pixel technology



Direction of Mobile Imaging Technological Evolution

I&SS Segment

CY24

CY25

26

27

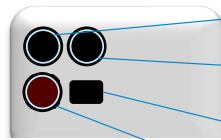
28

29

CY2030

Still images are expected to exceed ILC *1 image quality by mobile camera's large pixel + High Qs*2 technology + AI processing (still image)

Multi-camera evolution

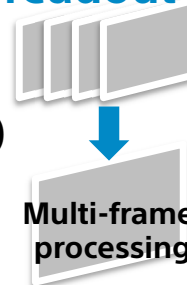


- Wide: Larger diameter
- UW: High speed (Support video)
- Tele: Multi pixels (Higher magnification)
- ToF: Auto focus/Blur

Sensor optimization for multi-camera

Evolution of High-speed readout

- Support 8K video
- Multi-frame processing (High SN ratio*3 , Video HDR)

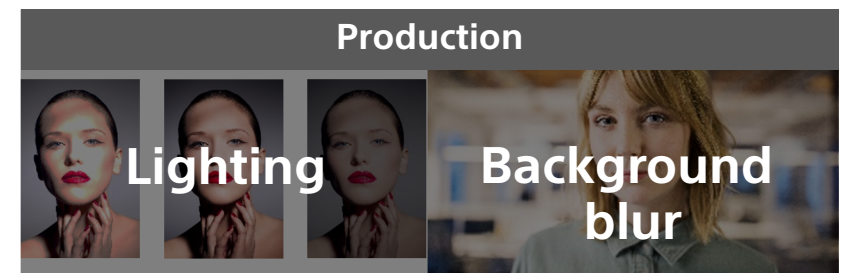
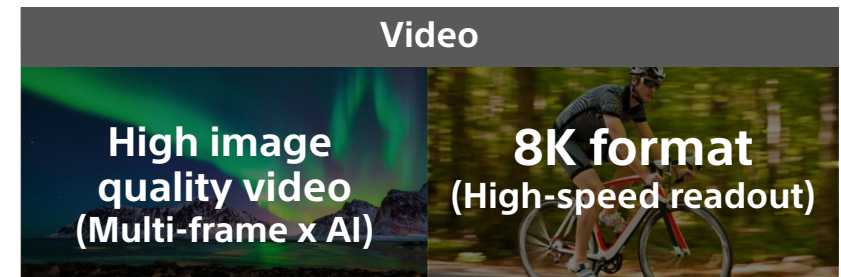
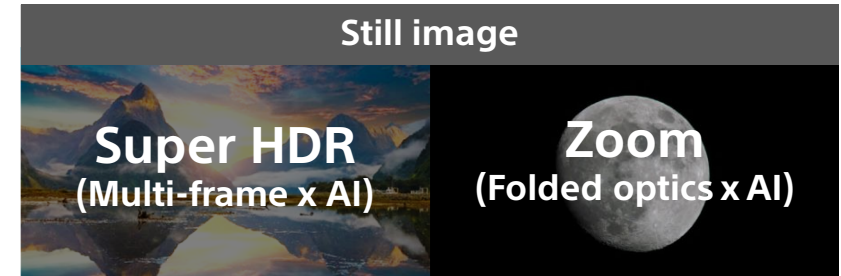


Evolution of Edge AI

- Realize AI processing for video
- Realize low latency processing

Link with distance information

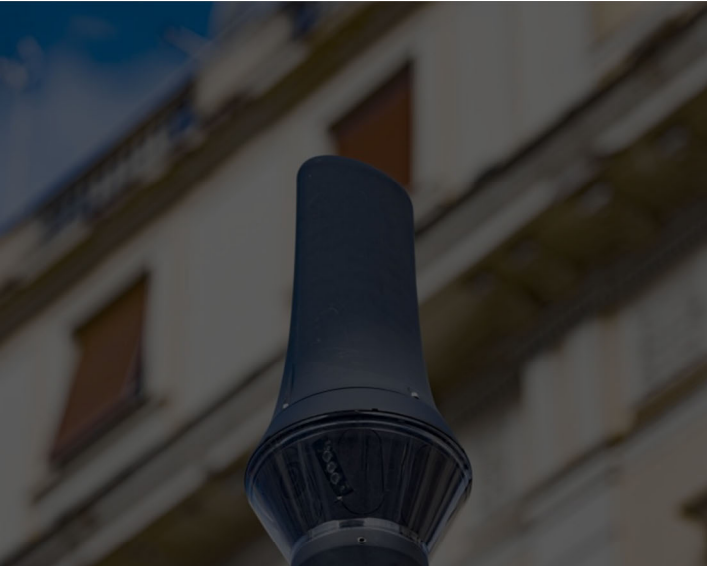
- Apply to Focus and Production



*1 ILC: Interchangeable lens camera

*2 Qs: Quantum saturation

*3 SN Ratio: Signal-to-noise ratio

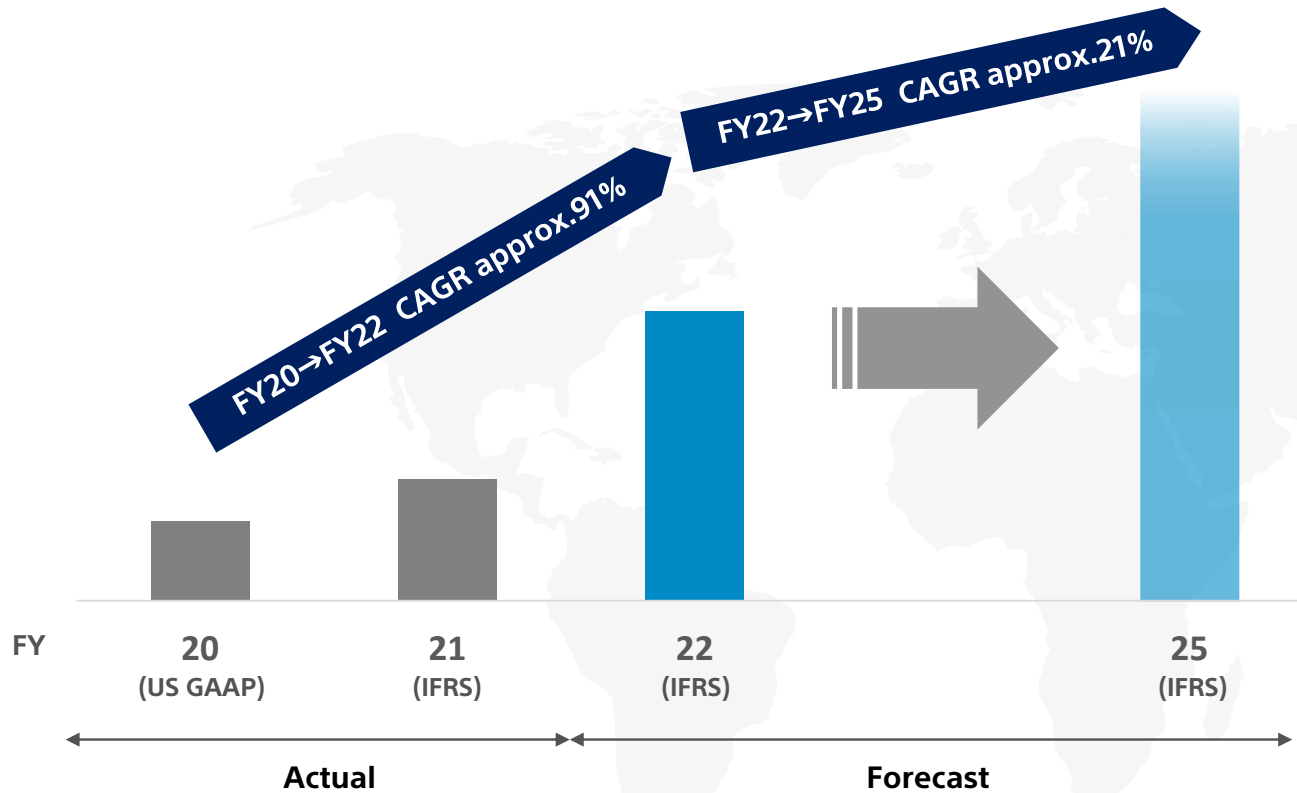


Sensing Society



Sales Trend of Automotive Image Sensors

I&SS Segment



In FY25, do business with*1

75%

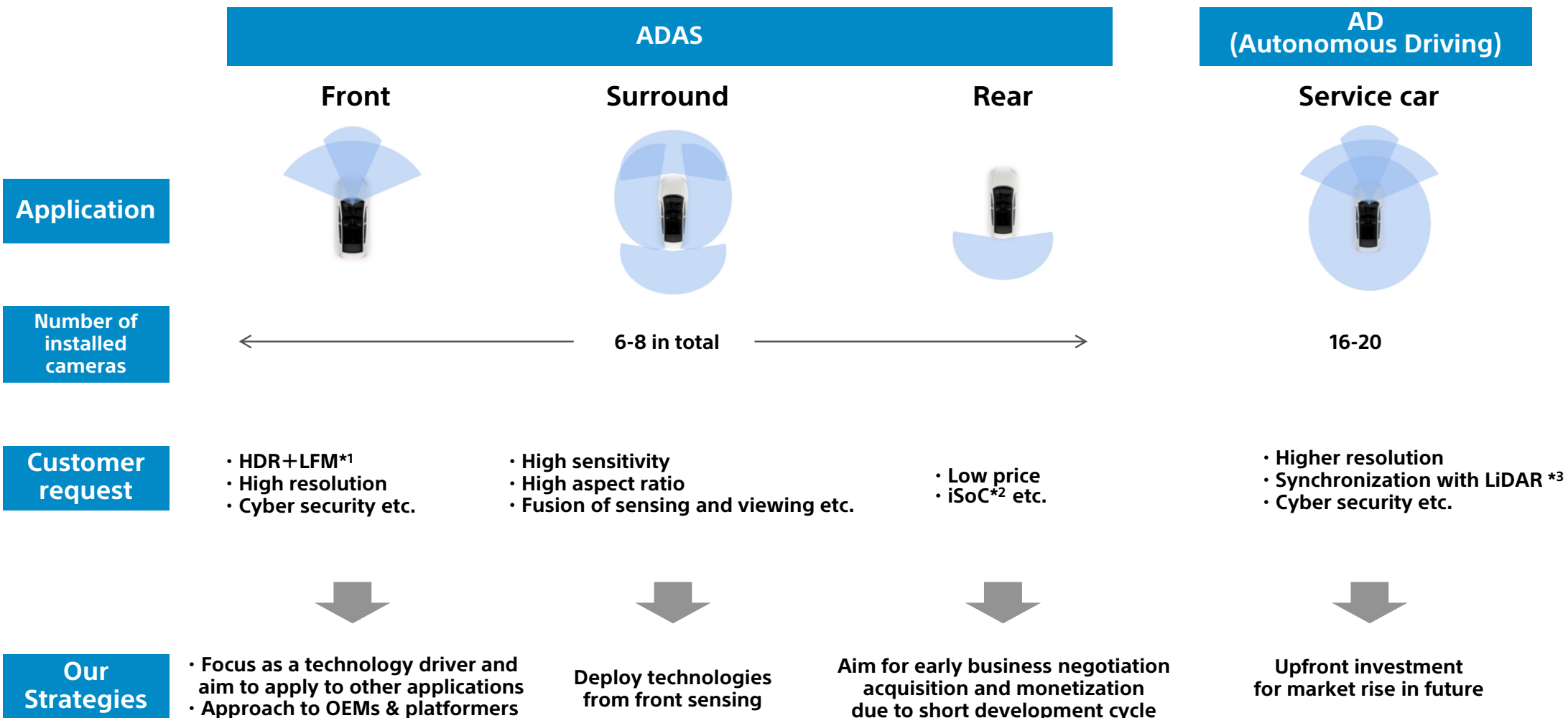
of the top 20 global OEMs*2

*1 OEMs with transaction record and those who are expected to conduct any transaction by FY25.

*2 Based on CY21 results. Source: Sony

Automotive Camera Market Trends and Our Strategies

I&SS Segment



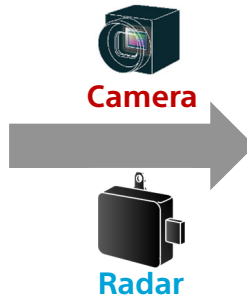
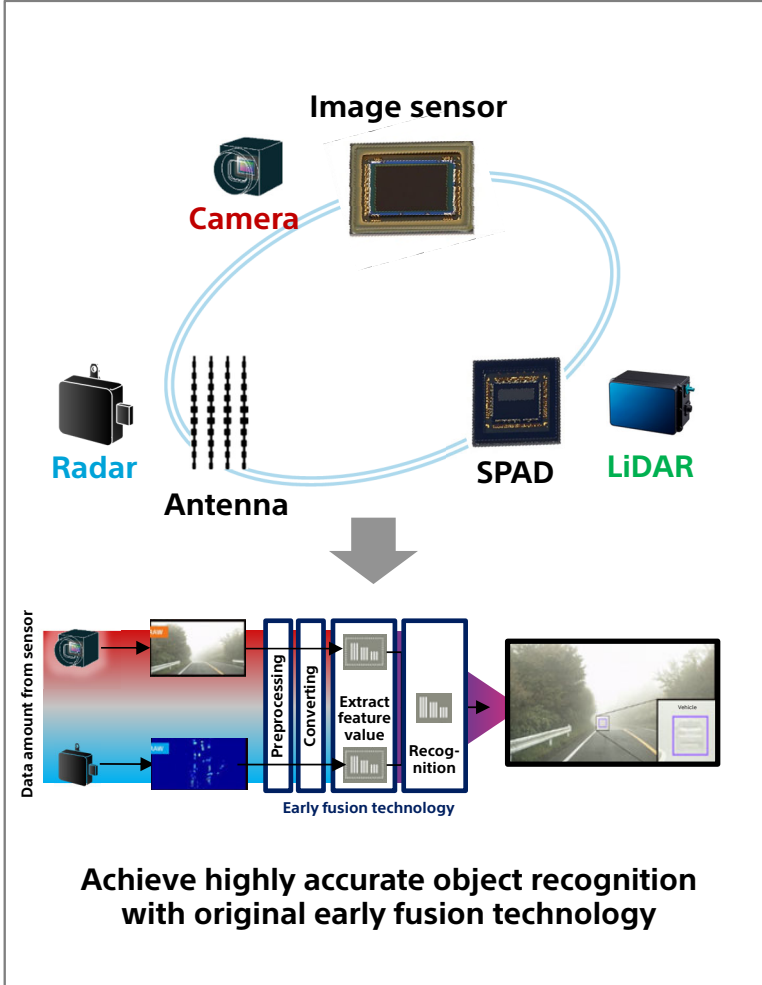
*1 LFM : LED flicker mitigation

*2 iSoC : Image sensor with ISP

*3 LiDAR : Light Detection And Ranging

Differentiated Technology in Front/Surround Sensing ~Sensor Fusion~

Technical overview



Front sensing FY25~

Utilize not only for vehicle recognition in adverse environments but also for recognition of people and vehicles at night



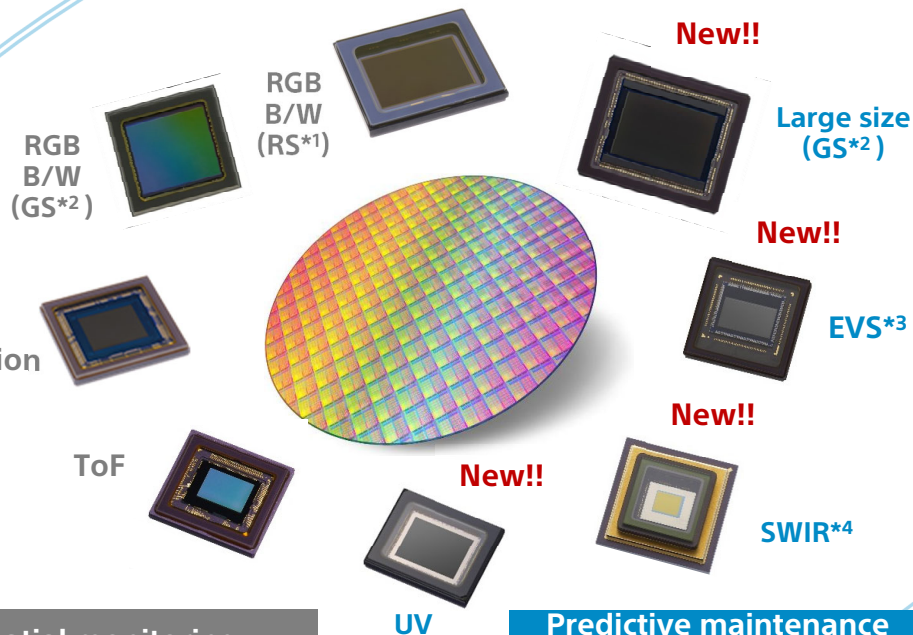
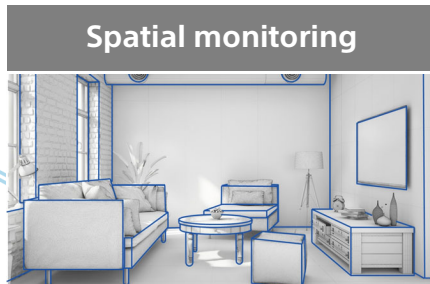
Surround sensing (parking assistance) ~FY25

Apply to parking assistance functions that require highly accurate distance measurement



Industrial Applications

I&SS Segment

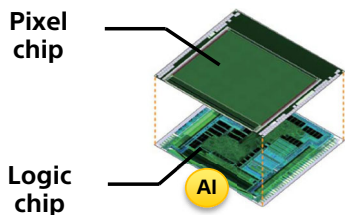


*1 RS : Rolling Shutter
 *2 GS : Global Shutter
 *3 EVS : Event-based Vision Sensor
 *4 SWIR : Short Wavelength Infra-Red

Solution Business Initiatives

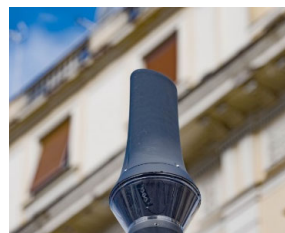
I&SS Segment

2020/5



Launch world's first intelligent vision sensor "IMX500" with AI processing functionality

2021/6



Start smart city trial project in Rome city

2021/10



Launch Edge AI Platform Service "AITRIOS™"

2019/5



SONY  **Microsoft**

Strategic partnership

2020/5



Start collaboration to create smart camera solutions utilizing IMX500 and Microsoft Azure AI

2021/8



Support Nomad Go's smart building solution

~2021/12



Establish joint innovation labs in US, Japan, China and Germany

Camera Manufacturer / Module Integrator

Application Developer



 Camera development environment

 Application development environment

AI Developer

System Integrator



 AI development environment



AITRIOS

 Cloud Service

 Marketplace



<https://www.youtube.com/watch?v=BiPPdrWJ8bU>

New Opportunities in the VR / AR Market

Red: Display device
 Blue: Sensor
 Green: Laser

I&SS Segment

Head-Mounted Display

AR Glass

Virtual Display



OLED Microdisplay

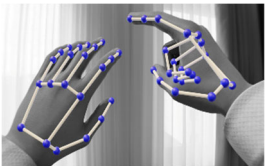


Mixed Reality (MR)



Image Sensor (RGB)

Hand Tracking



ToF Image Sensor
 VCSEL

Iris Recognition

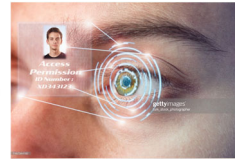


Image Sensor (SWIR)
 VCSEL

Gaze Detection



Image sensor (SWIR)
 Event-based Vision Sensor

SLAM*1



Image Sensor (B/W)
 ToF Image Sensor
 VCSEL

Superimposition on Real Space



OLED Microdisplay
 Micro LED



Human/Space recognition

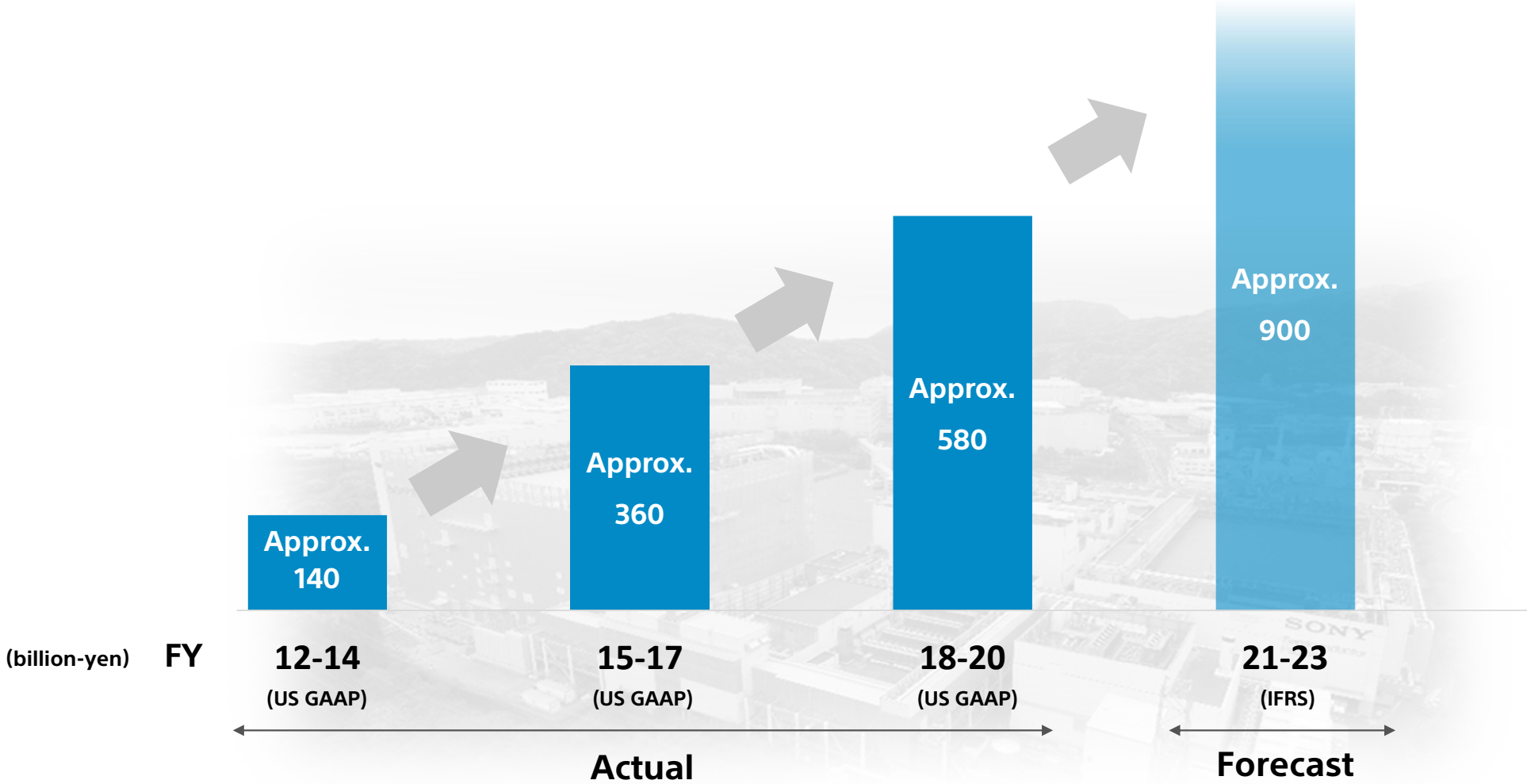


Image Sensor
 (RGB/equipped with DNN*2/always on)

*1 Simultaneous Localization And Mapping
 *2 Deep Neural Network

Image Sensor's Capital Expenditure Investment Plan for 3 years

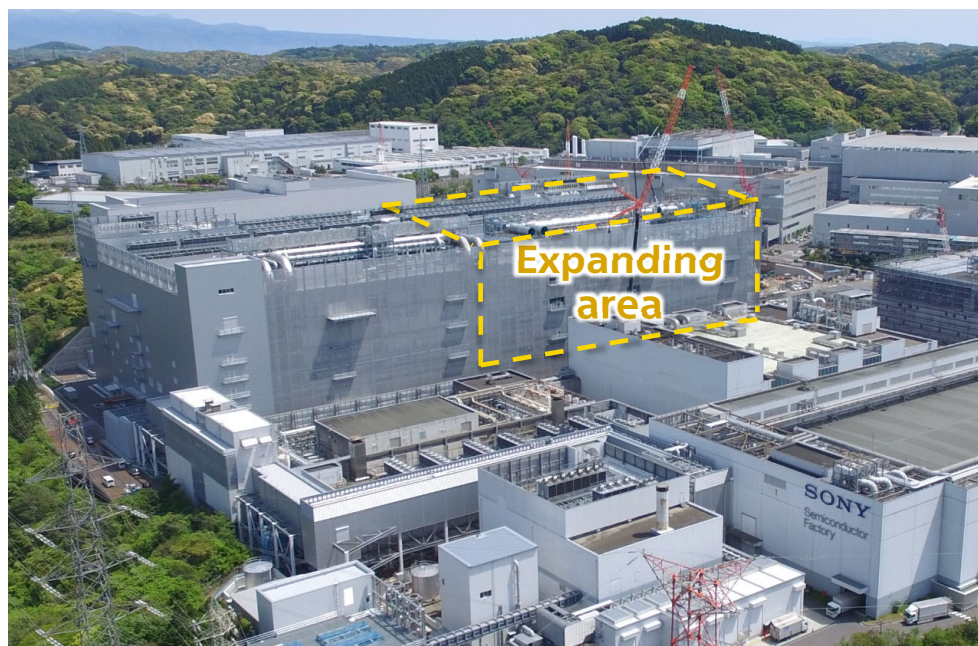
I&SS Segment



Nagasaki Technology Center's Fab5

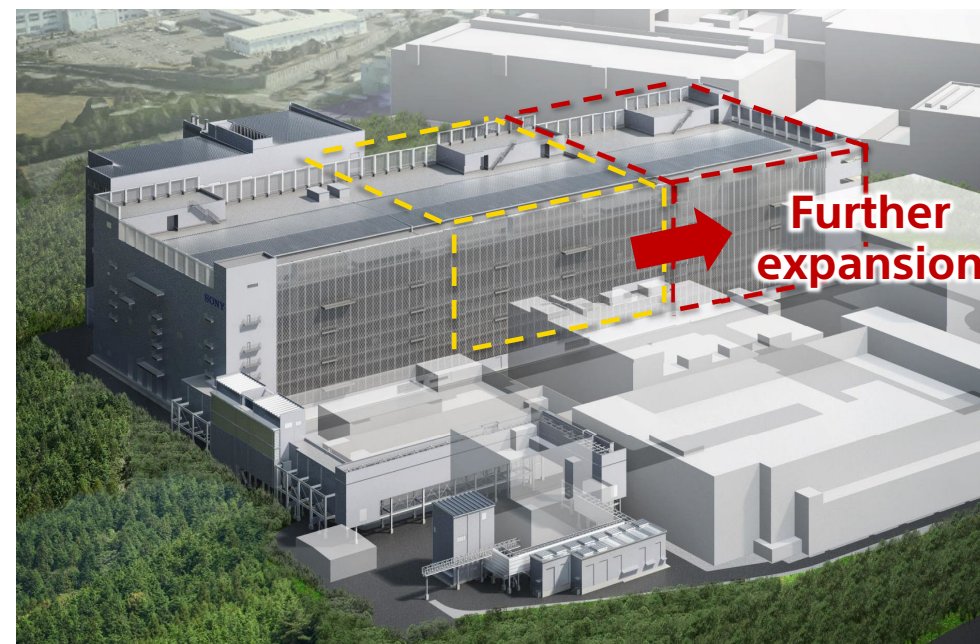
I&SS Segment

Current status



Expanding area is expected to start operation in July 2022

Completion Rendering



For further expansion, construction started in May 2022

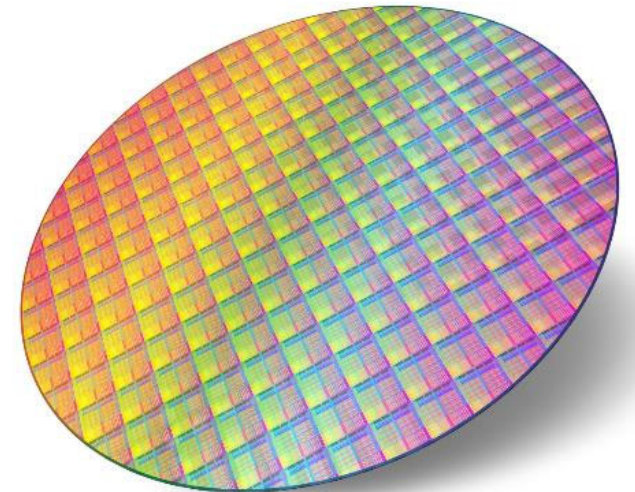
Equity investment in JASM

I&SS Segment

Secure a stable supply of logic semiconductors

Enhance technical collaboration with TSMC

Contribute to the enhancement of the supply chain in Japan



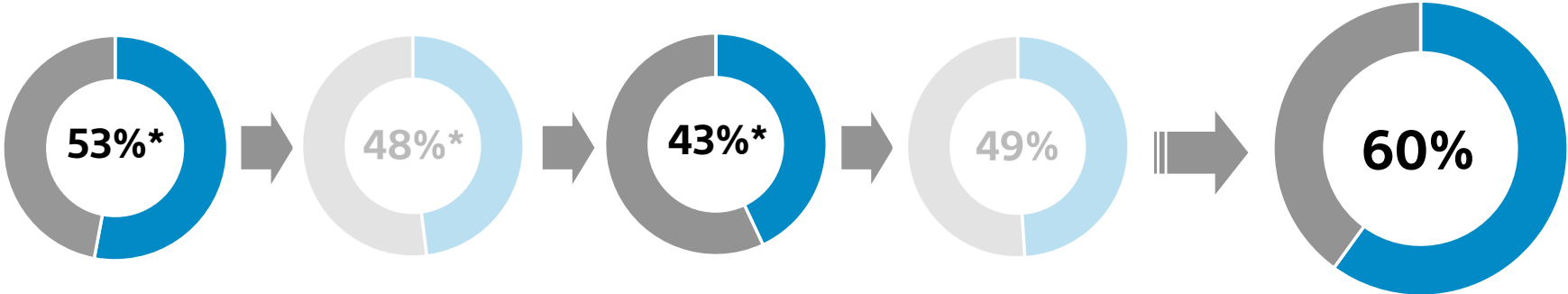
Management indicator

I&SS Segment



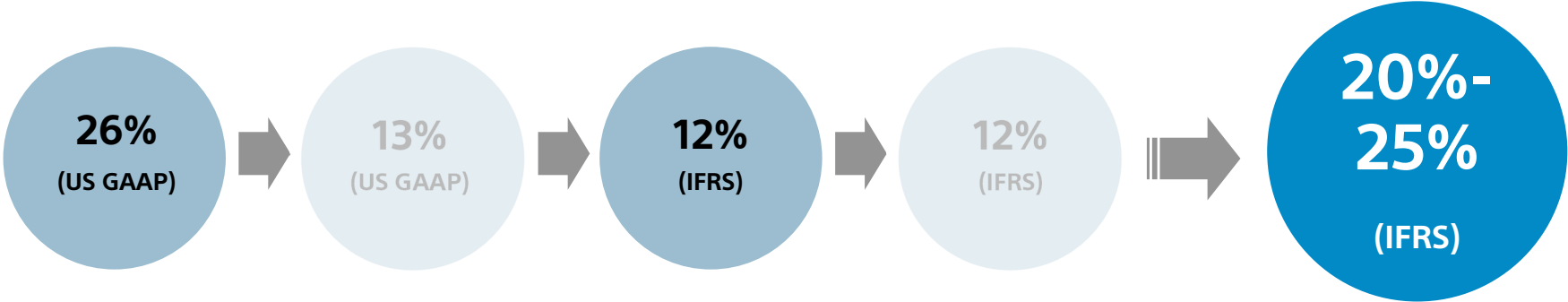
■ Sony ■ Other companies

Image sensor revenue share



*Source: Sony. Excluding the sales of fingerprint sensor. Updated the share of 49% (FY20 ACT) announced at IR Day 2021 held on May 28, 2021.

ROIC



For the detail of ROIC calculation, please refer to "Supplemental Information for the Consolidated Financial Results for the Fourth Quarter Ended March 31, 2022" on page 8. ROIC is not a measure in accordance with US GAAP and IFRS. However, Sony believes that this disclosure may be useful information to investors.



**Target year to achieve
carbon neutrality
2050 → 2040**

RE100

**Target year to achieve
100% renewable energy
2040 → 2030**



<https://www.youtube.com/watch?v=vJBldliiHko>



Sense the Wonder

"Fascinate with the wonders of the world."

Sense Word that suggests human ability to become aware of or develop a feeling something, their sensibilities, and image sensors

Wonder Word that suggests corporate culture that Sony has been cherishing, curiosity which is the starting point of R&D, and recalls discoveries full of amazement and moves people's souls

SONY

SONY is a registered trademark of Sony Group Corporation.

Names of Sony products and services are the registered trademarks and/or trademarks of Sony Group Corporation or its affiliates.

Other company names and product names are registered trademarks and/or trademarks of the respective companies.

Cautionary Statement

Statements made in this presentation with respect to Sony's current plans, estimates, strategies and beliefs and other statements that are not historical facts are forward-looking statements about the future performance of Sony. Forward-looking statements include, but are not limited to, those statements using words such as "believe," "expect," "plans," "strategy," "prospects," "forecast," "estimate," "project," "anticipate," "aim," "intend," "seek," "may," "might," "could" or "should," and words of similar meaning in connection with a discussion of future operations, financial performance, events or conditions. From time to time, oral or written forward-looking statements may also be included in other materials released to the public. These statements are based on management's assumptions, judgments and beliefs in light of the information currently available to it. Sony cautions investors that a number of important risks and uncertainties could cause actual results to differ materially from those discussed in the forward-looking statements, and therefore investors should not place undue reliance on them. Sony adopted International Financial Reporting Standards (IFRS) starting in the three months ended June 30, 2021, in lieu of the previously applied generally accepted accounting principles in the United States (U.S. GAAP). Investors also should not rely on any obligation of Sony to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. Sony disclaims any such obligation. Risks and uncertainties that might affect Sony include, but are not limited to:

- (i) Sony's ability to maintain product quality and customer satisfaction with its products and services;
- (ii) Sony's ability to continue to design and develop and win acceptance of, as well as achieve sufficient cost reductions for, its products and services, including image sensors, game and network platforms, smartphones and televisions, which are offered in highly competitive markets characterized by severe price competition and continual new product and service introductions, rapid development in technology and subjective and changing customer preferences;
- (iii) Sony's ability to implement successful hardware, software, and content integration strategies, and to develop and implement successful sales and distribution strategies in light of new technologies and distribution platforms;
- (iv) the effectiveness of Sony's strategies and their execution, including but not limited to the success of Sony's acquisitions, joint ventures, investments, capital expenditures, restructurings and other strategic initiatives;
- (v) changes in laws, regulations and government policies in the markets in which Sony and its third-party suppliers, service providers and business partners operate, including those related to taxation, as well as growing consumer focus on corporate social responsibility;
- (vi) Sony's continued ability to identify the products, services and market trends with significant growth potential, to devote sufficient resources to research and development, to prioritize investments and capital expenditures correctly and to recoup its investments and capital expenditures, including those required for technology development and product capacity;
- (vii) Sony's reliance on external business partners, including for the procurement of parts, components, software and network services for its products or services, the manufacturing, marketing and distribution of its products, and its other business operations;
- (viii) the global economic and political environment in which Sony operates and the economic and political conditions in Sony's markets, particularly levels of consumer spending;
- (ix) Sony's ability to meet operational and liquidity needs as a result of significant volatility and disruption in the global financial markets or a ratings downgrade;
- (x) Sony's ability to forecast demands, manage timely procurement and control inventories;
- (xi) foreign exchange rates, particularly between the yen and the U.S. dollar, the euro and other currencies in which Sony makes significant sales and incurs production costs, or in which Sony's assets, liabilities and operating results are denominated;
- (xii) Sony's ability to recruit, retain and maintain productive relations with highly skilled personnel;
- (xiii) Sony's ability to prevent unauthorized use or theft of intellectual property rights, to obtain or renew licenses relating to intellectual property rights and to defend itself against claims that its products or services infringe the intellectual property rights owned by others;
- (xiv) the impact of changes in interest rates and unfavorable conditions or developments (including market fluctuations or volatility) in the Japanese equity markets on the revenue and operating income of the Financial Services segment;
- (xv) shifts in customer demand for financial services such as life insurance and Sony's ability to conduct successful asset liability management in the Financial Services segment;
- (xvi) risks related to catastrophic disasters, geopolitical conflicts, pandemic disease or similar events;
- (xvii) the ability of Sony, its third-party service providers or business partners to anticipate and manage cybersecurity risk, including the risk of unauthorized access to Sony's business information and the personally identifiable information of its employees and customers, potential business disruptions or financial losses; and
- (xviii) the outcome of pending and/or future legal and/or regulatory proceedings.

Risks and uncertainties also include the impact of any future events with material adverse impact. The continued impact of COVID-19 and developments relating to the situation in Ukraine and Russia could heighten many of the risks and uncertainties noted above. Important information regarding risks and uncertainties is also set forth in Sony's most recent Form 20-F, which is on file with the U.S. Securities and Exchange Commission.