

SONY

Semiconductors Segment

Executive Vice President
Sony Corporation

Representative Director and President
Sony Semiconductor Solutions Corporation

Representative Director and President
Sony Semiconductor Manufacturing Corporation

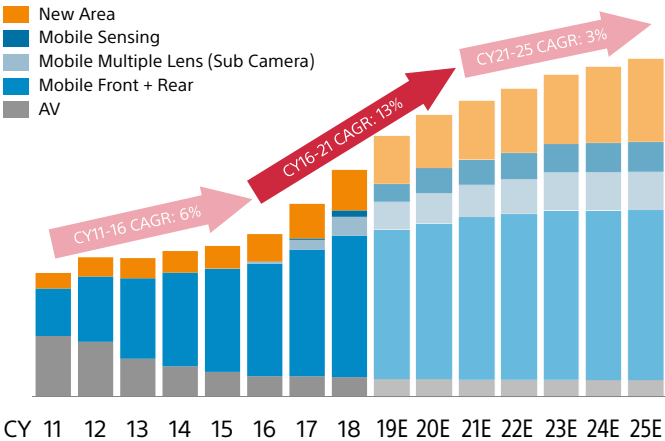
Terushi Shimizu

Semiconductors Segment

- 1. Business Environment**
- 2. Long-Term Business Strategy**

1. Business Environment

Worldwide Image Sensor Shipments (Revenue Basis)



New Area

- Automotive: No change in the speed of growth of the ADAS market
- Factory Automation : Growth market in the mid to long term
- Security : Stagnant market from late FY18 to early FY19. Expect recovery in FY19

Mobile Area

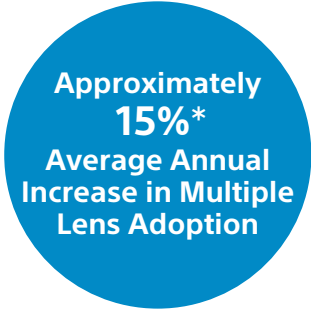
- Market expansion from multiple lens and large sized sensors
- Steady adoption of sensing products although the pace of market growth is slower than expected

AV Area

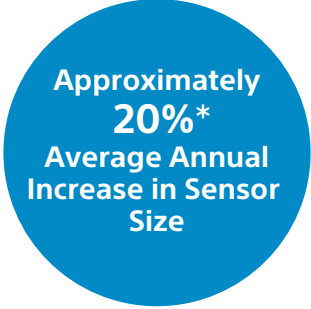
- No change in expansion of high-end sensor market

※Source: Sony

Mobile Market Growth: Smartphone Units x Multiple Lens x Larger Size



**Smartphone
Multiple Lens
Adoption Rate**



**Smartphone
Sensor Optical Size**

**Increase in
Sensor Units
and
Number of Wafers**

※Source: Sony's Forecast

Toyota Corolla Sports vehicle with Sony's sensor was awarded the top score in the automatic braking tests for night-time pedestrians (1st half of FY18)



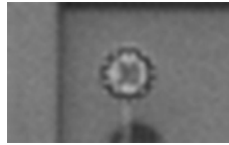
TOYOTA

DENSO

Automotive Initiatives



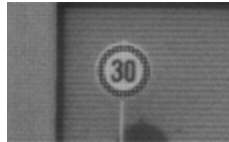
Current Model



IMX224 (1.27M pixels)



IMX490

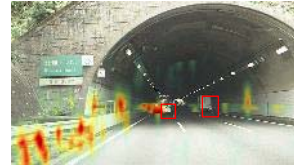
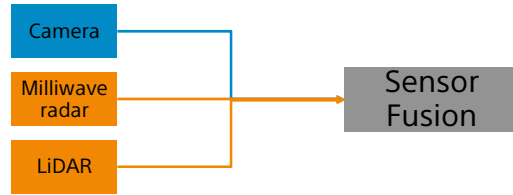


IMX324 (7.42M pixels)

- Achieve quality and functionality for automotive - high sensitivity, high resolution, and capable of reducing LED flicker while maintaining high dynamic range

Recent initiatives
Automotive image sensor space

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- Able to integrate large amounts of raw data from camera images, LiDAR and milliwave radar
- Identify objects even in harsh conditions

Initiatives for the future
Sensor fusion

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Automotive Initiatives: Sensor Fusion

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Current Technology



Sony's Sensor Fusion



- Identify car ahead despite fog making it difficult to see

Scene 1: Fog

- Identify car ahead despite glare making it difficult to see

Scene 2: Backlight

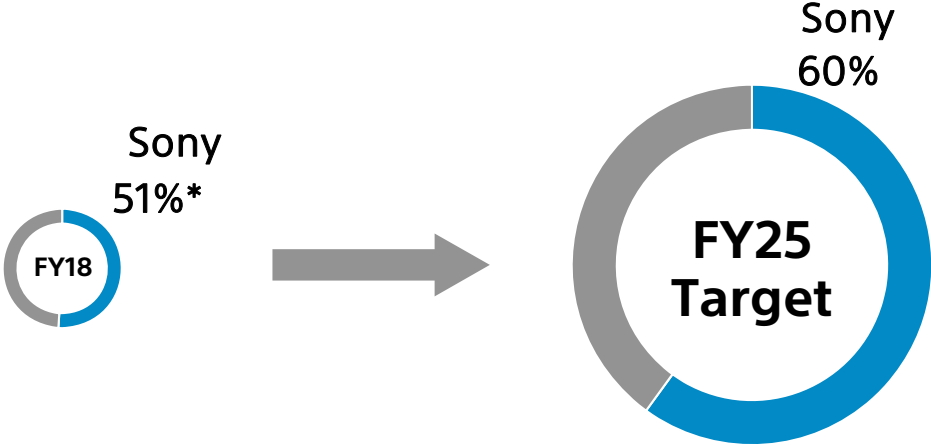
- Identify car ahead despite headlights and rain making it difficult to see

Scene 3: Night & Rain

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Image Sensor Revenue Share Target

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※Source: Sony

Revenue Portfolio Target

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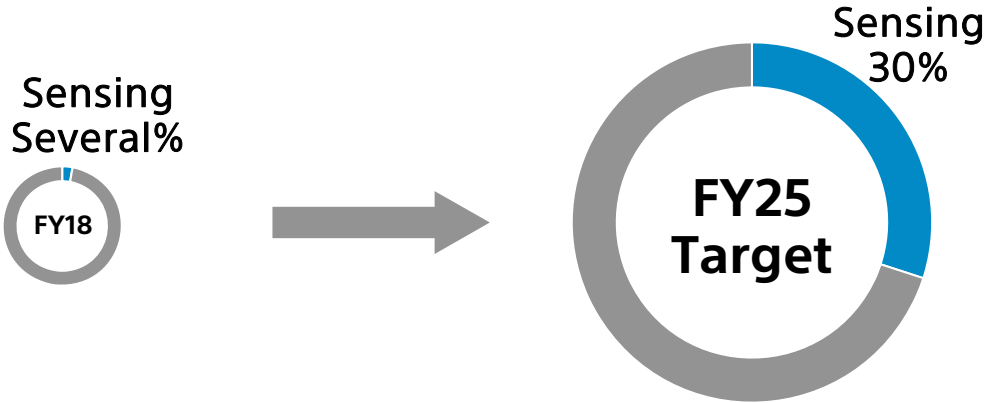
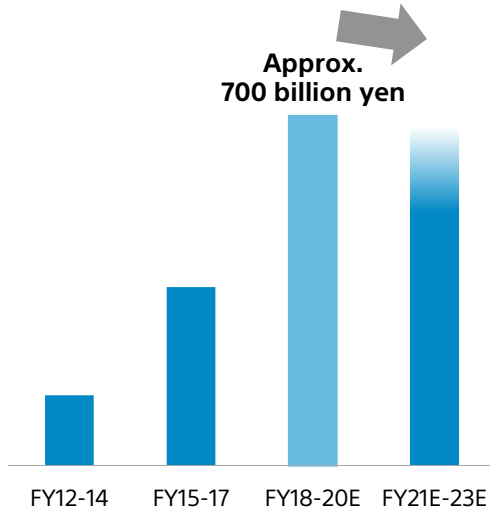


Image Sensor CAPEX

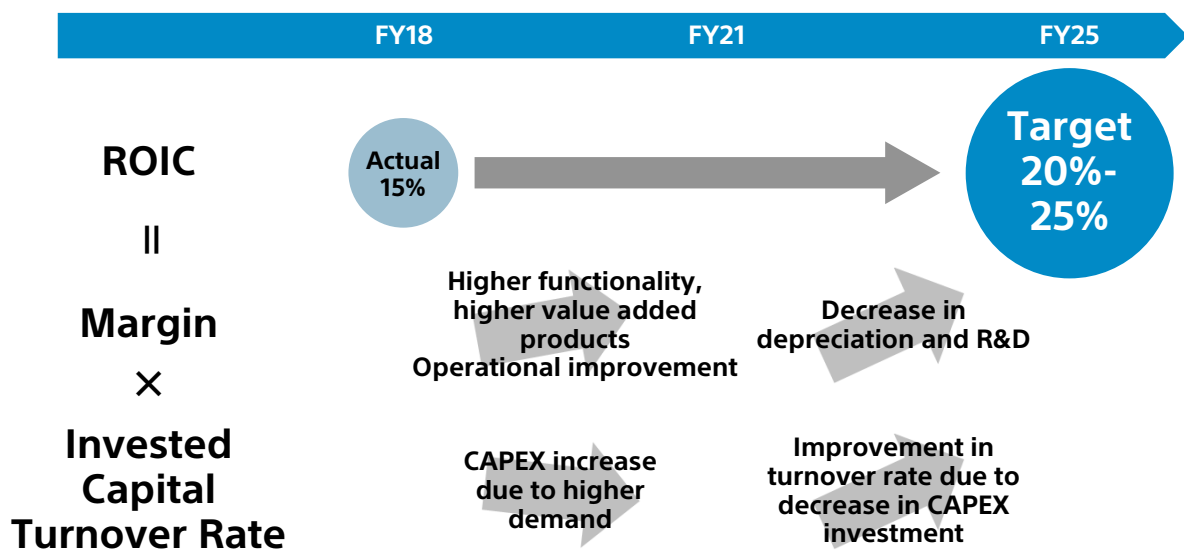
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ROIC Target / Roadmap to Improvement

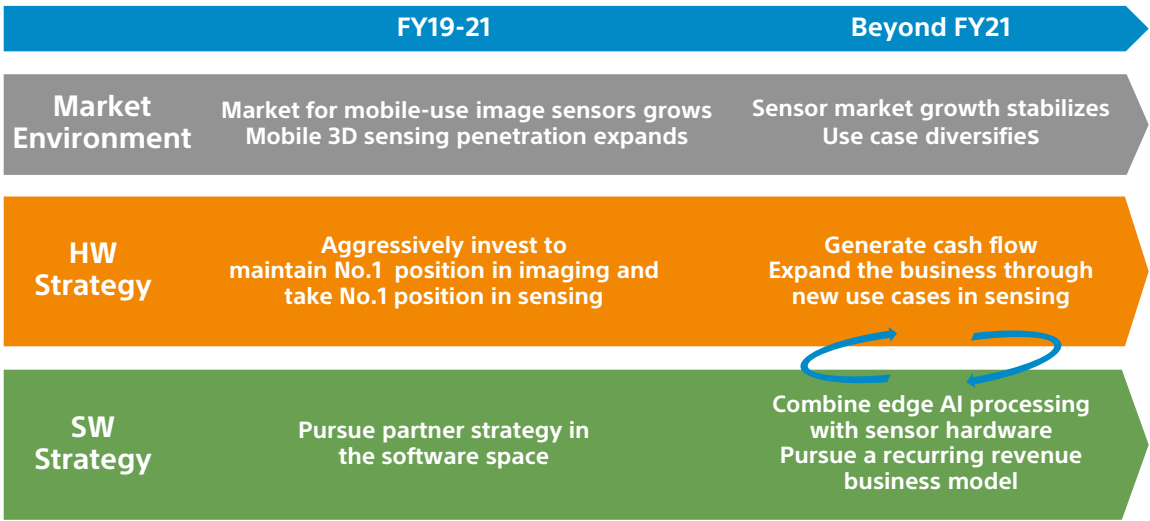
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2. Long-Term Business Strategy

Long-Term Business Strategy



*HW: hardware, SW: software

Sony Sensors Used in Various Applications Around the World



Cloud and Edge AI Processing

Cloud AI Processing

Benefit:

- Big data processing is possible
- Less influence from edge device performance

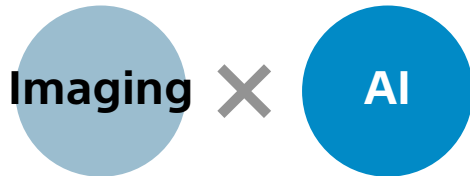
Edge AI Processing

Benefit:

- Ensure privacy
- Reduces data transfer time
- Reduces cloud usage costs
- Reduces bandwidth

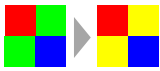
Image Sensors × AI Possibilities

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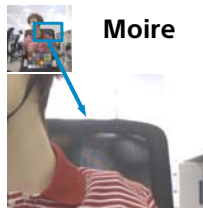


Better Picture Quality

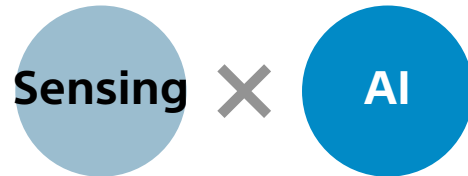
Possibilities limited to the number of human eyes



Utilizes complementary colors
High sensitivity and color reproduction



Eliminates moiré
Correction beyond physical limitations



Recognition and Machine Vision

Unlimited Possibilities



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Role of Image Sensors in the AI Era

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What Image Sensors Aimed To Do Up Until Today

Create clean images based on how human eyes see the world



What Image Sensors Aim To Do Going Forward

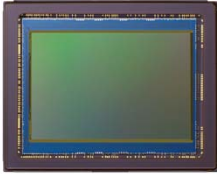
Create clean image data based on how AI sees the world

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Integration of Edge AI Processing and Sensor Hardware

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Sony Image Sensors

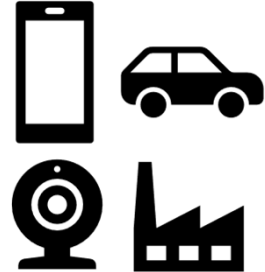


Approximately 51%* global market share
Superb expertise in data output space

AI



Applications



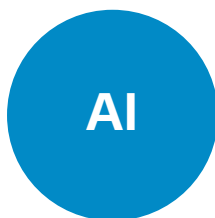
Integrate edge AI processing and sensor hardware
Pursue a recurring revenue business model

※Revenue basis, Source: Sony

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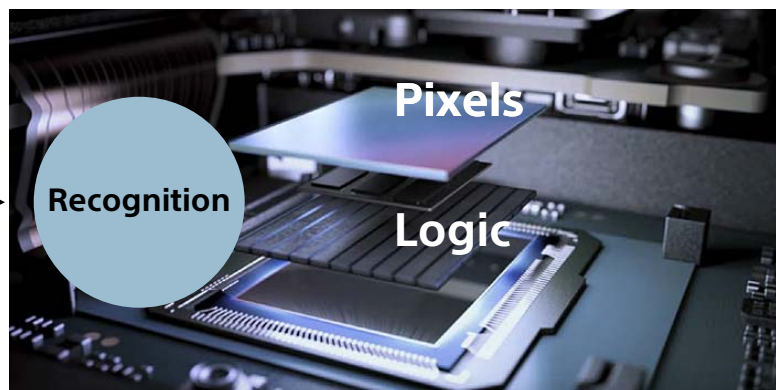
Increase Image Sensor Possibilities with Stacked Structure

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Embed

Recognition



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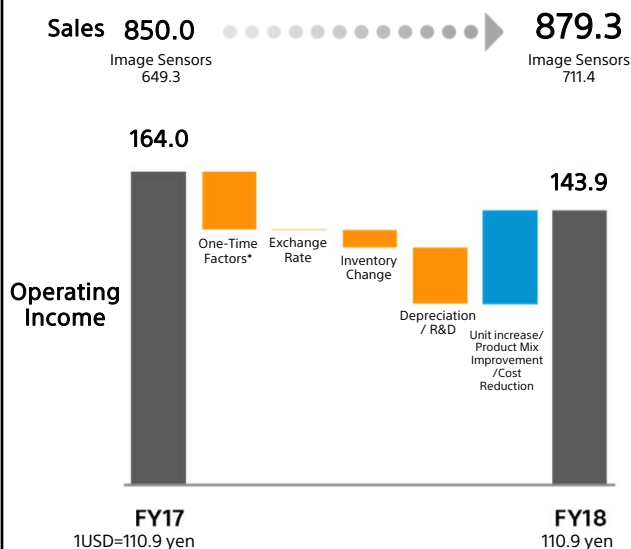
Growth in Image Sensor Business

Sensing

Edge AI

FY2018 Review

Operating Income Analysis (bln yen)



* Please refer to slide 24 of Presentation Material for FY2018 Earnings.

Achievements

- Increase in sales and OI in image sensors for mobile-use due to the shift to multiple lenses and larger sized sensors
- Adoption of Sony's ToF sensors for mobile applications
- Increased presence in the automotive market

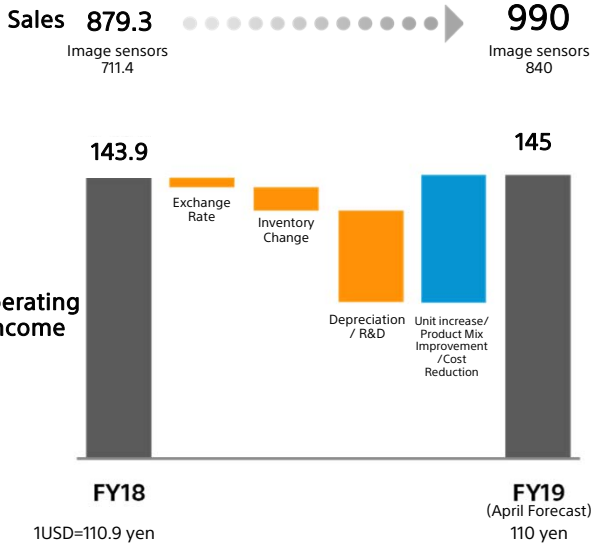
Issues

- Adaptability to market volatility for factory automation and security cameras

FY2019 Forecast

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Operating Income Analysis (bln yen)



Environment

- Acceleration in multiple lens and larger sized sensor adoption
- Sensor market for factory automation and security are expected to recover from the second half of FY19, after a slowdown in the second half of FY18

Basic Strategy

- Invest to meet the growing demand for sensors
- Accelerate initiatives to generate monetization opportunities that go beyond selling sensor hardware

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