(Securities code: 6728)

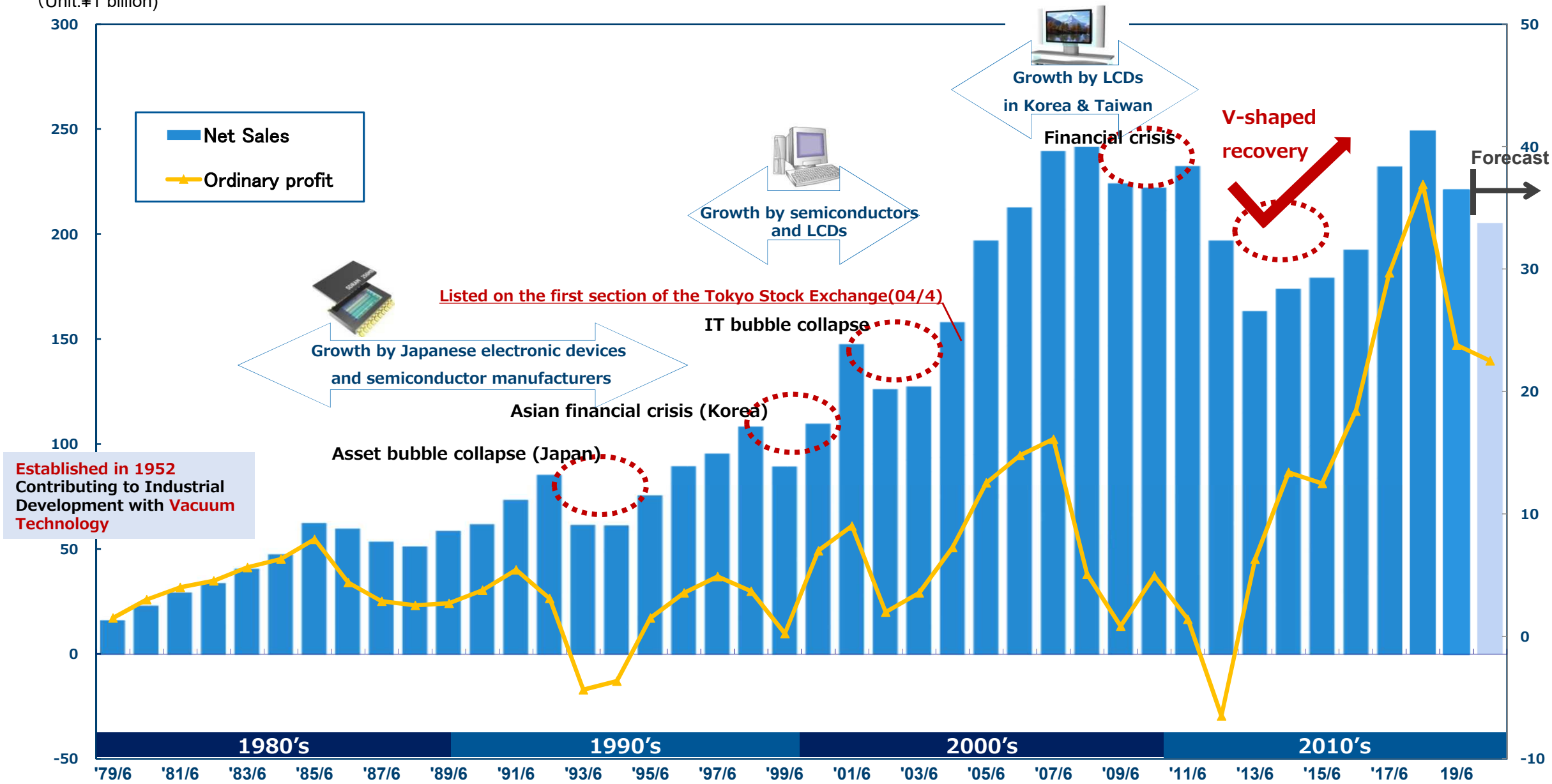
ULVAC's Growth Strategy in the coming Smart Society

Dec. 2019

ULVAC Inc.

Growth through overcoming violent ups and downs

(Unit:¥1 billion)



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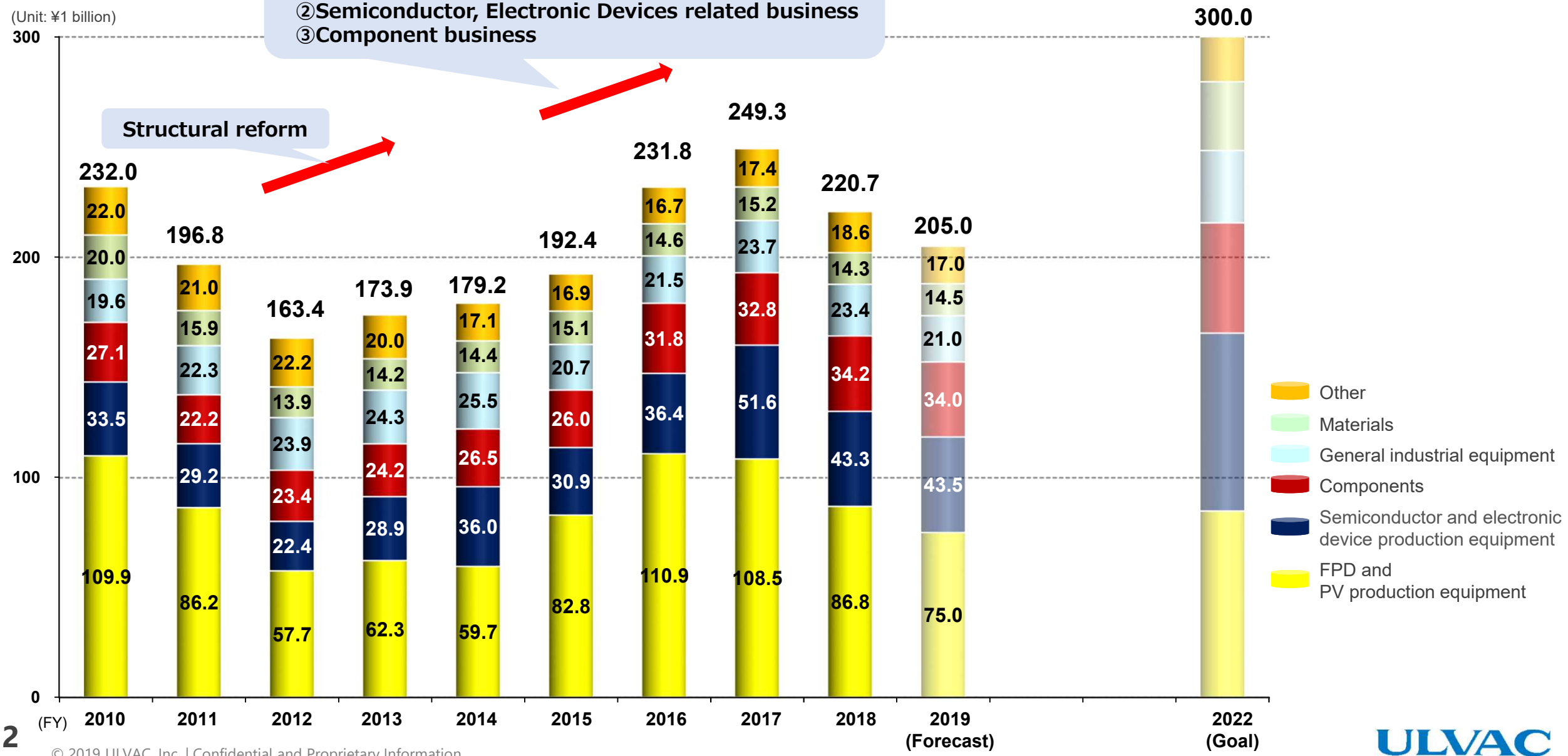
Sales by segments

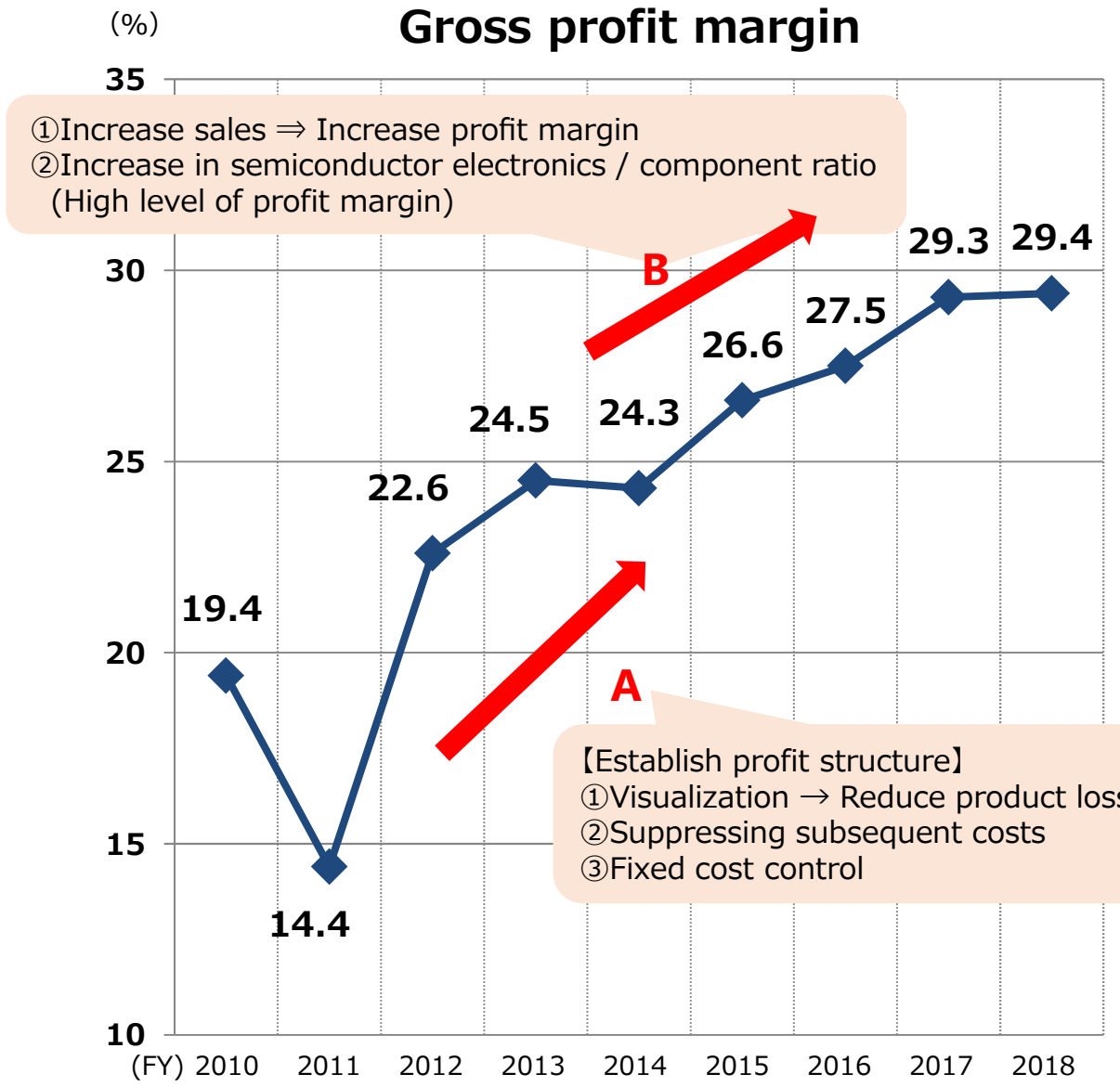
Growth in
①FPD,
②Semiconductor, Electronic Devices related business
③Component business

Structural reform



Profit margin improved steadily

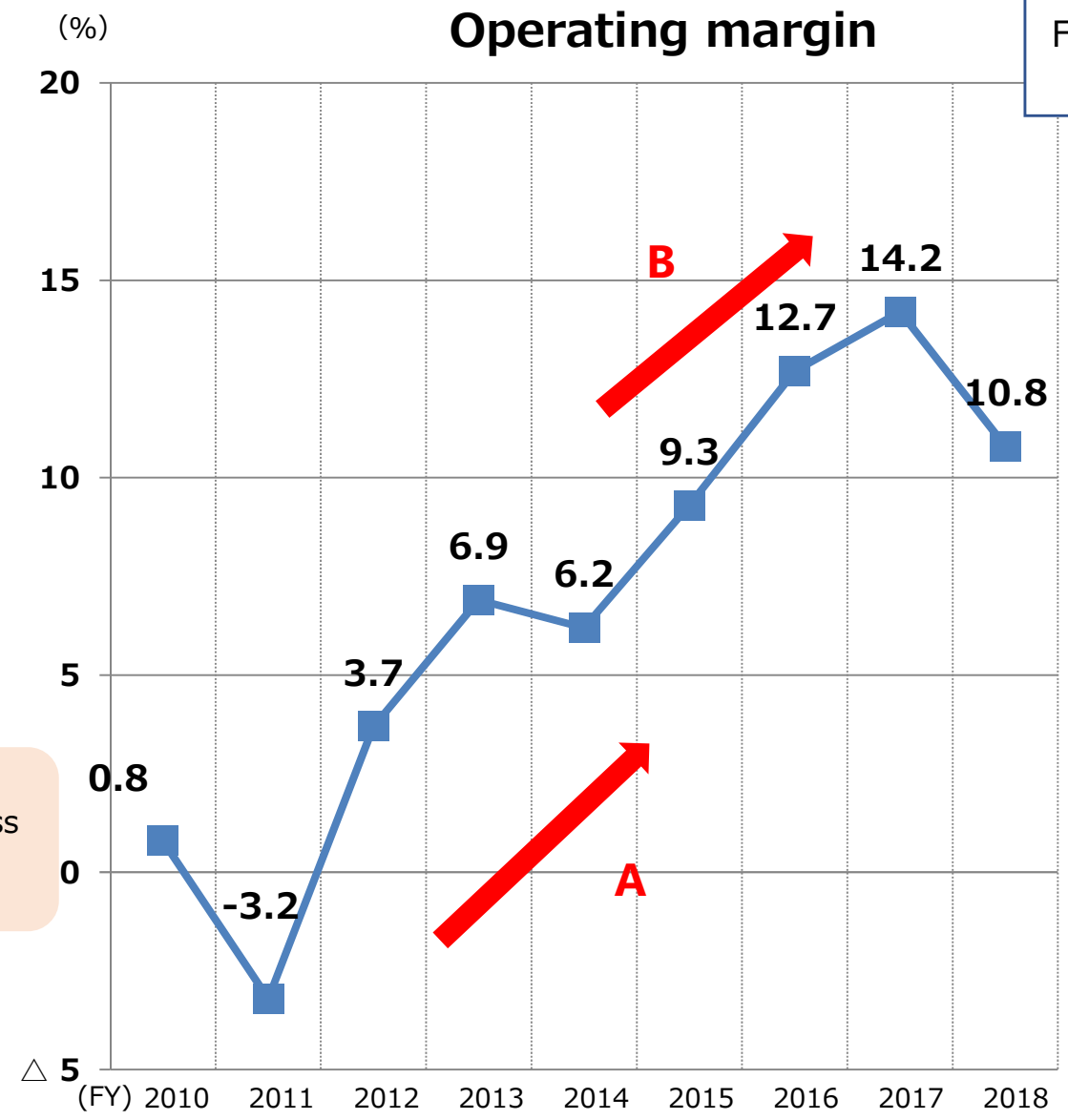
Gross profit margin



①Increase sales ⇒ Increase profit margin
②Increase in semiconductor electronics / component ratio
(High level of profit margin)

【Establish profit structure】
①Visualization → Reduce product loss
②Suppressing subsequent costs
③Fixed cost control

Operating margin



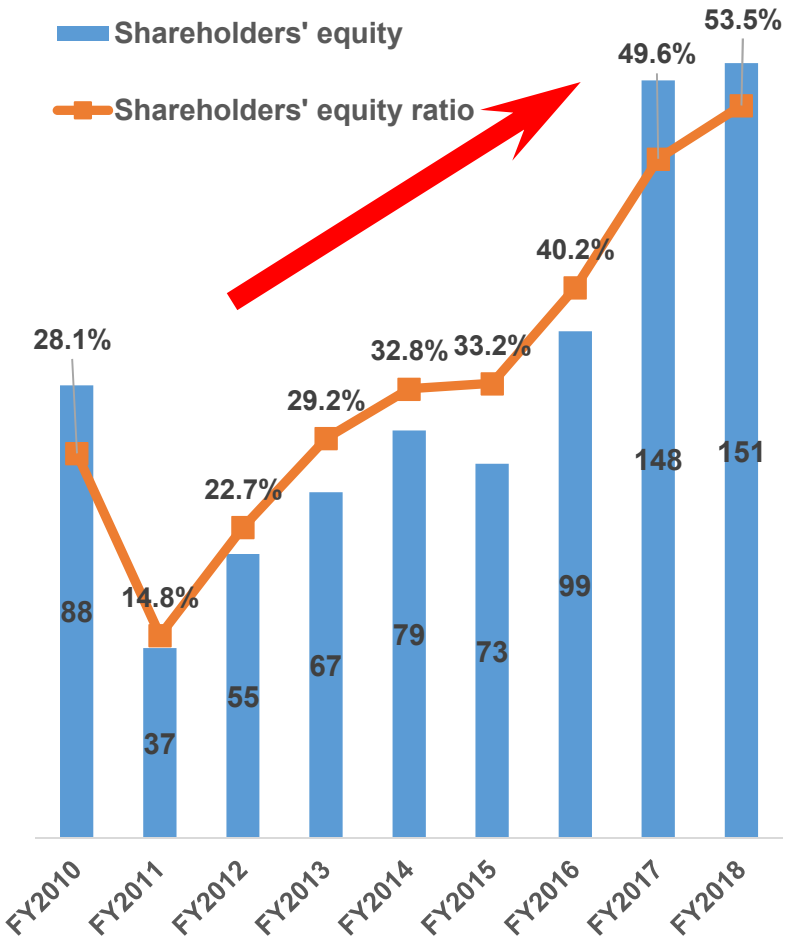
FY2022
16%

ULVAC

Enhancing Shareholders' Equity and R&D Investment for the future

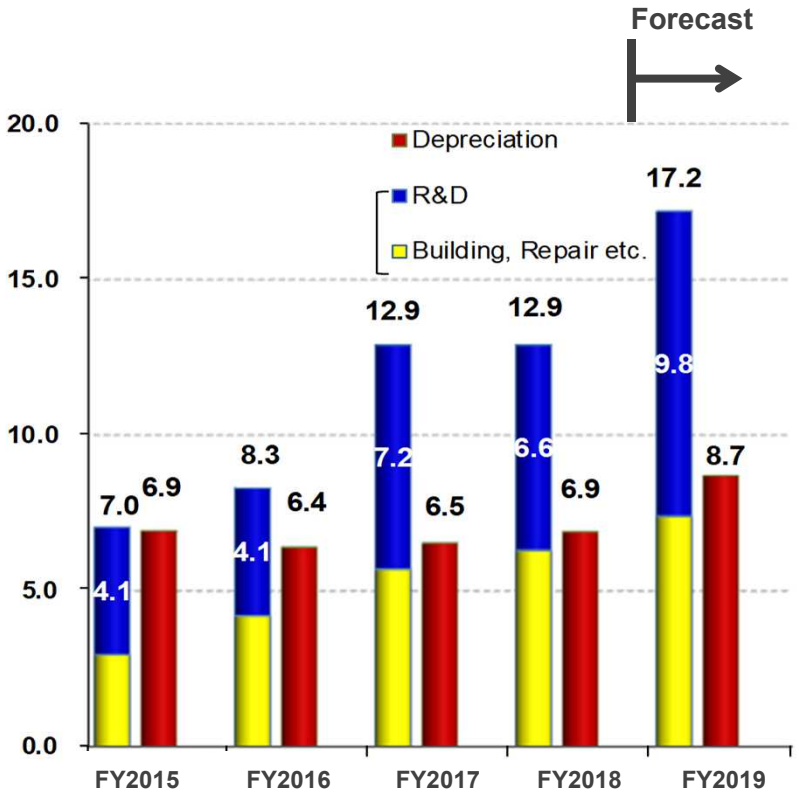
Shareholders' Equity Ratio

(Unit: ¥1 billion)



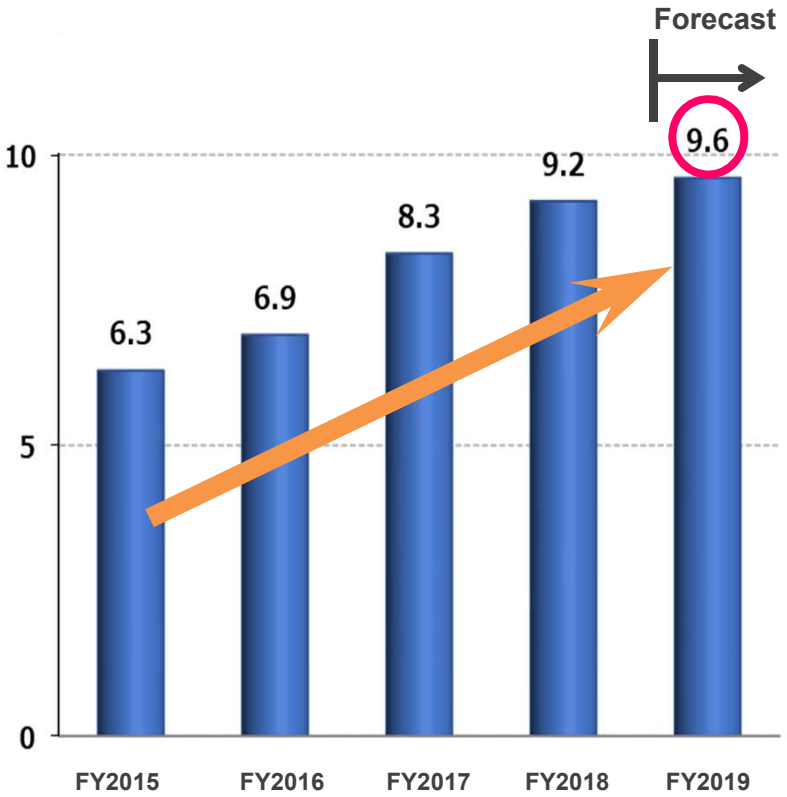
Capital Expenditures (actual and forecast)

(Unit: ¥1 billion)



R&D Expenses (actual and forecast)

(Unit: ¥1 billion)



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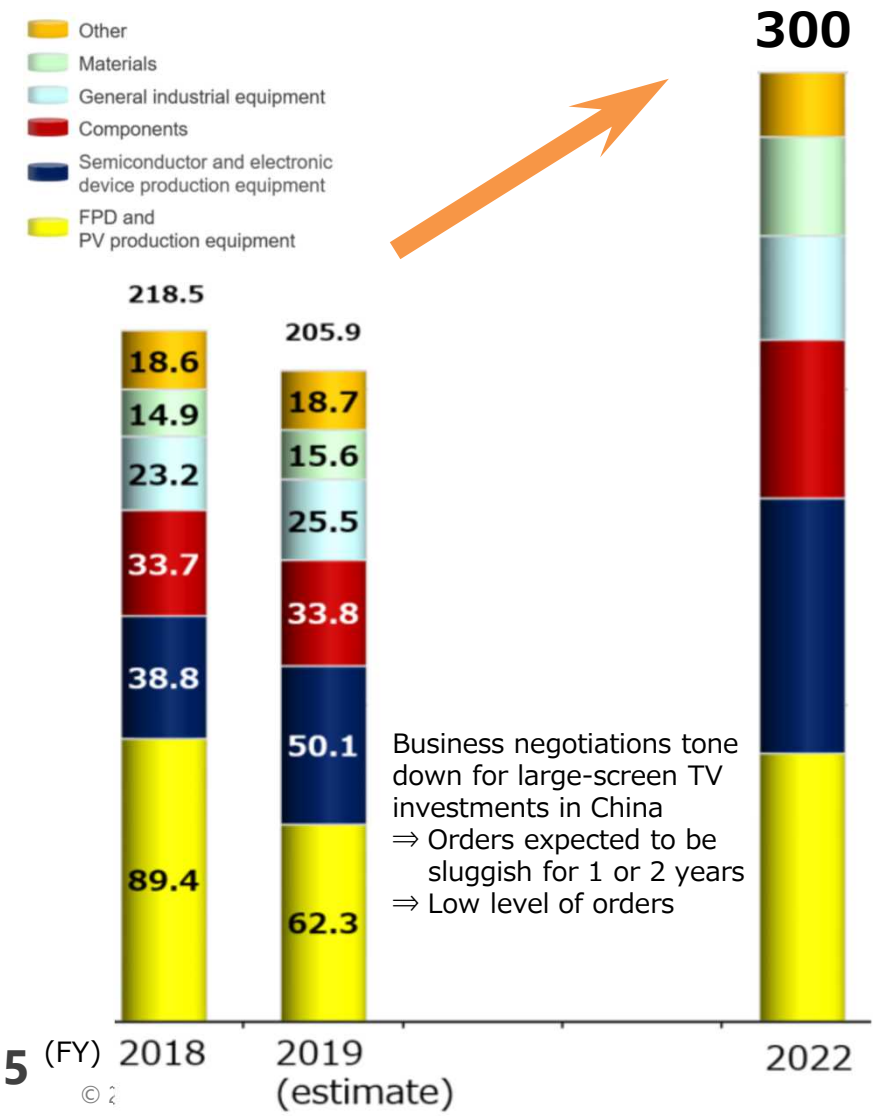
Growth Strategy

Aim Net sales of ¥300.0 billion & Operating profit margin of 16% in FY2022(Jul.2022-Jun.2023).



Growth strategy

1. Semiconductor and electronics

・Successful entry into the **logic** field related to EUV.
⇒ Future expansion (Entering two major companies)
・Growth of new **nonvolatile memory** (**PCRAM**, etc.)
・Growth in **Memory**.
・Incorporating **5G-accelerated innovation** into business opportunities.
(MEMS sensor / communication device / power device / packaging / optical etc.)

2. FPD・PV

Medium-Large OLED panel, **Battery**(RTR)

3. Growth of Stable business

Components, **Materials**, **Customer support**

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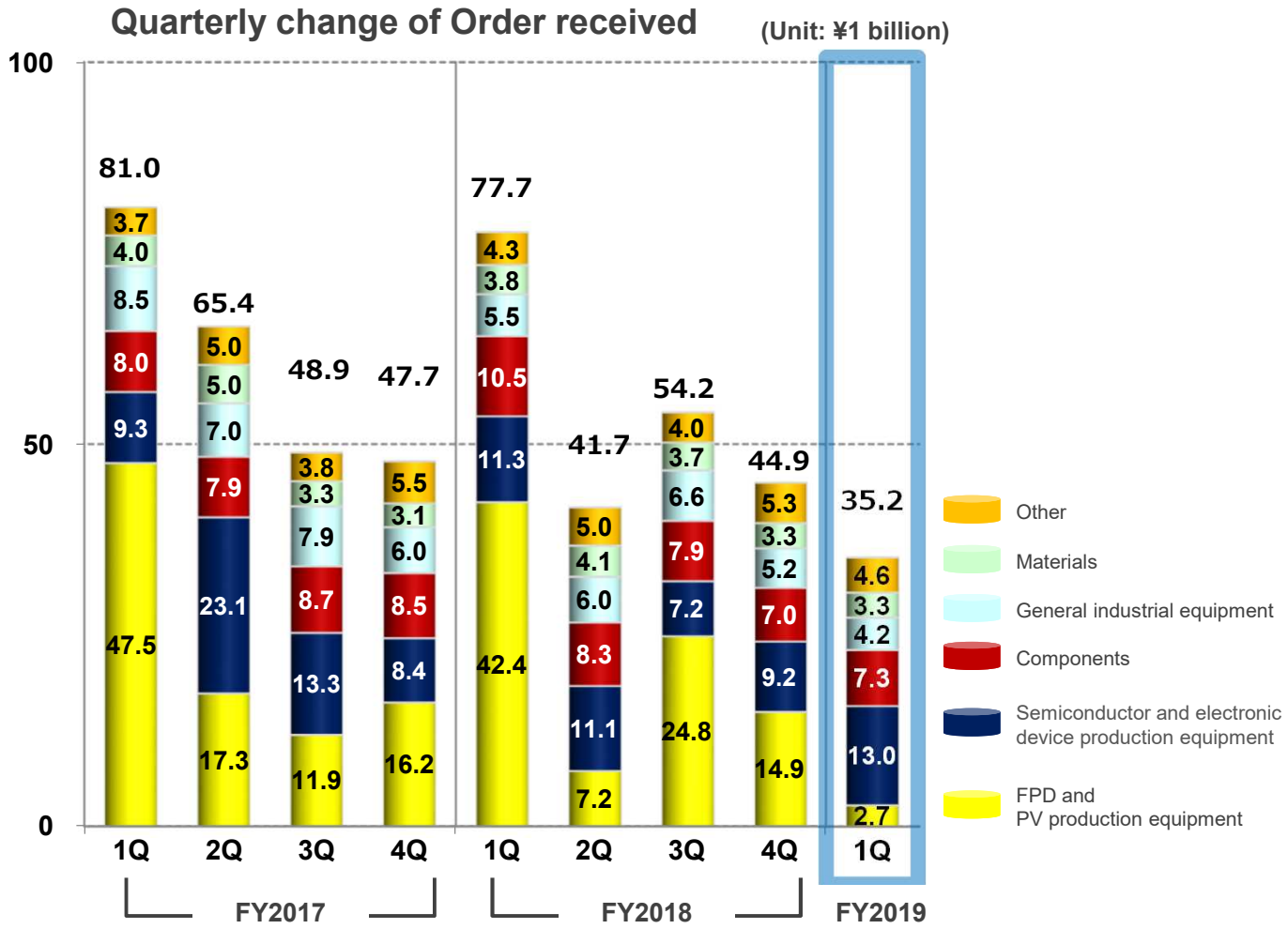
Business Result for 1Q FY2019 and Order Trend

	FY2018	FY2019			
	Full Year Result	1H Forecast	Full Year Forecast	1Q Result	Progress against 1H Forecast
Orders Received	218.5	98.6	206.0	35.2	36%
Net Sales	220.7	97.5	205.0	46.8	48%
Operating Profit	23.8	8.5	22.5	4.9	58%
Net Income	18.7	6.0	15.5	3.4	57%

※The cancellation of contract for ¥3.4 billion due to the cancellation of FPD related contract (allowance for doubtful accounts booked in 4Q 2019/6). Excluding the cancellation contract, orders received would be ¥6.1 billion for FPD and PV and ¥38.6 billion on consolidated basis.



FPD Market Environment: Terminal Gap Period for 1 or 2 years

2018 2019 2020 2021 2022

Investment in medium/large-sized OLEDs (South Korea, China)

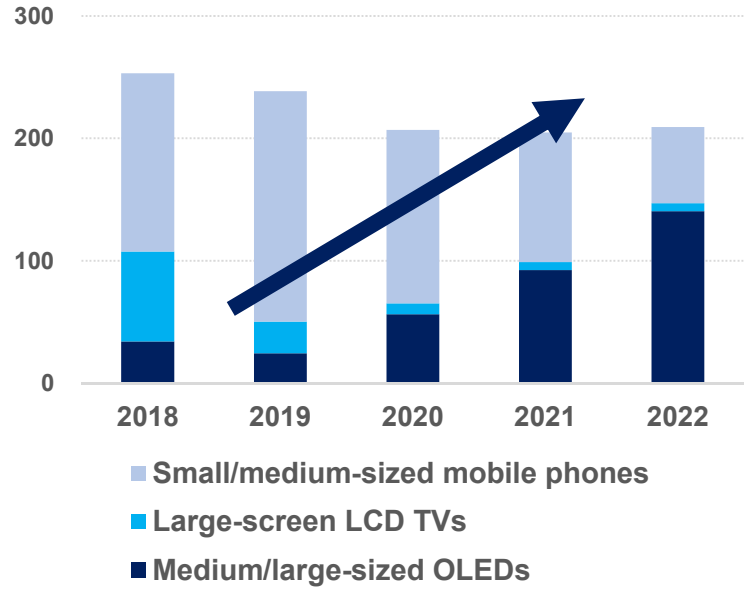
Investment in LCDs for large-screen TVs (China)
(begin operations in 2019–21: business negotiations tone down)

Differentiation

Active investment in OLEDs for small/medium-sized smart phones (China)
(business negotiations with customers expected in FY2020)

(Unit: ¥1 billion)

FPD capital expenditure trends



Source: Interviews by ULVAC

- LCD production facilities for large-sized TVs (G10.5 in China) are scheduled to begin production gradually from 2019 through 2021
- Investment in OLED for smart phones is expected to continue
  ⇒FPD-related investment is expected to be sluggish for 1 or 2 years
- Expansion of the medium/large-sized OLED market by anticipated increase in applications
  ⇒ Collaboration in development for mass production with top manufacturers
  (Contribution to our Sales is expected to be 1 or 2 years later)

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Expanding business opportunities by shifting to OLEDs

Characteristics of OLEDs

- Flexibility
- Enable to be made thin and lightweight
- Possibility of cost reduction

Expansion of applications for OLED displays

- Foldable smart phones
- Wall-hung large-screen displays
- In-vehicle flexible displays
- Rollable displays
- Transparent displays

Technological challenges

- Development of equipment for large substrates
- Structural change (Evaporation process ⇒ Sputtering)
- Development for mass production

ULVAC's strengths

- Sputtering on large substrates and transport technology
- Expertise in sputtering equipment
- Collaboration in development for mass production with top manufacturers

Aim for top share in medium/large-sized OLED market

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Smart society: Shift to electronics in every industry

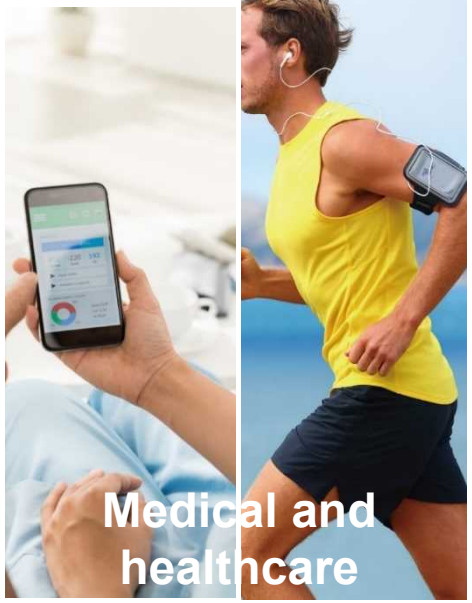
Global social problems: population expansion, aging population, concentration in cities

Shortage of medical care | **Shortage of food and water** | **Shortage of energy** | **Traffic congestion** | **Changes in the natural environment**

Technological solutions

Smart society

Anytime **Anywhere**

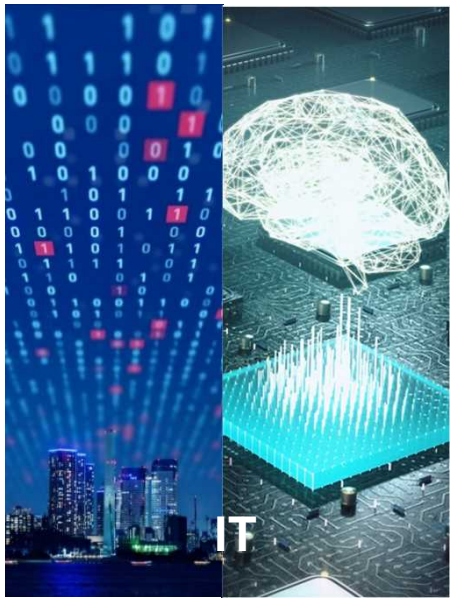


Medical and healthcare

Wireless

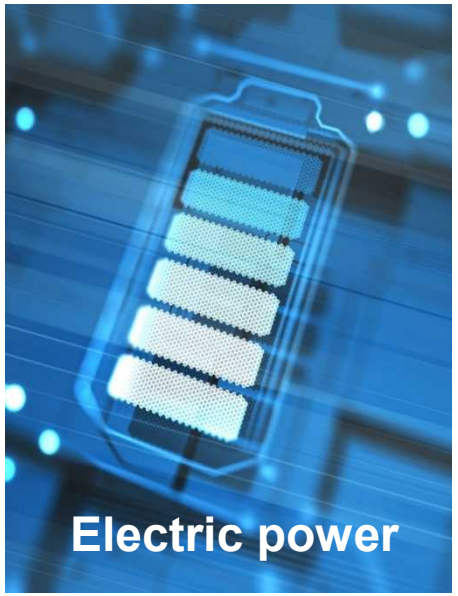
Agriculture

High-speed **Prediction**



IT

Low power consumption



Electric power

Autonomous

Transportation and distribution

ULVAC

Technology for enabling a smart society = Growth market

Applications

Automobile
(autonomous-driving)

Finance
(blockchain)

Drones
(unmanned delivery)

Food
(smart agriculture)

Smart phones
(healthcare)

Medicine
(remote medicine)

5G

5G

Edge

Smart systems

IoT

AR/VR

Cloud

Big data

AI

ULVAC's growth markets!!

Growth markets (key technologies)

Semiconductors (memory & logic), new non-volatile memory, MEMS, Sensors, Communication devices, Power devices, Li-ion batteries (LIB), Advanced packaging, OLED displays, Solar panels

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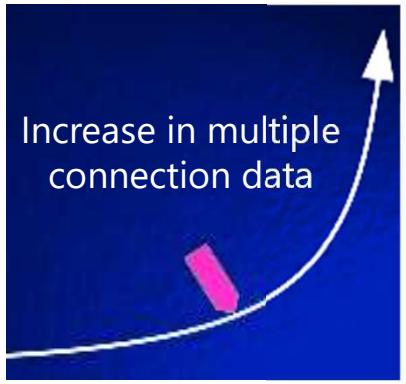
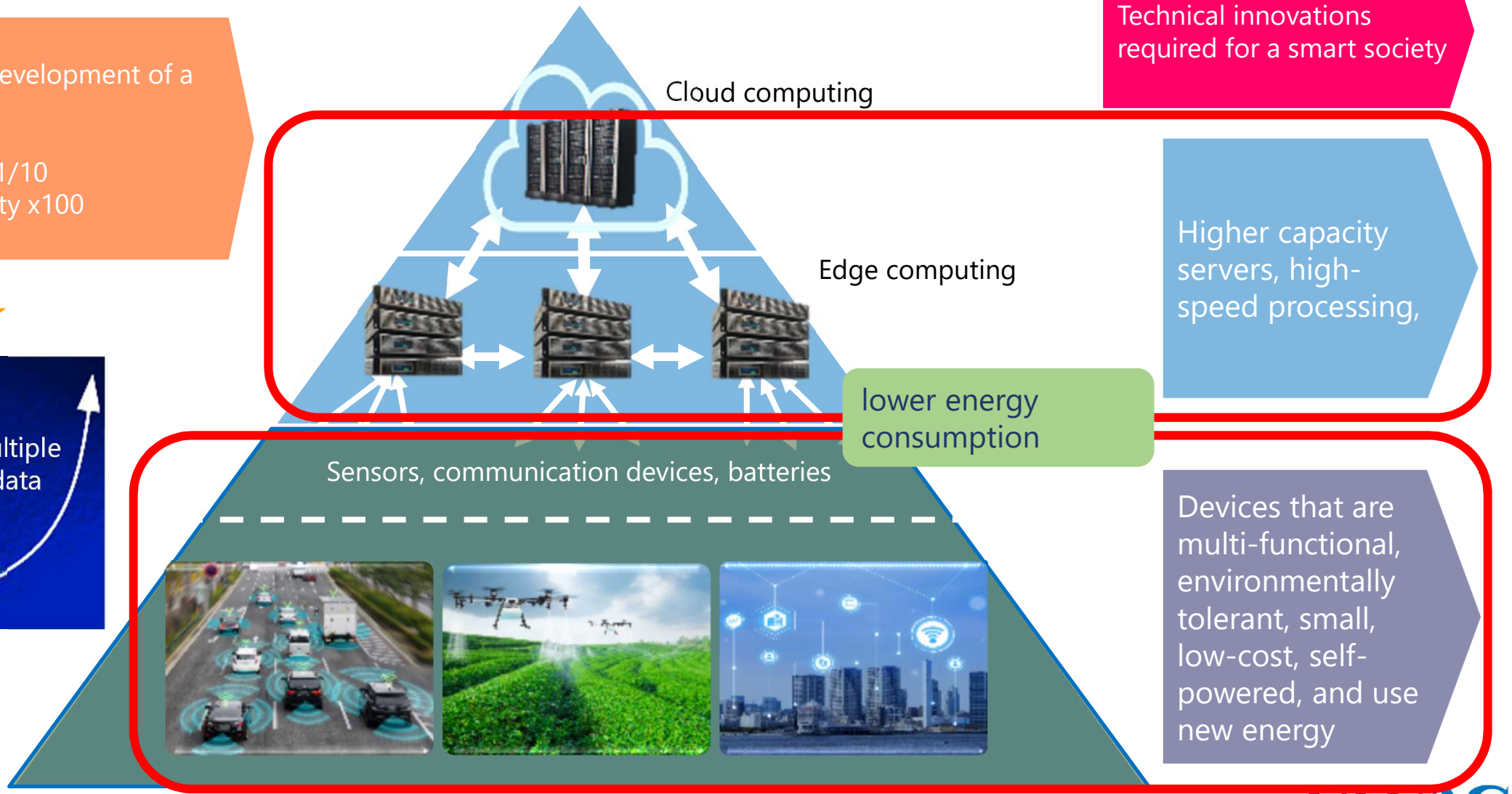
Big opportunity occurred only once every few decades

5G accelerates the development of a smart society
- Ultra fast x100
- Ultra low latency x1/10
- Massive connectivity x100



Technical innovations required for a smart society



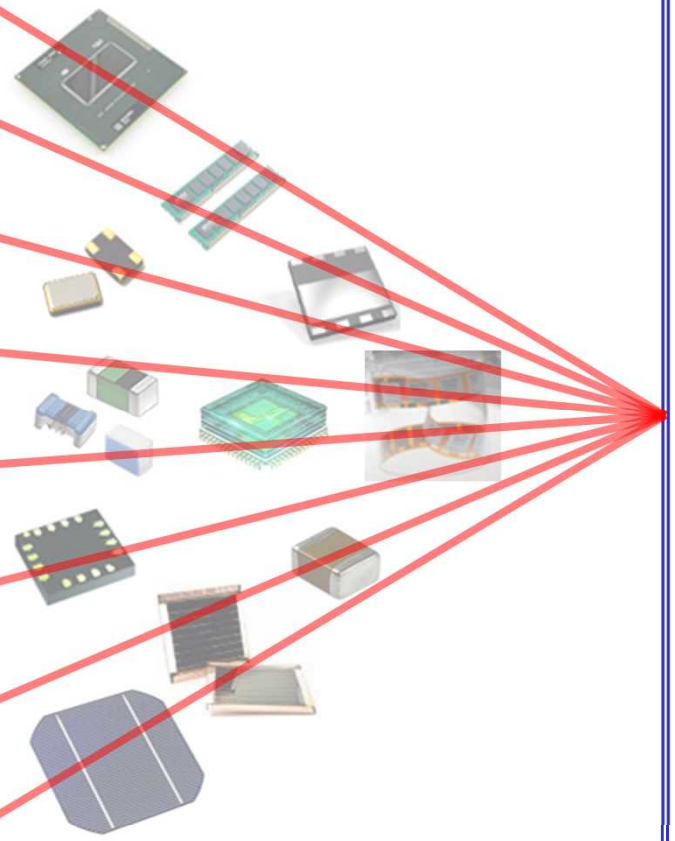
Higher capacity servers, high-speed processing,

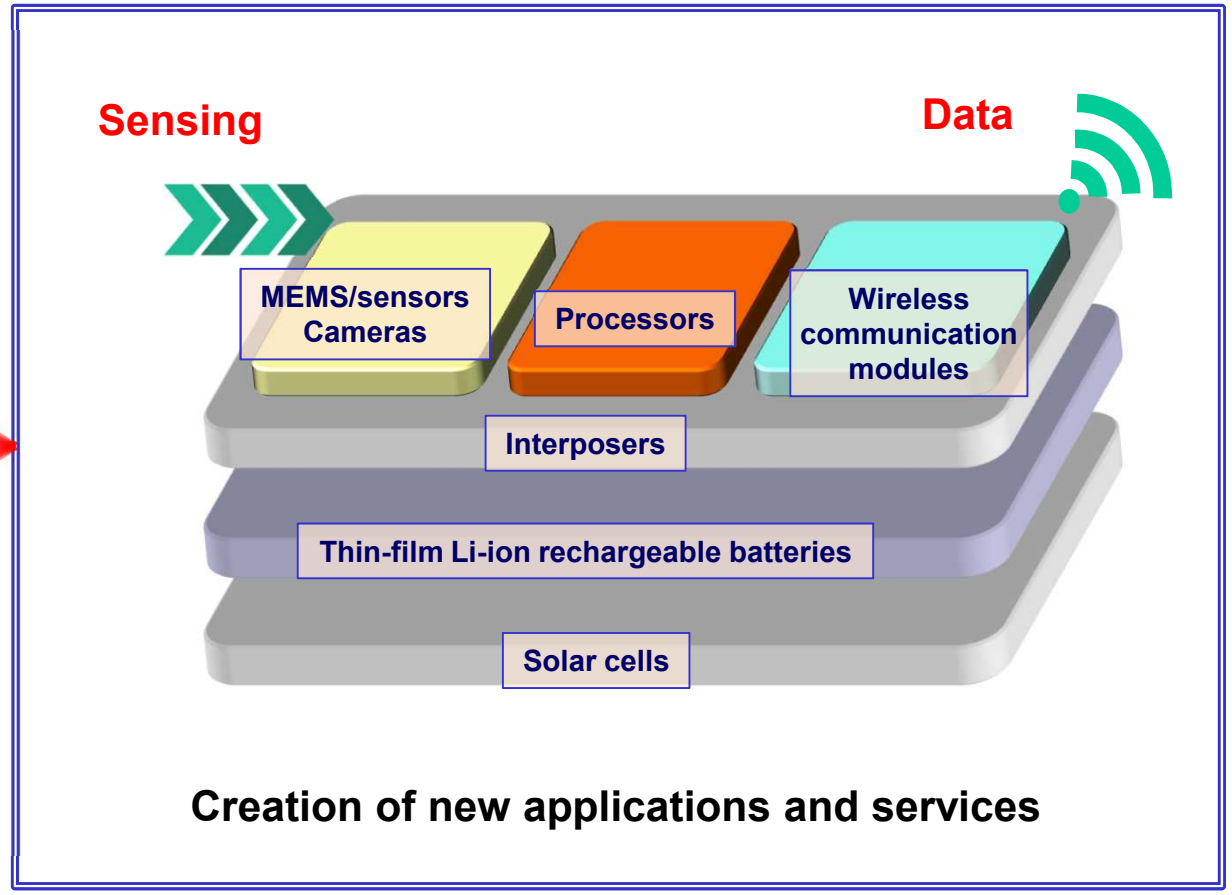
lower energy consumption

Devices that are multi-functional, environmentally tolerant, small, low-cost, self-powered, and use new energy

ULVAC's technical advantage: Integration of core technologies (semiconductors, electronic device, energy, packaging)

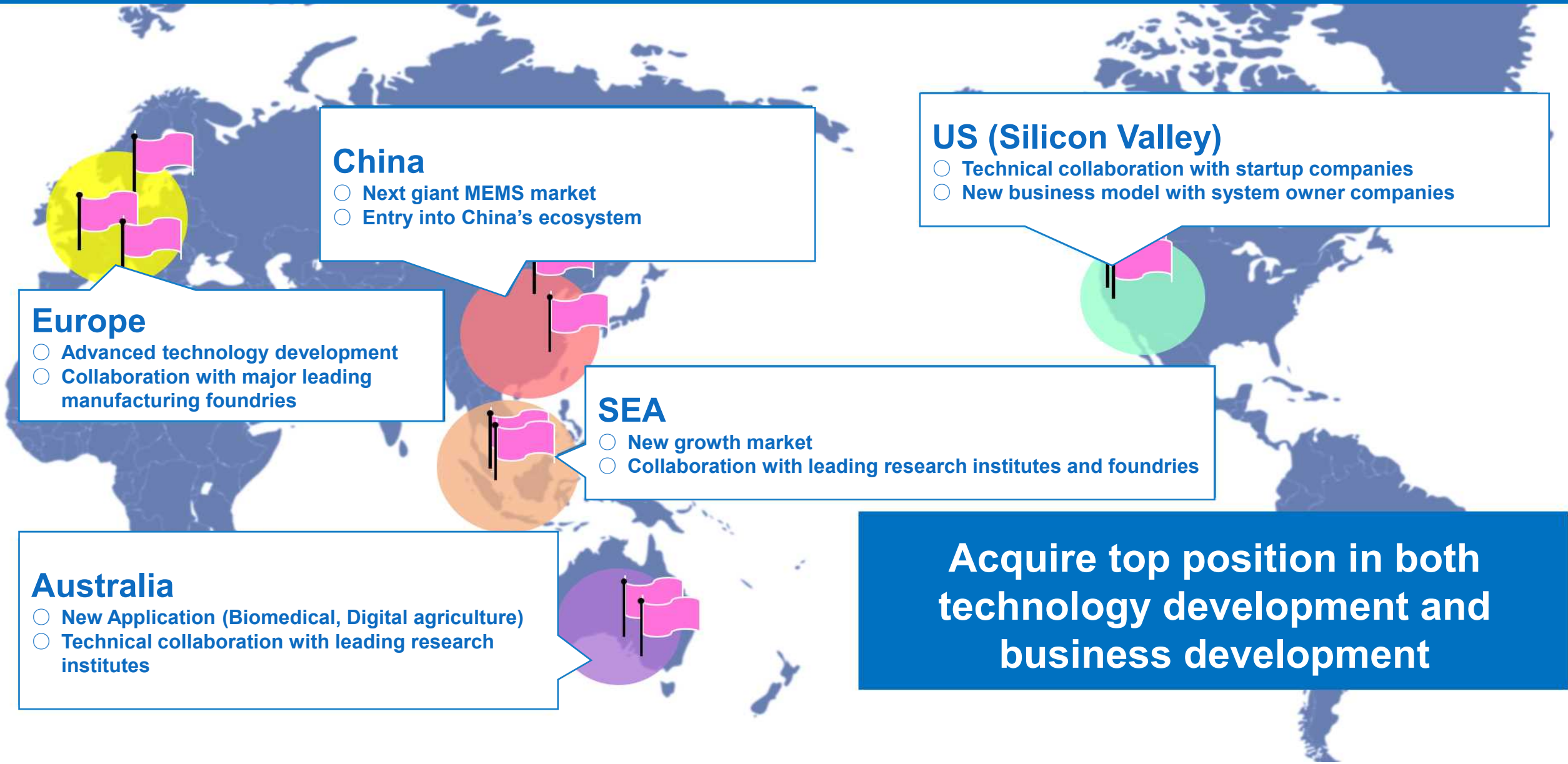
- AI chips
- Non-volatile memory (PCRAM)
- Wireless communication modules (5G)
- MEMS sensors
- Cameras
- Converters
- Solar cells
- Thin-film Li-ion 2nd batteries





Thin-film processing technology and new materials are needed to support these technologies!!

ULVAC's strategic collaborations in PiezoMEMS



China
- Next giant MEMS market
- Entry into China's ecosystem

US (Silicon Valley)
- Technical collaboration with startup companies
- New business model with system owner companies

Europe
- Advanced technology development
- Collaboration with major leading manufacturing foundries

SEA
- New growth market
- Collaboration with leading research institutes and foundries

Australia
- New Application (Biomedical, Digital agriculture)
- Technical collaboration with leading research institutes

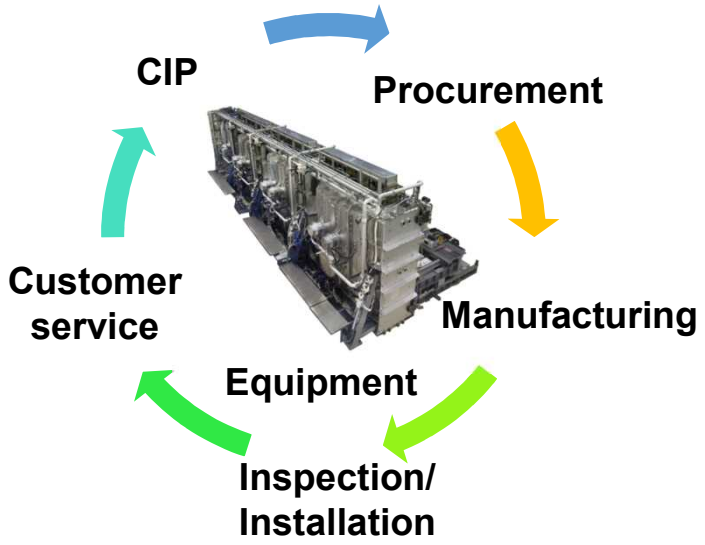
Acquire top position in both technology development and business development

ULVAC's geographic structure

Local production systems, supply chains, and networks built in individual expanding markets and regions

Global Production

Regional supply chain



Customer Service (e.g., China)

Realizing new value: SaaB (Service as a Business)

Attract new customers by using ULVAC's wide technical coverage, strengthen marketing

Customers

Foundries	Fabless
Venture companies	Universities and research institutes

Customer ideas

↓

Design

↓

Initial prototypes

↓

Testing

↓

Order Receiving

:

Conventional business scheme

(Sales → technical development → product development → production procurement → service)

◆ Use ULVAC technology platform

- Using ULVAC equipment for prototyping and testing as a business expansion tool.
- Capture new potential customers

◆ Provide One-Stop Service

- Achieve mass production in a short time through one-stop service from prototyping to mass production stage

Market expansion,
New business creation

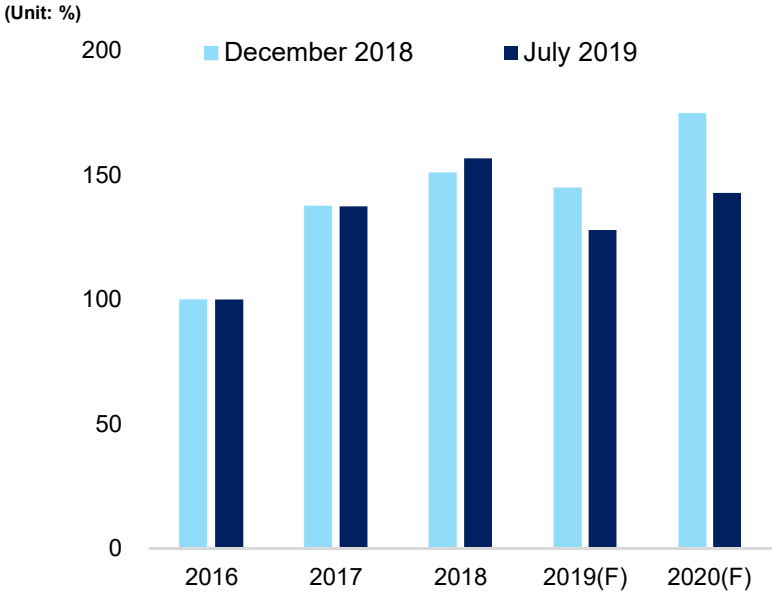
ULVAC

Semiconductor Market Environment: Memory

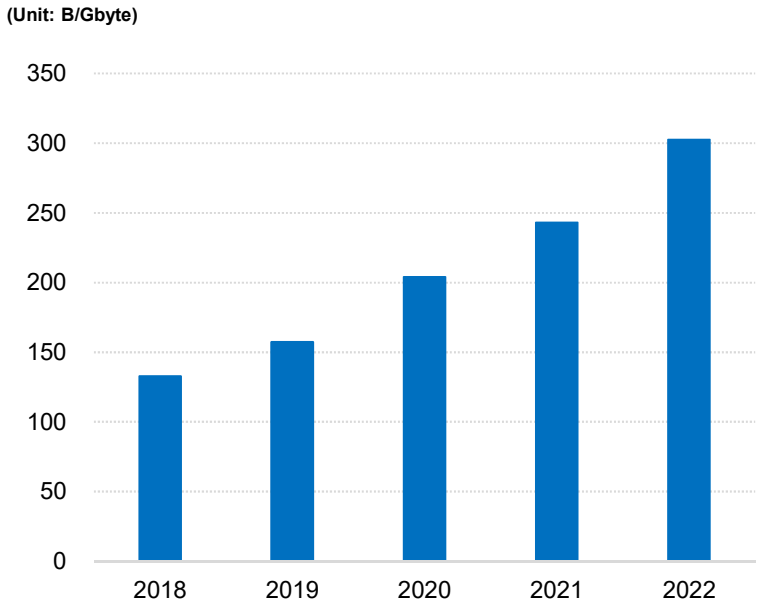
Memory market

- Active investment by memory manufacturers in 2017 to 2018 ⇒ Oversupply and significant price declines
- Postponement of investment by memory manufacturers from the end of 2018 ⇒ Investment is not expected to fully resume until 2020 or later due to high-tech trade friction between the US and China (Investment in 2019 to 2020 is forecast by SEMI to be lower than in 2018)
- Growth in DRAM and NAND demand (memory capacity) ⇒ After realization of the smart society, the current forecast may be exceeded

Semiconductor Manufacturing Equipment Market Outlook (SEMI)
2016 = 100

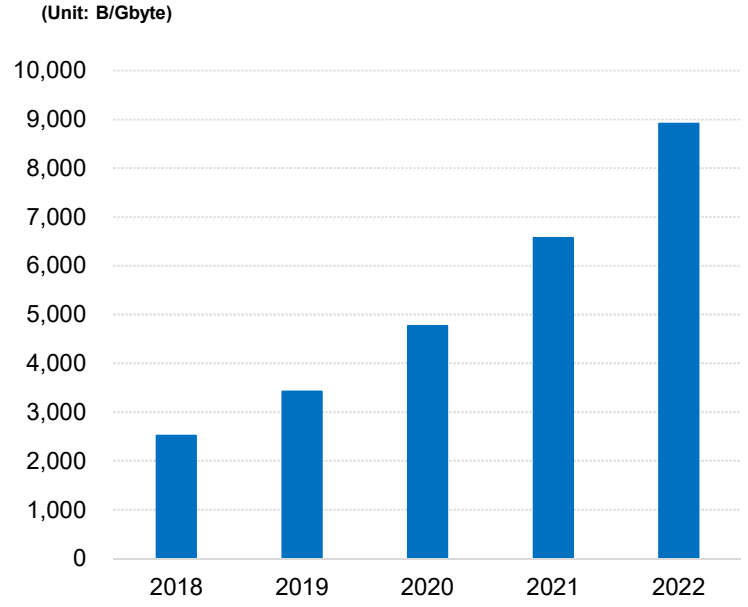


DRAM demand (shipment volume) forecast



Source: Gartner

NAND demand (shipment volume) forecast



Source: Gartner

Semiconductor Market Environment: Logic

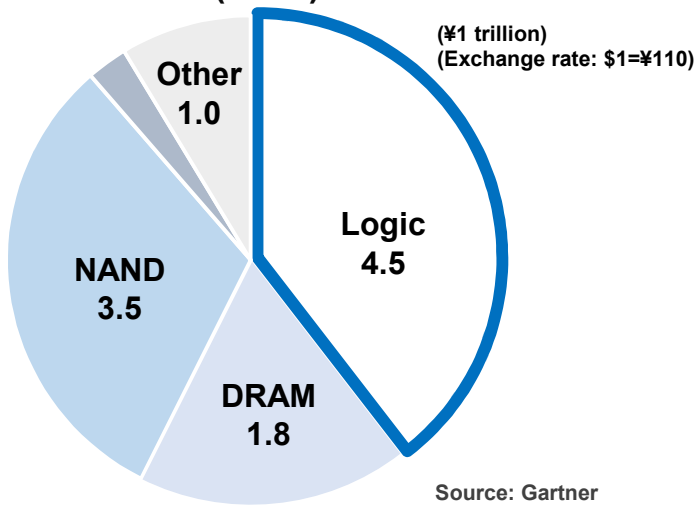
Logic market

- Investment on par with that for memory (DRAM and NAND)
- Logic-related investment is stable (¥4.4-4.7 trillion)
- Future growth is expected for advanced miniaturized products ⇒ Focus on capital expenditures
  (Advanced miniaturized products will not be fully developed until 2020 or later)

Success in entering the logic field

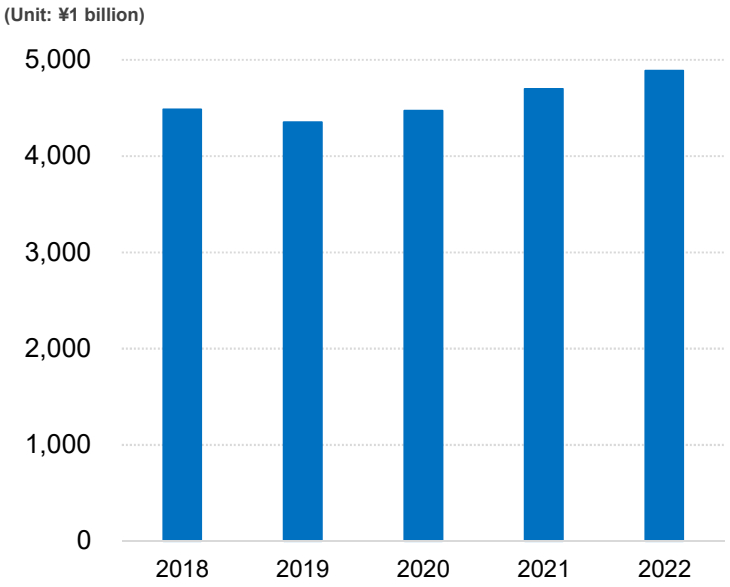
- Two major manufacturers rated us higher than the competitors in the sputtering process required for miniaturization in EUV process⇒ Certified as standard equipment
- Grow by expanding business to logic foundry manufacturers who are pursuing miniaturization

Semiconductor capital expenditure amount (2018)



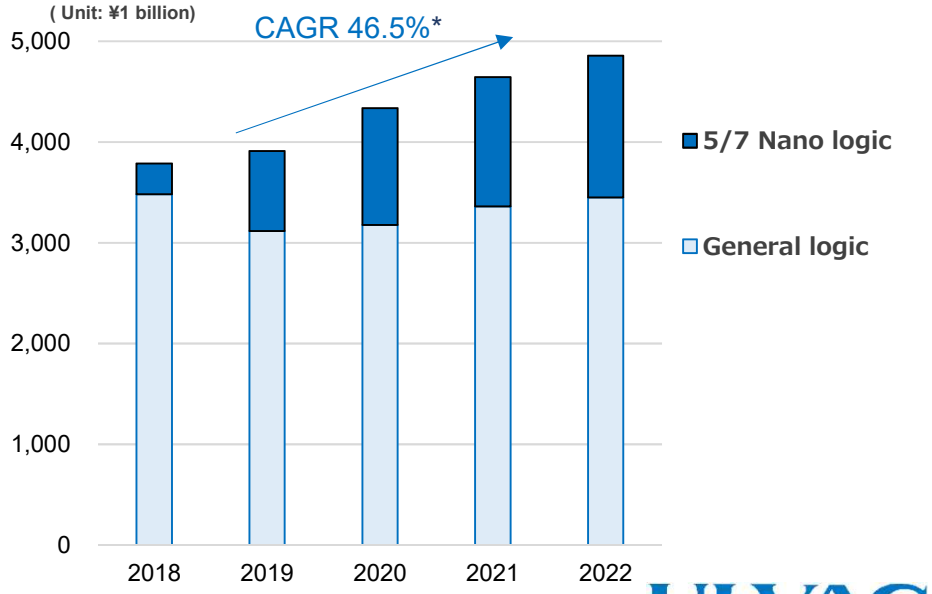
Source: Gartner

Logic capital expenditures



Source: Gartner

Demand forecast



*CAGR for advanced logic
Source: Gartner

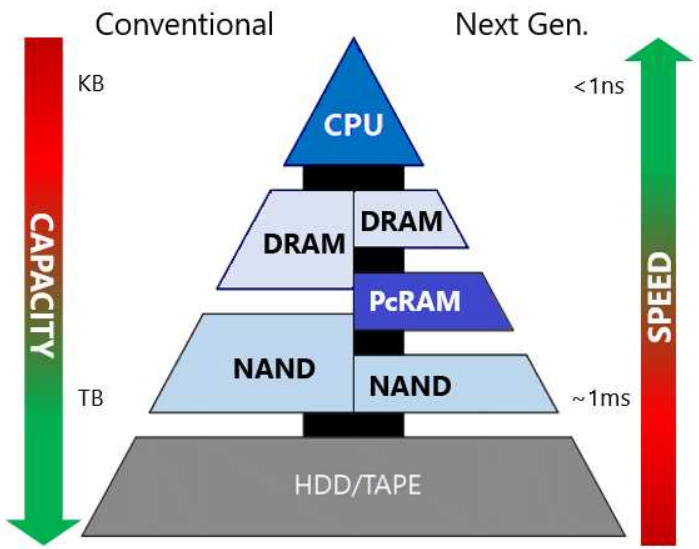
Semiconductor Market Environment: New non-volatile memory (PCRAM)

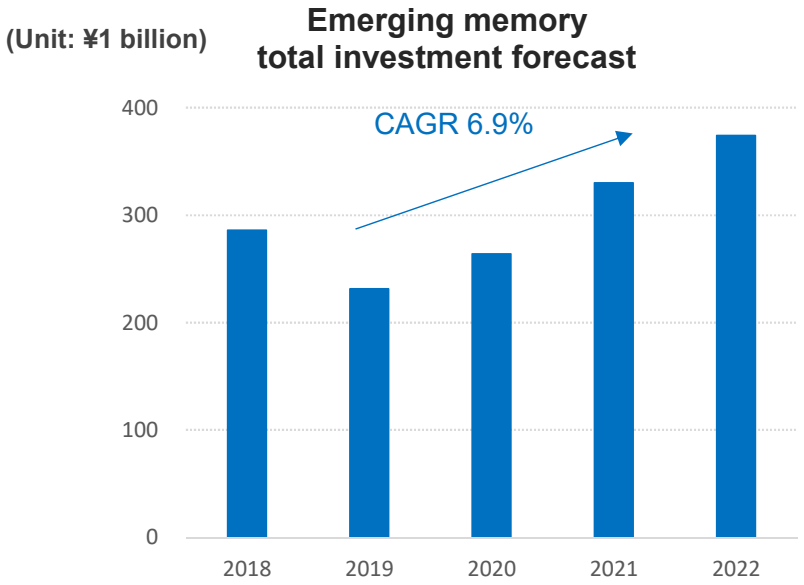
New non-volatile memory market

- Memory positioned between NAND and DRAM in that it 1) has a faster processing speed than NAND, and 2) unlike DRAM, it is non-volatile (memory is preserved even if power supply is cut)
  ⇒ Contributes to high-speed processing of big data and energy conservation
- PCRAM can be used to replace DRAM-based DIMMs on servers. Other applications will also be developed.

ULVAC's strengths

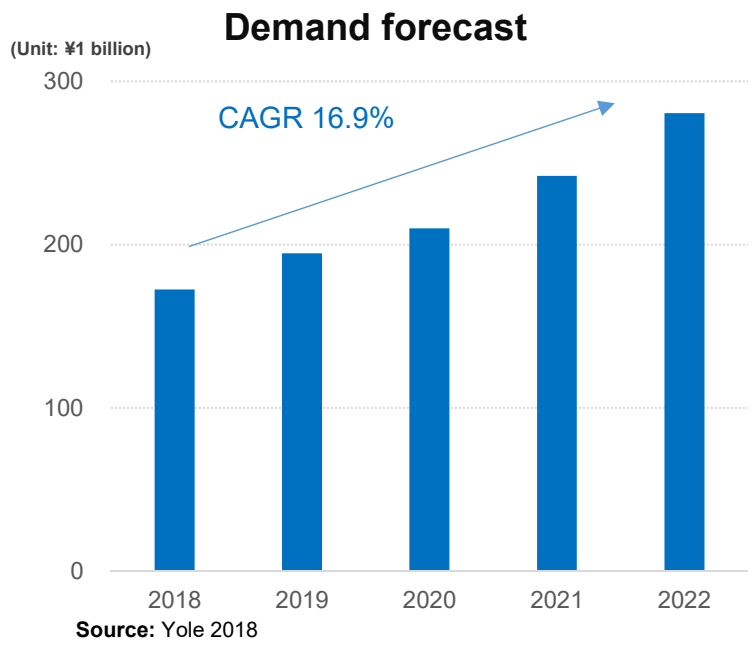
- ULVAC is the only equipment supplier to enable mass-produced film deposition system for PCRAM
- Providing equipments to several major leading manufacturers at mass production level
- Supporting the development for next-generation products of manufacturers as a partner





Note: Emerging Memory includes MRAM, ReRAM, PCRAM, etc.
Source: Gartner 2018

MEMS sensors



Source: Yole 2018

PZT-MEMS production equipment

Characteristics and market growth

- Expansion of market for VR/AR, microphones, LIDAR, and other sensors to support 5G/smart society
- Anticipated expansion of applications and markets by raising the performance and lowering the cost of MEMS devices used in sensors

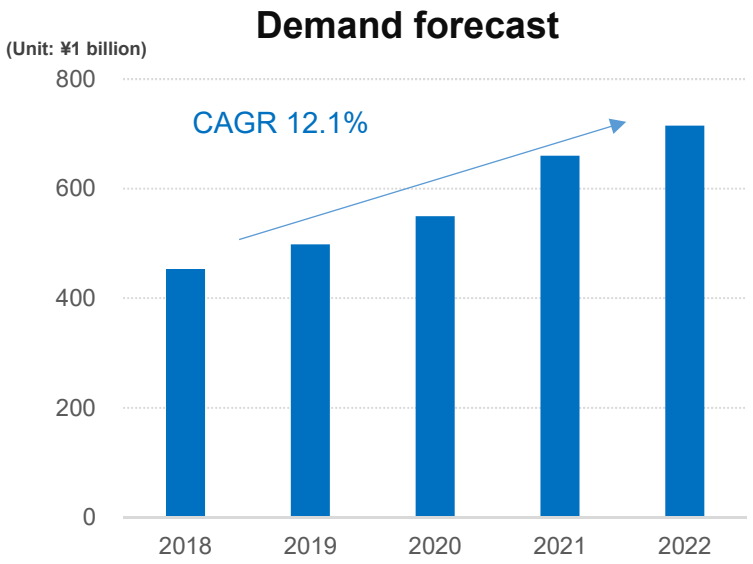
ULVAC's strengths

- Achieved low-temperature process using PZT sputtering equipment
  - ⇒ Enable PZT thin-films on CMOS
  - ⇒ Enable development and production of high-performance MEMS devices

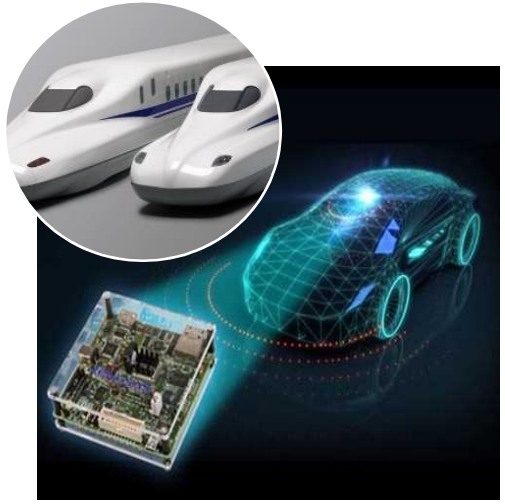
Growth strategy

- Leverage our PZT-MEMS sputtering equipment technology, which we launched ahead of our competitors
- Capture market share by using the advantage being the first development, mass production supplier working with major research institutes and manufacturers in Europe and Asia
- Support next-generation process development

Power Devices



Source: Yole 2017



SiC power device production equipment

Characteristics and market growth

- Increase in Si-IGBT production expected mainly for Japanese automobiles
- Increase in market entries by Taiwanese, Chinese, and South Korean manufacturers (China particularly is moving in the direction of domestic-made products: currently around 5%)
- In China and Europe, demand for SiC for replacements in electric vehicles is expected starting around 2023

ULVAC's strengths

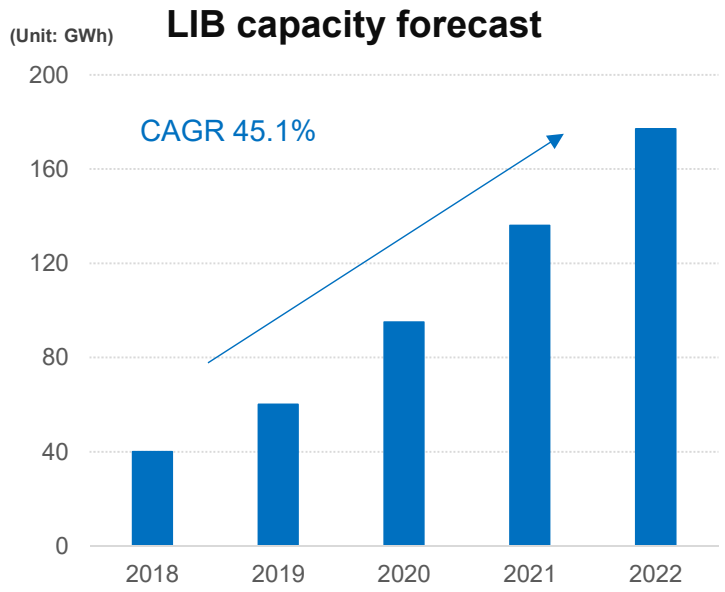
- Si-IGBT experience in Japan (more than 100 units for sputtering of 200 mm mass production line (backside))
- Maintain a share of nearly 50% in stable high-temperature injection technology for SiC implants

Growth strategy

- In addition to the existing 200 mm sputtering equipment, we will add 300 mm to the development lineup to maintain and increase our share
- Ion injection increases incoming orders by promoting equipment that is cost-effective due to in-house sourcing of ions,300 mm-compatible equipment, and by installing Si-IGBT mass production lines

ULVAC

Next-generation Li-ion Battery



Source: Interviews by ULVAC

RTR Li-ion battery production equipment

Characteristics and market growth

- In-vehicle LIB demand: 40 GWh in 2018 ⇒ 177 GWh in 2022
- The challenge is to increase the running distance of electric vehicles (EV)
  ⇒ Need to increase in-vehicle LIB capacity, reduce size and weight, develop quick recharging capability, etc.
- Solution: Focus on lithium metal thin film (vacuum evaporation using RTR*) as a negative electrode material for next-generation LIBs

ULVAC's strengths

- Collaboration with leading companies, universities, and research institutes
  ⇒ Establish RTR*-type metal lithium evaporation technology
- Developing and testing mass production manufacturing with leading companies (use experience in two-sided deposition for LIBs)

*RTR (Roll to roll: ULVAC's market share is over 90% in RTR evaporation equipment for in-vehicle high-capacity capacitors)

Growth strategy

- Support the advancement of mass production for leading global battery manufacturers using technology experience of RTR evaporation and RTR metal lithium evaporation (two-sided deposition equipment)

ULVAC vacuum technology contributes to many industries and applications

Automobile 自動車 | Semiconductor 半導体 | Flat Panel Display フラットパネルテレビ | Photovoltaic 太陽電池 | Food Processing 食品

Aircraft 航空 | Bio バイオ | Smart Phone スマートフォン | Magnetic Device 磁気デバイス | Home Appliance 家電製品

Aerospace 宇宙産業 | Pharmaceutical 医療・薬剤 | Wearable/VR ウェアラブル/VR | Power Device パワーデバイス | MEMS Device MEMS デバイス

Architectural Glass 建材・スマートガラス | Optical 光学 | Flexible フレキシブル | Packaging Materials パッケージング | Next Generation Light 次世代照明