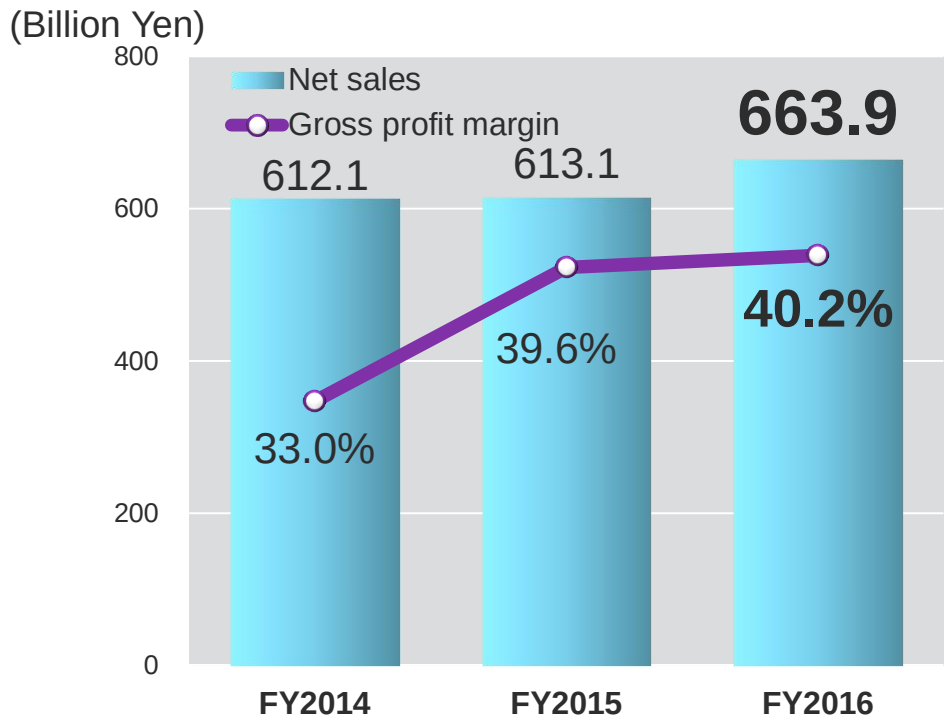
# Medium-term Management Plan Progress and TEL Initiatives

July 7, 2016

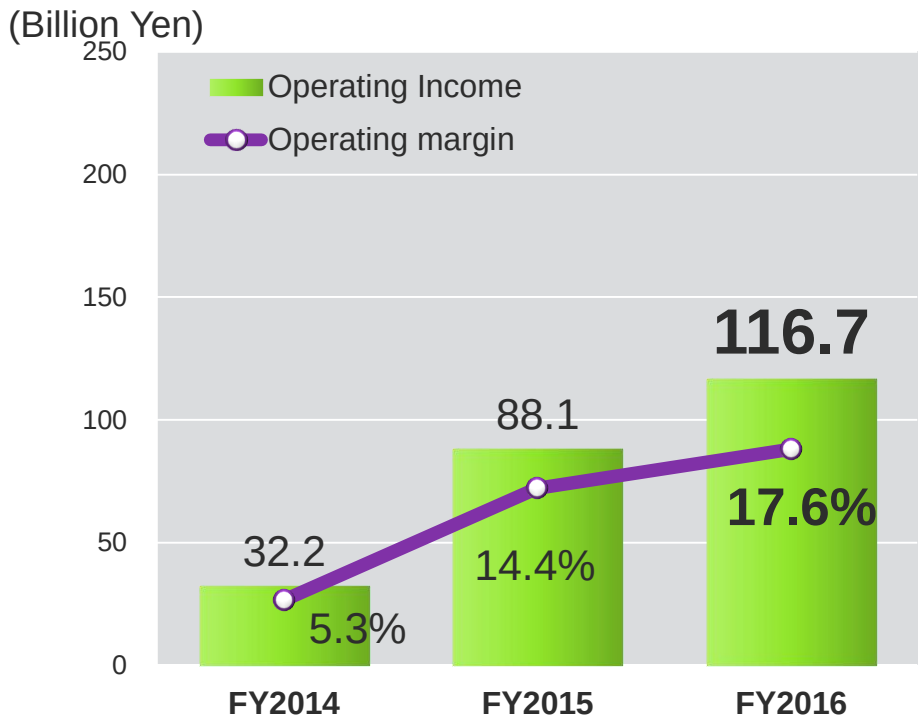
Toshiki Kawai
Representative Director, President & CEO

# FY2016 Highlights

## Net Sales and Gross Profit Margin




## Operating Income and Operating Margin




- Increased sales and profit YoY. Achieved sales of ¥663.9B and highest-ever gross profit margin of 40.2%
- Since the 2008 global financial crisis, improved operating income to over ¥100.0B. Substantially improved operating margin to 17.6%, up 3.2 pts YoY

# FY2016 Highlights

- Since the 2008 global financial crisis, improved operating income to over ¥100B
- Achieved +8.3% sales increase YoY, GPM of 40.2%, OPM of 17.6% and ROE of 13.0%. Strong progress towards Medium-term Plan targets
- Made steady progress in certification of equipment applications within Medium-term Plan's SPE focus areas (etching, cleaning and ALD systems)
- Implemented reorganization to strengthen product development ability and responsiveness to customers
- Announced new shareholder return policy, cancelled 15.4 million shares of treasury stock, paid highest-ever annual DPS of ¥237
- Announced that we are building a proactive governance structure with emphasis on linkage to Medium-term Plan

# FY2017 Consolidated Financial Estimates

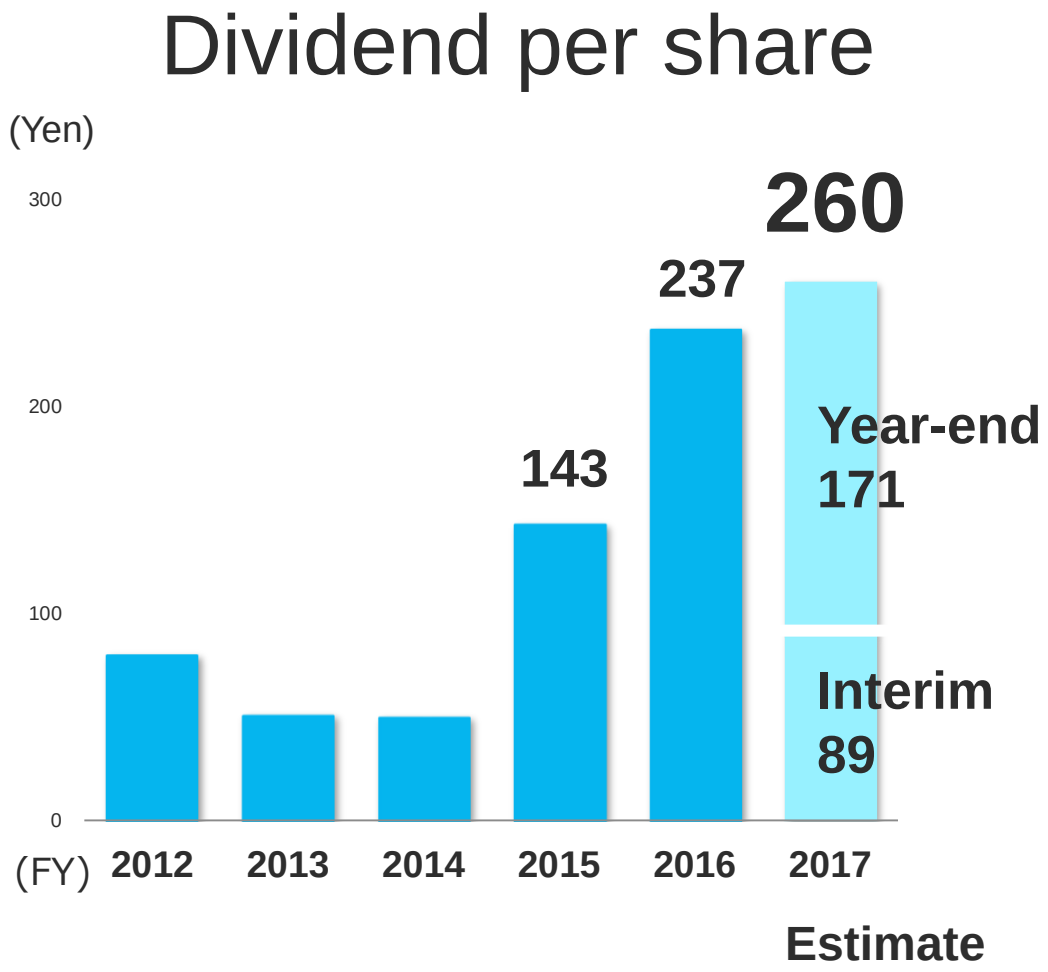
(Billion Yen)

| | | 1st Half | 2nd Half | Full year | YoY changes |
|---|---|---|---|---|---|
| Net Sales | | 330.0 | 384.0 | 714.0 | +7.5% |
| Sales by division | SPE | 304.0 | 361.0 | 665.0 | +8.5% |
| | FPD | 26.0 | 23.0 | 49.0 | +9.7% |
| Operating Income | | 49.0<br>14.8% | 75.0<br>19.5% | 124.0<br>17.4% | +6.2%<br>-0.2pts |
| Ordinary Income | | 49.0 | 75.0 | 124.0 | +3.9% |
| Income before income taxes | | 39.0 | 75.0 | 114.0 | +7.1% |
| Net income attributable to owners of parent | | 29.0 | 56.0 | 85.0 | +9.1% |

SPE: Semiconductor Production Equipment
FPD: Flat Panel Display Production Equipment

## Forecasting further YoY increases in sales and profits

# Dividend Forecast




- **FY2017 DPS(E): ¥260**
- **DPS expected to set new record high for the third consecutive year**

# Current Progress with Medium-term Financial Target

| | FY2015 | FY2016 | Medium-term financial target | |
|---|---|---|---|---|
| WFE market size | $31.9B | $31.5B | $30B | $37B |
| Sales | ¥613.1B | ¥663.9B | ¥720B | ¥900B |
| Operating margin | 14.4% | 17.6% | 20% | 25% |
| ROE | 11.8% | 13.0% | 15% | 20% |

# Three Focus Areas for New Growth Opportunities


Create strong next-generation products

Become the best and sole strategic partner

Pursue operational efficiency

# Organizational Reforms to Strengthen TEL

| | | |
|---|---|---|
| 1 | Unification of development divisions | Implemented (Jan. 2016) |
| 2 | Establishment of new account structure | Implemented (Jan. 2016) |
| 3 | Reorganization of business units | Started in Jul. 2016 |

**Optimized organization for further growth**

# Unification of Development Divisions – Create Strong Next-generation Products

- **Reinforce proposal ability with an eye to markets**
- **Integrate our diverse technologies**
  - Improve performance of individual products
  - Create solutions for patterning, integration, etc.
- **Optimize the use of resources**

# Establishment of New Account Structure

**Back-ground**

- **Overseas sales ratio of 80%, consolidation among semiconductor manufacturers**
- **Technology diversification**

  Optimization of device manufacturing processes, as well as improving performance of individual products

**Actions**

- **Assign regional GM, account GM and account technology GM for each customer**
- **Pursue technology marketing that creates customer needs**

**Purposes**

- **Rapidly identify latent customer needs and provide solutions that exceed customer expectations**
- **Become the best and sole strategic partner by further enhancing the great trust customers place in us**

# Reorganization of Business Units

- **Reorganized business units in accordance with 4 strategic markets (deposition, coat & clean, etch, test)**
  - Structure to maximize technological synergies realized with an eye to strategic markets
  - Make effective use of resources
  - Further speed up decision-making

# SPE Product Line-up

**Coater/developers**
CLEAN TRACK™
LITHIUS Pro™ Z

**Single wafer cleaning system**
CELLESTA™-*i*

**Plasma etch system**
Tactras™ Vigus™

**Thermal processing system**
TELINDY PLUS™

**ALD system**
NT333™

**Single wafer CVD system**
Triase⁺™EX-II™ TiN

**Multi-cell test system**
Cellcia™

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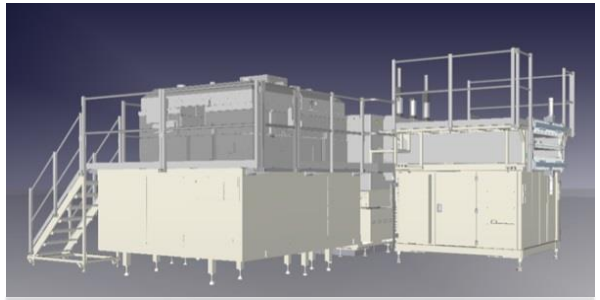
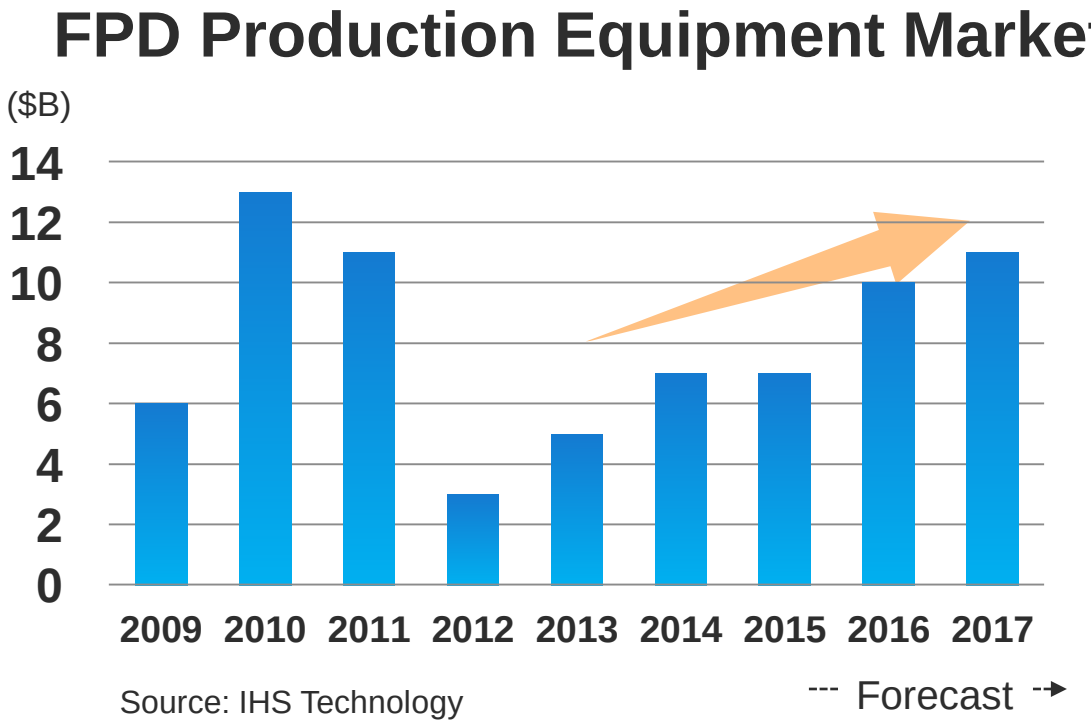
**Wide range of products that solve customers' tough technological issues**

# FPD Production Equipment Market Again Approaching $10 Billion



FPD plasma etch/ash system
Impressio™ 1800 PICP™




Inkjet printing system for OLED panel manufacturing
Elius™ 2500

## Capture opportunities in the rapidly growing OLED market with new products

# Summary

- **Unified development divisions**
  - Create strong next-generation products
  - Respond to diverse requirements by taking advantage of an extensive product line-up
- **Established new account structure**
  - Become the best and sole strategic partner by further enhancing the great trust customers place in us
- **Reorganized business units**
  - Focusing on 4 strategic markets, established a structure that will maximize technological synergies
- **Expand revenues in field solutions business**
- **FPD business: Aim for further growth through providing solutions in high value-added areas**
  - Ultra-high resolution, low power consumption, large size

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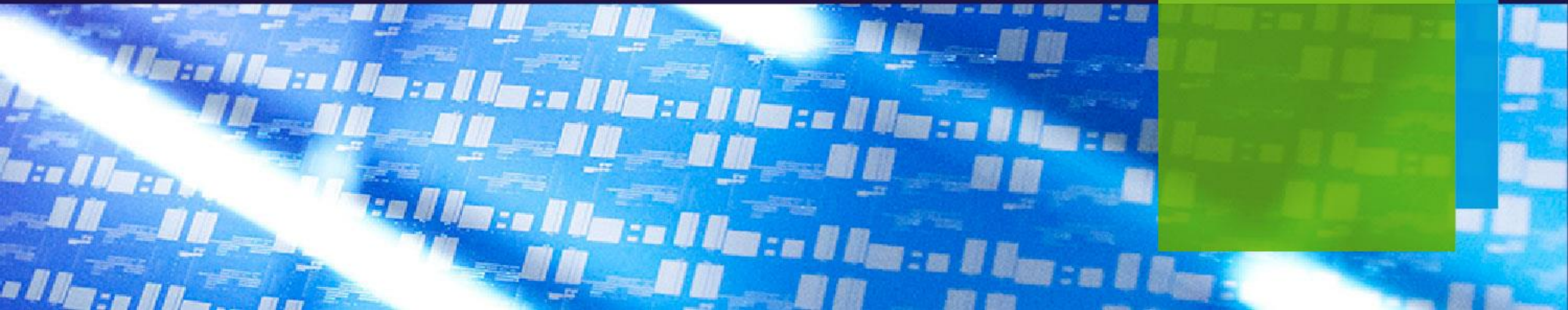
# SPE R&D Strategy

Sadao Sasaki
Representative Director, Executive Vice President & General Manager,
Development & Production Division



# Contents

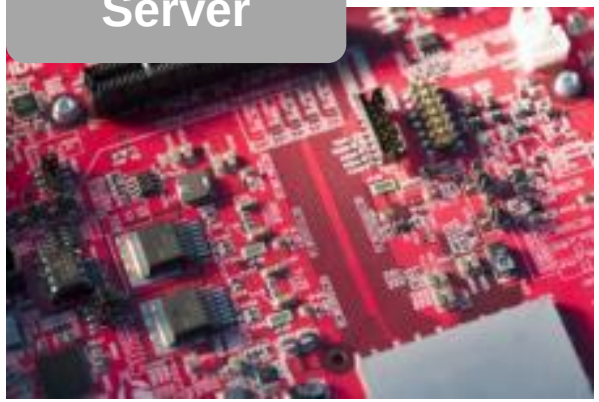
- Leading-edge Technology Requirements and Business Opportunities for TEL
  - Technological Requirements for Next-generation Leading-edge Devices from the Perspective of Trends in Final Products
  - SPE Business Focus Areas

- SPE R&D Strategy
  - Strategy for Strengthening R&D Ability
  - Growth Strategy for Business Focus Areas (Deposition, Cleaning Systems)
  - IoT Technology R&D

# Requirements for Next-generation Devices for Final Products

**Mobile**

**Server**



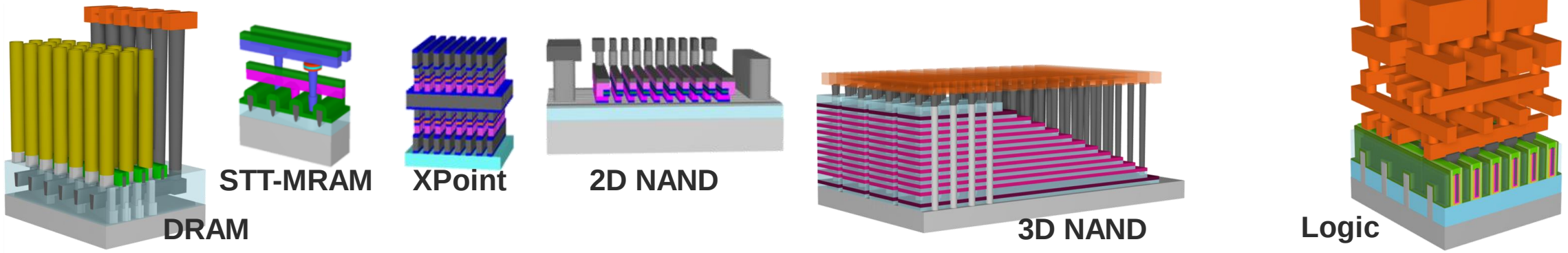
**Industry & Automotive**

| Pursuit of convenience and user experience | Expansion of use in IoT era | Overall society converting to digital data<br>Network sophistication |
|---|---|---|
| **High performance, low power requirement, functional diversification** | **Accelerating 3D integration<br>Introduction of next-generation memory technology** | **Low power consumption, high reliability devices** |

## Requirements for continuous miniaturization and devices with high quality and reliability

# Manufacturing Technology Requirements for Semiconductor Devices

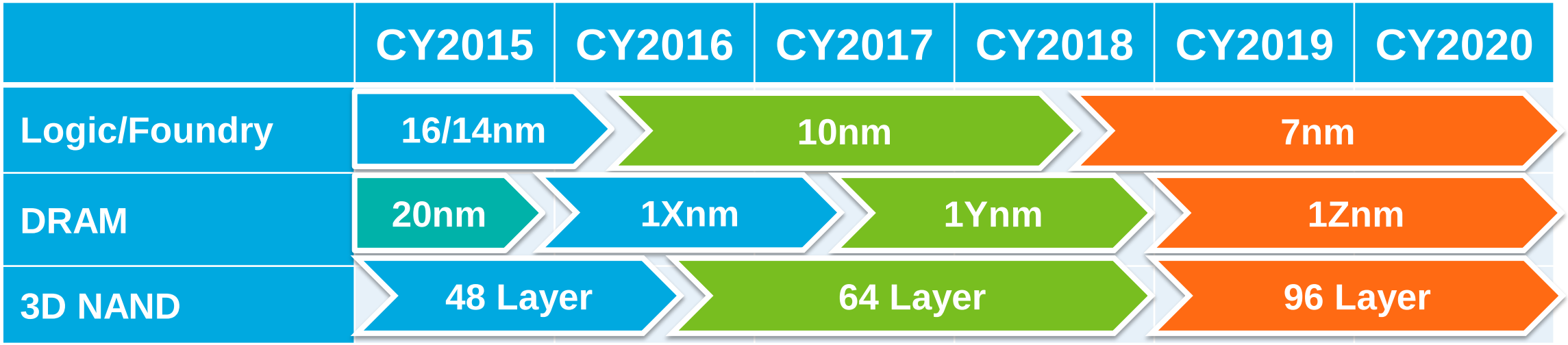
| DRAM | NAND | Logic |
|---|---|---|




| Built-in memory capacity driving demand | Acceleration of introduction of SSD at data centers | Further miniaturization and changes in structure |
|---|---|---|
| High aspect, thin film controllability, new materials<br>Achievement of ultimate miniaturization | Both precision in fine processing and high productivity<br>Innovative cost reductions | Taking on challenges in patterning technology, new structures<br>Pursuing defect control technology |

## Grasp of customer needs and rapid provision of equipment, process solutions

# SPE Business Focus Areas




| | |
|---|---|
| Coater/developer | Maintain 85%+ market share. Further expand technological differentiation with leading-edge immersion and EUV |
| Etching system | Expand applications in 3D NAND processes, expand PORs in patterning processes with new technologies |
| Deposition system | Improve position in ALD products and expand market share in new products, establish volume production process for STT-MRAM* |
| Cleaning system | Expand sales of batch system for 3D NAND, increase share in single wafer clean through pattern collapse prevention technology |
| Common technology | Defect control and removal technology, make systems intelligent |

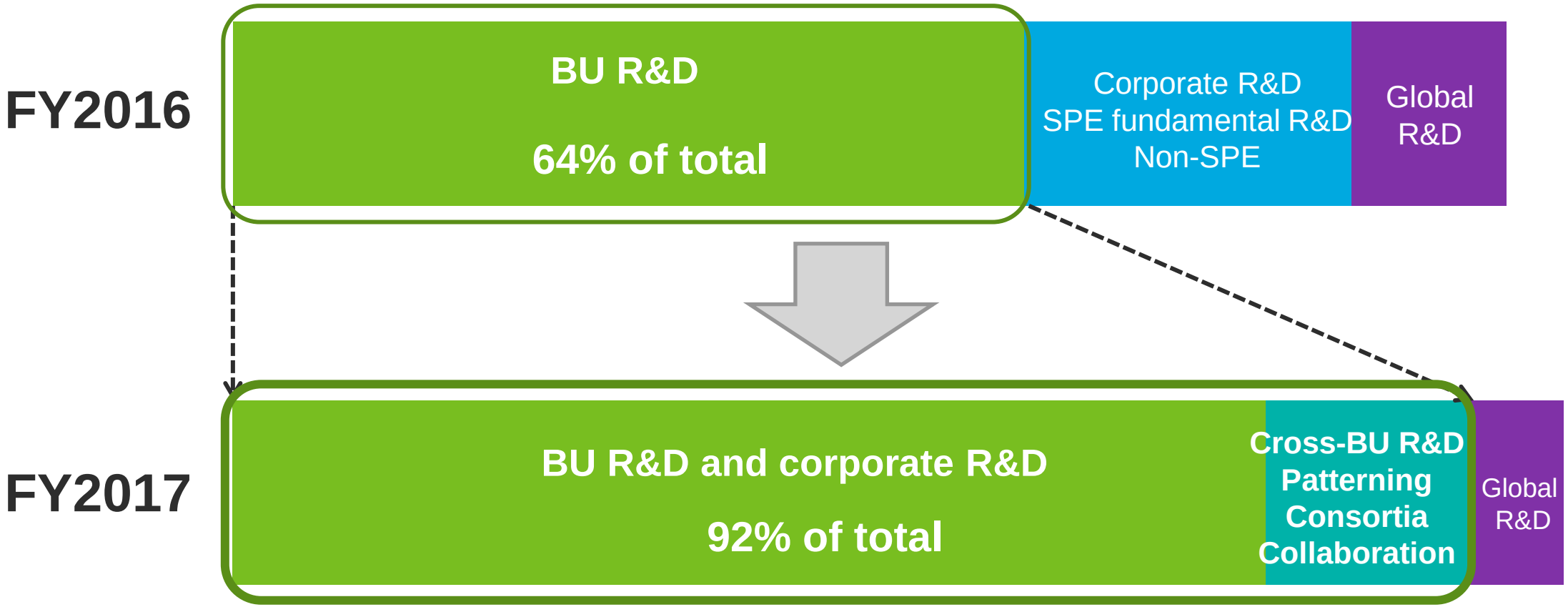


*STT-MRAM (Spin Transfer Torque-Magnetoresistive Random Access Memory): Magnetic memory that shows promise for low power consumption

# SPE R&D Strategy

# Unification of R&D Resources

- **Selection and concentration of company-wide R&D resources in SPE R&D**

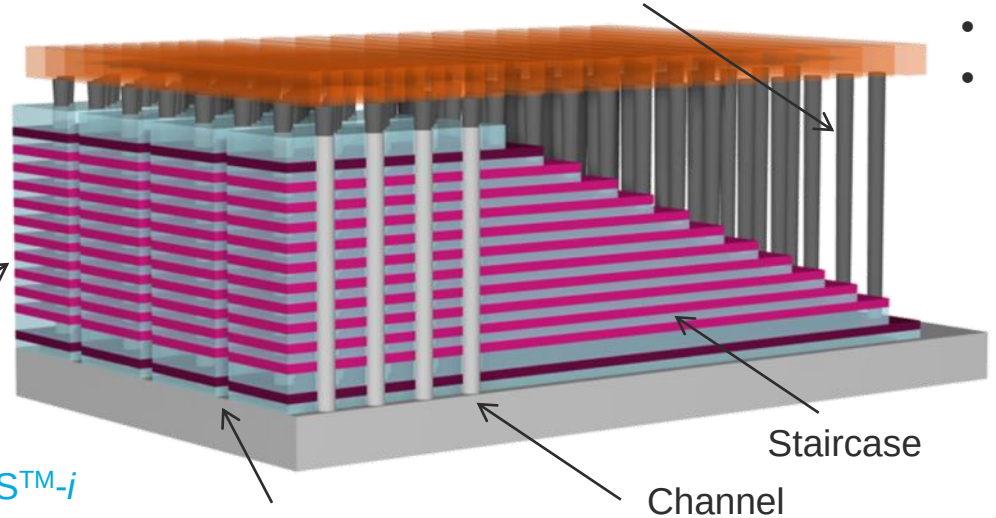



*Allocation ratio of R&D engineering staff

# 3D NAND Key Process Technologies and TEL's Solutions

**Plasma dry etch**
- Word line isolation
- Channel hole
- Multi-level contact

Tactras™




**Lithography**
- Word line isolation
- Channel hole
- Multiple contact
- Staircase

LITHIUS Pro™ Z

**Chemical dry etch**
- Source line pre-clean

Certas™

**Thermal process (batch deposition)**
- Block oxide (high-k)
- Charge trap (ALD SiN)
- Channel Si
- Cap Si

TELINDY PLUS™

EXPEDIUS™-*i*

**Wet etch**
- Replacement word line

**Atomic layer deposition**
- Core oxide

CELLESTA™-*i*

**Wet clean**
- Bevel clean

**Single wafer deposition**
- Word line barrier
- Multi-level contact barrier
- Source line barrier

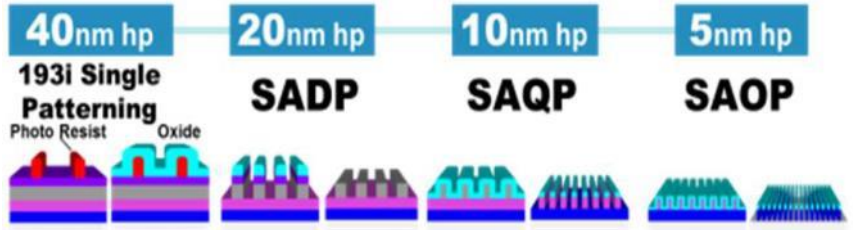
Triase+™

NT333™

# SPE Business Strategy: Strategic Collaboration in Patterning

## Collaboration with customers

Capture next-generation POR through joint evaluation and by providing integrated solutions that draw on our broad product range




Coater/ Developer

Chemical etching system

Etching system

Cleaning system

Deposition system

## Consortia

imec

COLLEGES OF NANOSCALE SCIENCE + ENGINEERING SUNY POLYTECHNIC INSTITUTE

EIDEC

A*STAR Institute of Microelectronics

New technologies

New materials

Leading-edge lithography

+

## TEL's R&D locations

Patterning Solution Project

TEL Technology Center America

# SPE R&D Strategy (Deposition, Cleaning)

# SPE Business Strategy: Expansion of Deposition System Line-up

**Thermal processing system**
TELINDY PLUS™

**Single wafer deposition system**
Triase+™

**ALD system**
NT333™

**Single wafer deposition system**
Triase+™

**Sputtering system for the next-generation devices**
EXIM™

CVD

ALD

PVD

Large batch type
Applicable to various film deposition

Single wafer type
High coverage ability

Semi-batch type
High productivity SiO2 ALD

Single wafer type
High precision metal deposition

Single wafer type
New PVD applicable to multilayer, laminated film
Won “Semiconductor of the year 2015”

**Product line-up responds to high coverage and productivity required in miniaturization and 3D structure**

# SPE Business Strategy: Cleaning Systems

- Single wafer wet cleaning system will contribute to improved yield for customers through TEL's strengths in areas
  - Pattern collapse prevention technology
  - BEOL polymer removal/metal loss reduction
  - High precision back-side bevel cleaning
- Fulfill high technological needs with dry cleaning
- Realize higher share by accelerating introduction of new technologies for further miniaturization
  - Strengthen back-side bevel cleaning technology
  - Microscopic particle control/removal

Single wafer cleaning system
CELLESTA™

| Market share | CY2014 | CY2015 |
|---|---|---|
| Cleaning system | 25% | 24% |

| CY2019 Target |
|---|
| >35% |

# IoT R&D Strategy (Making Equipment Intelligent)

# Providing New Added-value

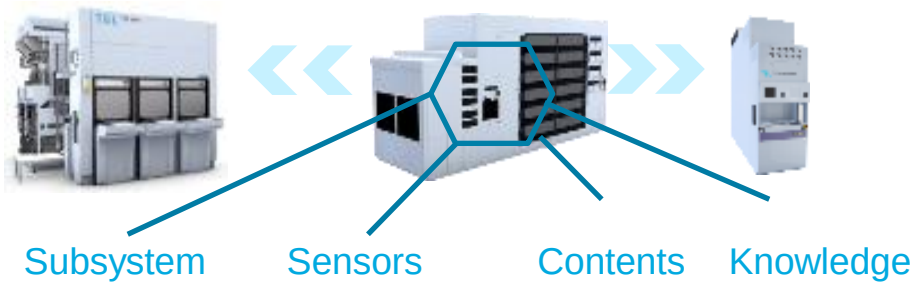
## Application of big data and AI through IoT

**Use IoT to analyze diverse data**

**Combine with expert knowledge**

**Learns on its own while controlling optimally and safely**

**Develop intelligent equipment**




# R&D Initiatives


## Optimal, safe equipment control

- **Self-diagnosis ability**
- **Learning ability**
- **Autonomous control ability**

## Business value

- Higher reliability, lower support requirements with self-diagnosis
- Streamlined spare parts stocks through parts lifespan prediction
- Improved response speed and avoidance of damage through pre-fault detection
- Higher yield through optimal stability control for wafer production
- Less downtime, higher utilization rate through PM optimization

**Continuously build high profit structure by achieving high efficiency through incorporation of the newest technology**

# Making SPE Intelligent

**Self-diagnosis ability**

**Optimal equipment management**

**Learning ability**

**Absolutely stable operation**

**Autonomous control ability**

**Expansion of functions**

## R&D of autonomous production systems

# Summary

- **TEL will grow substantially in consideration of the ever-increasing technological demand for SPEs**
- **Strategically strengthen collaboration with customers and consortia to create innovative technology. Aim for growth with existing product enhancement and cross-BU synergies**
  - **Promote technological development of patterning solutions**
  - **Make SPE intelligent**
- **Aim to grow our share in etching, deposition, and cleaning through the unification of R&D resources**

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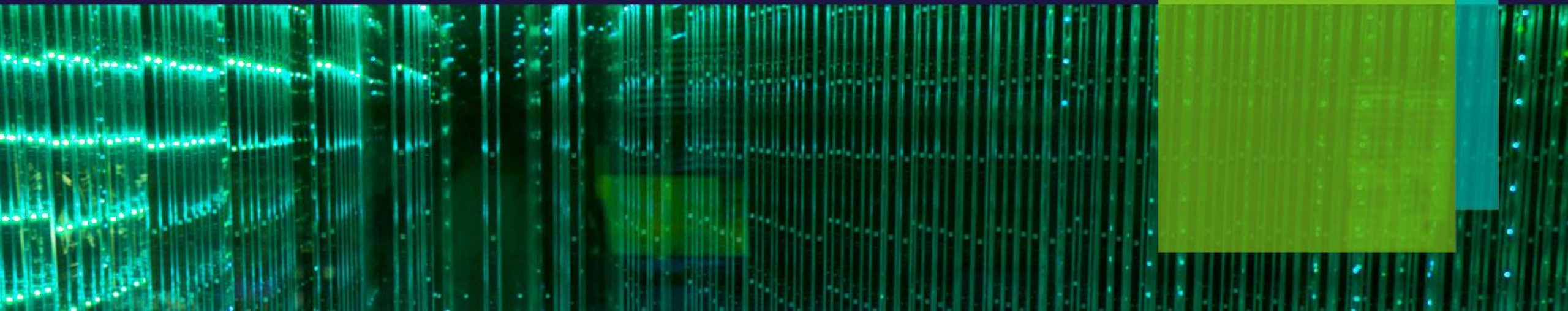
# Environment Around the Leading-edge Semiconductor Industry: TEL's Patterning Strategies

Akihisa Sekiguchi, PhD
Vice President & General Manager
Advanced Semiconductor Technology Division



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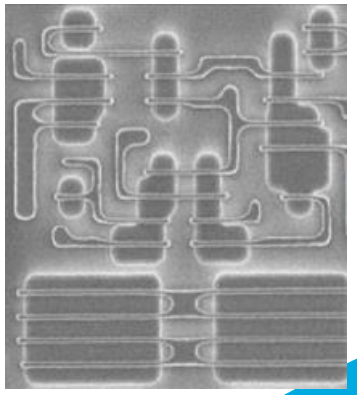
- Technical Challenges in Patterning
  - Sustainability of Device Scaling and Migration to 3D structure
  - Extendibility of Immersion 193 nm (ArF) Exposure Technology and EPE (edge placement error)
- Technical Approaches
  - Unit Process Solution
  - Integrated Patterning Solution (co-optimization of multiple unit processes)
- Next Generation Process
  - Control Techniques in Atomic Scale: ALD (atomic layer deposition) and ALE（atomic layer etch)

# Environment of the Leading-edge Semiconductor Industry: Sustainability of Device Scaling and Migration to 3D Structure

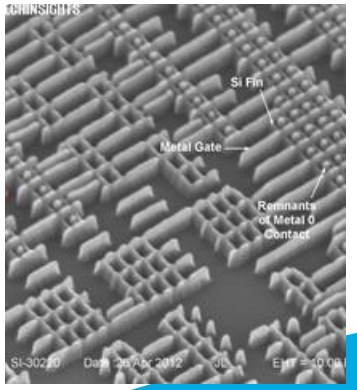
**Planar**



Source: Intel
(65 nm node)

**2005**
**65 nm node**
193 nm litho – Single mask

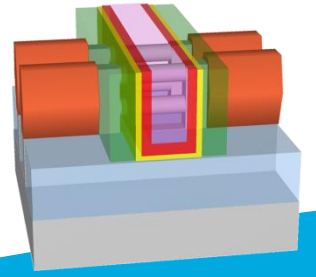
**FIN FET**




Source: Intel
(22 nm node)

**2012**
**22 nm node**
193i litho – Multiple masks

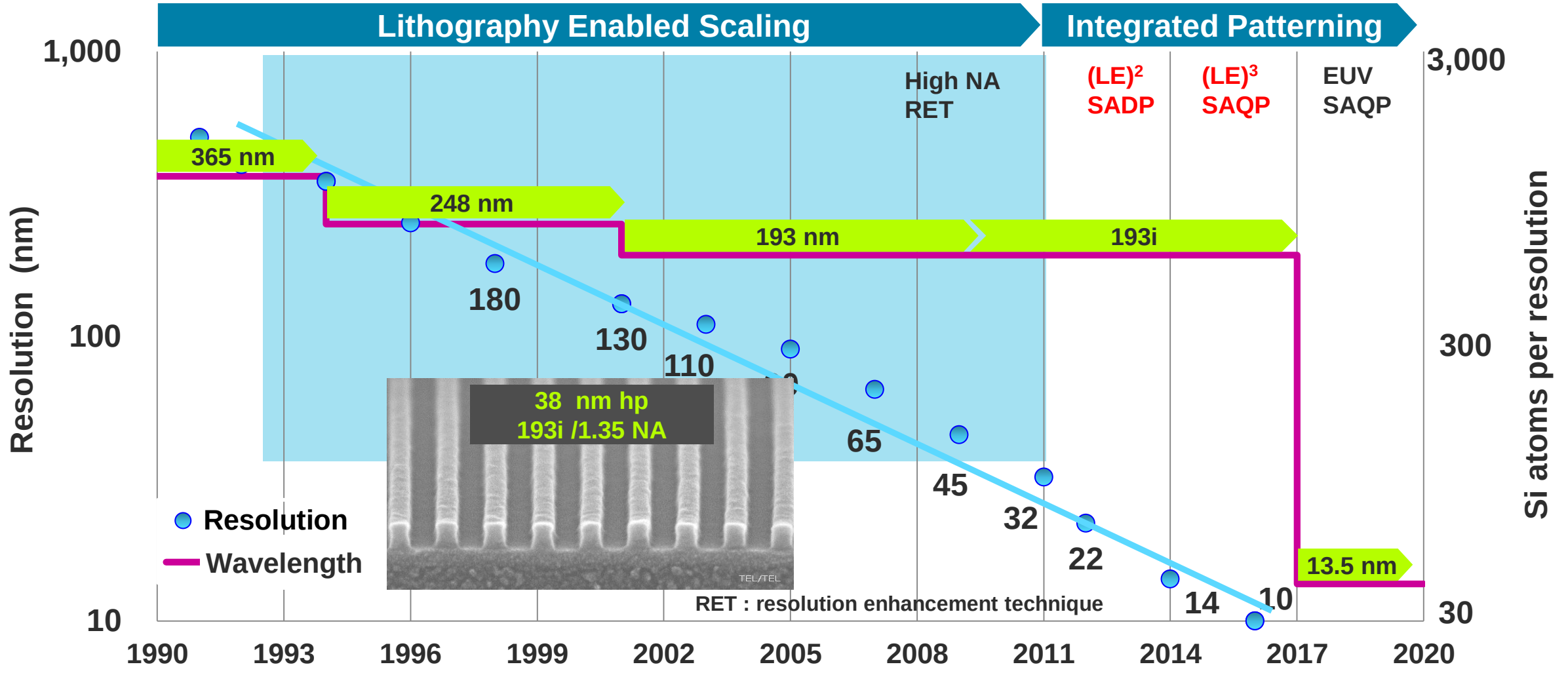
**Nanowire FET (Future)**



**Future**
**≤ 7 nm node**
193i litho – Multiple masks
EUV litho
Memory-like gridded DR

**Migrating to 3D structure with CD scaling makes process more difficult, but sustains Moore's law**

# Environment of the Leading-edge Semiconductor Industry: from Immersion 193 nm (ArF) to EUV

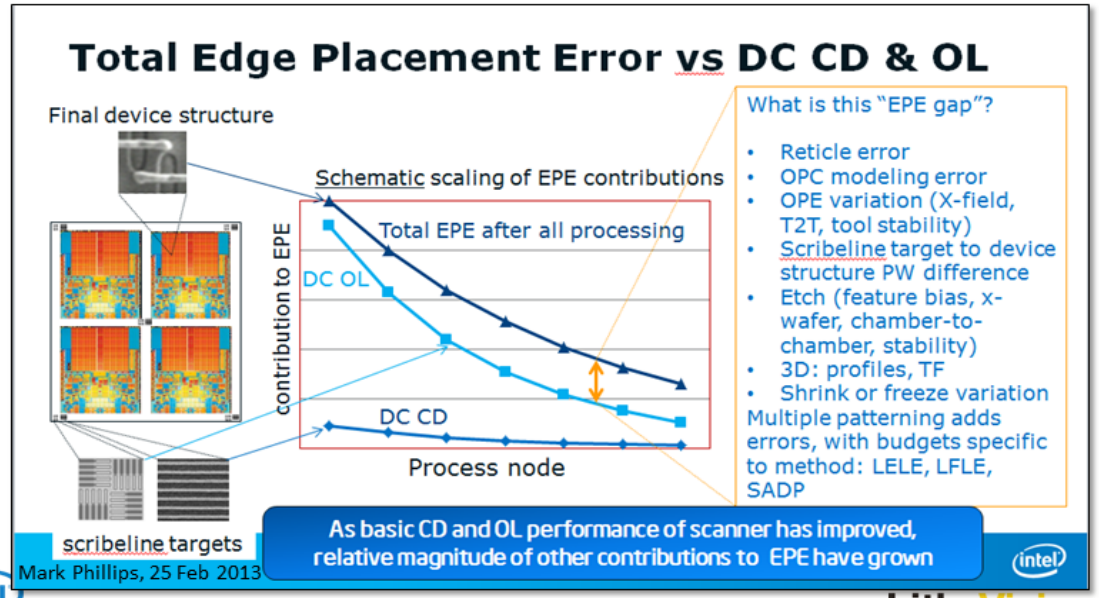


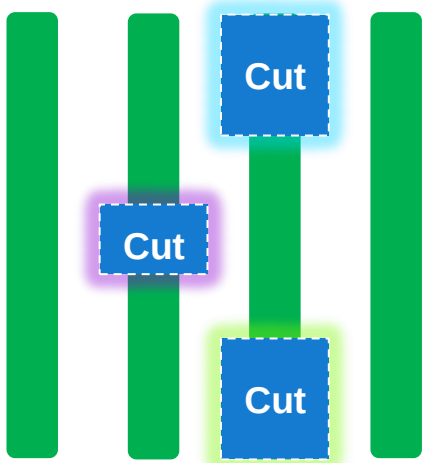

**Lithography has already migrated from single exposure of immersion 193 nm to integrated patterning**

# Technical Challenges: Resolution and EPE

## 3. Resolution isn't the only challenge

- Total Edge Placement Error is the biggest technical challenge to scaling (limiting before device physics)
  - Must reduce EPE contributions from all process steps (not just Litho) in order to take full advantage of resolution benefits of EUVL



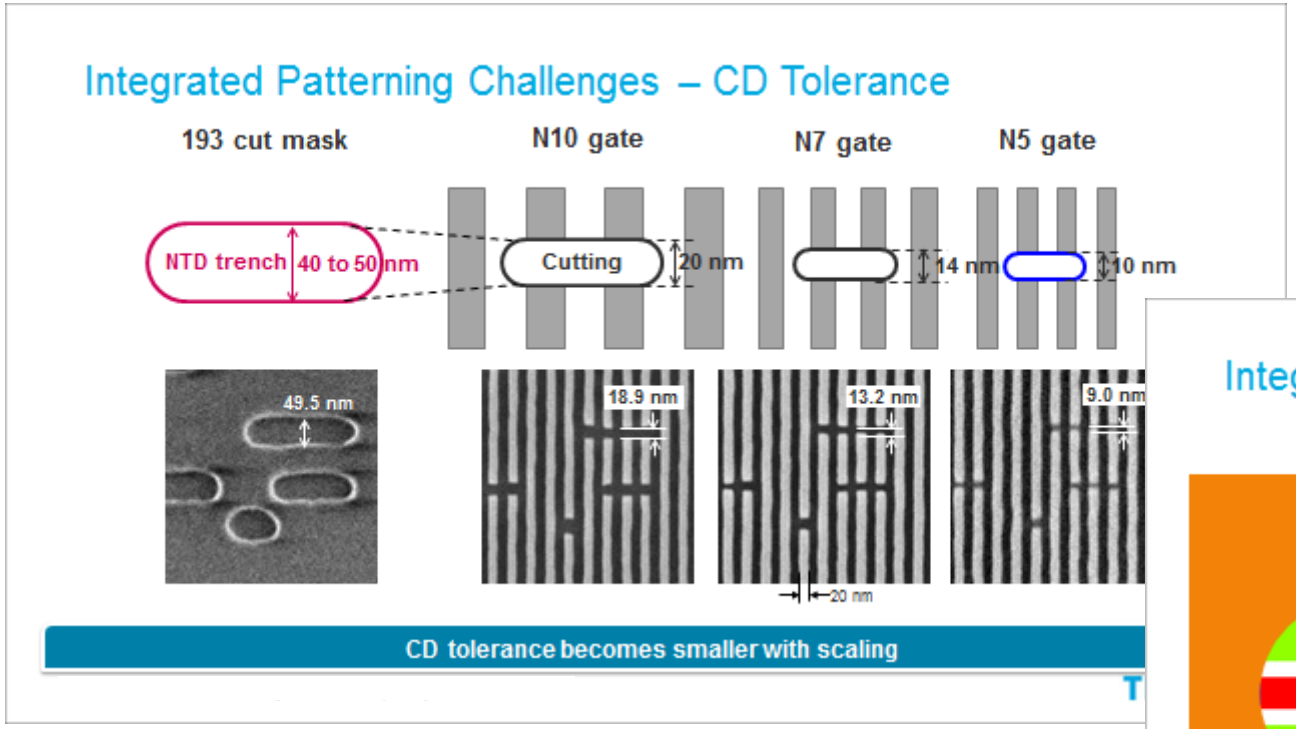

**EPE (edge placement error)**

LithoVision | 2016

Source: Intel

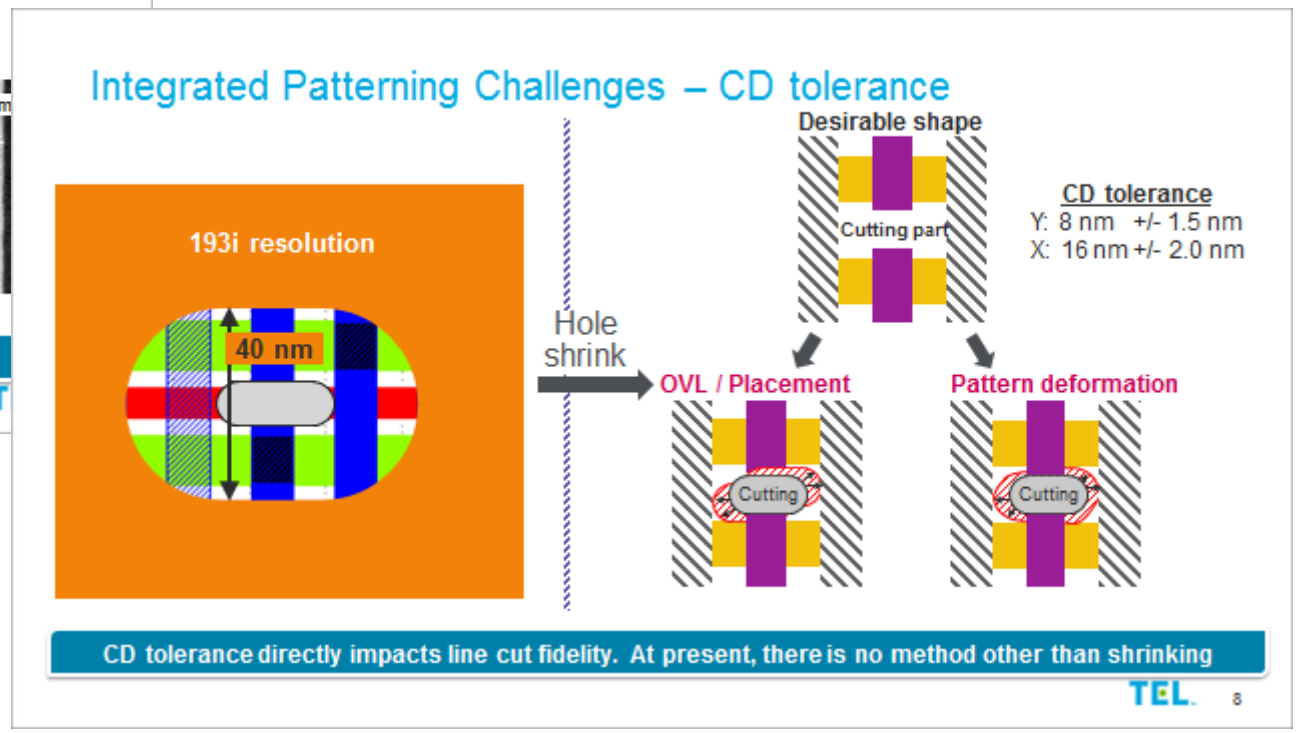
**Precision of edge placement needs to be at the nm scale, which is more critical than resolution**

# Progress in Conventional Process: Precision in Cutting and Shrinking




Line cutting technique

Hole shrinking technique




## Continuous improvement of etching and thin film formation is key in patterning

# Evolution of Self-aligned Technology: Necessity of New Integration and Module Development

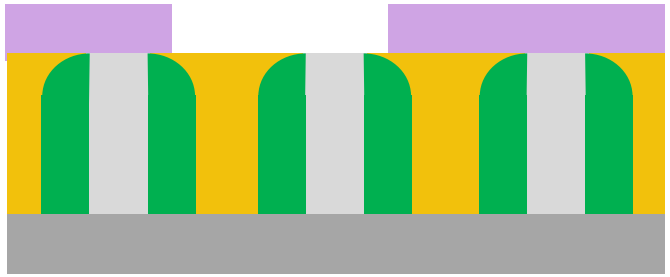
## SAMP

(self-aligned multiple patterning)

SAMP requires ALD, which can control deposition thickness at the nm scale

## SAB

(self-aligned block)



SAB is enabled by taking advantage of different etch selectivity between different combinations (complex material combination)

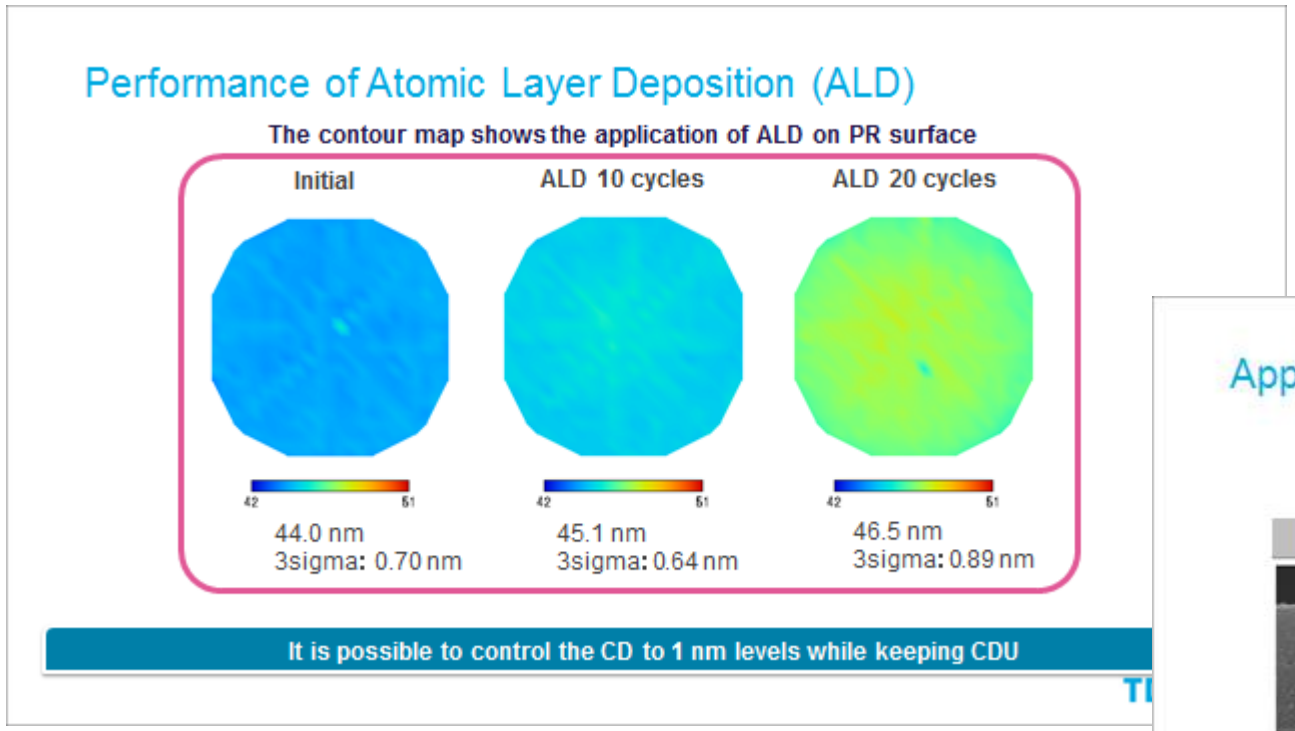
## SAC

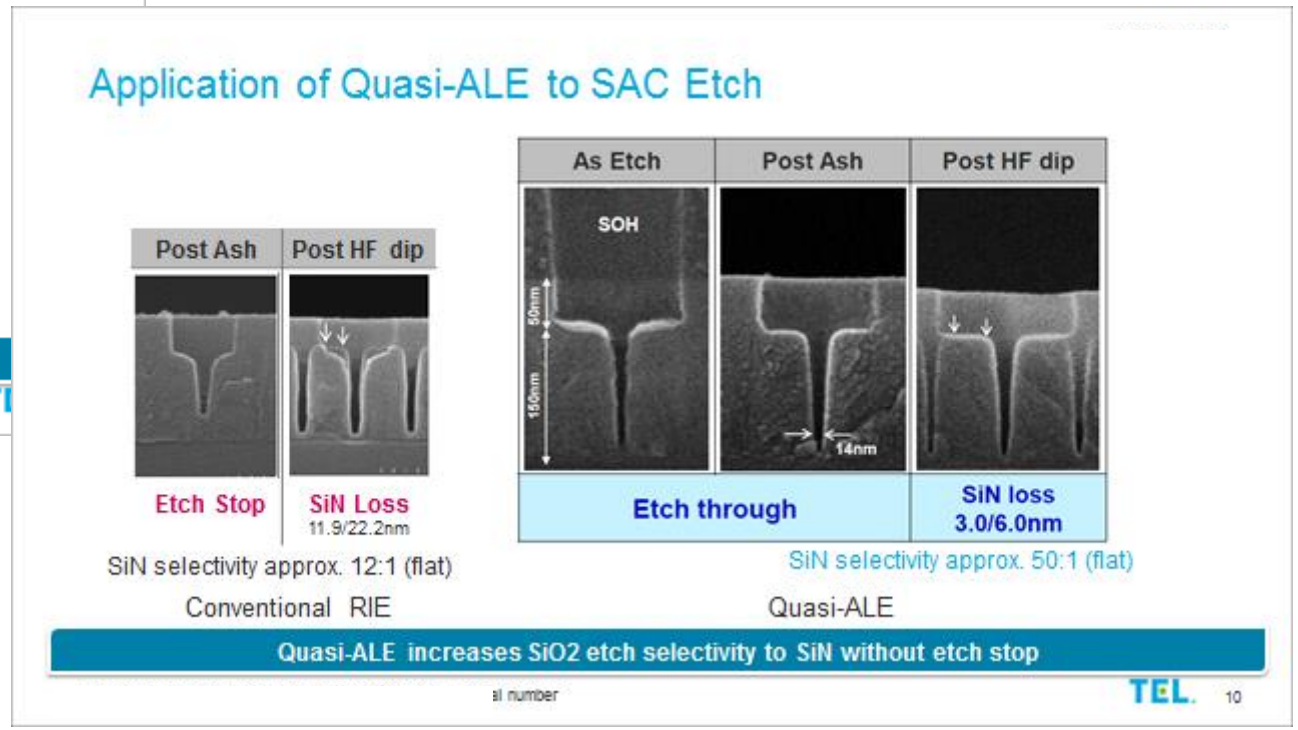
(self-aligned contact)

ALD and ALE are indispensable to SAC, which is now dominant in MOL contact

**Innovative solutions can be found by combining a variety of our equipment and processes**

# Evolution of Unit Process Technology: Atomic Level Controllability

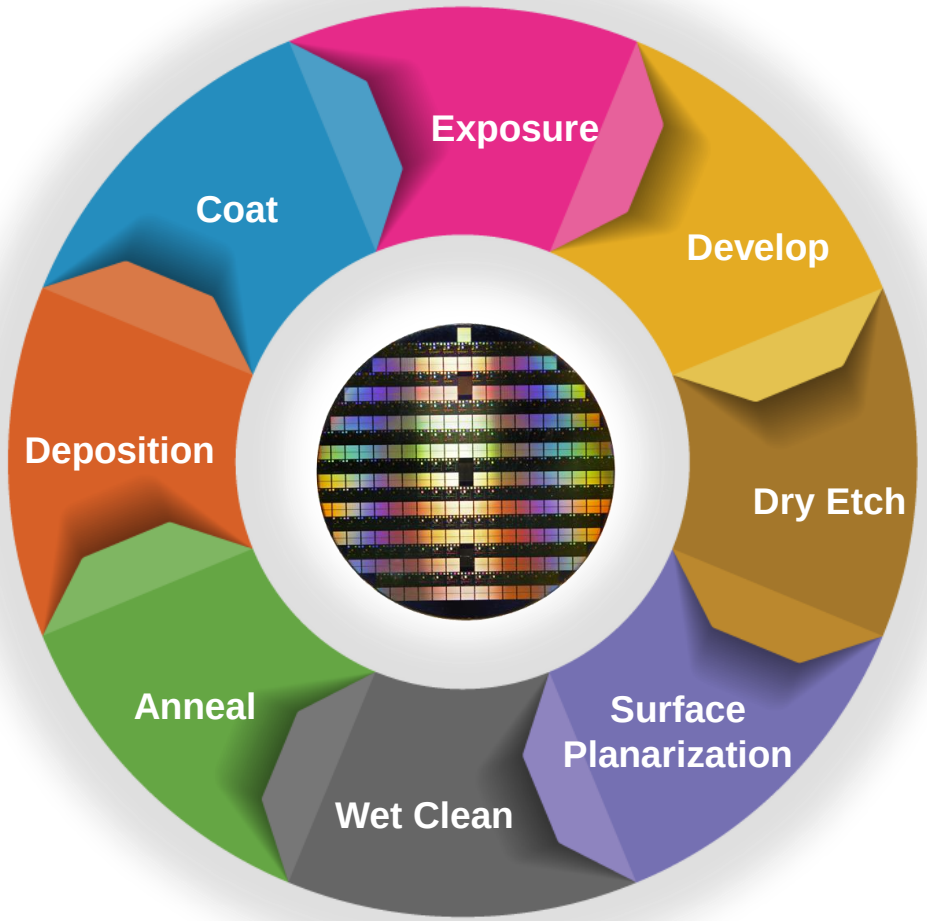



## ALD and ALE require both deposition and etch process/equipment technologies

# Summary of Patterning Technology

- Scaling will still be important in logic devices
- Process will become more complex
- Integrated solutions have become indispensable in addition to continuous improvement in unit process
- Our key strength is the variety in our product lineup – deposition, etch, clean, coat



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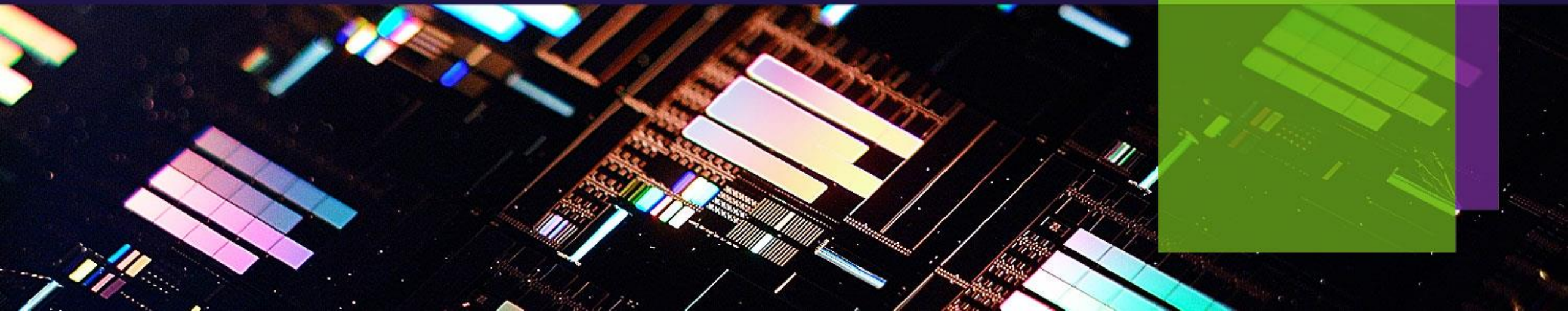
# Etching System: Business Strategies

Yoshinobu Mitano
Vice President & General Manager, ES BU



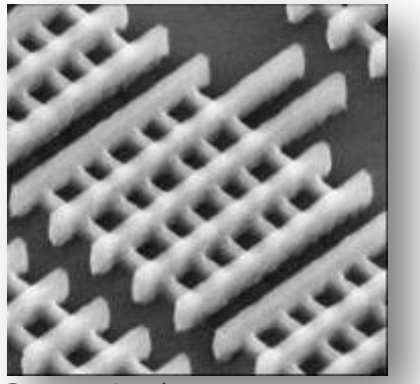
# Current Situation of Etching Market and TEL

- **Expansion in etching market continues due to growth in 3D NAND and patterning processes**
- **Sales in 3D NAND expected to be double those of previous year**
- **Leveraging our technological advantage, we have seen good progress in the first year of the Medium-term Plan**

# Technologies Sought for Leading-edge Logic Devices

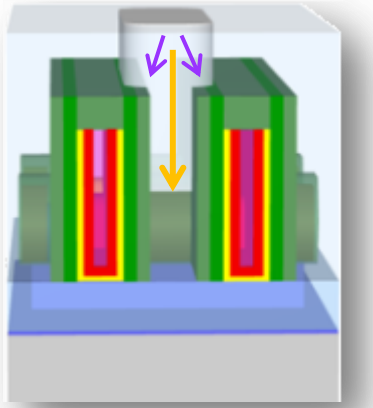
**Demand for Advanced Device**

**FIN FET (FEOL)**



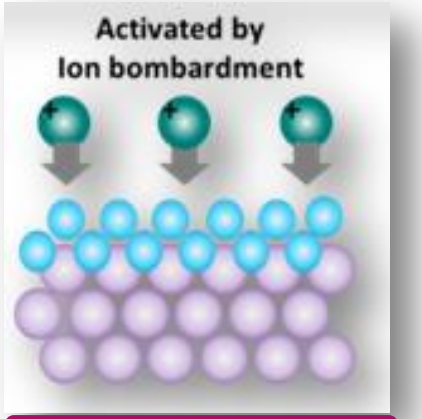
Source: Intel

**SAC etch (MEOL)**



- Low damage/CD uniformity
- High selectivity
- Vertical form

**Key Technology/Solution**

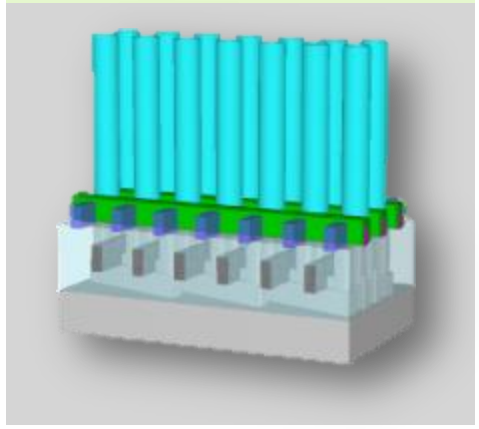

**ALE concept**

- Low electron temperatures
- Radical control
- ALE technology

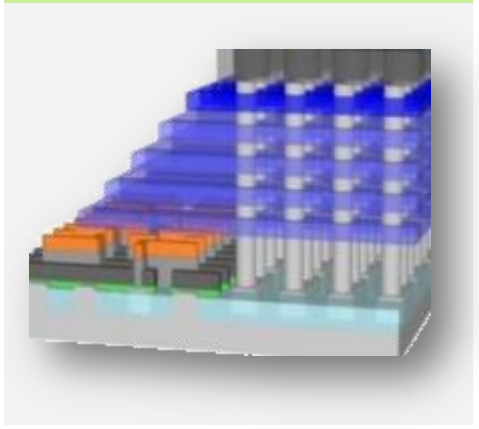
# Etching Technologies Demanded for Cutting-edge Memory

## Demand for Advanced Device

**DRAM**

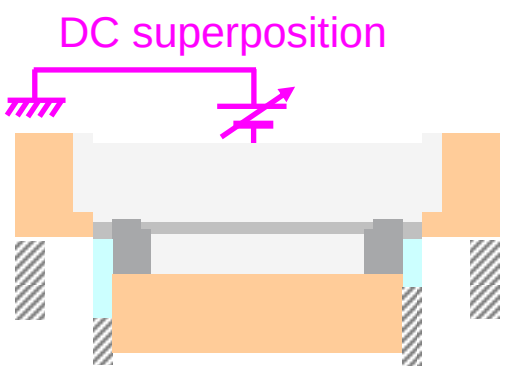


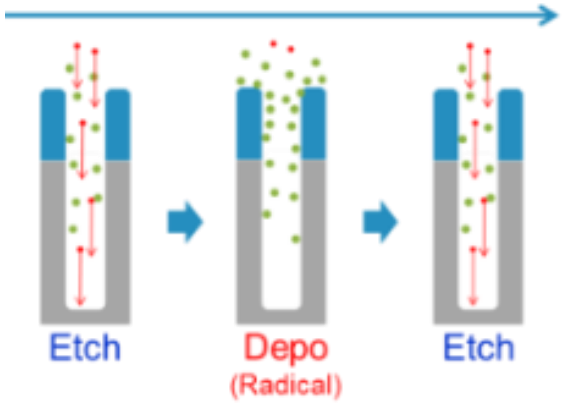
**3D NAND**



- High selectivity to mask
- Vertical etching
- Productivity

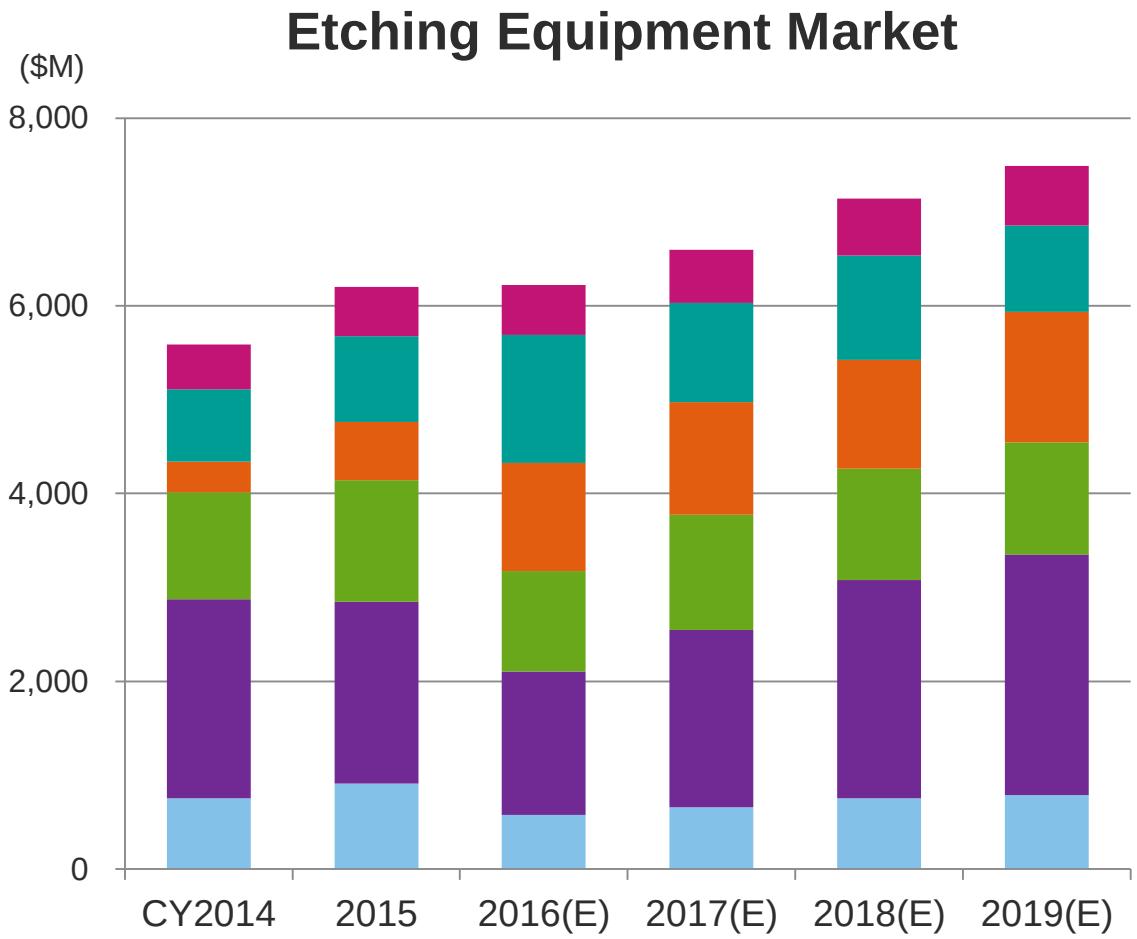
## Key Technology/Solution



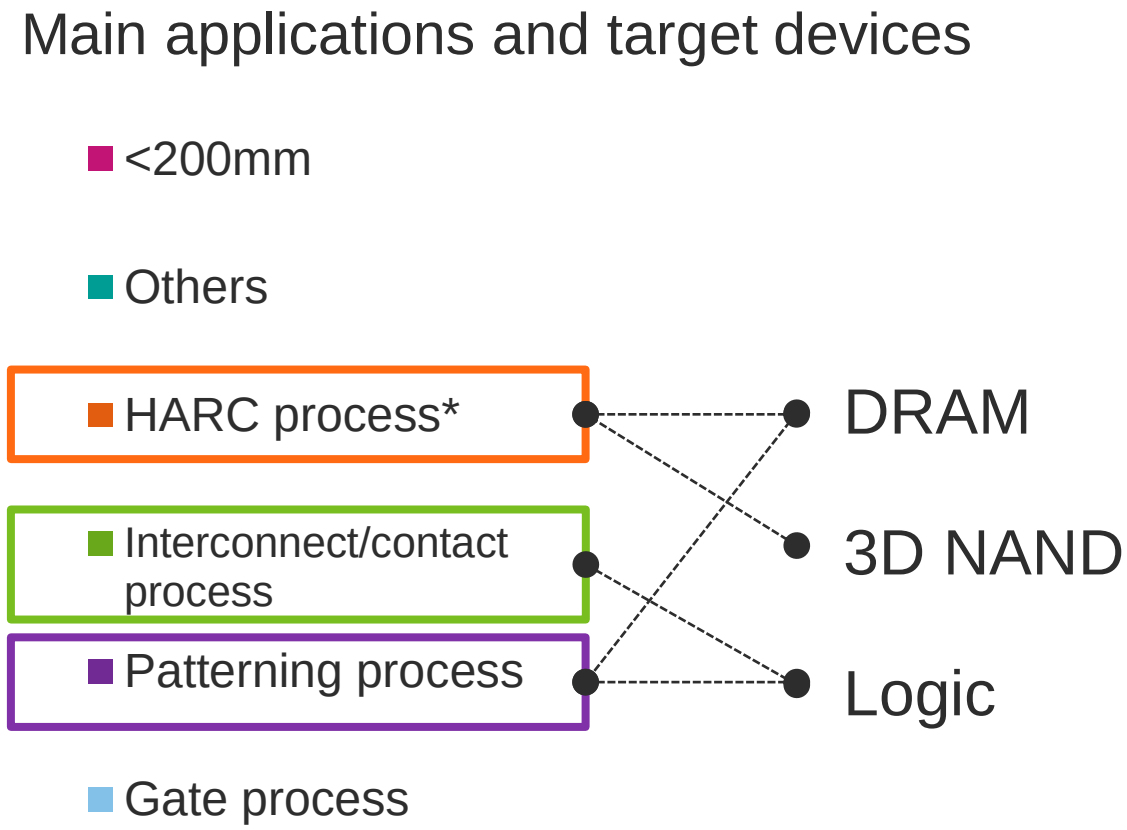




- TEL's unique DC superposition technology
- Dynamic processing
- Process control at the wafer edge

# Etching Equipment Market and Business Opportunities



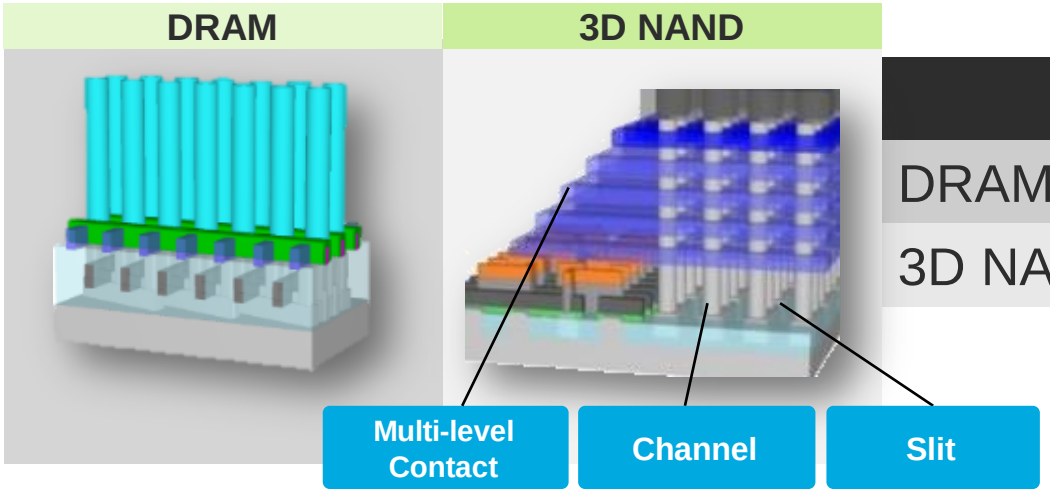

Dry etch total market size: Gartner, "Forecast: Semiconductor Wafer-Level Manufacturing Equipment, Worldwide, 1Q16 Update" 14 April 2016
Based on sales revenue
Graph made by TEL based on Gartner's research
*By application ratios are based on TEL estimates




*HARC (High Aspect Ratio Contact) process: A process for forming holes that requires advanced processing technology

# HARC Processing for DRAM/3D NAND

- Market needs
  - Further HARC vertical processing through miniaturization (DRAM) and stacking (3D NAND) needed

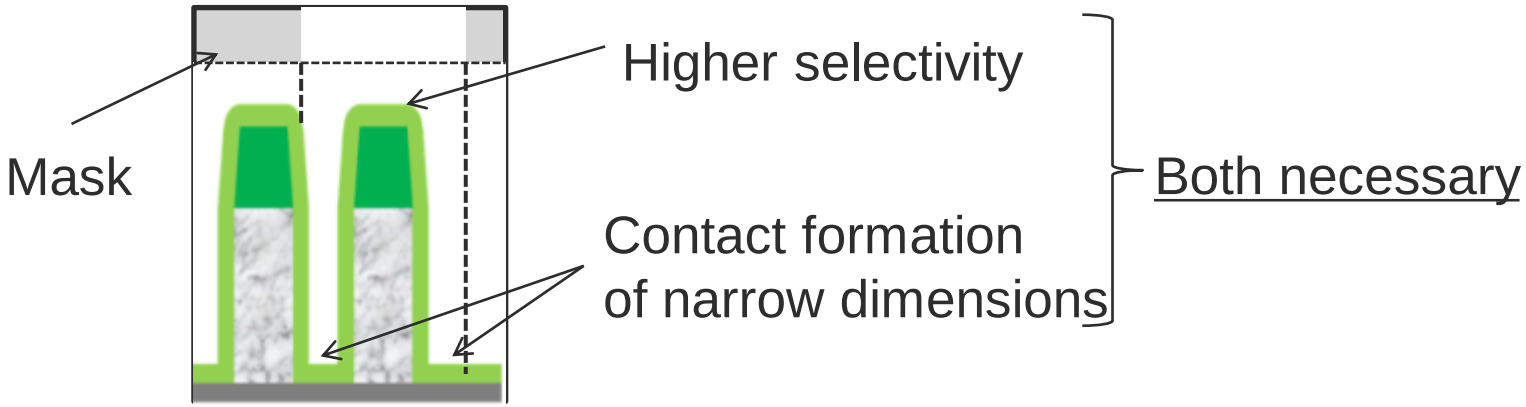



| | CY2016 | CY2017 | CY2018 | CY2019 |
|---|---|---|---|---|
| DRAM | 20~25nm | 18~20nm | 17~18nm | 16~17nm |
| 3D NAND | ~48Layers | ~64Layers | ~96Layers | ~128Layers |

- TEL actions and results
  - In DRAM processing, achieved vertical processing of 18nm and beyond
  - In 3D NAND, made progress with slit processing, in addition to multi-layer contact processing
  - Improved productivity through improved processing performance at wafer edge (increased number of chips in yield)

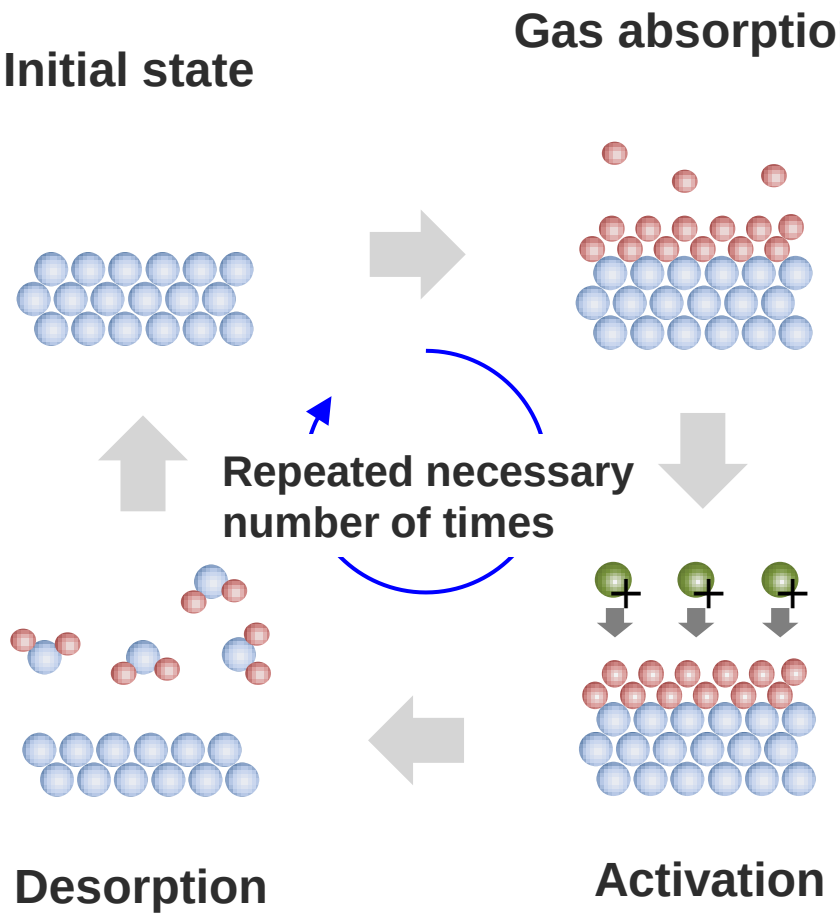
# BEOL/Contact Processing

- Market needs



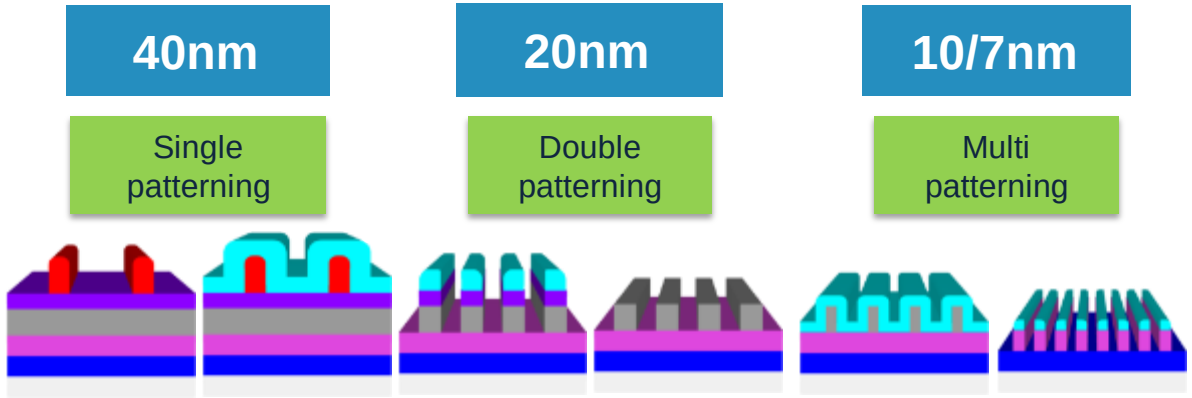

- TEL actions and results
  - Realized high-selectivity ALE through optimization of electricity supply system
  - Higher productivity through improvements to gas supply system

**ALE Concept**

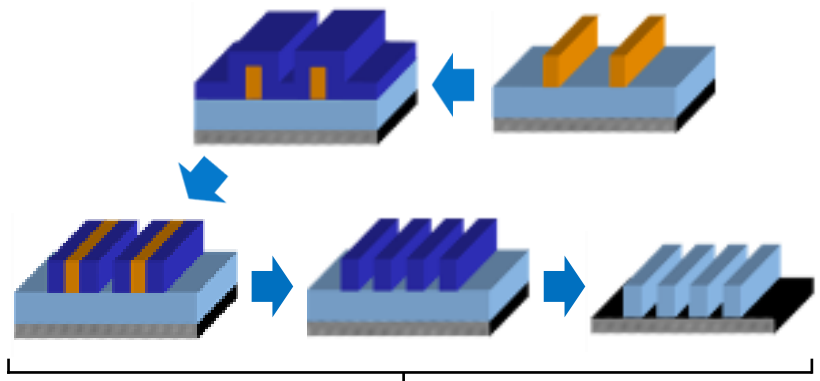


# Patterning for Logic/DRAM

- Market needs




Evolution of multi patterning technology



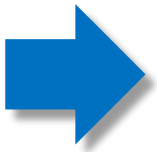
Simplify process and raise productivity by combining multiple etching steps

- TEL's initiatives and results
  - Logic: Utilize the strengths in our oxide etching to handle expanding patterning processes
  - DRAM: Realize productivity merits through process simplification and leveraging equipment adoption in logic customers

# Summary

- **Achieve Medium-term Plan target (raise profitability on 10 pt increase in share) through stable position in logic interconnect/contact process, our initiative to realize HARC/patterning market needs**

| Market Share | CY2014 | CY2015 |
|---|---|---|
| Etching system | 26% | 19% |



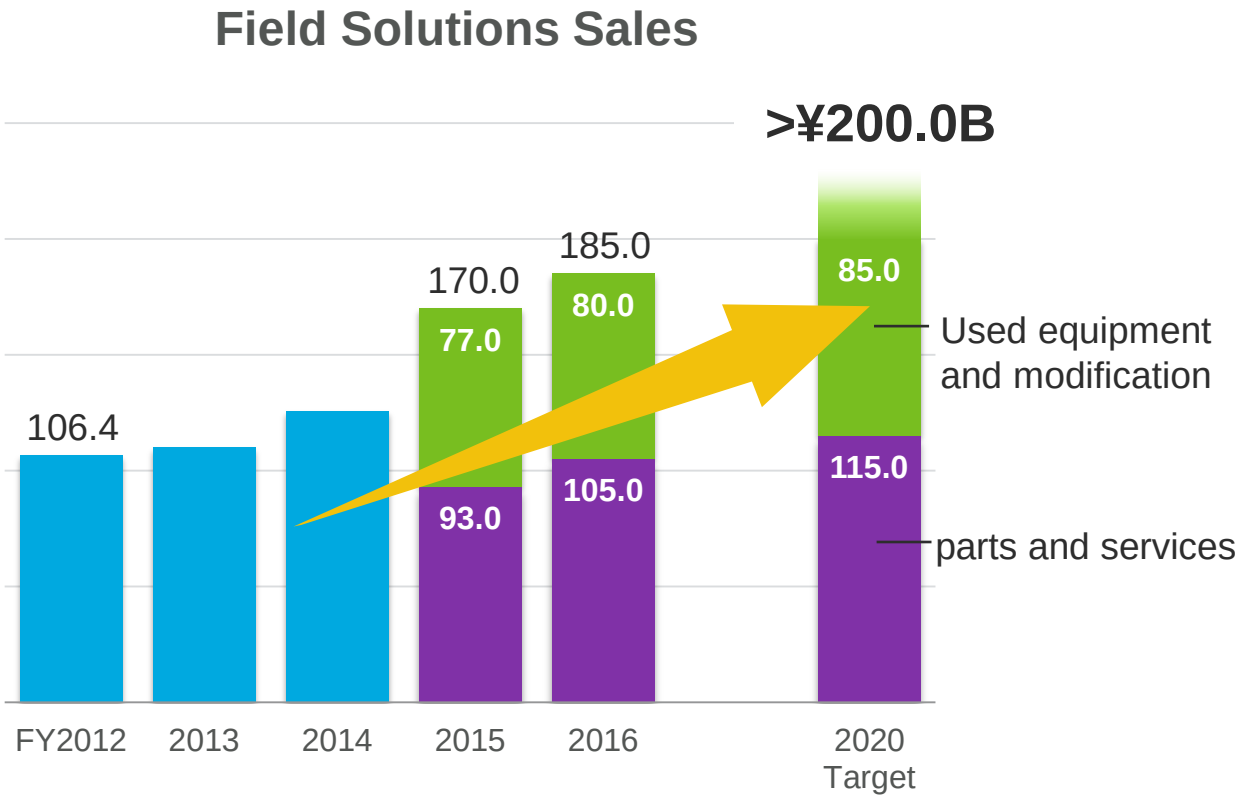
| CY2019 Target |
|---|
| >36% |

TOKYO ELECTRON

# Field Solution Business Strategies

Kiyoshi Sunohara
Senior Vice President & General Manager, FS BU

# FY2016 Highlights and Revenue Plan




## FY2016 Highlights

- Grew sales ¥15.0B YoY
- Began supplying remanufactured equipment
- Introduced new TELeMetrics™ service
  - 50 fabs remotely connected
- Installed base of 59,000 units

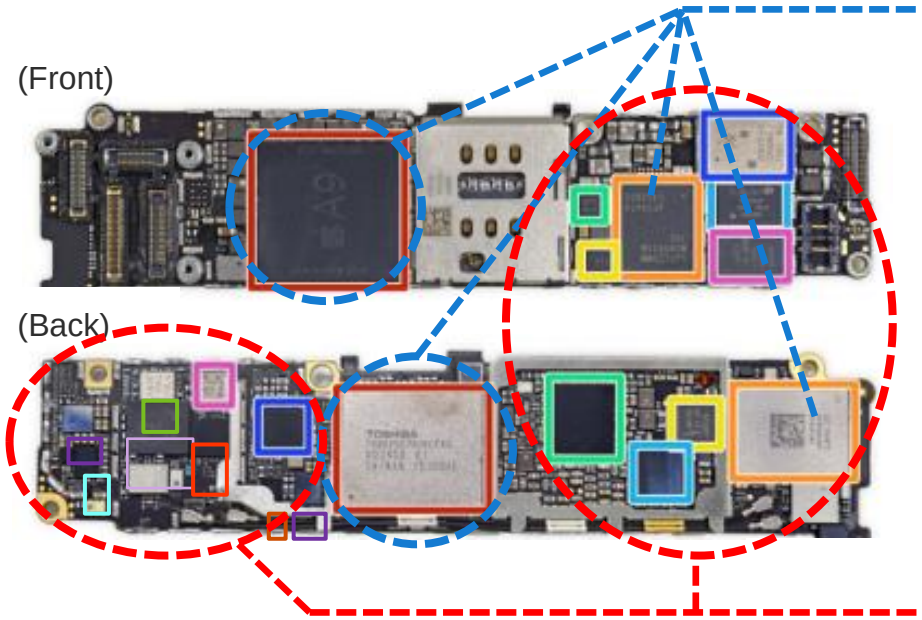
**Increased earnings in both the used equipment/modification and parts/service segments**

# IoT Expanding Business Opportunities

Chips for iPhone 6S

(Front)

(Back)



Source: iFixit website

**Leading-edge equipment**
- Processor/DRAM
- NAND Flash
- LTE Modem
- Others

**Upgraded previous generation equipment**
- Power amplifier
- MEMS
- Display controller
- Sensor
- Others

**Customer needs driven by IoT**

- Used equipment/modification
  - Fast delivery/low price
  - Compatibility with new applications
  - Upgrades based on changes in (technological) needs
- Parts/services
  - Stable operation of equipment
  - Reduced running costs
  - Long life support for equipment

**Upgrades to leading-edge technology being sought for all generations of equipment**

# A Business Model Utilizing Makers' Strengths

## Used equipment/modification

### 1. Reliable equipment supply structure

■ **Remanufactured equipment model**

In addition to our existing used equipment supply, upgrade and resale business, supply remanufactured equipment made with new and used parts

New and used parts

Assembly at plant

TEL-certified used equipment

### 2. Upgrades that meet customers' needs

■ **Increased capabilities and life-span extension of equipment already in place**

With the rise of diverse device needs due to IoT, there is demand for reuse of equipment already in place through life-span extension. We provide upgrades that address these needs

- **Leading-edge abilities**
- **Upgrade kit**

New equipment

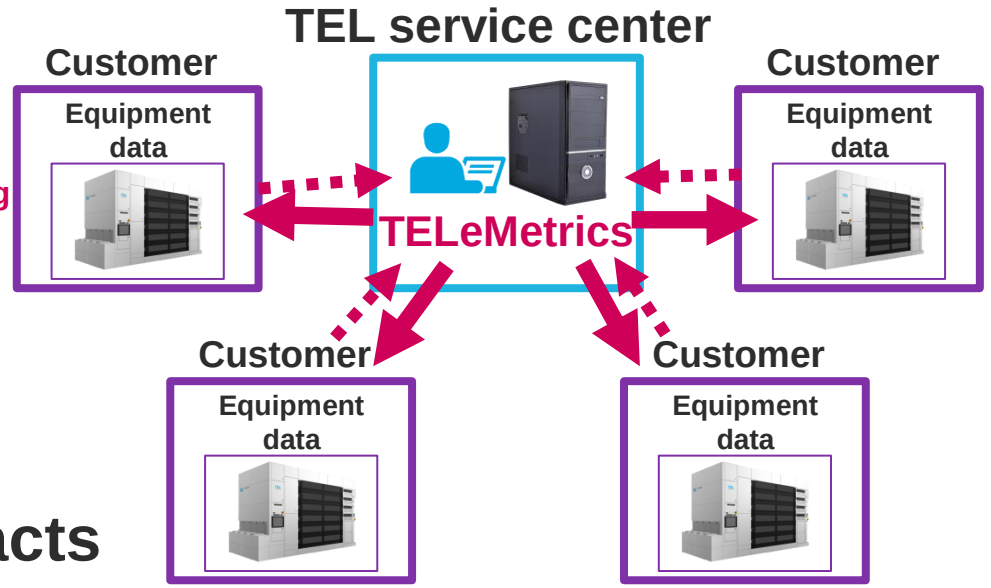
R&D

Equipment already in place

# A Business Model Utilizing Makers' Strengths

**Parts/services**

- Predictive maintenance
- Improved throughput
- Chamber-to-chamber matching
- Fewer defects



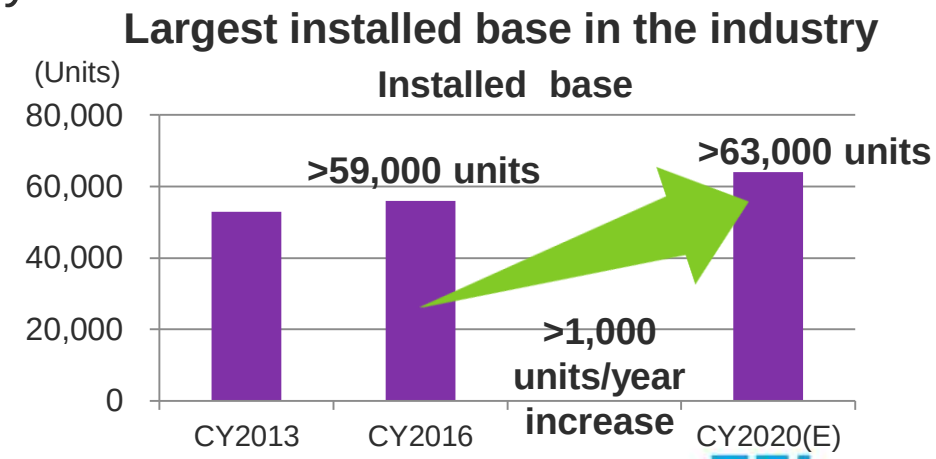

## 1. TELeMetrics™ Service

Supply high value-added services through real time monitoring of operational status of customer equipment

## 2. Growing share through annual parts contracts

In addition to increasing the number of installed units, supply contracts that meet customer needs by combining parts-based service, consumables and repairs

**High value-added services** + **Parts supply** → **Comprehensive service contracts**



# Summary

- **We are driving our business through a business model that utilizes makers' strengths in response to diverse technological needs being expanded by IoT**

- **We will achieve sales growth and increased profitability by expanding a broad range of businesses, including services, parts, used equipment and upgrades**

TOKYO ELECTRON

# FPD Business Strategy

Tsuguhiko Matsuura
Vice President & General Manager, FPD  BU

# Display Trend

## Business opportunities in technological inflection around OLED

| | Conventional | Advanced display |
|---|---|---|
| Major end products | Notebook  Monitor   TV |  Smartphone, tablet  OLED TV* 4K, 8K TV  Flexible* |
| Display technology | a- Si LCD ⇨ | LTPS, metal oxide, OLED |
| Required features | Large screen, low cost ⇨ | High resolution, flexible large screen TVs (＞65”, 8K) |

*Source: LG Display website

# FPD Production Equipment Market and Medium-term Plan

- Increase share and profitability in market that has begun to grow again
- FY2020 target: sales ¥60.0B, operating margin over 20%
  (FY2016 sales ¥44.6B, segment profit margin* 10%)

**Others**

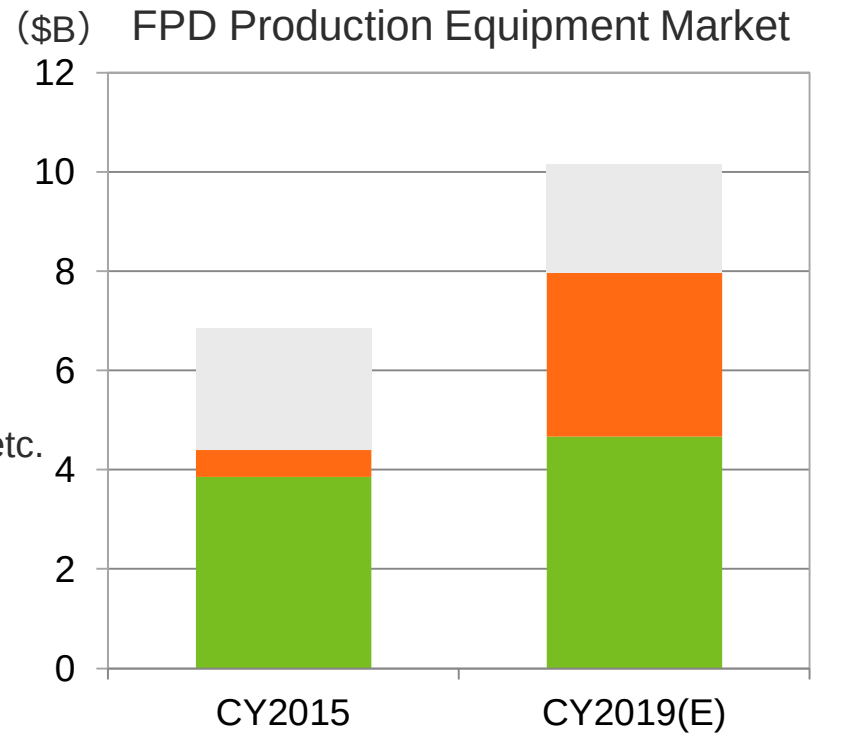
Cell, module processes, etc.

**OLED**

OLED-specific manufacturing.
Emitting layer deposition, encapsulation, etc.

**TFT Array****

Substrate fabrication process.
Essential manufacturing process common to both LCD and OLED




Source: IHS Technology, Display Supply Demand Equipment Tracker Data Tables Q1 2016

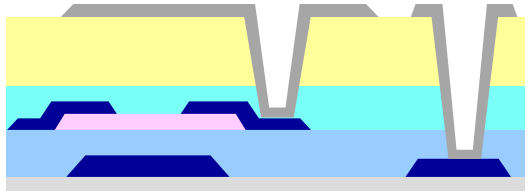
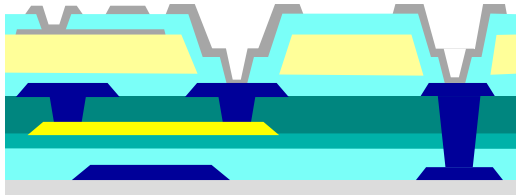
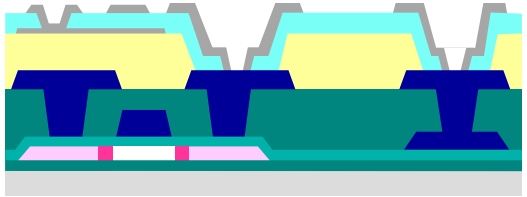
Grow sales in leading-edge sectors where we can differentiate

- Inkjet OLED printing system
- G10.5 compatible etching system and coater/developers
- High performance PICP™*** etching system

* Segment profit margin is based on profit margin before income tax
** TFT Array: Substrate that realizes display images
*** PICP: Plasma source for producing extremely uniform high density plasma on substrate

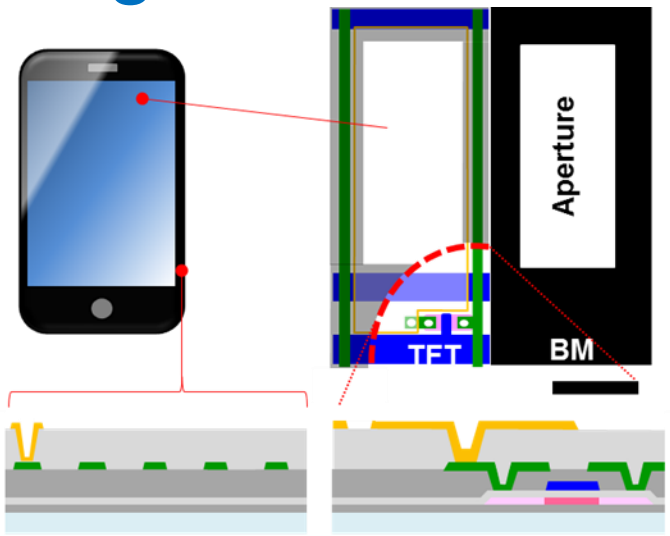
# Opportunity - Metal Oxide/LTPS

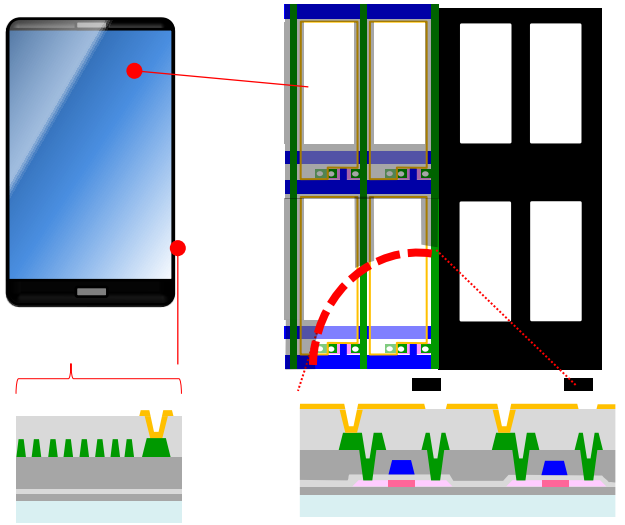
## Sophistication of LCD/OLED etching technology, increased number of processes

| TFT | a-Si | Metal oxide | LTPS |
|---|---|---|---|
| Representation of structure |  |  |  |
| Application | LCD TV<br>Monitor | Tablet<br>OLED TV | Smartphone<br>(LCD, OLED) |
| Number of masks | 5 | 6 ~ 8 | 9 ~13 |
| Dry etch processes | 3<br>a-Si, SiNx | 3<br>SiO, SiNx | ~11<br>SiO, Metal |

# PICP™ Etching System

## Our proprietary high precision plasma technology. Currently growing share in LTPS LCD/OLED



Miniaturization of TFT
Reduced diameter of contact holes
Thick film/miniaturization of interconnect
Increased size of substrate

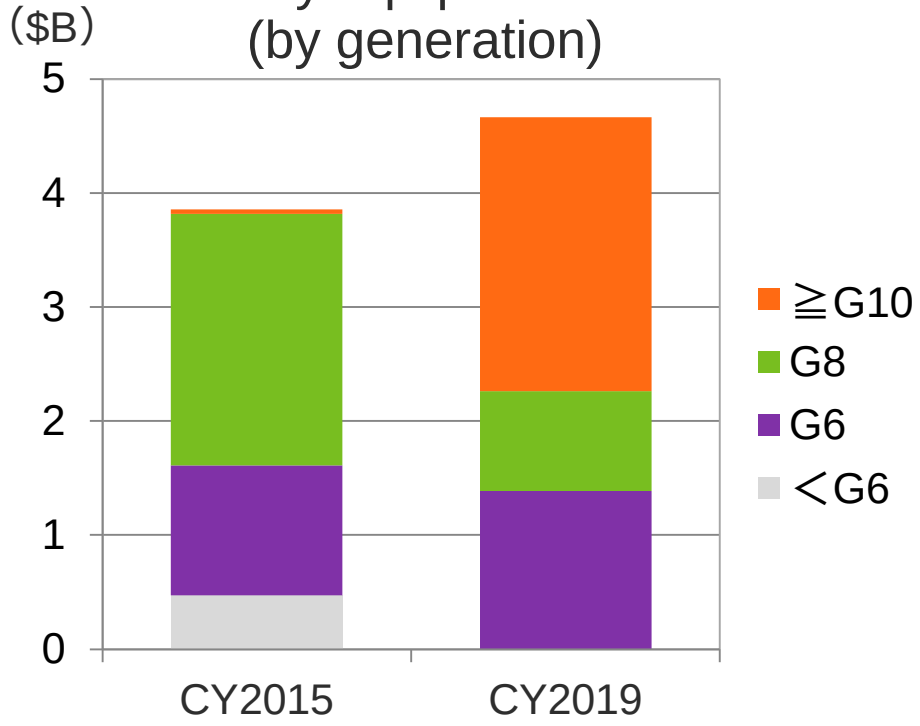
Merits of PICP™ etching system

Increased precision in etching process
Suppression of process changes during continuous processing
Underlayer loss suppression (uniformity, selectivity)

# Opportunity – Growth of Large Panel TV Market/G10.5 Substrate Size

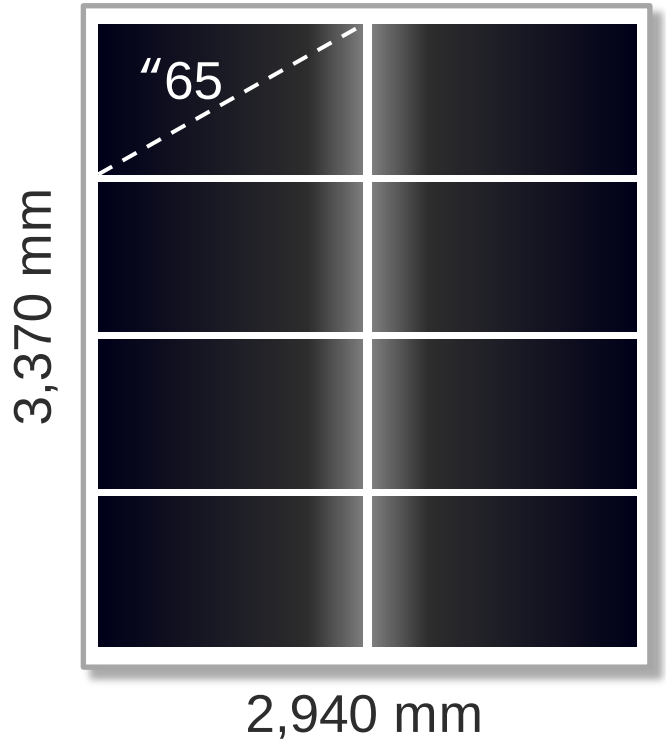
## Expect to capture high share in rapidly growing G10.5 market on G10 results and differentiated technology (large area plasma suppression, air floating coater)

TFT Array equipment market (by generation)




Source: IHS Technology, Display Supply Demand Equipment Tracker Data Tables Q1 2016

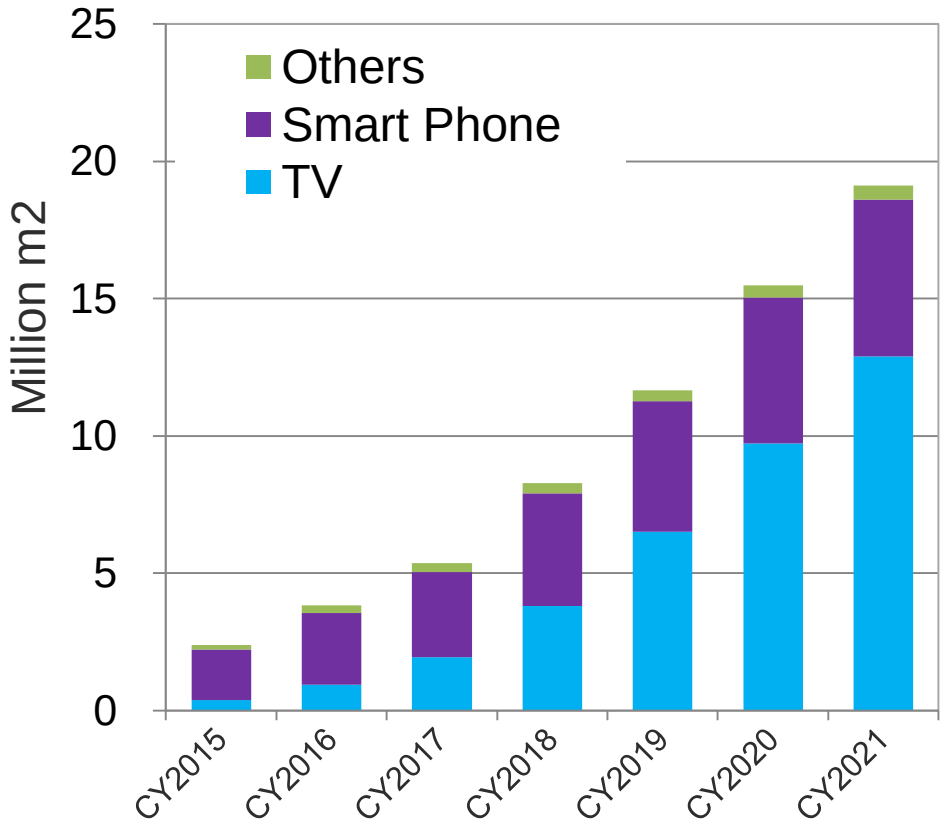
Possible to make 65 inch TV with eight panels



# Opportunity – Growth of OLED TV Market

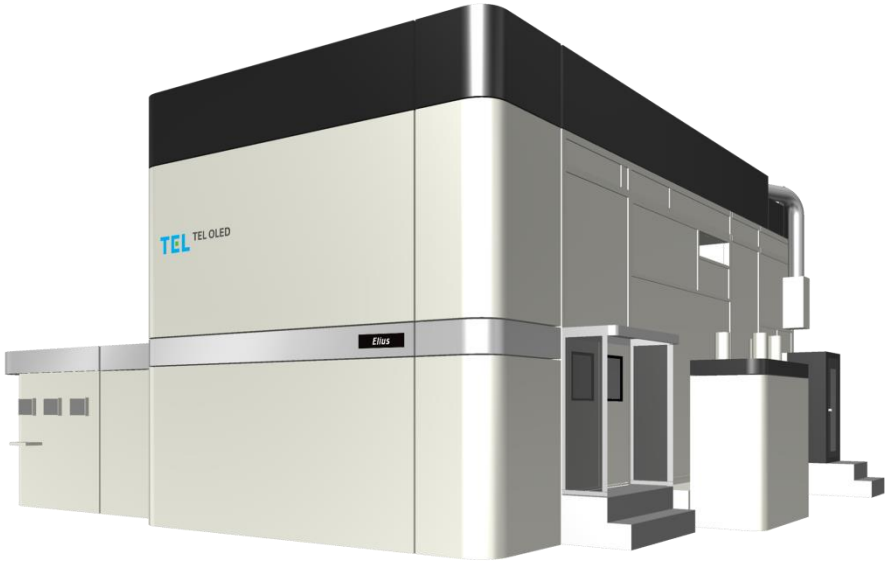
## Market launch of inkjet printing system for start after 2018

Forecast for OLED area demand




Source: IHS Technology, Display Long Term Demand Forecast Tracker 1Q16

Inkjet printing system
for manufacturing OLED panels *Elius*$^{TM}$*2500*




Material utilization efficiency
far higher than evaporation method

# Summary

- **Increase share and profitability in market that has begun to grow again.**
  **FY2020 target: sales ¥60.0B, operating margin over 20%**
- **For leading-edge production processes, focus on areas where we have technological superiority**
  - **High performance PICP™ etching system**
  - **G10.5 compatible etching system and coater/developer**
  - **Inkjet printing system for OLED TV**

TOKYO ELECTRON

# Medium-term Management Plan: Financial Progress

Tetsuro Hori
Representative Director, Executive Vice President & General Manager
Corporate Administration Division

# Financial Model

(Billion Yen)

| | FY2016 (Actual) | FY2017 (Estimate) | FY2020 (Medium-term plan) | |
|---|---|---|---|---|
| | WFE $31B | WFE $31B | WFE $30B | WFE $37B |
| Net Sales | 663.9 | 714.0 | 720.0 | 900.0 |
| SPE | 613.0 | 665.0 | 660.0 | 840.0 |
| FPD | 44.6 | 49.0 | 60.0 | 60.0 |
| Gross profit | 267.2 | 280.0 | 305.0 | 395.0 |
| Gross profit margin | 40.2% | 39.2% | 42% | 44% |
| SG&A expenses | 150.4 | 156.0 | 160.0 | 170.0 |
| SG&A expense ratio | 22.6% | 21.8% | 22% | 19% |
| Operating income | 116.7 | 124.0 | 145.0 | 225.0 |
| Operating margin | 17.6% | 17.4% | 20% | 25% |
| Net income attributable to owners parent | 77.8 | 85.0 | 100.0 | 155.0 |
| ROE | 13% | - | 15% | 20% |

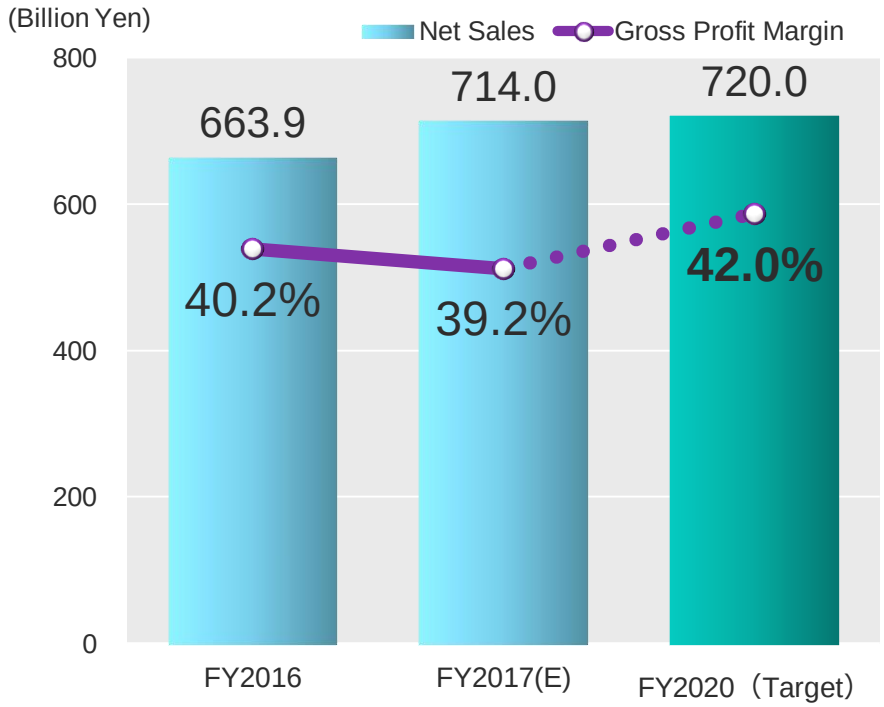
# Our Initiatives as Seen From Our Financial Model

## Comparison of FY2017 (estimate) and ¥720B sales Model

- Challenge: Net sales are around target level, but gross margin is still 3 pts short of FY2020 target
- Response:

1. Supply markets with equipment and services that are even more differentiated. Plan to increase profitability by providing high added-value
2. Aim to reduce cost of sales ratio by more quickly achieving the equipment performance demanded by customers and further raising quality
3. Lower outsourcing costs by reducing delivery time

Net Sales and Gross Profit Margin



# Control of SG&A Expenses

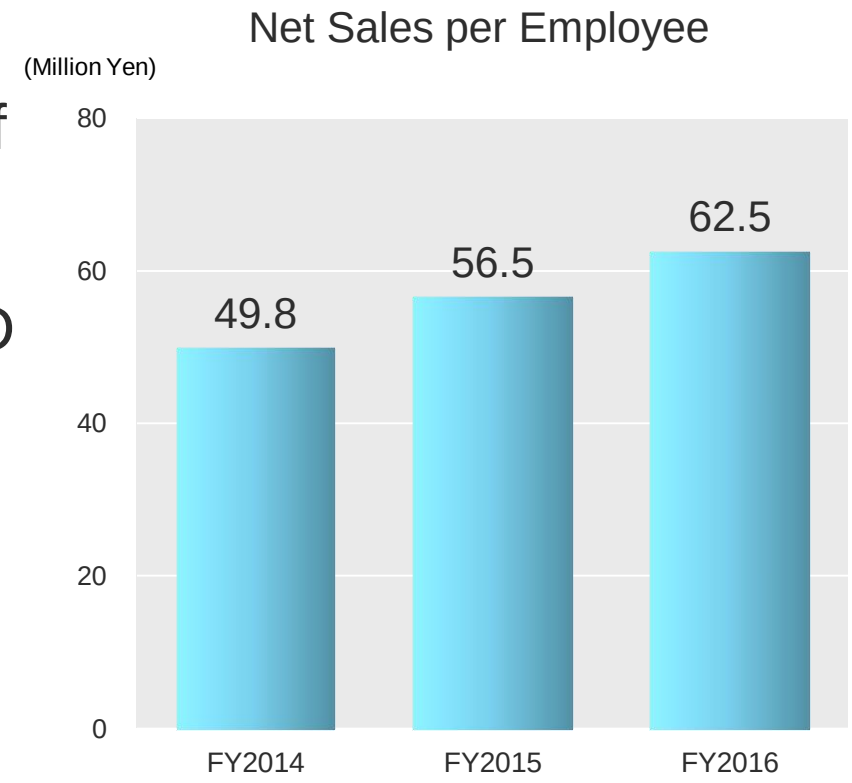
- Progress: Level of SG&A expenses is as planned
- Going forward:

1. Pursue greater efficiency through unification of R&D divisions
2. Rebalance SG&A expenses, reallocate to R&D expenses

   – Increase productivity by strengthening IT systems

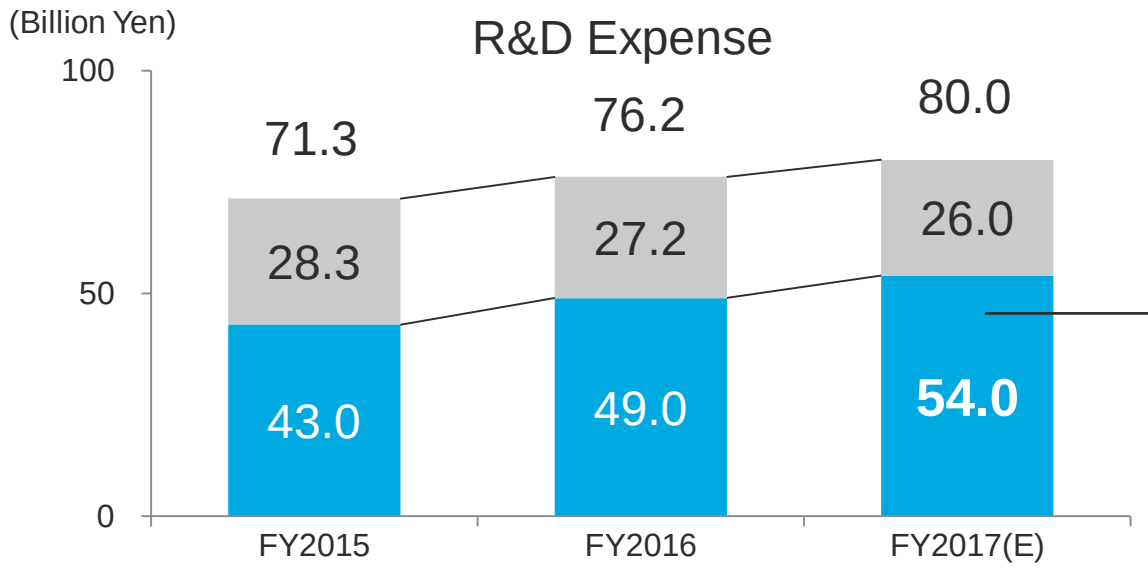
   – Balance sales growth and inventory control for space saving

   – Aim to expand sales in excess of staff increases



# Increasing Efficiency of R&D

- Strengthen R&D across the business units that integrate leading-edge technologies in each product
- Focus resources on strategic products
  - R&D expenses for focus areas ¥54.0B
    （Increase by +¥11.0B, 26% vs. FY2015)



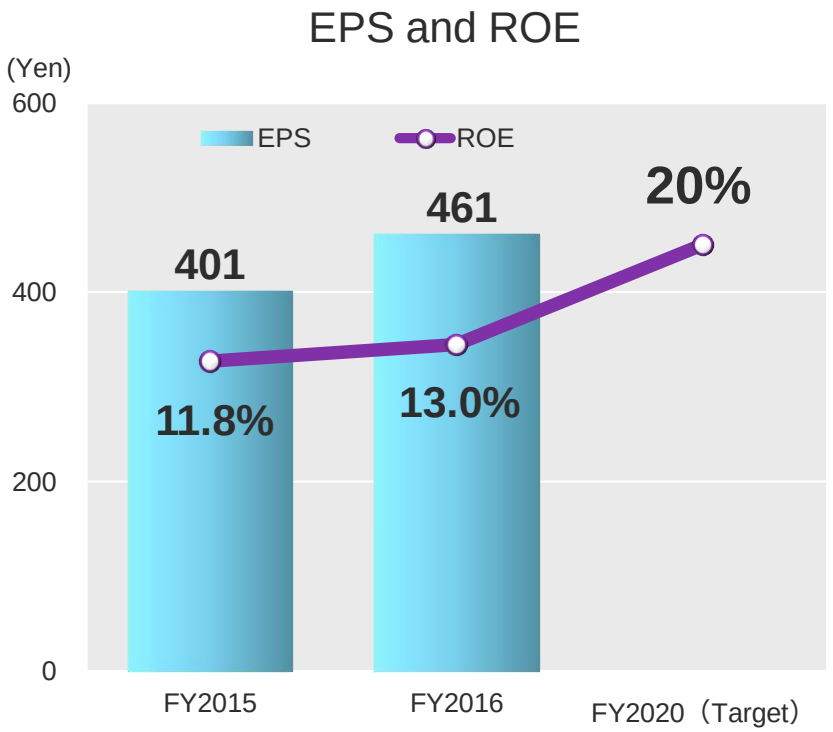

Focus areas (etching, deposition, cleaning)

+¥11.0B, +26%

（vs. FY2015）

# Assets and Capital Efficiency (Sales ¥900B Model)

- Accounts Receivable Turnover
  – Current approx. 60 days: Appropriate
- Inventory Turnover
  – Current 107 days → Target 85 days
- ROE
  – Current 13% → Target 20%




ROE = Net income attributable to owners of parent / Average total number of shares outstanding in each fiscal year (excluding the treasury stock)

# Summary

- **Making progress towards achieving our FY2020 financial model**
- **Key to achieving profit margin target is further improving competitive strength of products and raising gross profit margin through higher quality**
- **Progress in raising R&D and operational efficiency**

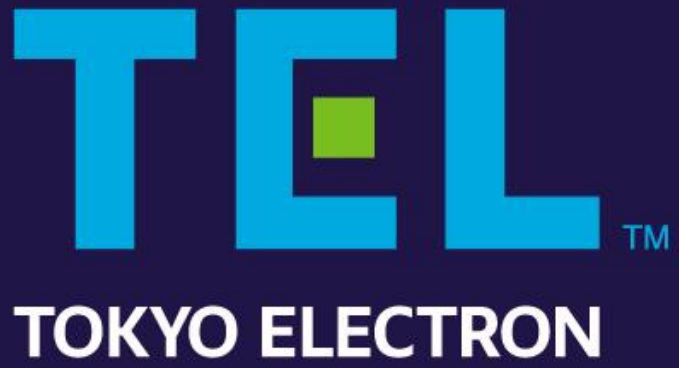
**Pursue global standard profitability**
**Aim to further enhance our corporate value**

- Disclaimer regarding forward-looking statement
  Forecast of TEL's performance and future prospects and other sort of information published are made based on information available at the time of publication. Actual performance and results may differ significantly from the forecast described here due to changes in various external and internal factors, including the economic situation, semiconductor/FPD market conditions, intensification of sales competition, safety and product quality management, and intellectual property-related risks.

- Processing of numbers
  For the amount listed, because fractions are rounded down, there may be the cases where the total for certain account titles does not correspond to the sum of the respective figures for account titles. Percentages are calculated using full amounts, before rounding.

- Exchange Risk
  In principle, export sales of Tokyo Electron's mainstay semiconductor and FPD panel production equipment are denominated in yen. While some settlements are denominated in dollars, exchange risk is hedged as forward exchange contracts are made individually at the time of booking. Accordingly, the effect of exchange rates on profits is negligible.

FPD: Flat Panel Display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TM
TOKYO ELECTRON