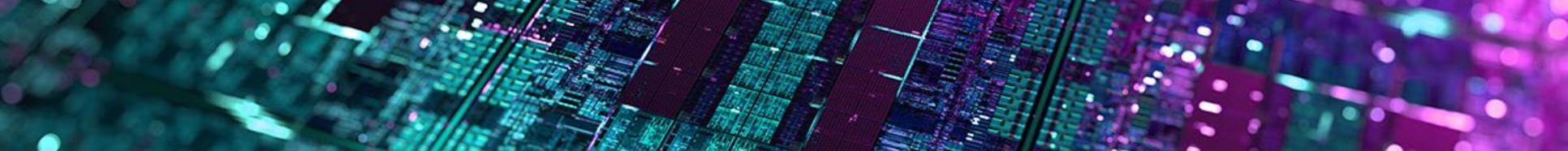




Electronic Materials Business Briefing



FUJIFILM Holdings Corporation

June 9, 2022

Corporate Vice President, FUJIFILM Corporation
General Manager of Electronic Materials Business Div.
In charge of FUJIFILM Electronic Materials group Companies

Tetsuya Iwasaki

Corporate Vice President, FUJIFILM Corporation
General Manager, Electronic Materials Research Laboratories

Hitoshi Noguchi

President & CEO, FUJIFILM Electronic Materials Co., Ltd.

Masashi Enokido

Presenter Profile

Tetsuya Iwasaki

April	1986	Joined Fuji Photo Film Co., Ltd.* ¹	* ¹ current FUJIFILM Co., Ltd
October	2001	Manager, Fuji Photo Film (Europe) GmbH* ² [Residing in Germany]	* ² current FUJIFILM Europe GmbH
August	2010	President, ZAO ‘FUJIFILM-RU’* ³ [Residing in Russia]	* ³ current FUJIFILM RUS LLC
August	2014	General Manager, FUJIFILM Electronic Materials Co., Ltd	
September	2016	President & Managing Director, FUJIFILM Electronic Materials(Europe)N.V [Residing in Belgium]	
June	2017	General Manager of Photo Imaging Products Div., FUJIFILM Corporation	
June	2019	President, FUJIFILM Holdings America Corporation President & CEO, FUJIFILM North America Corporation [Residing in U.S.A]	
December	2020	Corporate Vice President, FUJIFILM Corporation President, FUJIFILM Holdings America Corporation President & CEO, FUJIFILM North America Corporation	
October (current position)	2021	Corporate Vice President, FUJIFILM Corporation General Manager of Electronic Materials Business Div. In charge of FUJIFILM Electronic Materials group Companies	

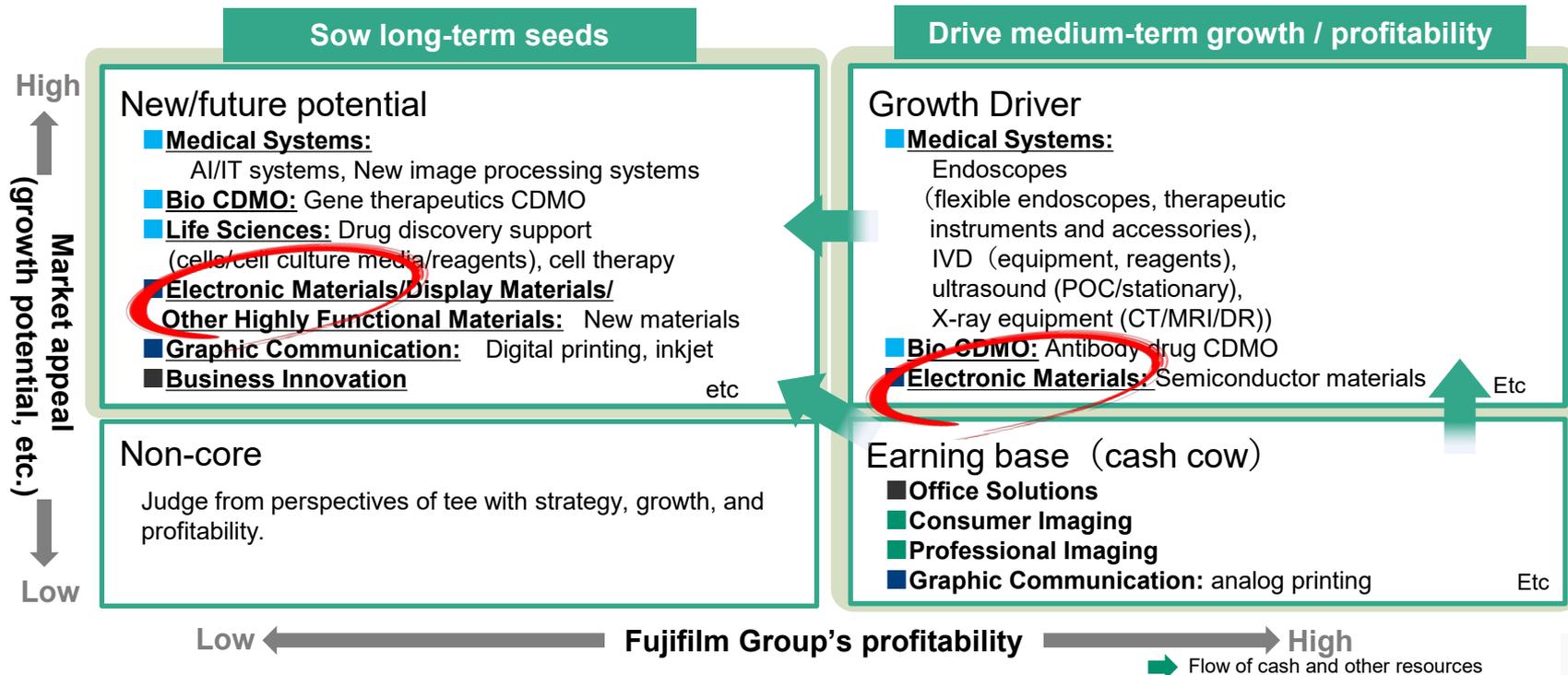
- 1. Positioning and Structure of Fujifilm's Electronic Materials business**
- 2. Growth Potential of The Semiconductor Market**
- 3. Superiority of Fujifilm's Electronic Materials business**
- 4. Strategy for Further Growth**
- 5. Initiatives Towards a Net Zero CO₂ Emissions**
- 6. Summary**

1-1 | Position of Electronic Materials on Portfolio management

*Excerpt from the presentation material, "Medium-term Management Plan VISION2023" (Announced on April 15, 2021)

Inject ¥1.2 trillion growth investment* over 3 years, with ¥1.0 trillion channeled into new/future potential and growth driver areas.

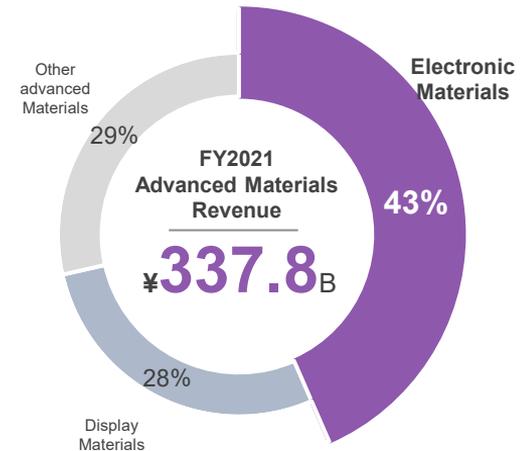
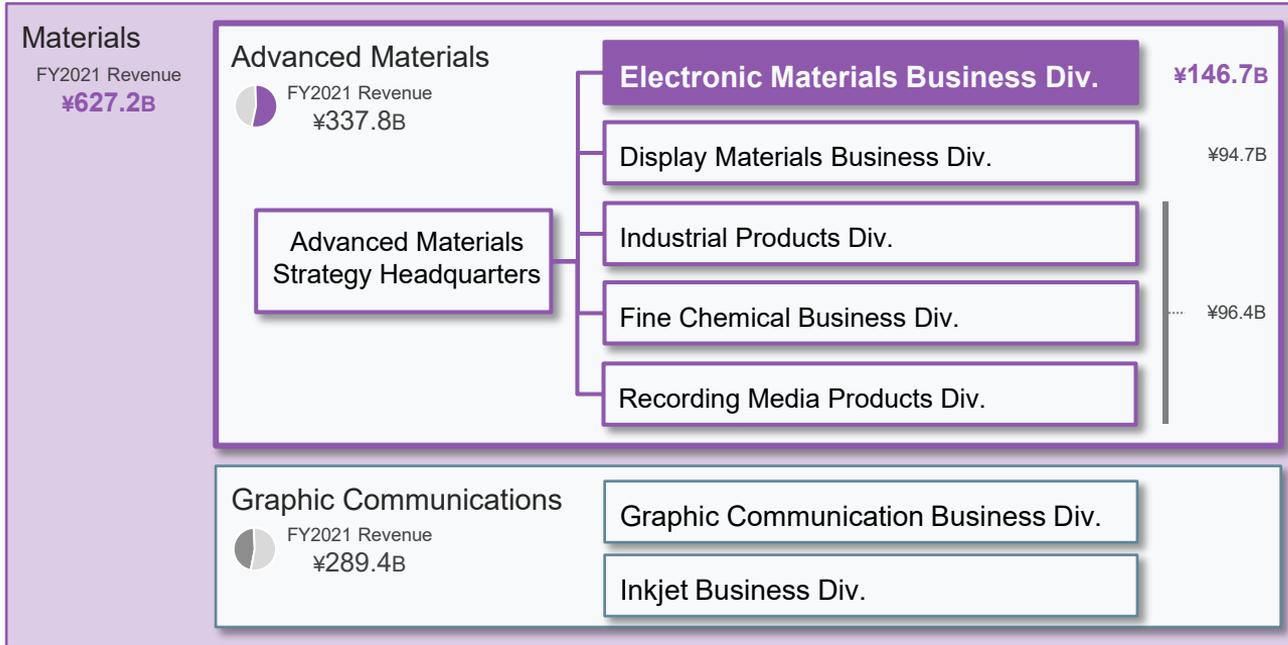
*Total R&D investment and capex for FY2021–FY2023



1-2 | New Organizational Structure for the Materials Business Segment

- The Electronic Materials business is the largest business in the Advanced Materials domain within the Materials business segment.
- In October 2021, the Advanced Materials Strategy Headquarters was established to draw up and implement cross-divisional strategy in the area of Advanced Materials.

Under the Advanced Materials Strategy Headquarters, the domain will reinforce collaboration with other business divisions to develop innovative semiconductor materials from a mid- to long-term perspective.



1-3 | Electronic Materials – Growth Track and Further Business Expansion

- In 1983, Fujifilm began manufacturing and marketing photoresist products following the establishment of a joint venture with Philip A. Hunt Chemical.
- Fujifilm will implement growth-oriented investments and strategy for further business expansion to evolve into a semiconductor materials manufacturer capable of offering One-stop-solutions and achieve revenues of ¥250B in FY2026 and ¥400B in FY2030.



July 1983
Established a joint venture with Philip A. Hunt Chemical Corp. for full-scale business entry

FY2004
M&A
Acquisition of Arch Chemicals' semiconductor materials business

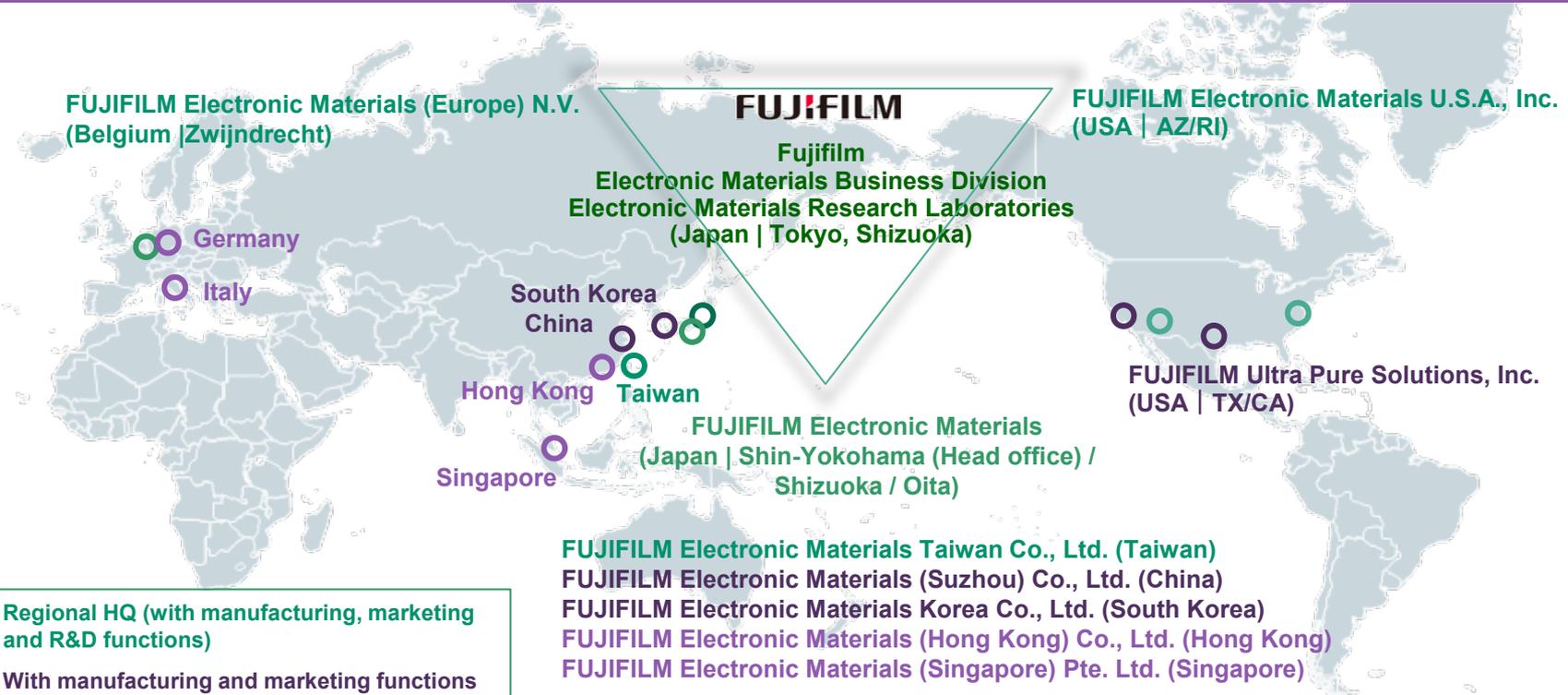
FY2010
M&A **CMP Slurry**
Planar Solutions became a wholly-owned subsidiary

FY2015
M&A **High-purity solvent**
Acquisition of Ultra Pure Solutions

FY2017
M&A **PCMP**
Acquisition of Wako Pure Chemical

FY2022
Capital investment
Strengthening of global supply chain infrastructure

Tri-polar structure (Japan, USA, EU) with development, manufacturing and marketing networks reaching customers around the world



- FUJIFILM Electronic Materials Taiwan Co., Ltd. (Taiwan)
- FUJIFILM Electronic Materials (Suzhou) Co., Ltd. (China)
- FUJIFILM Electronic Materials Korea Co., Ltd. (South Korea)
- FUJIFILM Electronic Materials (Hong Kong) Co., Ltd. (Hong Kong)
- FUJIFILM Electronic Materials (Singapore) Pte. Ltd. (Singapore)

1. Positioning and Structure of Fujifilm's Electronic Materials business
- 2. Growth Potential of The Semiconductor Market**
3. Superiority of Fujifilm's Electronic Materials business
4. Strategy for Further Growth
5. Initiatives Towards a Net Zero CO₂ Emissions
6. Summary

2-1 | Semiconductor Materials Market's Growth Background and Trends

Amid the continuing growth of the semiconductor market, the COVID-19 pandemic triggered semiconductor supply shortage. As the result, stable supply chain became the biggest challenges. Some countries are attracting semiconductor fabs and developing domestic manufacturers under a government-led industrial policy from the perspective of economic security.

Further growth acceleration in the semiconductor market The market scale is expected to reach \$600B (¥72 trillion) in 2022.

1) Post-COVID digital revolution:

The semiconductor market is expected to grow further due to additional demand for advanced computing application devices (e.g., autonomous cars). These continuous growth will be spread over the United States, South Korea and Taiwan (approx. ¥100 trillion by 2030).

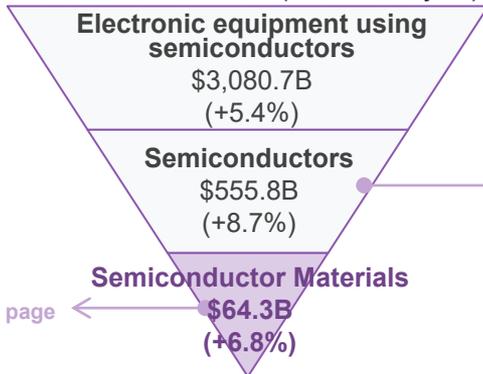
2) Increased demand for semiconductor materials: In 2021, the semiconductor market recorded \$64.3B as highest than ever. Taiwan and China market are main drivers of growth following the evolution of advanced semiconductor packaging technology and expansion of semiconductor demand. It is expected to continue growing at the rate of CAGR 9.4%*1.

(*1 Source : Fuji Chimera Research Institute, Inc.)

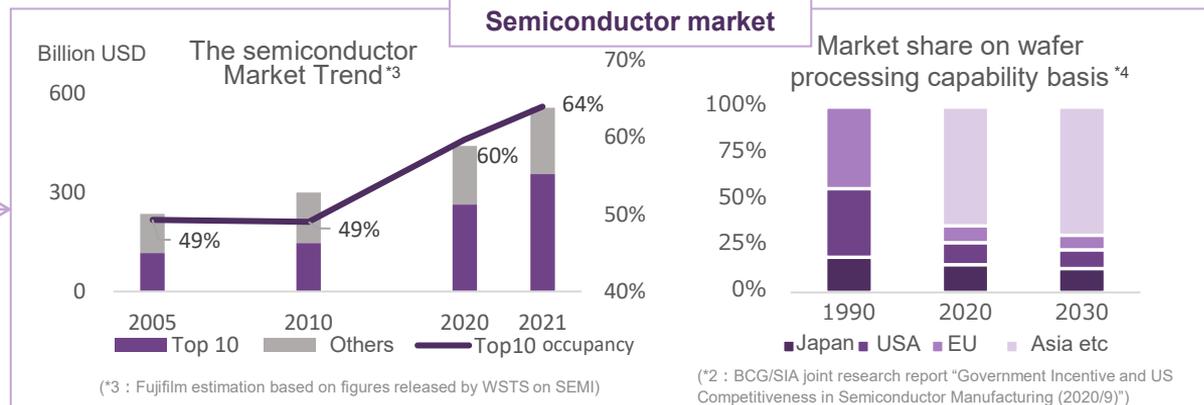
Intensifying international industrial policy competition of a new dimension from the perspective of economic security

Background of a technological power conflict between the US and China as well as semiconductor supply shortage, there are moves to domestically produce advanced semiconductors and build a structure for supply stability as a national strategy.

Global market in 2021(CAGR in last 5 years)*2



Next page ←

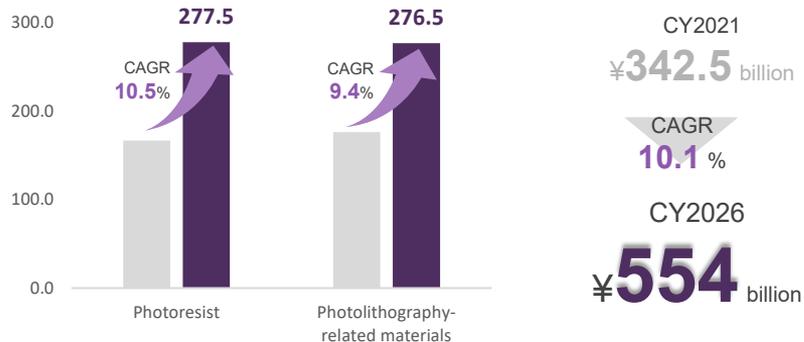


(*2 : Fujifilm estimation based on JEITA report on SEMI)

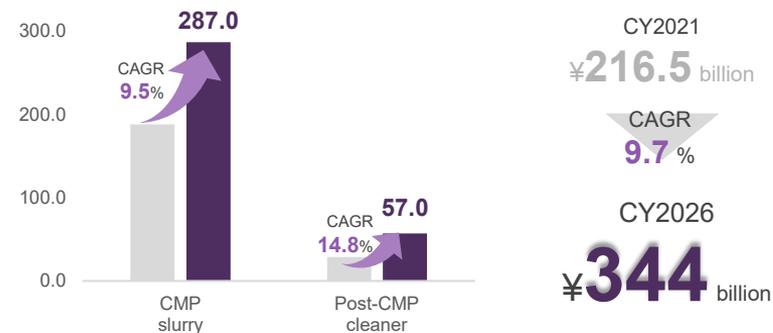
2-2 | Trends of The Semiconductor Materials Market

The market scale of Fujifilm's main product groups is generally expanding alongside the growth of the semiconductor market.

Lithography materials



CMP materials



Polyimide for forming protective films and rewiring layers

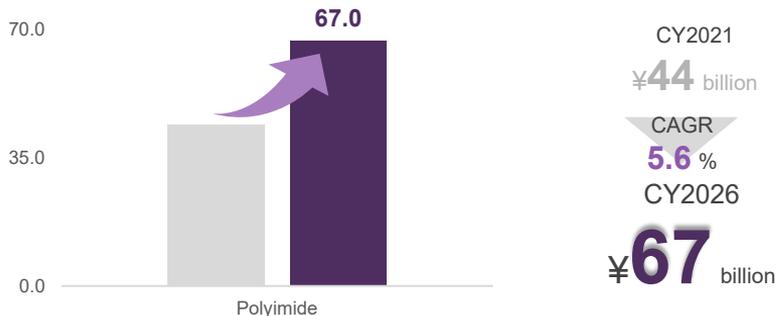
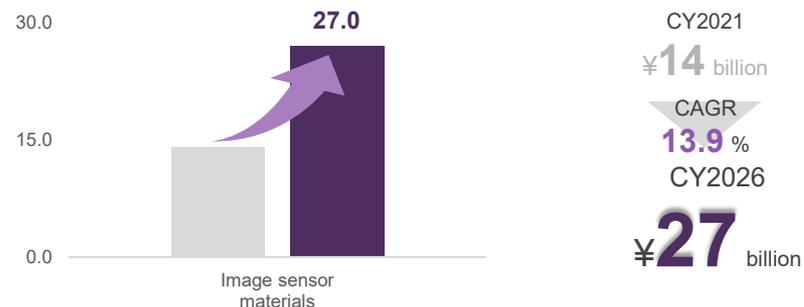


Image sensor materials



(In-house research based on data from Fuji Chimera Research Institute, Inc, Linx Consulting and YoleDevelopment)

Today's Agenda

1. Positioning and Structure of Fujifilm's Electronic Materials business
2. Growth Potential of The Semiconductor Market
- 3. Superiority of Fujifilm's Electronic Materials business**
4. Strategy for Further Growth
5. Initiatives Towards a Net Zero CO₂ Emissions
6. Summary

Fujifilm has maintained strong growth due to a stable and reliable global supply chain, growing comprehensive product portfolio, R&D successfully developing enabling next generation products, and strong global partnerships with customers.

Superiority

1

Global supply chain that caters to customer needs

- Products and services with **stable and the consistent quality** from Global 11 manufacturing sites
- **Organized BCP sites*** handling manufacturing at multiple sites

*BCP:Business Continuity Plan

Superiority

2

Broad product portfolio

- **Broad** lineup of advanced process materials built through in-house development and M&A's
- **Mutually-complementing materials** such as CMP slurry and post-CMP cleaner

Superiority

3

R&D capabilities that can meet the strict demands of customers and strong relationship with customers

- **Technology capabilities that can realize rapid product development through collaboration between** local R&D and corporate laboratories
- Strong Partnerships with customers built by past development activities

3-2-1 | Superiority① : Global Supply Chain that Caters to Customer Needs

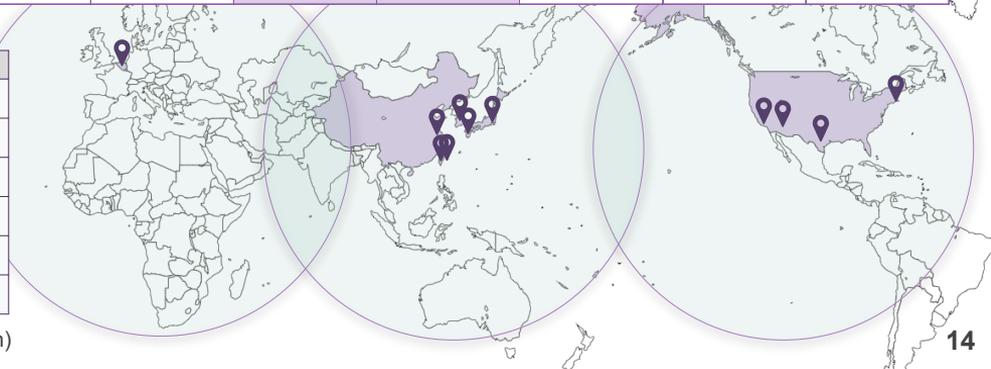
- Capability of offering products and services with consistent quality across the global 11 sites.
- Stable supplies of high-quality products based on advanced evaluation/analytical equipment, evaluation technology, and global QA/QC system.

Japan		USA				Belgium	Taiwan		China	South Korea
Shizuoka	Oita	Rhode Island	Arizona	Texas	California	Zwijndrecht	Hsinchu	Tainan	Suzhou	Cheonan

	Japan	USA	Belgium	Taiwan	China	South Korea
Manufacturing						
Photoresist	✓		✓			
Photolithography-related materials	✓		✓	✓	✓	✓
CMP slurry			✓		✓	✓
Post-CMP cleaner		✓			✓	
Thin film formation materials			✓		✓	
Polyimide	✓		✓		✓	
Image sensor materials	✓				✓	
Research and Development(R&D)	✓		✓	✓	✓	✓

Manufacturing Footprint

	Fujifilm	Firm A	Firm B	Firm C	Firm D	Firm E	Firm F
Japan	✓	✓	✓	✓	✓	✓	✓
USA	✓	✓	-	-	-	✓	-
EU	✓	✓	-	-	-	-	-
Taiwan	✓	✓	-	✓	-	✓	-
China	✓	-	✓	✓	-	✓	✓
South Korea	✓	✓	✓	✓	-	✓	✓



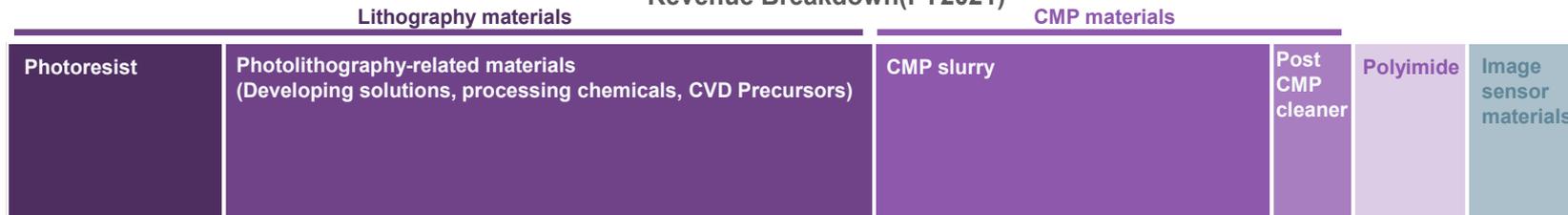
(In-house research)

Broad product lineup developed through in-house development and M&A's

(In-house research)

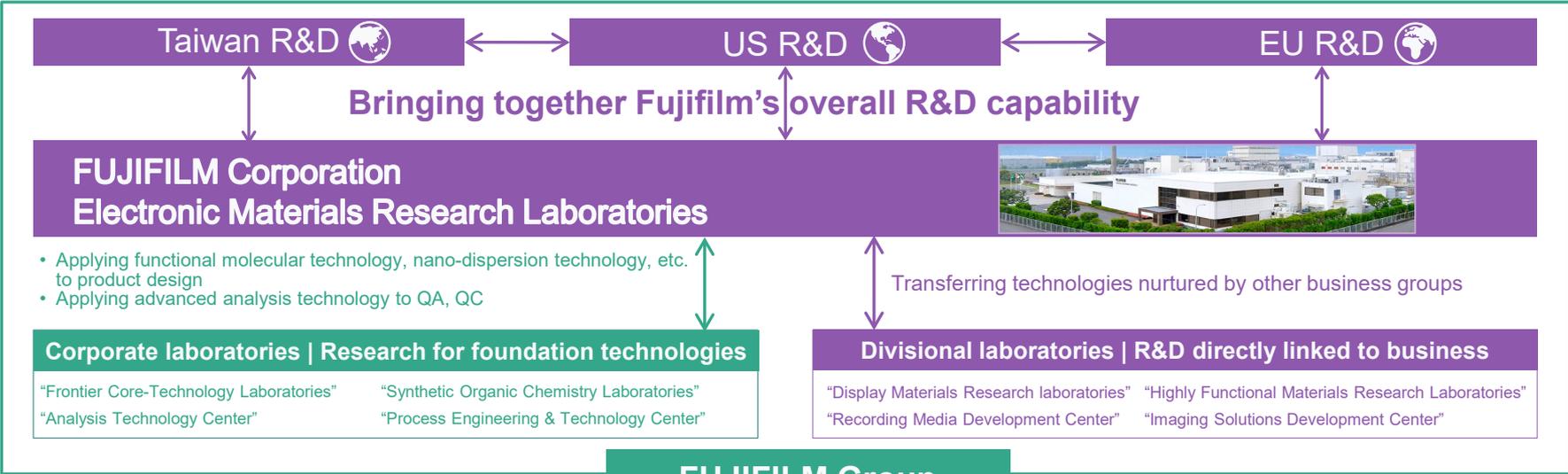
	Fujifilm	Firm A	Firm B	Firm C	Firm D	Firm E	Firm F
Wafer	-	-	-	✓	-	-	
Photoresist	✓	✓	✓	✓	-	✓	✓
Photolithography-related materials	✓	✓	✓	-	-	✓	✓
CMP slurry	✓	-	✓	-	-	✓	-
Post-CMP cleaner	✓	-	-	-	-	-	-
Polyimide	✓	-	-	-	✓	-	-
Image sensor materials	✓	-	-	-	-	-	✓

Revenue Breakdown(FY2021)



3-2-3 | Superiority③ : R&D Capabilities and The Strong Relationship of Trust FUJIFILM

- Direct communication between regional R&D Div. and customers enable to understand true needs at customer in timely manner.
- Collaboration among regional R&D Div. and Corporate Laboratories can provide essential solutions.



Today's Agenda

1. Positioning and Structure of Fujifilm's Electronic Materials business
2. Growth Potential of The Semiconductor Market
3. Superiority of Fujifilm's Electronic Materials business
- 4. Strategy for Further Growth**
5. Initiatives Towards a Net Zero CO₂ Emissions
6. Summary

Be a semiconductor materials company offering One-stop-solutions**Strategy**

①

Offer solutions with broad products and core technologies

- ▶ Broad product portfolio and Core technologies solves customer complex issues that cannot be resolved with single material or conventional insight.
- ▶ Further products line-up through new products development with Fujifilm's technologies.

Strategy

②

Enhance supply chain capability through aggressive capital investments

- ▶ Spending a total of ¥110 billion* in growth-oriented investments over 3 years from FY2021 to FY2023 to enhance production infrastructures, facilities and quality.

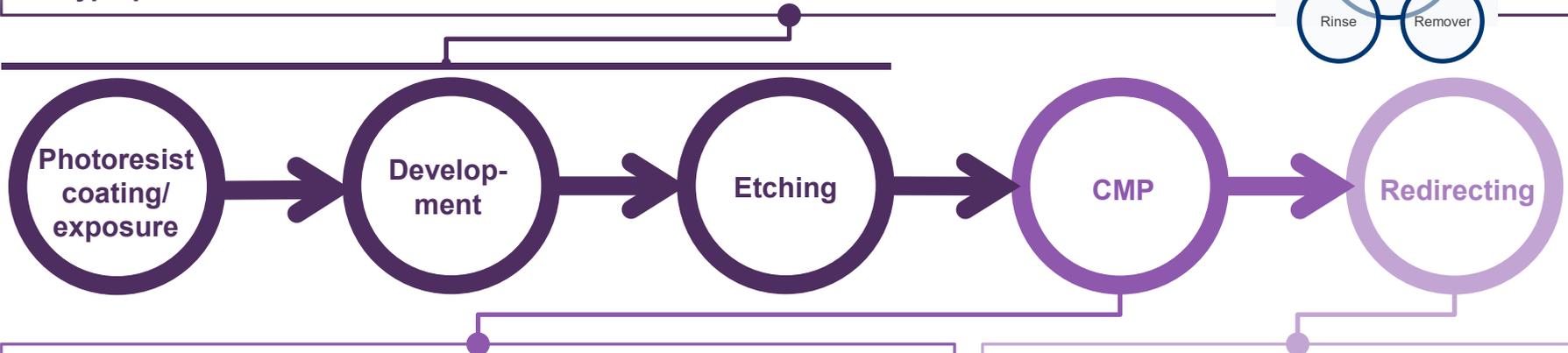
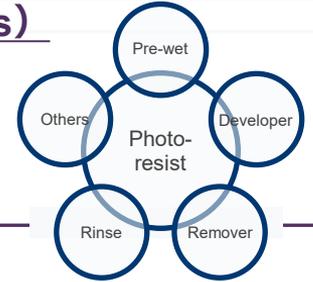
* The sum of CAPEX and R&D exp. Increased by ¥40B from Medium-Term Management Plan VISION2023 announced in April, 2021

4-2-1 | Fujifilm's Strategy Addressing High Integration at Semiconductor

Solving the customer issues for semiconductor miniaturization and 3D packaging through broad products lineup and our advanced technology.

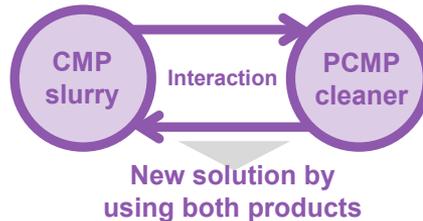
Addressing miniaturization (Photoresist, Photolithography-related materials)

- Offer total solution including pre-wet, developer and rinse on top of photoresist.
- Addressing EUV
Focus on developing **negative type EUV resist** and ancillaries with **our strong negative type process IP**.



Addressing new metals (CMP slurry, Post-CMP cleaner)

Offer interactive CMP slurry and p-CMP cleaner which can solve more complex challenges.

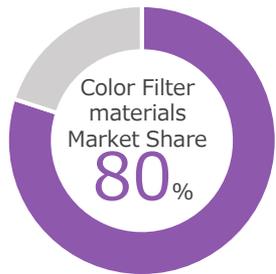


Addressing 3D package(Polyimide)

Develop the material with **low temperature cure and high resolution through lithography technology**. These material enable to solve complex 3D package issues.

4-2-2 | Creating Image Sensor Materials Market, Originating from Color Filter Materials

Expanding the materials market in Image Sensor through development of materials which can control wider wavelength light for high pixelization, high sensitivity, high functionalization.



COLOR MOSAIC®

WCM -Wave Control Mosaic-

Expand product line-up

New material Developing with customers for new generation

Shade material Low transmittance, Low reflection etc
Low refraction Low refraction etc

FY27 – Growth acceleration

FY21-FY26 CAGR +13.9%

Color filter materials

High resolution, High durability, Complementary color, Thinner, IR sensing etc

High Function

New(Automotive, Security, FA etc)

Image Sensor Market

AV

Mobile

2010

2020

4-3-1 | Global Structural Changes Surrounding Semiconductors

1. Change in the economic security environment

- ▶ Technological power struggle between the US and China means securing semiconductors links directly to economic security.

2. Post-COVID digital revolution

- ▶ Semiconductors now underscore our digital society due to their involvement in 5G, Big Data, AI, IoT, self-driving vehicles and DX. They represent a critically-important strategic technology for each country.

3. Increased supply chain risk

- ▶ Semiconductor supply shortage has had a serious impact on all industries (supply chain risk), e.g. production suspension of final products.



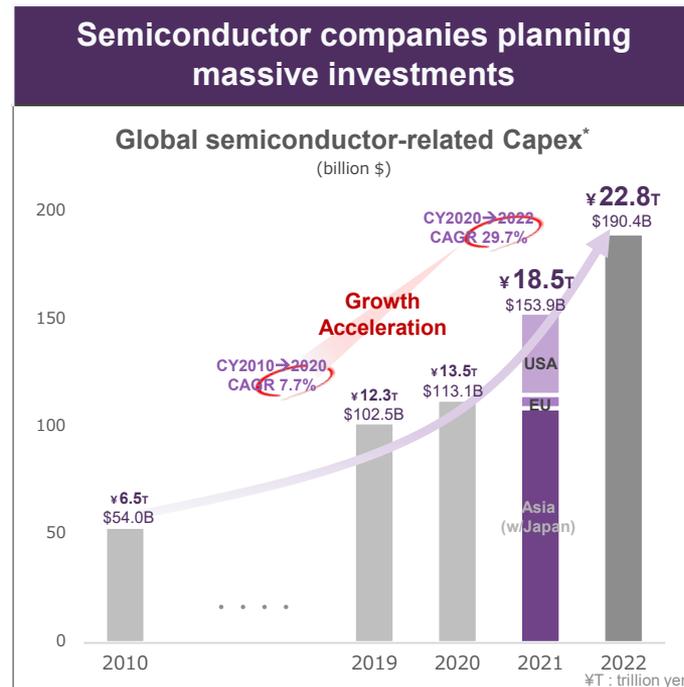
Many countries are deploying industrial policies of a new dimension, securing key production foundation from the perspective of economic security.

4-3-2 | Active Investments by Chipmakers Under Industrial Support in Various Countries

Major semiconductor companies are making massive investments against the backdrop of active government support in their respective countries for supply chain reinforcement.

Country / region	Trend in government industrial support policy
USA	Investing \$52B (approx. ¥6.2T) in the semiconductor industry, including capital investments in R&D facilities (May 2021)
China	The “ Made in China 2025 ” program aims to produce 70% of semiconductor chips domestically by 2050 , planning to inject \$150B(¥18T) into the semiconductor industry from a national IC fund, etc.
EU	Investing over €145B(approx. ¥19T) in the digital field including semiconductors over the next 2 – 3 years (March 2021)
Taiwan	Announcing a plan to inject a total of ¥ 30B in grants to the semiconductor field by 2021 (July 2020)
South Korea	Drawing up the “ K-Semiconductor Belt Strategy ” to establish itself as a semiconductor superpower (May 2021)
Japan	Drawing up an emergency plan to inject a total of ¥ 800B to reinforce the foundation of the semiconductor industry (November 2021)

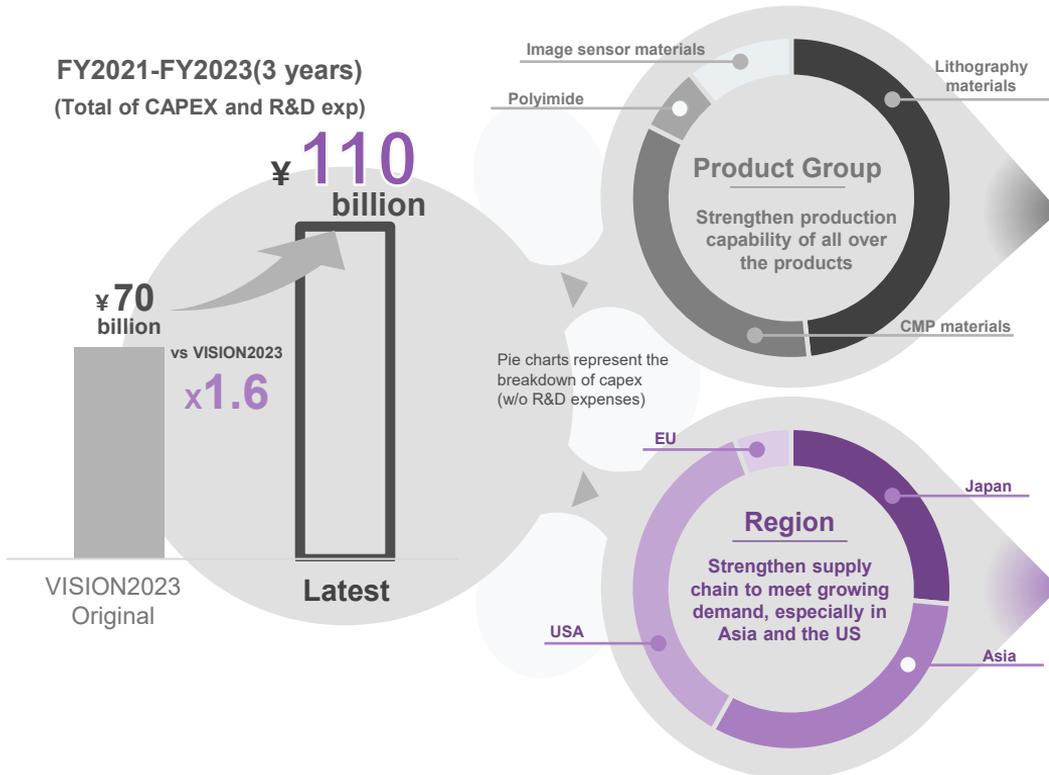
*120 yen / USD, 132 yen /EUR



*In-house research based on IC Insights and “Global Semiconductor Plant Almanac 2021” by Global Nets

4-3-3 | Strengthening Global Production Sites to Build a Robust Supply Chain

Fujifilm spend ¥110B investments* over 3 years from FY2021 to FY2023 to enhance and grow our supply chain and R&D strengths to meet expanding demand.
 (* including Capital investment and R&D spending)



FY2026 Revenue target ¥250B

Growth investments in all product groups and in all locations, especially in Asia and the U.S., where semiconductor companies are increasingly investing.

Major investment in each region

- Japan**
 - PCMP cleaner
 - New establishment of manufacturing and QC equipment (Kanagawa site)
 - Photolithography-related materials and PCMP cleaner
 - Expansion of manufacturing and QC equipment (Shizuoka/Oita plant)
- Asia**
 - CMP slurry and Photolithography-related materials
 - Expansion of manufacturing and QC equipment (Taiwan/South Korea site)
- US**
 - CMP slurry and Photolithography-related materials
 - Expansion of manufacturing and QC equipment (Arizona/Rhode Island site)
- EU**
 - Polyimide and Photolithography-related materials
 - Expansion of manufacturing and QC equipment (Belgium site)

Today's Agenda

1. Positioning and Structure of Fujifilm's Electronic Materials business
2. Growth Potential of The Semiconductor Market
3. Superiority of Fujifilm's Electronic Materials business
4. Strategy for Further Growth
- 5. Initiatives Towards a Net Zero CO₂ Emissions**
6. Summary

5 | Initiatives Towards a Net Zero CO₂ Emissions

Under the Fujifilm Group’s environmental strategy “Green Value Climate Strategy,” the company will work to “promote production activities with a low environmental impact” and “create and spread products and services with excellent environmental performance.”

Fujifilm Group environmental strategy “Green Value Strategy” (December, 2021)

Target

- ① Reduce CO₂ emissions across entire product life cycle : **50% reduction vs FY19 by FY2030**
- ② CO₂ emissions from manufacturing (Scope1+2*) : **Achieve net zero CO₂ emissions in FY2040**

*Scope 1: Direct emission of greenhouse gases (during fuel combustion, industrial processes) by the business operator
Scope 2: Indirect emissions through the use of electricity and heat/steam supplied by other companies

Measures

- ① Manufacturing with a lower environmental impact **“Green Value Manufacturing”**
- ② Creation / promotion of products and services with excellent environmental performance **“Green Value Products”**
- ③ **Adopting business-specific targets** in line with new environmental strategy
- ④ **Introducing internal carbon pricing**

Initiatives of the Electronic Materials Business

FUJIFILM Electronic Materials (Europe) N.V. (Manufacturing site in Belgium)

Purchased electricity has been changed to 100% from renewable energy sources.

FUJIFILM Electronic Materials U.S.A., Inc. (Manufacturing site in Mesa, Arizona)

Installation of solar panels. (Construction to begin in April, 2022 and all installation to be completed in December, 2023)

Panel area 10,000m² (x1.5 soccer fields)→Expected to supply 15% of total electricity used by the plant.



Today's Agenda

1. Positioning and Structure of Fujifilm's Electronic Materials business
2. Growth Potential of The Semiconductor Market
3. Superiority of Fujifilm's Electronic Materials business
4. Strategy for Further Growth
5. Initiatives Towards a Net Zero CO₂ Emissions
- 6. Summary**

Be a semiconductor materials company offering One-stop-solutions

Strategy

①

Offer solutions with broad products and core technologies

- ▶ Broad product portfolio and Core technologies solves customer complex issues that cannot be resolved with single material or conventional insight.
- ▶ Further products line-up through new products development with Fujifilm's technologies.

Strategy

②

Enhance supply chain capability through aggressive capital investments

- ▶ Spending a total of ¥110 billion* in growth-oriented investments over 3 years from FY2021 to FY2023 to enhance production infrastructures, facilities and quality.

* The sum of CAPEX and R&D exp. Increased by ¥40B from Medium-Term Management Plan VISION2023 announced in April, 2021

plus Initiative

Initiatives Towards a Zero Net Carbon Emissions

- ▶ Promoting production activities with a low environmental impact

FUJIFILM
Value from Innovation

Appendix 1 | Six Lines of Products Used in the SC Manufacturing Process (1/2)

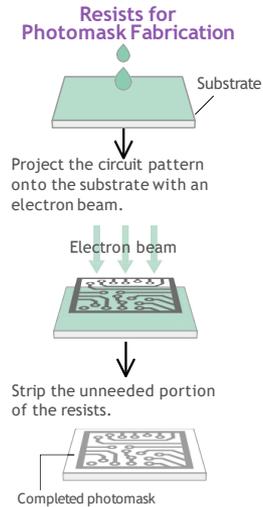
Fujifilm offers a wide range of materials used mainly in the front-end process of semiconductor manufacturing.

The front-end process in manufacturing semiconductors involves forming transistors (semiconductor elements) and wires on a thin, circular silicon substrate (wafer) with a diameter of 300 mm.

Front-end Process of Manufacturing Semiconductors (Positive-types)

1. Make Photomasks

Coat a glass photomask substrate with **resists for photomask fabrication**.



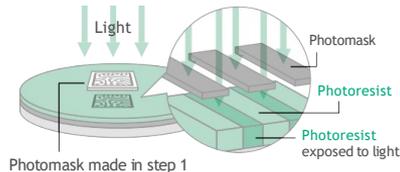
2. Apply Photoresist to the Wafer

Apply an insulating layer to the wafer, the base of the semiconductor, and then apply **photoresist**.



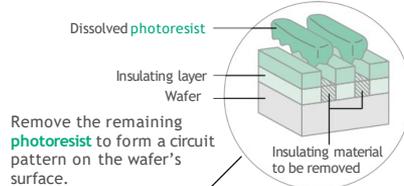
3. Expose the Photomask to Light

Place the photomask made in step 1 on top of the wafer made in step 2 and expose it to light. Circuit patterns are created on the **photoresist**.

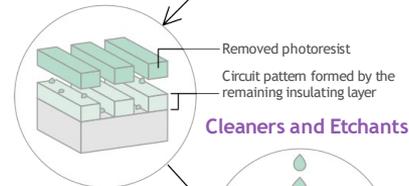


4. Conduct Etching

Dissolve the portion exposed to light in step 3 using a developer, and remove the insulating material lying underneath.

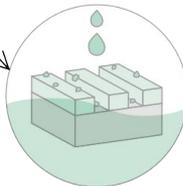


Remove the remaining **photoresist** to form a circuit pattern on the wafer's surface.



Cleaners and Etchants

Use **cleaners and etchants** to remove the **photoresist** residues.



1. Resists for Photomask

Materials for making photomasks, a “die” circuit pattern

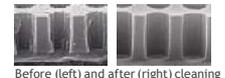
2. Photoresists

Photosensitive polymer material used in the process of making circuit patterns



4. Cleaners and Etchants

Various cleaners to remove etch residues, etc.



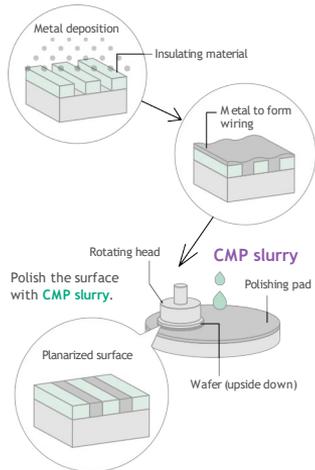
Appendix 1 | Six Lines of Products Used in the SC Manufacturing Process (2/2)

Fujifilm offers a wide range of materials used mainly in the front-end process of semiconductor manufacturing.

Front-end Process of Manufacturing Semiconductors (Positive-types)

5. Form Wiring and Planarize the Surface

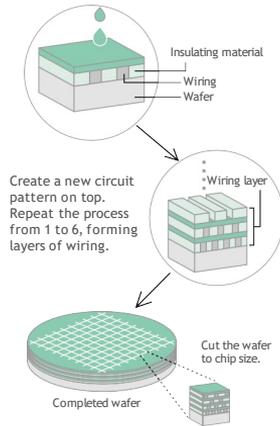
Deposit metal onto the circuit pattern to form wiring.



6. Insulate the Surface

Apply thin film forming material to prevent deterioration of semiconductor performance.

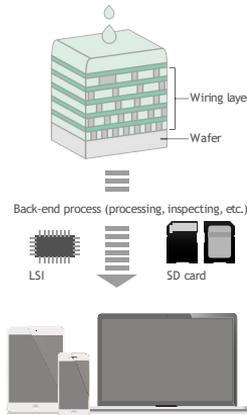
Thin Film Forming Material



7. Protect the Semiconductor Circuit

Apply polyimide products with each chip to form a protective film.

Polyimide Products



5. CMP Slurries

An abrasive to evenly planarize, on a micron scale, the surface of semiconductors where wires and insulating materials with different stiffness are mixed

6. Thin Film Forming Materials

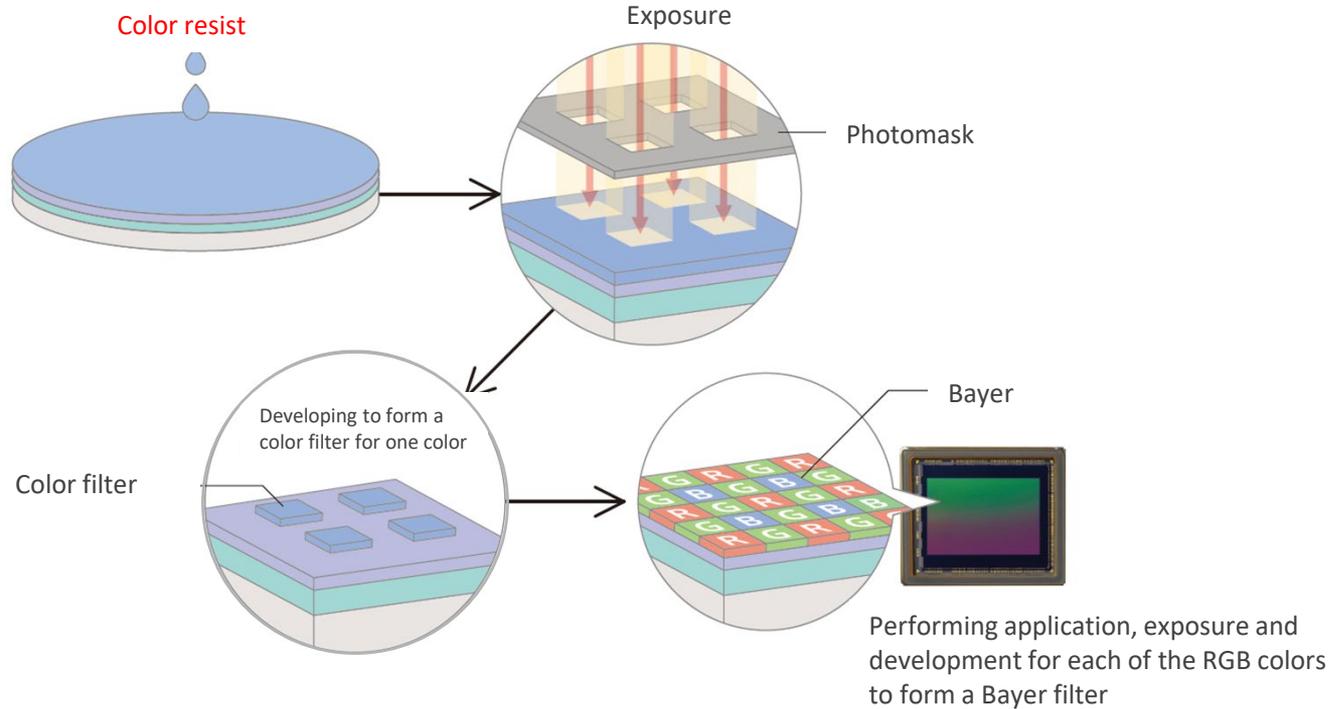
A low dielectric constant insulation material used to prevent loss of speed in semiconductor performance arising from the narrowing insulation between wires

7. Polyimide Products

A compound with high thermal durability and insulating capacity, used as a protective film in semiconductors. Its use is expanding to rewiring layer materials for IC chips of higher speeds and functionalities.

Appendix 2 | Semiconductor manufacturing processes -Image sensor-

Applying **color resist** on the wafer, which forms the base



A person is running away from the camera on a dirt path that winds through a vast, open landscape. The terrain is a mix of dry grass and dirt, leading towards a range of mountains in the distance. The sky is a clear, bright blue, and the sun is low on the horizon to the right, creating a strong lens flare and casting a long shadow of the runner onto the path. The overall mood is one of determination and forward motion.

NEVER STOP

Achieving Continual Growth