

Financial Results for 3Q(Nine months) of FYE 3/2020

Securities code: 4109

1. Consolidated Financial Results for 3Q(Nine months) of FYE 3/2020

- Financial Summary
- Breakdown of Non-Operating Profit and Loss/Extraordinary Profit and Loss
- Quarterly Operating Profit
- Sales Revenue and Operating Profit by Business
- Transitions in Trade Statistics Value of Anhydrous Hydrofluoric Acid
- Balance Sheet

<Financial Summary>

| (In millions of yen) | 3Q(Nine months) of FYE 3/2019 | 3Q(Nine months) of FYE 3/2020 | Increase/ Decrease | Percentage Increase/ Decrease |
|--|----------------------------------|----------------------------------|-----------------------|-------------------------------------|
| Sales Revenue | 28,734 | 24,731 | -4,002 | -13.9 |
| Gross Profit | 6,087 | 4,843 | -1,243 | -20.4 |
| Operating Profit | 2,887 | 1,649 | -1,237 | -42.9 |
| Ordinary Profit | 3,196 | 1,611 | -1,585 | -49.6 |
| Quarterly Profit Attributable to Owners of Parent | 1,980 | 1,094 | -885 | -44.7 |
| Earnings Per Share (yen) | 153.34 | 84.76 | -68.58 | -44.7 |
| Capital Expenditures | 2,503 | 2,652 | 148 | 5.9 |
| Depreciation & Amortization | 2,358 | 2,426 | 68 | 2.9 |
| Research & Development Expenses | 1,131 | 1,121 | -9 | -0.9 |

<Breakdown of Non-Operating Profit and Loss/Extraordinary Profit and Loss>

■ Non-Operating Profit and Loss

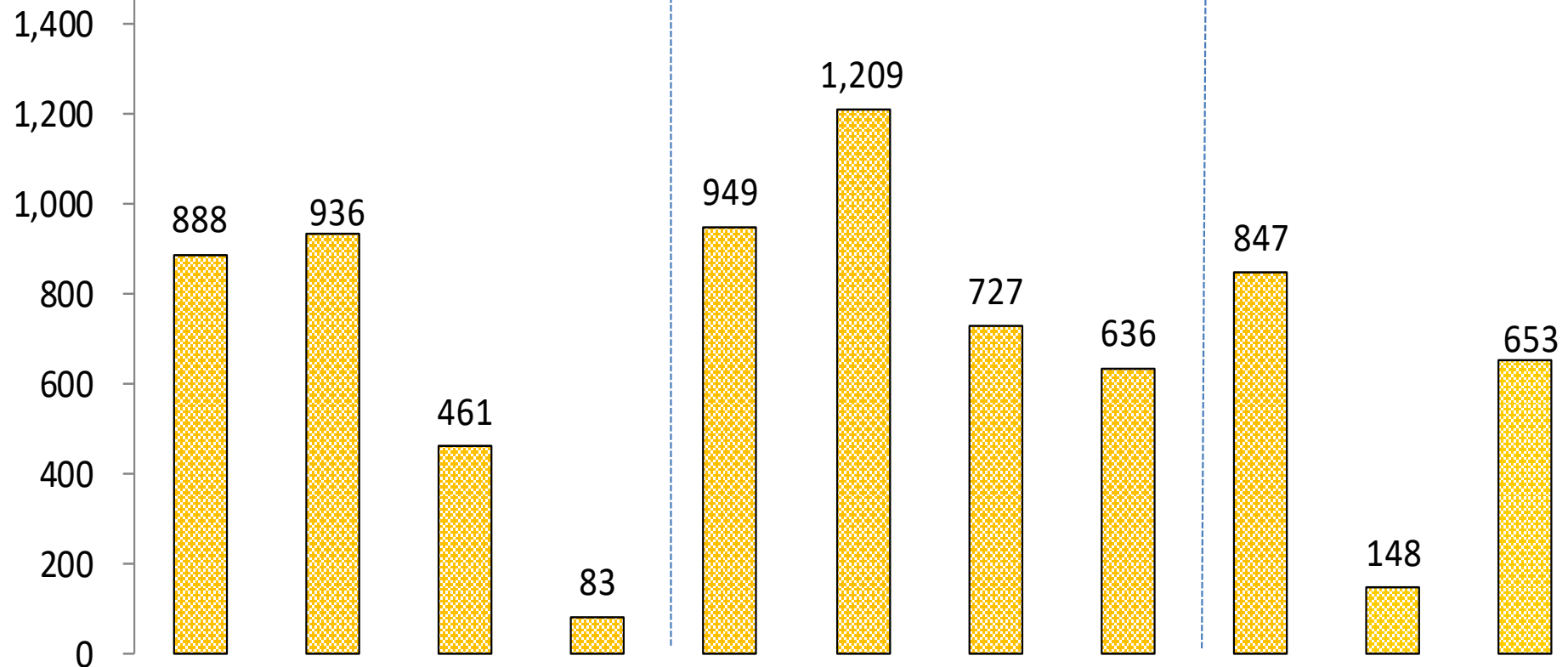
| (In millions of yen) | 3Q(Nine months) of FYE 3/2019 | 3Q(Nine months) of FYE 3/2020 |
|---|----------------------------------|----------------------------------|
| Non-Operating Profit | 594 | 112 |
| Interest income | 11 | 13 |
| Dividend income | 2 | 2 |
| Foreign exchange gains | 118 | - |
| Gain on valuation of Derivatives | 310 | 16 |
| Other | 151 | 80 |
| Non-Operating Expenses | 285 | 150 |
| Interest expenses | 26 | 24 |
| Foreign exchange losses | - | 48 |
| Share of loss of entities accounted for using the equity method | 234 | 34 |
| Other | 24 | 42 |

■ Extraordinary Profit and Loss

| (In millions of yen) | 3Q(Nine months) of FYE 3/2019 | 3Q(Nine months) of FYE 3/2020 |
|---|----------------------------------|----------------------------------|
| Extraordinary Profit | 14 | 34 |
| Gain on sales of non-current assets | 13 | 34 |
| Other | 0 | 0 |
| Extraordinary Losses | 93 | 91 |
| Loss on abandonment of non-current assets | 93 | 91 |
| Loss on sales of non-current assets | - | 0 |

<Quarterly Operating Profit>

(millions of yen)

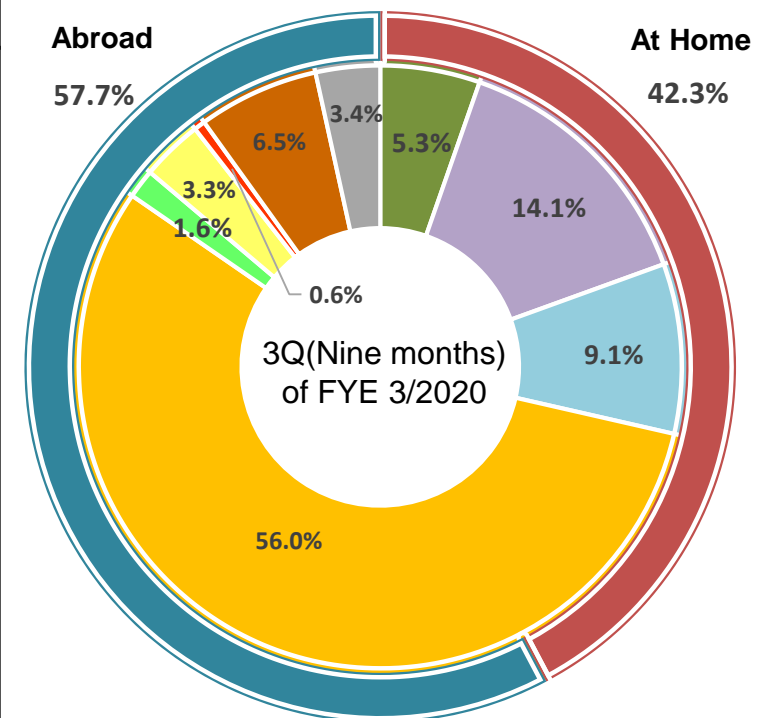


| | FYE 3/2018 | | | | FYE 3/2019 | | | | FYE 3/2020 | | | |
|-------------------------|------------|-------|-------|-------|------------|-------|-------|-------|------------|-------|-------|----|
| | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q |
| Sales Revenue | 8,159 | 8,561 | 8,314 | 8,587 | 10,134 | 9,323 | 9,275 | 9,649 | 9,733 | 7,406 | 7,591 | |
| Operating Profit | 888 | 936 | 461 | 83 | 949 | 1,209 | 727 | 636 | 847 | 148 | 653 | |
| Operating Profit Margin | 10.9% | 10.9% | 5.5% | 1.0% | 9.4% | 13.0% | 7.8% | 6.6% | 8.7% | 2.0% | 8.6% | |

<Sales Revenue and Operating Profit by Business>

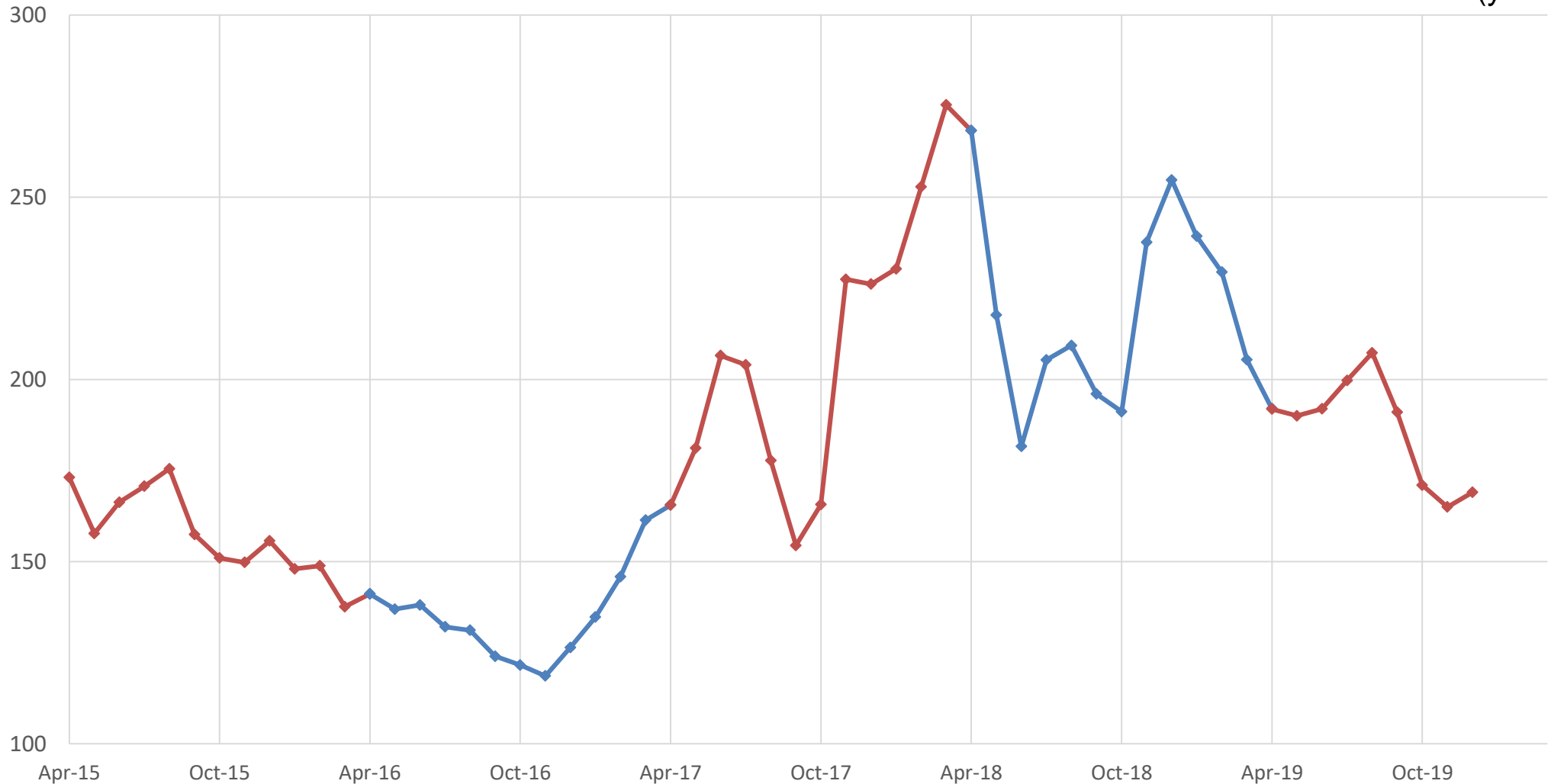
| (In millions of yen) | 3Q(Nine months) of FYE 3/2019 | | 3Q(Nine months) of FYE 3/2020 | | Percentage Increase/Decrease | |
|--|-------------------------------|------------------|-------------------------------|------------------|------------------------------|------------------|
| | Sales Revenue | Operating Profit | Sales Revenue | Operating Profit | Sales Revenue | Operating Profit |
| High-Purity Chemical Business | 25,261 | 3,008 | 21,249 | 2,008 | -15.9 | -33.3 |
| [High-Purity Chemical Business: Breakdown] | | | | | | |
| Surface Treatment | 1,672 | | 1,135 | | -32.1 | |
| Alternatives for CFCs | 2,599 | | 3,001 | | 15.4 | |
| Batteries | 2,897 | | 1,933 | | -33.3 | |
| Semiconductors /LCDs | 14,948 | | 11,908 | | -20.3 | |
| Semiconductor Devices | 531 | | 330 | | -37.8 | |
| Catalysts | 716 | | 701 | | -2.0 | |
| Gypsum | 90 | | 126 | | 39.8 | |
| General Products | 1,130 | | 1,377 | | 21.8 | |
| Other | 673 | | 732 | | 8.8 | |
| Transportation Business | 3,325 | 598 | 3,293 | 379 | -1.0 | -36.6 |
| Medical Business | — | -766 | — | -768 | — | — |
| Other | 147 | 29 | 188 | 24 | 28.4 | -16.1 |

Sales Revenue Constituent Ratio of High-Purity Chemicals



- Surface Treatment
- Alternatives for CFCs
- Batteries
- Semiconductors/LCDs
- Semiconductor Devices
- Catalysts
- Gypsum
- General Products
- Other

<Transitions in Trade Statistics Value of Anhydrous Hydrofluoric Acid> *Reference data (yen/kg)



| | FYE 3/2016 | FYE 3/2017 | FYE 3/2018 | FYE 3/2019 | 3Q(Nine months) of FYE 3/2020 |
|---------------|------------|------------|------------|------------|-------------------------------|
| Average Price | 158 | 135 | 209 | 220 | 187 |

Source: Prepared by our company based on the Ministry of Finance's "Trade Statistics of Japan" (<http://www.customs.go.jp/toukei/info/>)

<Balance Sheet>

| (In millions of yen) | FYE 3/2019 End-of-Year | Dec.31,2019 | Increase/ Decrease | Percentage Increase/ Decrease |
|-----------------------------------|---------------------------|-------------|-----------------------|-------------------------------------|
| Assets | 55,454 | 51,061 | -4,393 | -7.9 |
| Cash and deposits | 14,044 | 10,692 | -3,352 | -23.9 |
| Operating receivables | 9,678 | 8,911 | -767 | -7.9 |
| Inventory assets | 6,183 | 5,654 | -529 | -8.6 |
| Property, plant, and equipment | 22,329 | 22,502 | 173 | 0.8 |
| Intangible assets | 565 | 644 | 79 | 14.1 |
| Liabilities | 21,536 | 17,232 | -4,304 | -20.0 |
| Operating liabilities | 4,562 | 3,106 | -1,456 | -31.9 |
| Interest-bearing liabilities | 11,069 | 10,236 | -833 | -7.5 |
| Net Assets | 33,918 | 33,829 | -89 | -0.3 |
| Equity capital | 32,821 | 33,046 | 225 | 0.7 |
| Liabilities and Net Assets | 55,454 | 51,061 | -4,393 | -7.9 |

2. Financial Forecast for FYE 3/2020

- Financial Forecast
- Forecast on Sales Revenue and Operating Profit by Business

<Financial Forecast>

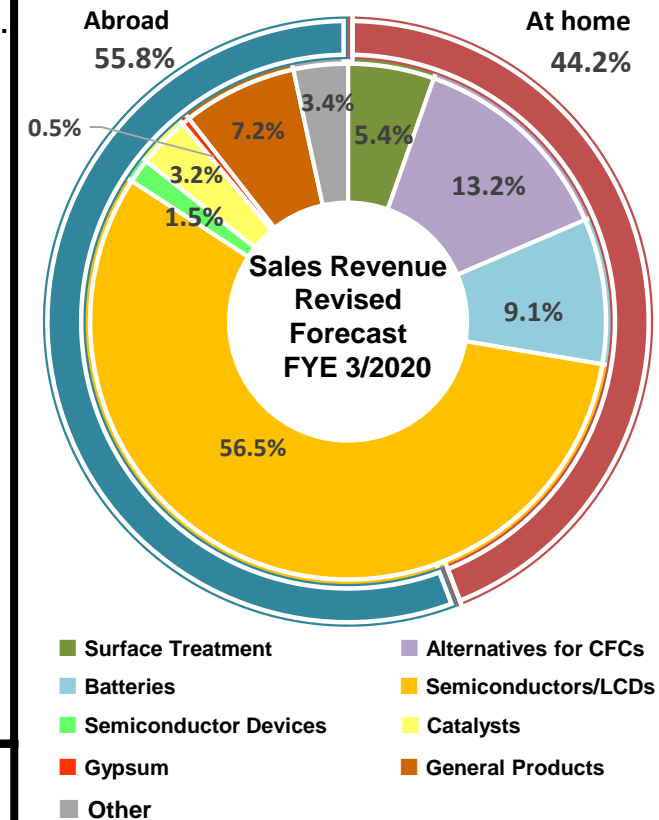
* Released on Feb.7.2020

| (In millions of yen) | FYE 3/2019 Actual | FYE 3/2020 Revised Forecast * | Percentage Increase/ Decrease | (Ref.) FYE 3/2020 Initial Forecast |
|---|----------------------|-------------------------------------|-------------------------------------|--|
| Sales Revenue | 38,384 | 32,200 | -16.1 | 37,800 |
| Gross Profit | 7,931 | 6,000 | -24.4 | 7,550 |
| Operating Profit | 3,523 | 2,100 | -40.4 | 2,450 |
| Ordinary Profit | 3,810 | 2,050 | -46.2 | 2,550 |
| Profit Attributable to Owners of Parent | 2,350 | 1,650 | -29.8 | 1,700 |
| Earnings Per Share (yen) | 182.06 | 127.77 | -29.8 | 131.65 |
| Dividend (yen) | 45 | 45 | - | 45 |
| ROE (%) | 7.3 | 5.0 | -31.9 | 5.1 |
| Capital Expenditures | 4,435 | 3,320 | -25.2 | 4,580 |
| Depreciation & Amortization | 3,253 | 3,220 | -1.0 | 3,490 |
| Research & Development Expenses | 1,566 | 1,520 | -3.0 | 1,770 |

<Forecast on Sales Revenue and Operating Profit by Business>

| | FYE 3/2019 Actual | | FYE 3/2020 Revised Forecast * | | Percentage Increase/Decrease | | (Ref.) FYE 3/2020 Initial Forecast | |
|--|-------------------|------------------|-------------------------------|------------------|------------------------------|------------------|------------------------------------|------------------|
| | Sales Revenue | Operating Profit | Sales Revenue | Operating Profit | Sales Revenue | Operating Profit | Sales Revenue | Operating Profit |
| High-Purity Chemical Business | 33,776 | 3,782 | 27,600 | 2,630 | -18.3 | -30.5 | 33,020 | 2,880 |
| [High-Purity Chemical Business: Breakdown] | | | | | | | | |
| Surface Treatment | 2,080 | | 1,490 | | -28.4 | | 1,730 | |
| Alternatives for CFCs | 3,618 | | 3,630 | | 0.3 | | 3,500 | |
| Batteries | 3,629 | | 2,510 | | -30.8 | | 2,700 | |
| Semiconductors/LCDs | 20,093 | | 15,600 | | -22.4 | | 20,410 | |
| Semiconductor Devices | 633 | | 420 | | -33.7 | | 530 | |
| Catalysts | 904 | | 890 | | -1.6 | | 840 | |
| Gypsum | 176 | | 140 | | -20.7 | | 150 | |
| General Products | 1,762 | | 1,980 | | 12.3 | | 2,360 | |
| Other | 876 | | 940 | | 7.2 | | 800 | |
| Transportation Business | 4,382 | 726 | 4,350 | 490 | -0.7 | -32.6 | 4,570 | 760 |
| Medical Business | — | -1,051 | — | -1,050 | — | — | — | -1,220 |
| Other | 225 | 42 | 250 | 30 | 10.7 | -28.8 | 210 | 30 |

Sales Revenue Constituent Ratio of High-Purity Chemicals



3. STELLA CHEMIFA CORPORATION

- Corporate Profile/Sales Office Locations/Plant Locations
(as of December 31, 2019)
- List of Affiliated Companies
- High-Purity Chemical Business

<Corporate Profile/Sales Office Locations/Plant Locations(as of December 31, 2019)>

◆ Corporate Profile

| | |
|-----------------|--|
| Corporate Name | STELLA CHEMIFA CORPORATION |
| Head Office | Meiji Yasuda Seimei Osaka Midosuji Bldg. 10F, 4-1-1 Fushimi-machi, Chuo-ku, Osaka City, Osaka |
| Founded | February 1916 |
| Established | February 1944 |
| Capital Fund | 4,829,782,512 yen |
| Representatives | Chairperson, Representative Director: Junko Fukada Representative Director, President and Chief Executive Officer: Aki Hashimoto Representative Director, Senior Managing Executive Officer (Products Management Group): Kiyonori Saka |
| URL | https://www.stella-chemifa.co.jp/ |



◆ Sales Offices

| | |
|------------------------|--|
| Osaka Sales Department | Meiji Yasuda Seimei Osaka Midosuji Bldg. 10F, 4-1-1 Fushimi-machi, Chuo-ku, Osaka City, Osaka |
| Tokyo Sales Department | Marunouchi Trust Tower North 12F, 1-8-1 Marunouchi, Chiyoda-ku, Tokyo |

◆ Factory Addresses

| | |
|--------------------|---|
| Sanpo Factory | 7-227 Kaisan-cho, Sakai-ku, Sakai City, Osaka |
| Izumi Factory | 1-41 Rinkai-cho, Izumiotsu City, Osaka |
| Kitakyushu Factory | 1-1 Kurosakishiroishi, Yahatanishi-ku, Kitakyushu City, Fukuoka |

<List of Affiliated Companies>

| Base | Logo | Corporate Name | Business Segment | Head office |
|---------|---|--|-------------------------------|--------------|
| At home |  | STELLA CHEMIFA CORPORATION | High-Purity Chemical Business | Osaka, Japan |
| |  | BLUE EXPRESS, Inc. | Transportation Business | Osaka, Japan |
| |  | BLUE AUTO TRUST Co., Ltd. | Other Business | Osaka, Japan |
| |  | STELLA PHARMA CORPORATION | Medical Business | Osaka, Japan |
| Abroad |  | STELLA CHEMIFA SINGAPORE PTE LTD | High-Purity Chemical Business | Singapore |
| |  | STELLA EXPRESS PTE LTD | Transportation Business | Singapore |
| |  | Blue Express (Shanghai) International Trade Inc. | High-Purity Chemical Business | China |
| |  | Blue Express (Shanghai) International Freight Forwarding Co., Ltd. | Transportation Business | China |
| |  | Zhejiang Blue Star Chemical Co., Ltd. | High-Purity Chemical Business | China |
| |  | FECT CO.,LTD | High-Purity Chemical Business | South Korea |
| |  | Quzhou BDX New Chemical Materials Co., Ltd. | High-Purity Chemical Business | China |

<High-Purity Chemical Business>

Our products, fluorine compounds, are still used in the manufacture of various products.

| Segment Name | Main Product | Applications |
|-------------------------|--|--|
| Surface treatment | Hydrofluoric acid for industrial use | Used for acid cleaning of stainless steel and for thinning glass substrates for LCDs |
| Alternatives for CFCs | Anhydrous hydrofluoric acid | Material for chlorofluorocarbon and fluorine resin |
| Batteries | Additive for batteries Lithium hexafluorophosphate | Additive for electrolytes to improve the performance of lithium-ion secondary batteries Electrolyte for lithium-ion secondary batteries |
| Semiconductors and LCDs | High-purity hydrofluoric acid | Cleaning solution for silicon wafers and LCDs Solar batteries |
| | High-purity buffered hydrofluoric acid | |
| Semiconductor devices | High-purity fluoride (CaF ₂ , PbF ₂ , MgF ₂ , AlF ₃ and others) | Lens material for i-line steppers and cameras |
| | Potassium fluoride | Auxiliary agent for manufacturing tantalum for tantalum capacitors |
| General Products | Tin fluoride | Quasi-drug |

Semiconductors and LCDs

- Features of Our Products and New Products
- Results and Forecast of World Semiconductor Market Scale by Product
- Development of a New Memory Market
- Maintenance and Strengthening of Quality Edge
- Change of Shipping Volume of High-Purity Hydrofluoric Acid (Semiconductors and LCDs)

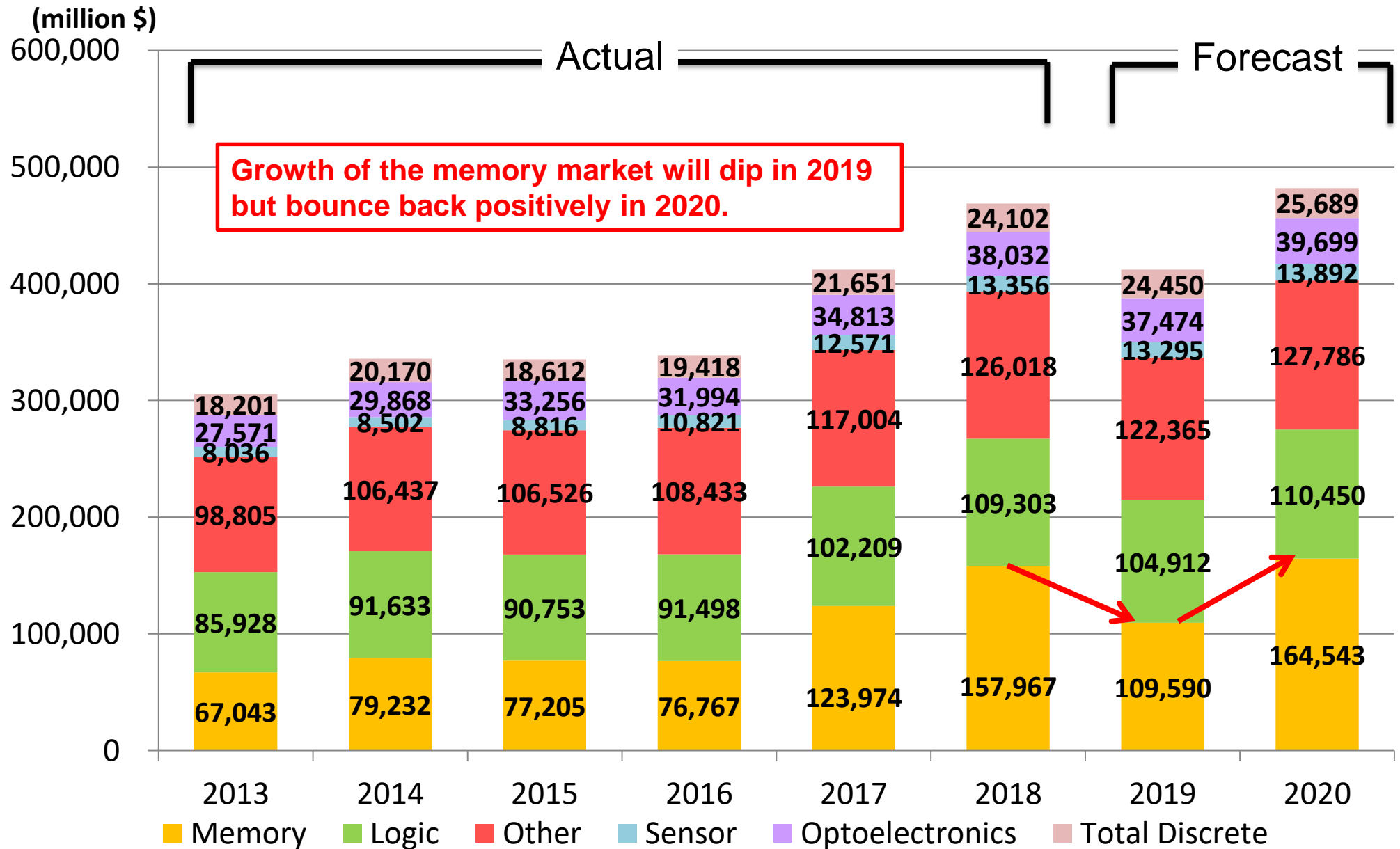
<Features of Our Products and New Products>

- (1) With our ultra-purification technology and ultra sensitive technology, we are able to supply the ultra-high-purity hydrofluoric acid and the ultra-high-purity buffered hydrofluoric acid with the best quality in the world.
- (2) Products Lineups are readied to respond the customer requirements, including like suppression of adhering particles, and suppression of increased roughness of wafer surfaces, and others.

| Product name (Semiconductors and LCDs) | Description |
|--|--|
| Ultra-high-purity hydrofluoric acid | An ultra-high-purity chemical used for wet cleaning of silicon wafers in manufacturing semiconductors, FPDs, solar batteries, and MEMS |
| Ultra-high-purity buffered hydrofluoric acid | A chemical mixed with 50% hydrofluoric acid and 40% ammonium fluoride solutions |
| LL BHF | BHF with various functionalities made possible by adding a surfactant |
| LAL BHF | BHF that contains a surfactant has enabled it to achieve extended service life and given other advantages by optimizing the concentration of ammonium fluoride at 15% to 25%, about half the concentration of ammonium fluoride contained in conventional BHF. |
| Ex-LAL BHF | An environmentally friendly BHF with a maximum ammonium fluoride concentration of 5% and added surface-active properties that give it a longer life than any other type of BHF |
| HSN Series | A functional BHF for etching silicon nitride with selectivity to silicon oxide, which is expected to be mainly used in the next-generation DRAM manufacturing process |
| LPL BHF | A silicon oxide etchant with minimum damage to silicon or polysilicon film |

Joint development of etchant for next-generation non-silicon semiconductor wafers is currently underway.

<Results and Forecast of World Semiconductor Market Scale by Product>



Source: World Semiconductor Trade Statistics Inc. (WSTS)

<Development of a New Memory Market>

| Manufacturer | Base Name | Produced Item | Wafer Size | Production Capacity | Plan |
|-------------------------------------|-----------|---------------|------------|---------------------|--|
| Samsung Electronics | X2 | 3D-NAND | 12 inches | 70K wafers/month | Planning to increase production from the current 5K wafers/month to 30K wafers/month by the end of 2019. Looking to increase production to 60K wafers/month by the end of 2020. |
| | P2 | DRAM | 12 inches | 40K wafers/month | Planning to install equipment in February 2020 and produce 40K wafers/month by the end of 2020. |
| SK Hynix | M15 | 3D-NAND | 12 inches | 25K wafers/month | Planning to produce 50K wafers/month by the end of 2020. |
| | M16 | DRAM/NAND | 12 inches | | Slated to be completed in the second half of 2020. |
| | C2F | DRAM | 12 inches | 130K wafers/month | Currently 40K wafers/month. |
| Kioxia | Y6 | 3D-NAND | 12 inches | | Phase 2 trial production started. |
| | K1 | 3D-NAND | 12 inches | | Planning to start phase 1 trial production by the end of 2020 (7.5K wafers/month). |
| | Y7 | 3D-NAND | 12 inches | | Construction to start in December 2020 and be completed in 2022. |
| Micron Technology | Fab2 | DRAM | 12 inches | | Slated to go partially online at the end of 2019. |
| | Fab10 | 3D-NAND | 12 inches | | Opening ceremony held in August 2019. |
| | Fab15 | DRAM | 12 inches | | Investments still being made. |
| | Fab16 | DRAM | 12 inches | | Construction of new building started. |
| ChangXin Memory Technologies (CXMT) | Phase1 | DRAM | 12 inches | 10K wafers/month | Trial production started. |
| Yangtze Memory Technology (YMTC) | Phase1 | 3D-NAND | 12 inches | 20K wafers/month | Trial production started. |

Source: STELLA CHEMIFA

The Chinese market, where large-scale investments have been made in new memory factories, is losing steam in FYE 3/2020 due to the U.S.-China trade friction but it is expected to grow in FYE 3/2021 despite some uncertainties.

Semiconductor-related investments remain strong in Japan, Taiwan, and Korea, and widespread use of 5G, IoT and AI is expected to keep demand for memory products up.

We will implement aggressive sales strategies in the memory market.

<Maintenance and Strengthening of Quality Edge>

◆ SA Grade HF quality ◆

| | | | |
|--------------------------------------|-----------|----------|---|
| Product technology generation | ≥45 nm | 28 nm | ≤16 nm |
| Our product grade | SA/SA-X | SA-XX | SA-XXX |
| Metal impurities level | <100 ppt | < 10 ppt | < 1 ppt <small>Succeeded in ultra-high-purity</small> |
| Management size of particle | 0.2/0.1um | 0.05um | 0.03um |

Further strengthening particle management

With Introducing the world's most advanced analytical instruments.



Liquid-borne particle counter

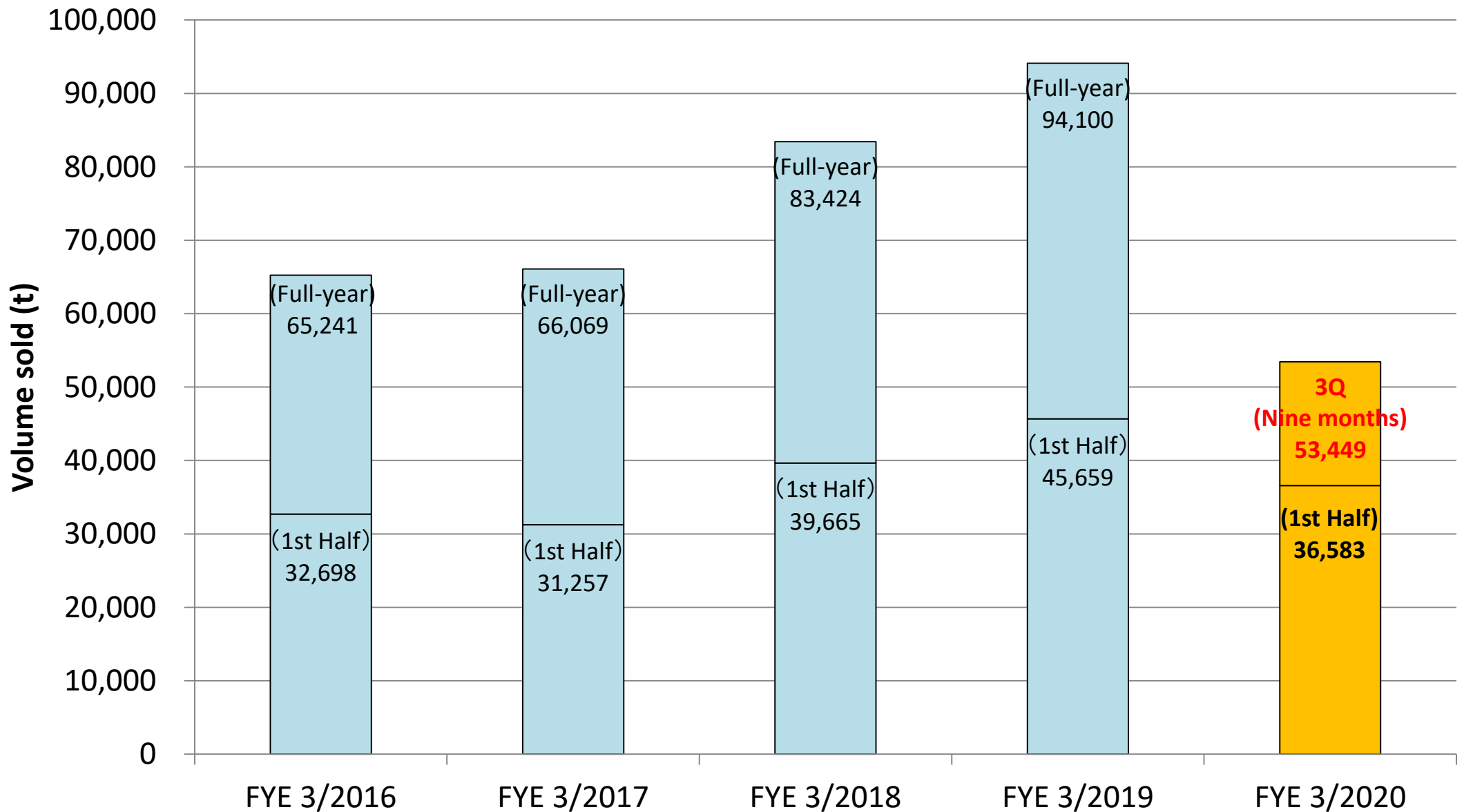
©RION CO., LTD.



High resolution ICP-MS

©Thermo Fisher Scientific K. K.

<Change of Shipping Volume of High-Purity Hydrofluoric Acid (Semiconductors and LCDs)>



Batteries

- Features of Our Products/Business Development in China
- Widespread Use of EVs and the Future of Mobility
- EV Applications Drive LiB Market Growth
- Construction Rush for Giant Battery Plants
- Sales Results and Forecast of Additives for LiB

<Features of Our Products>

- (1) Used as main material comprising the lithium-ion secondary batteries and commercialized ahead of other companies.
- (2) Because of the product's high purity, it is being used for high-performance lithium-ion secondary batteries.

| Product Name (Related to Batteries) | Description |
|-------------------------------------|--|
| Additive for batteries | Additive for electrolytic solution to improve the performance of lithium-ion secondary batteries |
| Lithium hexafluorophosphate | Electrolyte for lithium-ion secondary batteries |

<Business Development in China>



- Quzhou BDX New Chemical Materials Co., Ltd. (established in December 2015)
- Capital fund: 95 million Chinese yuan (STELLA CHEMIFA's stake: 25%) *As of September 30, 2019
- Some of the facilities used to manufacture electrolytes for lithium-ion secondary batteries were relocated to this joint venture company. (Maximum production capacity: 1,300 t/year)
The joint venture company uses the relocated facilities to produce electrolytes for lithium-ion secondary batteries and sells them in and outside China.

<Widespread Use of EVs and the Future of Mobility>

Environmental (emissions) regulations of different countries and industrial development

⇒ Diffusion policies with subsidies



Contributing to the development of the EV market

Development of a new mobility society

- Enhanced convenience in urban means of transport
- CASE; advancement and electrification of vehicle controls
- Maas; spurring new mobility businesses

CASE (Connected, Autonomous, Shared, Electric)
Maas (Mobility as a Service)

Development of social systems designed for EVs will drive EV sales up



<EV Applications Drive LiB Market Growth>

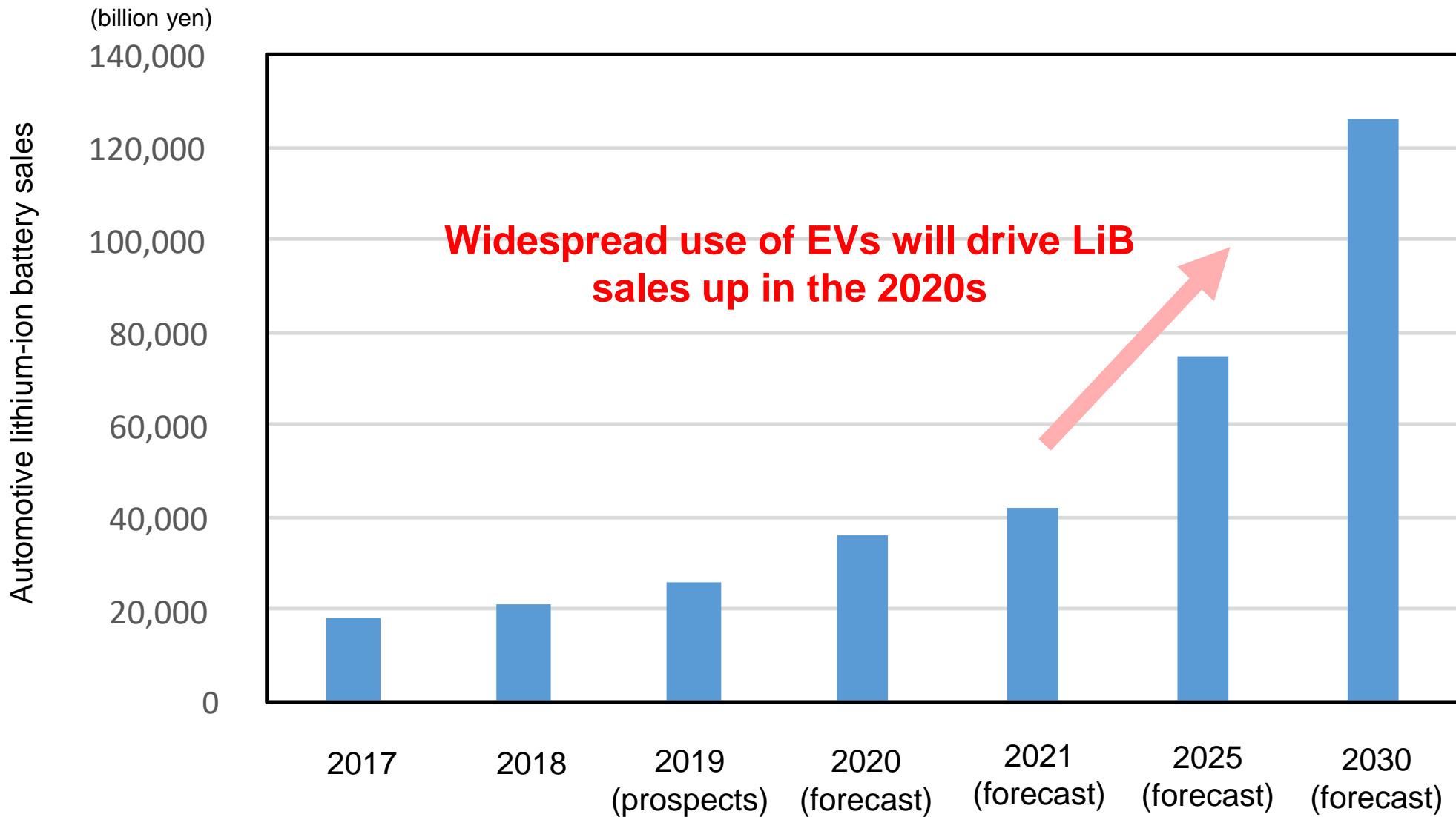


Fig. Change in sales in automotive lithium-ion secondary battery (results and forecasts)
(Source: Materials released by Fuji Keizai)

<Construction Rush for Giant Battery Plants> * Source: STELLA CHEMIFA

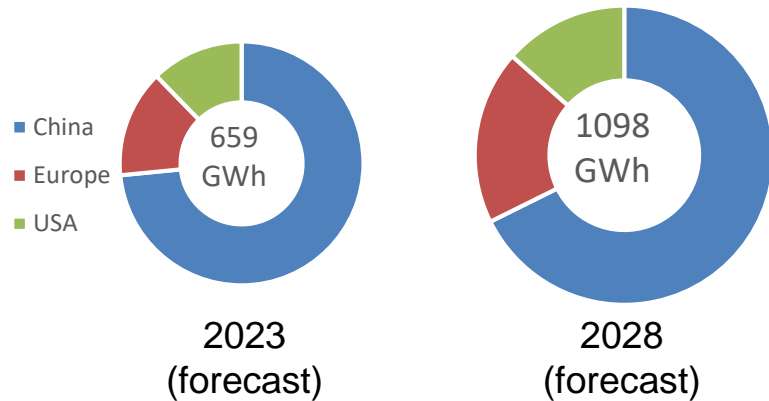
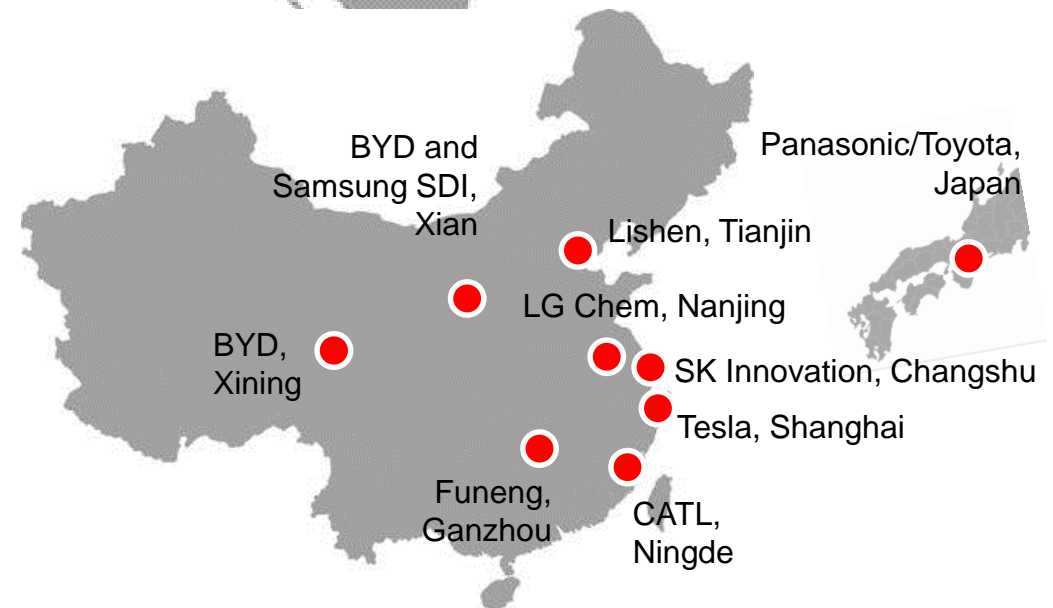
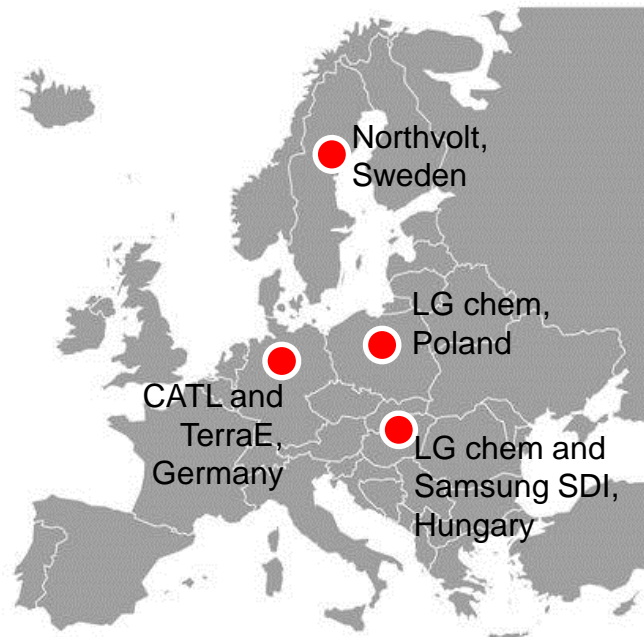
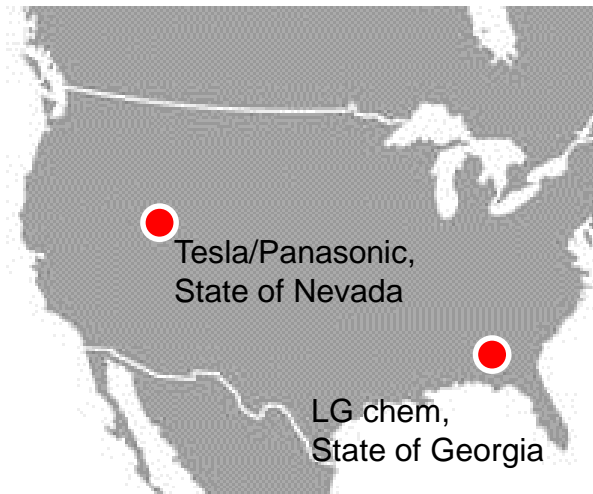
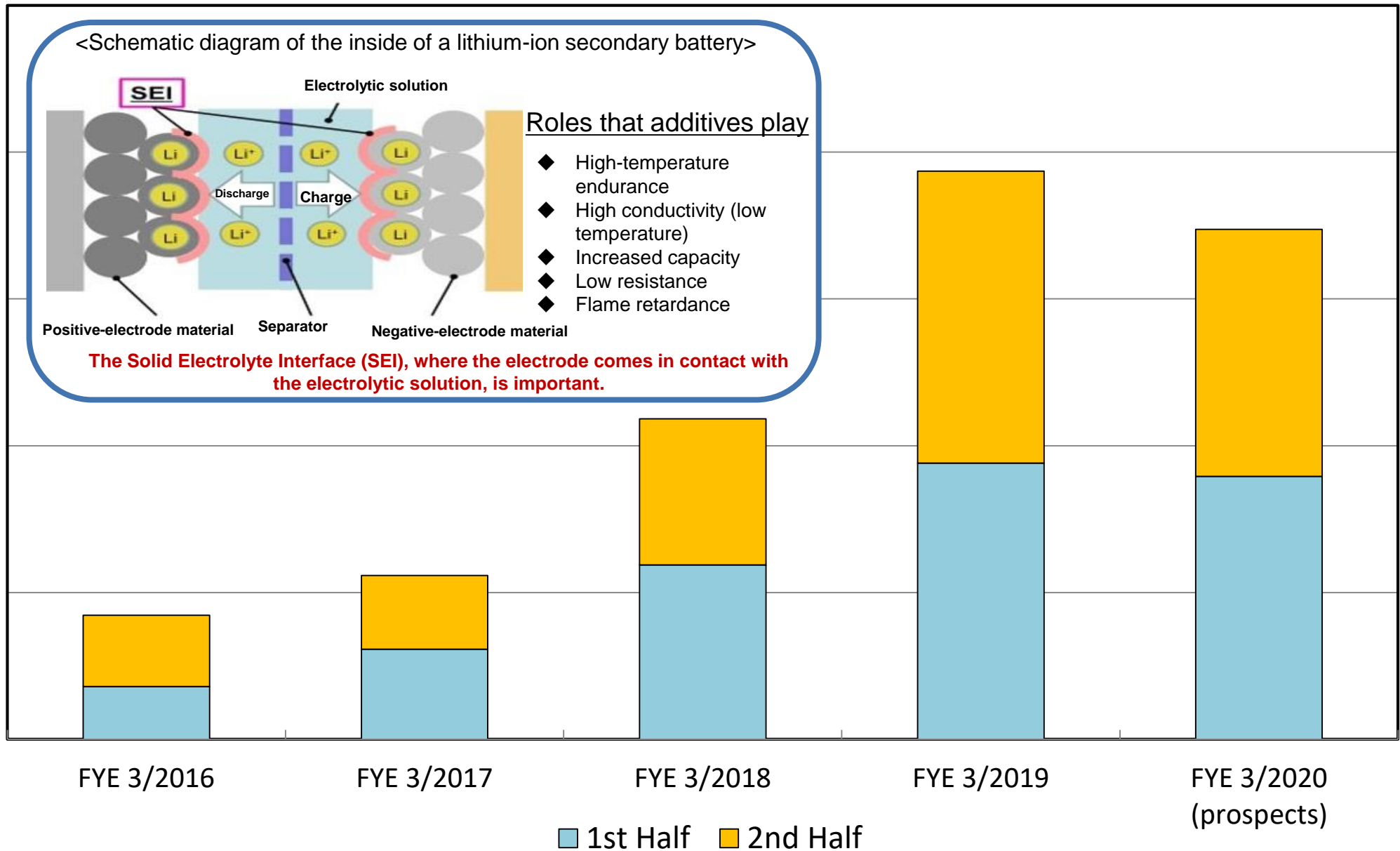


Fig. Change in production capacity for Li-ion secondary batteries by region (output-basis)



The medium-term demand for batteries for EVs will be supplied by Giga plants, which are being constructed around the world

<Sales Results and Forecast of Additives for LiB>



GMP-related

- GMP (Good Manufacturing Practice)
- Oral Care-related ~ Tin Fluoride (SnF_2) ~

< GMP (Good Manufacturing Practice) >

The **GMP inspection** by **USFDA** for tin fluoride, an active ingredient of OTC anticaries drugs, **was completed** in November 2017.



Obtained official approval by a public organization in the US



Started selling GMP-certified products in 2018



Inside Izumi Factory (Izumiotu City, Osaka)

Standards for Manufacturing Control and Quality Control for Drugs and Quasi-drugs

Three principles:

“Reducing human errors to the lowest level”

“Preventing contamination and product quality loss”

“Designing systems to assure high product quality”

<Oral Care-related ~ Tin Fluoride (SnF₂) ~>

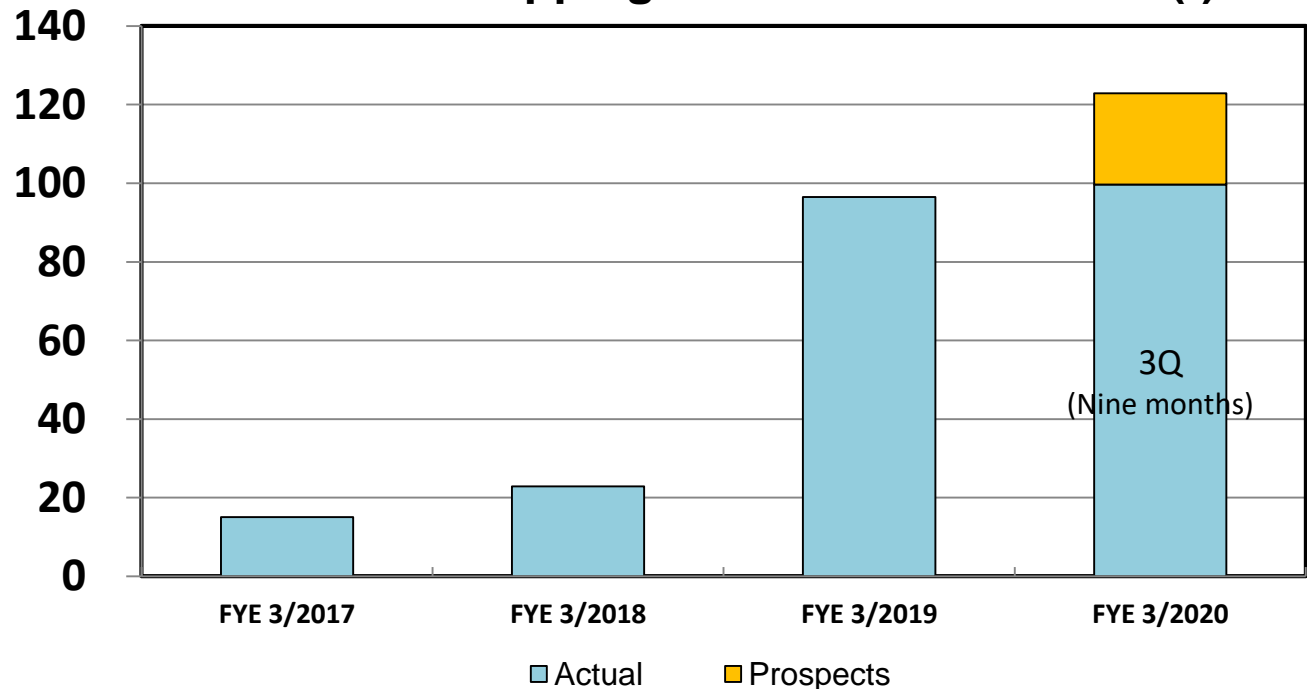
<Actions of fluorine on teeth>

- To suppress Streptococcus mutans from producing acid (Cavity prevention)
- To promote tooth remineralization
- To form acid-resistant teeth (to form fluorapatite)

We expect to see big demand mainly in Europe and the US, where there is strong interest in dental health and beauty.



Trend in shipping volume of tin fluoride (t)



4. Medical Business

- Corporate Profile (as of December 31, 2019)
- Development of New Radiotherapy Technology -BNCT-
- Establishment of Enrichment Technology/Features of Enriched Boron/Applications of Enriched Boron Compounds
- Filing of Marketing Application of Head and Neck Cancer Drug
- Updates on the Development of SPM-011
- Clinical Trials for Melanoma and Angiosarcoma
- Participation in Development of Imaging Diagnostic Technology - PET Diagnosis -

<Corporate Profile (as of December 31, 2019)>

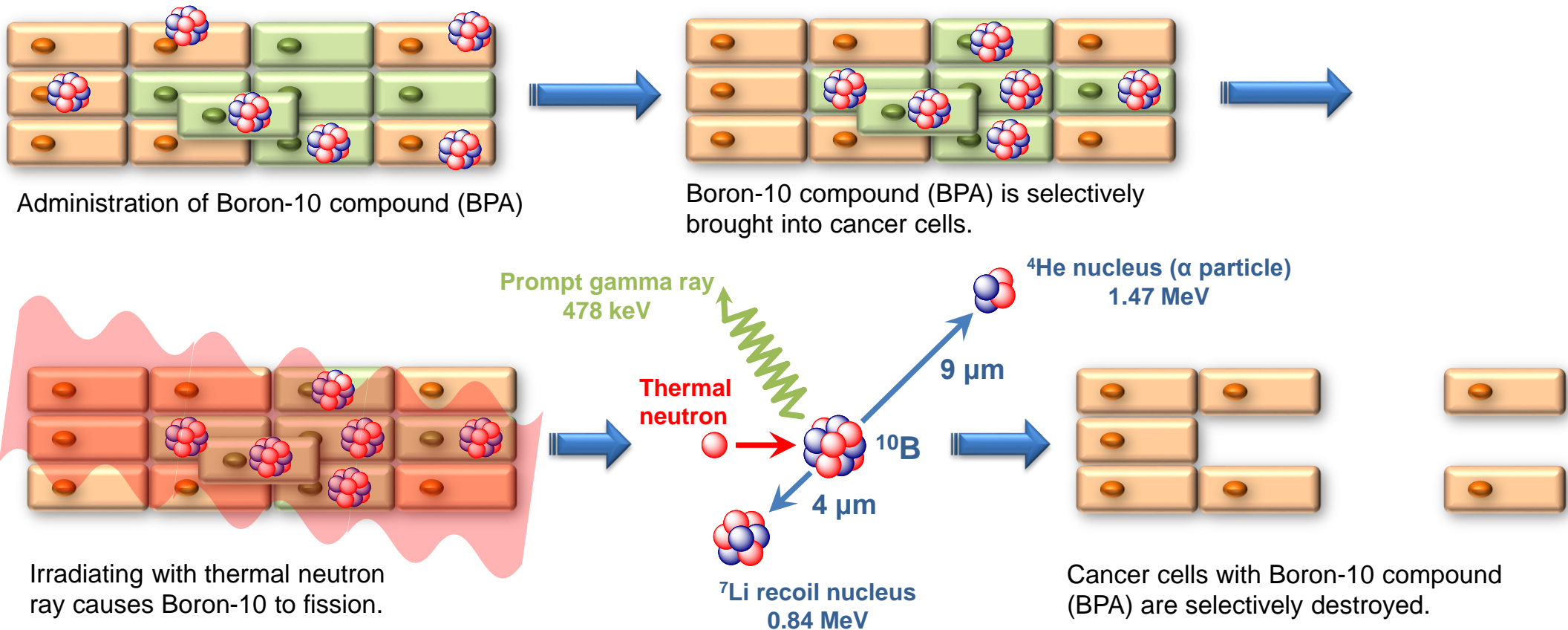
| | |
|--------------------------|--|
| Corporate name | STELLA PHARMA CORPORATION |
| Head Office | 3-2-7 Koraibashi, Chuo-ku, Osaka City, Osaka |
| Representative | President: Tomoyuki Asano |
| Established | June 2007 |
| Capital Fund | 1,900,000,000 yen |
| Business Lineup | Research and Development, Manufacture, and Marketing etc. of Drugs and Medical Devices |
| Shareholders | STELLA CHEMIFA CORPORATION INCJ, Ltd. Sumitomo Heavy Industries, Ltd. |
| Research Facility | Sakai Drug Discovery Research Center (Naka-ku, Sakai City, Osaka) |



STELLA PHARMA

<Development of New Radiotherapy Technology -BNCT->

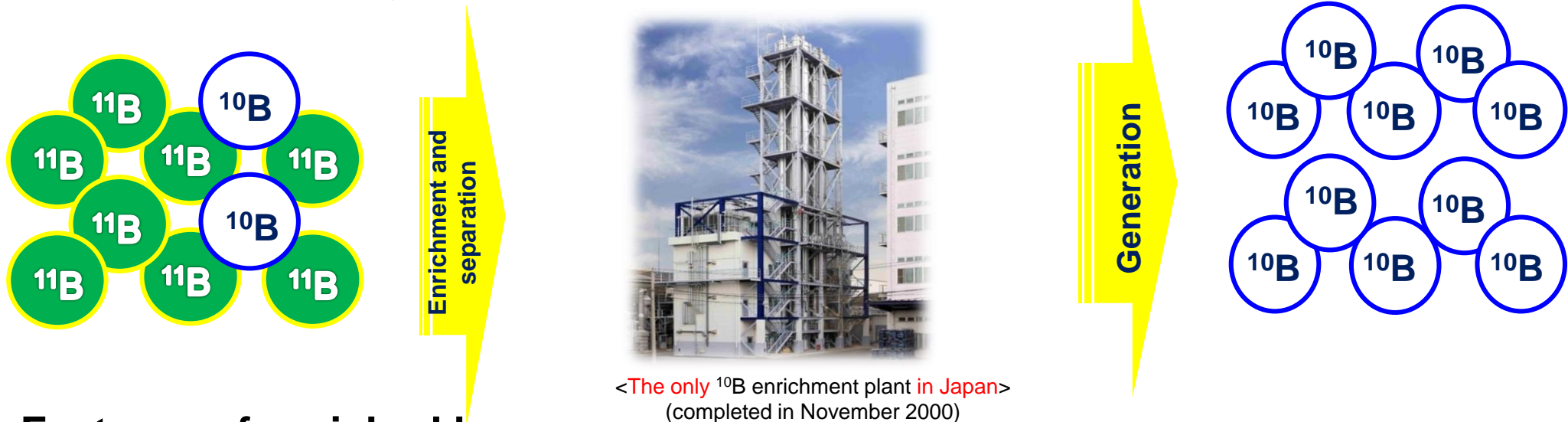
Boron Neutron Capture Therapy (BNCT) is a particle beam radiation therapy, which specifically damages cancer cells by making the best of **nuclear fission reactions** between **boron-10** and **thermal neutrons** with low energy.



<Establishment of Enrichment Technology/Features of Enriched Boron/ Applications of Enriched Boron Compounds>

■ Establishment of enrichment technology

STELLA CHEMIFA established mass production technology of ^{10}B for the first time in Japan. In November 2000, the only enrichment plant in Japan was established.



■ Features of enriched boron

^{10}B offers properties of remarkably high neutron absorption capacity, and by increasing ^{10}B concentration, the absorption capacity is improved significantly.

■ Applications of Enriched Boron Compounds

- Neutron-absorbing material of spent nuclear fuel transportation and storage containers
- Material of control rods of nuclear reactors and rack material of spent nuclear fuel pools
- Excess reaction control of pressurized-water reactors by dissolving into primary cooling water.
- **Cancer drug for boron neutron capture therapy (BNCT)**

<Filing of Marketing Application of Head and Neck Cancer Drug>

In October 2019, Stella Pharma filed a marketing application for boron-based drug (Development Code: SPM-011) for BNCT based on the results of a phase II study for head and neck cancer*¹ conducted in Japan.

Since the boron-based drug for treatment of head and neck cancer has been designated as a product subject to the Prioritized Review System for innovative medicines (SAKIGAKE Designation System), it will be given priority in the approval application and reviewed more quickly than usual.

*¹ Head and neck cancer: We conducted a phase II study in Japan for the treatment of unresectable locally recurrent head and neck cancer and unresectable advanced non-squamous cell carcinoma of the head and neck.

Characteristics of head and neck cancer

A group of cancers that develops in the facial area below the brain and above the collarbone, such as the nose, mouth, throat, upper or lower jaw, or ear, which is typically the area where the organs that allow us to lead our normal daily lives are located.

Development of treatment methods that enable the conservation of important organ functions and maintain QOL*² is needed.

*² QOL: QOL, an acronym for quality of life, means the overall quality of the physical, mental, social, and economic aspects of a patient's life.

<Updates on Development of SPM-011>

In order to expand the possibility of BNCT that uses SPM-011, Stella Pharma has established organizations that are conducting R&D on the target diseases and the treatment system used for BNCT.

Brain tumor (recurrent malignant glioma)

A phase II study is underway.
(We are currently conducting an ongoing follow-up study only)

Head and neck cancer

(recurrent head and neck cancer)

A marketing application for pharmaceutical product is now under review.

Melanoma/angiosarcoma

A phase I study plan has been accepted

Recurrent high-grade meningioma

A physician-led phase II study is underway.
(An investigational new drug has been provided)

<<Flow chart of planned steps from clinical trial to approval application>>

Phase I study

Phase II study

Approval application

Neutron dose is increased stepwise to check safety.

Verification of the effect at the determined dose.

<Clinical Trials for Melanoma and Angiosarcoma>

Working jointly with Cancer Intelligence Care Systems, Inc. (CICS), Stella Pharma will begin its phase I study for melanoma and angiosarcoma. (The clinical trial plan has been accepted).

The study will use the CICS-1, a new medical device designed for BNCT, which was installed at the National Cancer Center Hospital during a joint development project conducted by CICS and the hospital.

Characteristics of melanoma

Melanoma is a type of skin cancer. While it most commonly occurs on the sole of the foot, it can also develop in other areas of the body.

Characteristics of angiosarcoma

Angiosarcoma is a malignant tumor formed in the inner lining of blood vessels or lymph vessels. It commonly occurs in the skin, especially on the head in elderly people. It's an extremely rare type of cancer and is highly malignant.

Clinical trial team

Clinical trial requester

Stella Pharma
Investigational
new drug

CICS
Medical
device

Request
clinical trial

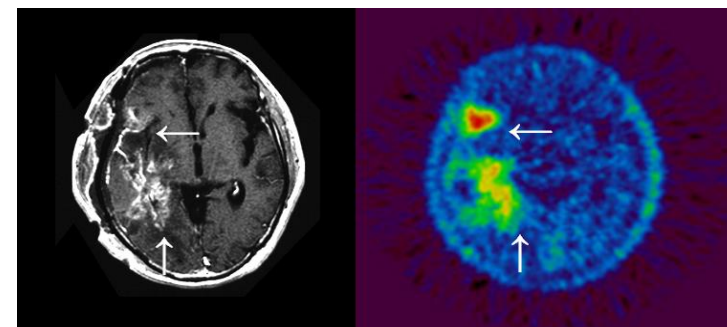
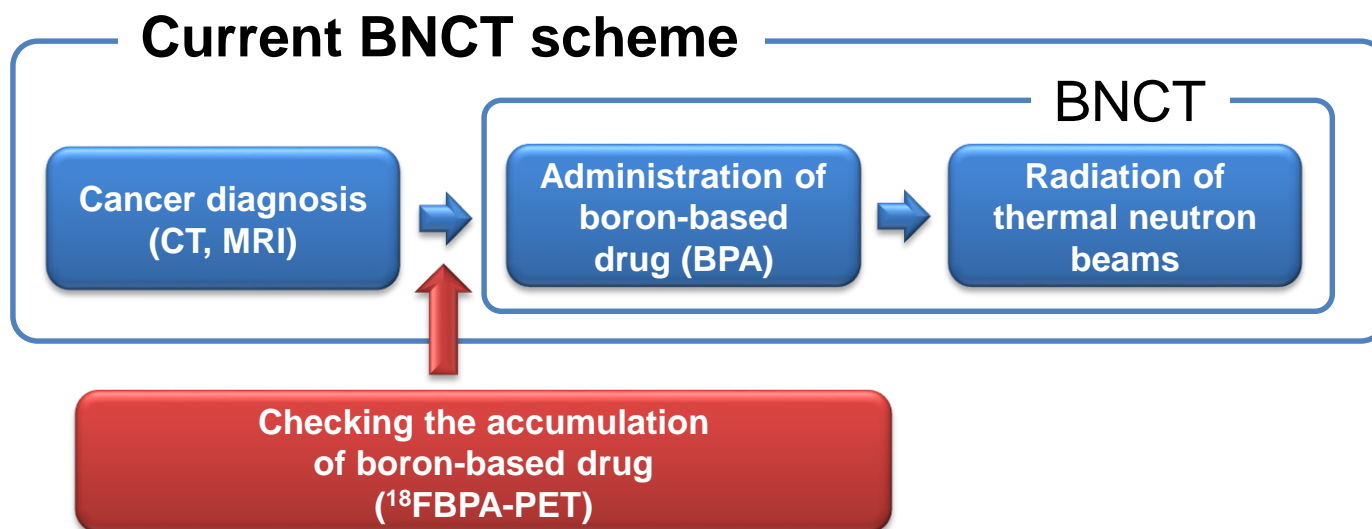
National Cancer Center
Hospital
Radiation/observation

<Participation in Development of Imaging Diagnostic Technology - PET Diagnosis ->

The “PET diagnosis” that attracts attention as a technology useful for the early detection of cancers. We have undertaken the development of ^{18}F BPA, which has been studied as a new drug to be used for the technology.

Features of ^{18}F BPA-PET

- ☆ It is expected that ^{18}F BPA-PET will contribute to the development of BNCT because the accumulation of the boron-based drug against cancer can be checked beforehand (before treatment).



(Left) MRI image of brain tumors
(Right) ^{18}F BPA-PET image of brain tumors

Photo: Courtesy of Professor Ono at Kyoto University Research Reactor Institute

5. Transportation Business

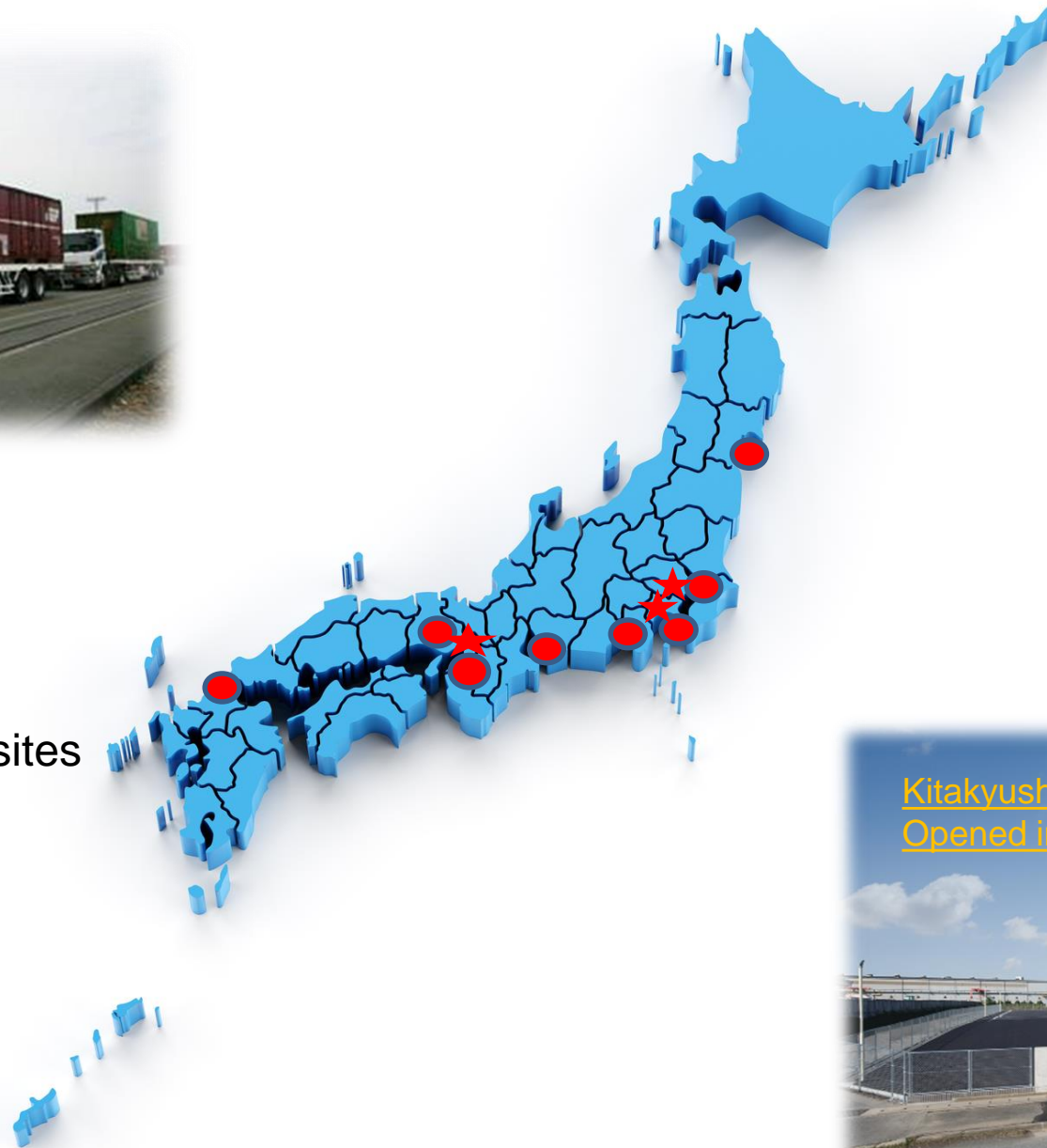
- Corporate Profile (as of December 31, 2019)
- Transportation System by Cooperation with Domestic Bases
- Overseas Bases
- Activity Policy 1
- Activity Policy 2
- Activity Policy 3

<Corporate Profile (as of December 31, 2019)>

| | |
|------------------------|--|
| Corporate Name | BLUE EXPRESS CORPORATION |
| Head Office | 10 Ohamanishi-machi, Sakai-ku, Sakai City, Osaka |
| Representative | Representative Director and President: Kiyonori Saka |
| Established | June 1991 |
| Capital Fund | 350,000,000 yen |
| Business Lineup | Common motor trucking/International intermodal transport Warehousing/Customs clearing agent/Sales, rental and lease of containers, tanks, etc. Automobile maintenance services/Business related to life insurance and non-life insurance agent, etc. |
| URL | http://www.blue-express.co.jp/ |



<Transportation System by Cooperation with Domestic Bases>



● Shipping terminals

- Sendai Office
- Kanto Office
- Yokohama Office
- Shimizu Office
- Nagoya Office
- Ohama Office
- Kobe Office
- Kitakyushu Office

★ Customs clearance sites

- Yokohama Office
- Osaka Office
- Ohama Office



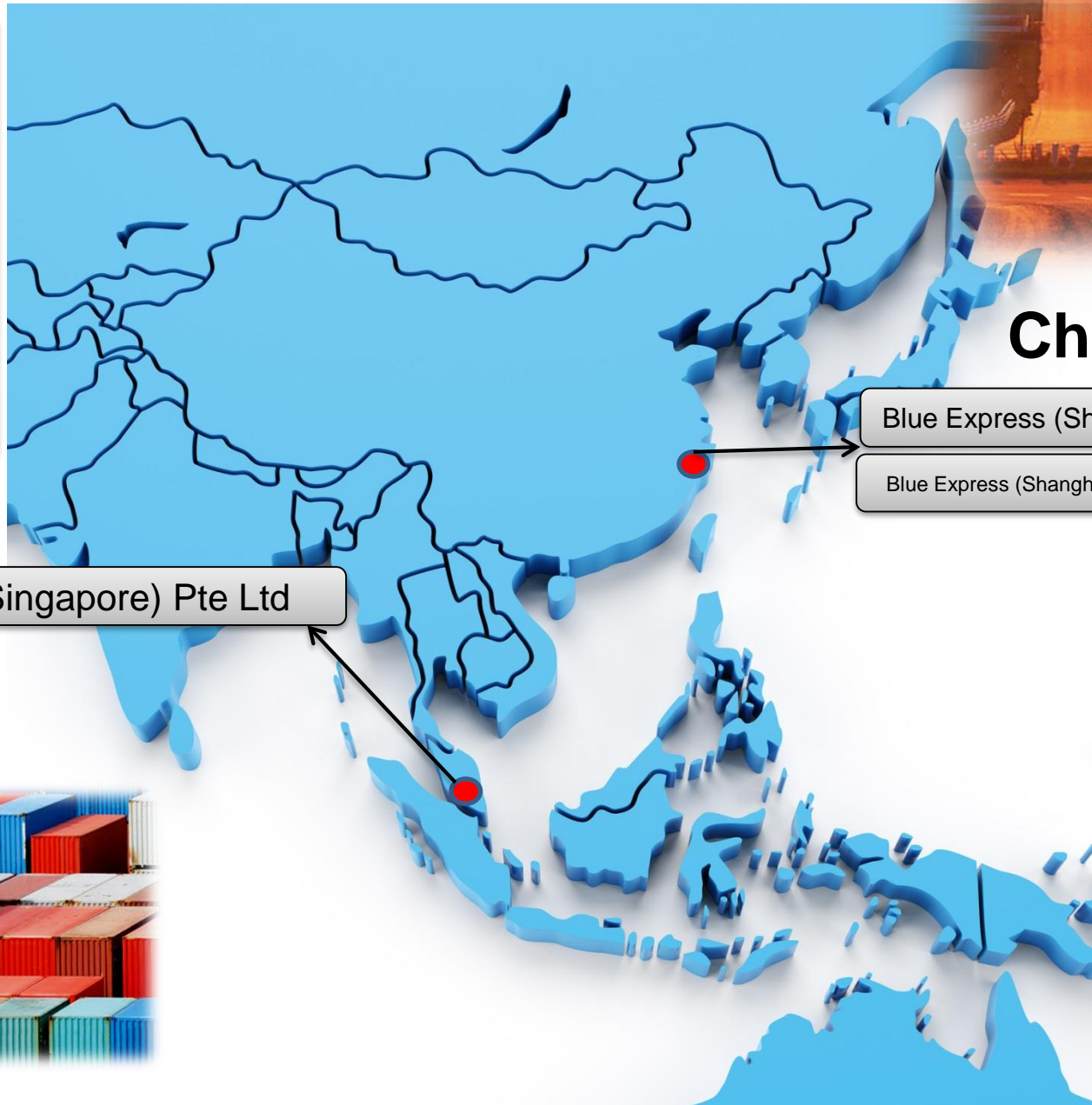
Kitakyushu Office
Opened in October 2014

<Overseas Bases>



Singapore

Stella Express (Singapore) Pte Ltd



China (Shanghai)

Blue Express (Shanghai) International Trade Inc.

Blue Express (Shanghai) International Freight Forwarding Co., Ltd.



<Activity Policy 1>

1. To enhance compliance capability

- To stop reckless driving and overworking through the use of dashboard cameras and digital tachographs, and revisions to fleet tracking operations, etc.
- To improve long-haul transportation (consider changing mode of transport) in order to mitigate excessive driver workload

- Our mission is to pioneer the future of logistics services with an eye to discovering a better tomorrow and an undying commitment to the pursuit of safety and sustainability.

- ▶ All our offices have been G-Mark certified (given to business establishments with excellent safety standards)
- ▶ Obtained ISO 14001

Certificate No.: JQA-EM5789

Certified locations: Headquarter, Sanpo Office Transport Section
Yokohama Office, and Warehouse Division

Operations covered: Freight transportation, warehousing,
container services, and customs clearance



- Ensure compliance across the Blue Express Group

- ▶ Blue Auto Trust Co., Ltd.
- ▶ Blue Express (Shanghai) International Freight Forwarding Co., Ltd.
- ▶ Blue Express (Shanghai) International Trade Inc.
- ▶ Stella Express (Singapore) Pte Ltd

<Activity Policy 2>

2. To carry out intra-group operations with a focus on safety and accuracy

- Working in line with Stella Chemifa's business policies, make investments aimed at relocating and expanding offices that serve as our transportation hubs and systematically hire drivers and customs specialists with an eye to enhancing the safety and accuracy of intra-group logistics.
- To work on the effective use of buildings to prepare for future transport volume growth.

★ Offices planning to relocate/expand

- (1) Sendai Office
- (2) Nagoya Office
- (3) Kitakyushu Office



Headquarters Sanpo Office
(completed in April 2018)



Kitakyushu Office
(completed in October 2014)



Headquarters new hazardous materials
warehouse
(completed in December 2018)

<Activity Policy 3>

3. To seek international intermodal logistics services and make business deals with a keen focus on profits.

- To, as a hazardous materials transport expert, seek added value for international intermodal logistics services, which includes transport, customs clearance, and container services.
- To make business deals with a keen focus on profits
- To focus on business transactions aimed at ensuring optimal operations



Transportation

Storage

- High-purity chemicals

- Poisonous and deleterious substances

- Hazardous materials

- High-pressure gas

- General cargo, etc.

Customs clearance

Container services

6. Future Activities

- R&D Initiatives
- Functional Fluoride 1
- Functional Fluoride 2
- Future Energy Devices 1
- Future Energy Devices 2
- Future Energy Devices 3
- Chemicals for Future Semiconductor Device Manufacturing

<R&D Initiatives>

Functional Fluoride

Applying fluorine technology to light-emitting devices, etc.



Future Energy Devices

Development and proposal of materials for next future batteries



Chemicals for Future Semiconductor Device Manufacturing

For LSI miniaturization technology that supports an IT-driven society

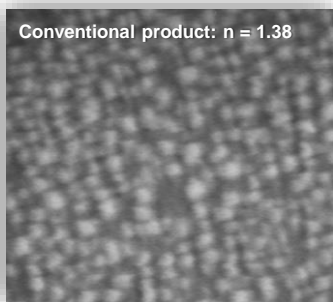


<Functional Fluoride 1>

Low refractive index materials

Fluoride nanoparticles with low refractive index for antireflection coatings

Ensures antireflection and other optical functions of cutting-edge devices without compromising the design



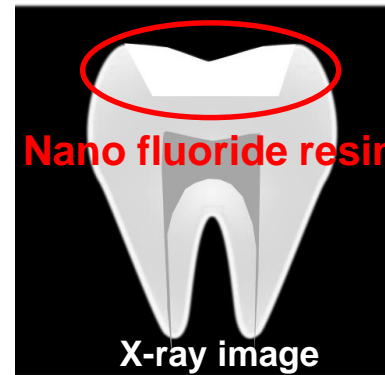
Development of Fluoride nanoparticle dispersion with low refractive index

Newly developed product: $n \leq 1.35$

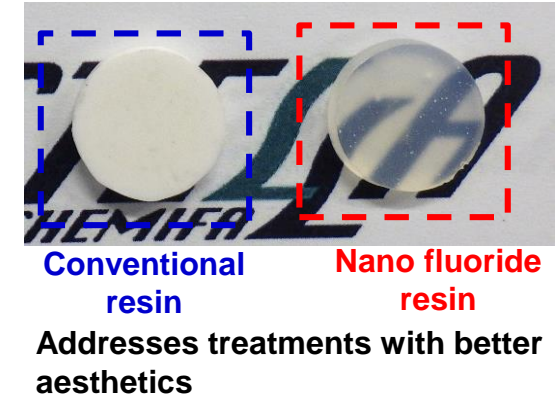
Dental materials

Fluoride nanoparticles for dental composite resins

(1) Radiolucency



(2) Transparency



Easy-to-identify boundary
Between dentino and dental fillings

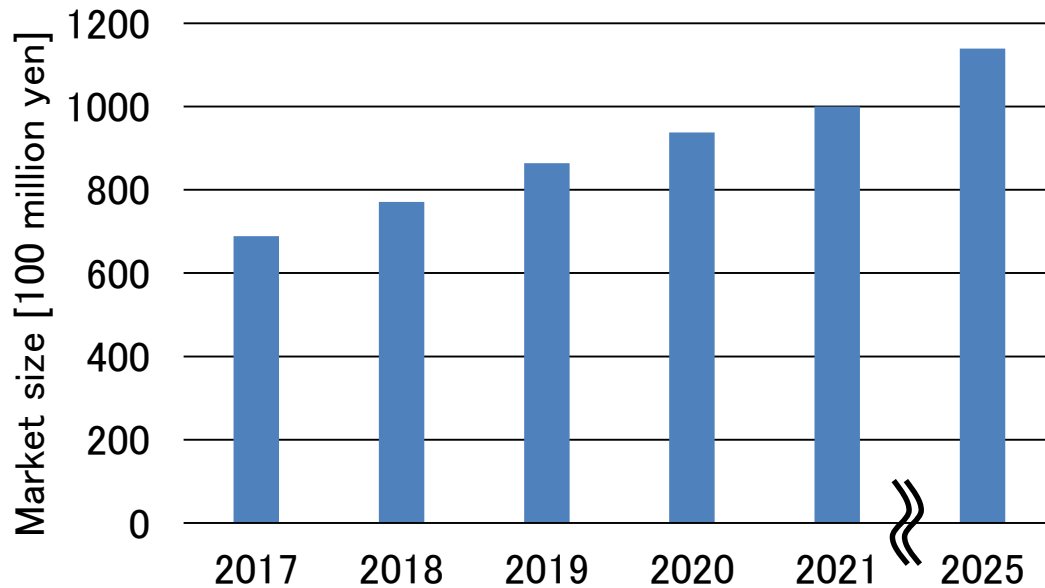
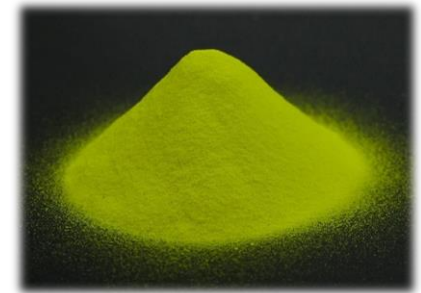


Applicable to CAD/CAM blocks

<Functional Fluoride 2>

Phosphor Materials

Development of high-efficiency, long-life fluoride phosphor materials utilizing our company's core technology



Source: 2018 Comprehensive Survey on LED/LD Market (Fuji Chimera Research Institute, Inc.)

Market Forecast of Phosphors for LEDs (prospect for 2018 and later)

Demands also increasing for Mini LEDs and PIDs (Public Information Displays)

Under evaluation by customers



No light emission

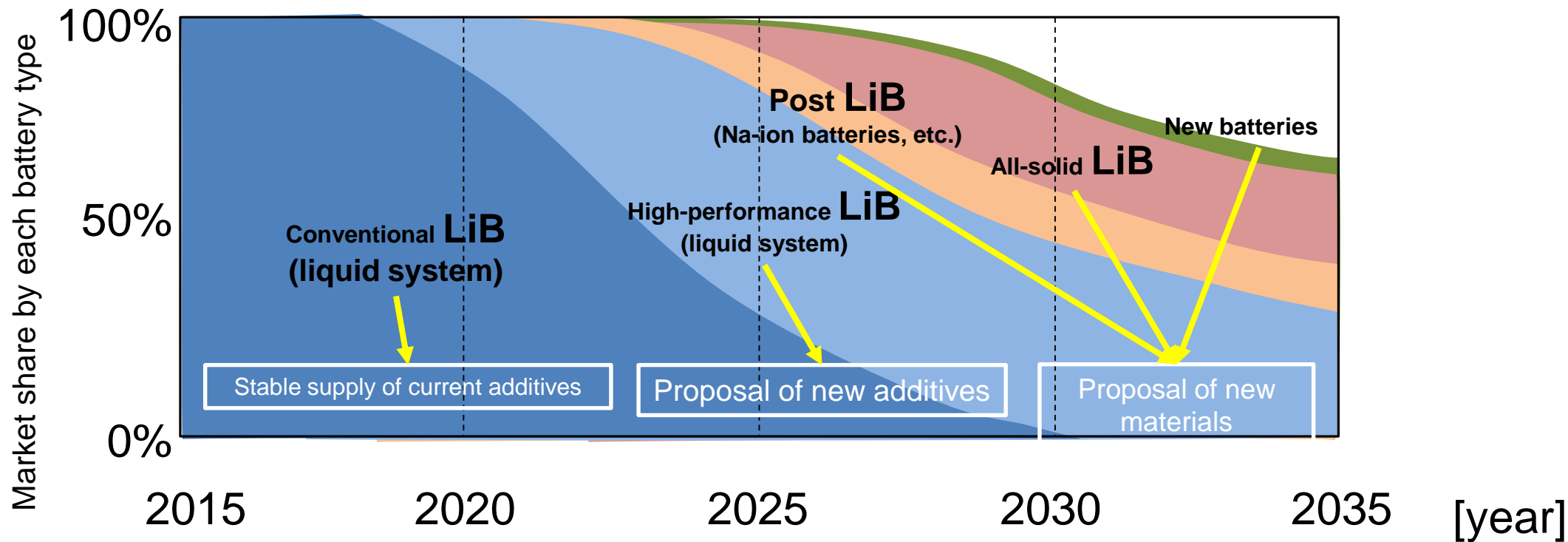


Light emitting state

Our fluoride phosphor materials

<Future Energy Devices 1>

Approaches to the Battery Roadmap



Source: STELLA CHEMIFA

Fig. Image for future changes in battery technology

Focusing on the development of new materials for post lithium-ion battery technologies

<Future Energy Devices 2>

Development of high-performance LiB materials

Improvement of battery performance and durability in EV batteries



Positive electrode
/
Negative electrode



Proposing materials for electrode

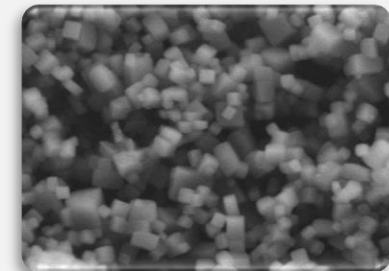
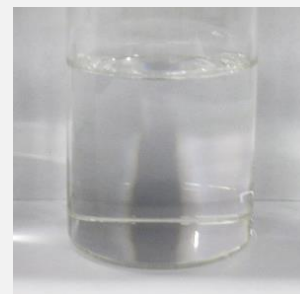


Image of electrode additive

Electrolyte



Proposing materials for electrolyte



Appearance of a new additive

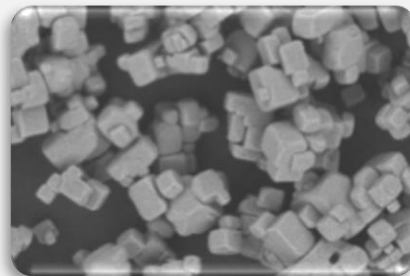
Evaluation is ongoing for proposed materials that have been fine-tuned to customers' battery systems.

<Future Energy Devices 3>

Proposing materials for post lithium-ion secondary batteries

Metal-ion secondary batteries

High-purity electrolytes for other types of ion batteries, such as sodium- or calcium-ion batteries



High-purity electrolyte

Mass production of high-purity electrolytes

All-solid lithium-ion secondary batteries

All-solid lithium-ion battery materials designed for enhanced safety



Material for all-solid battery electrode

Evaluation of products under development following the establishment of evaluation system

Fluoride-ion secondary batteries

Fluoride-ion conductor and electrode materials



Fluoride-ion conductor material

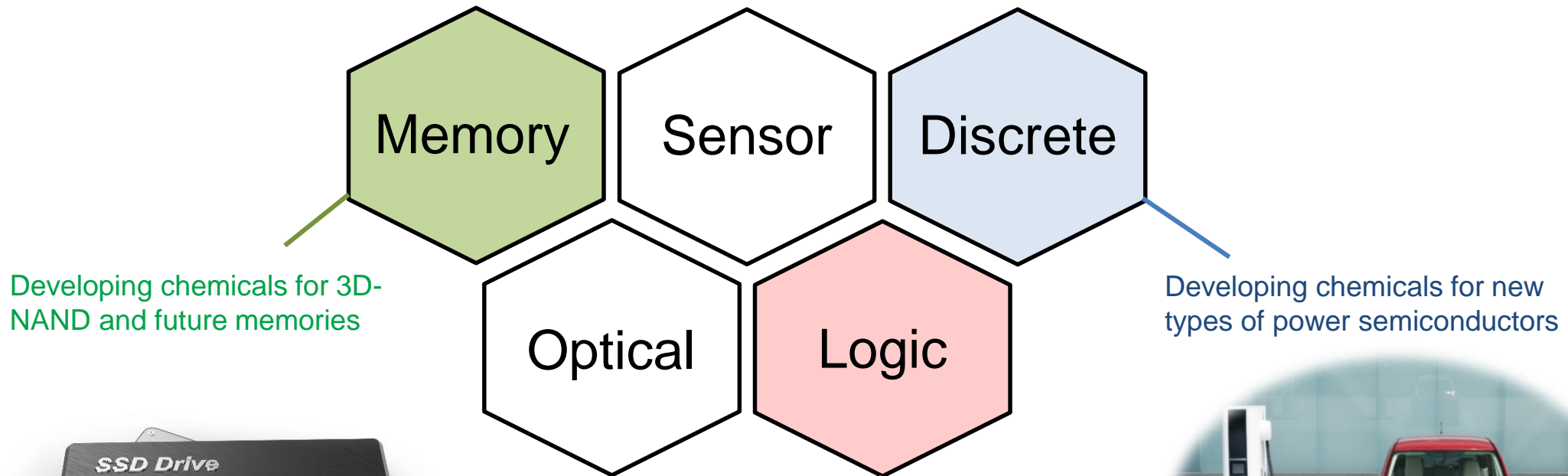


Molded electrolyte

Applying core technologies to make candidate materials for more future secondary batteries

<Chemicals for Future Semiconductor Device Manufacturing>

Working with customers and universities to develop chemicals for future semiconductor device manufacturing



Developing chemicals for 3D-NAND and future memories

Developing chemicals for new types of power semiconductors

Looking at ways to enhance performance of existing products



Corporate slogan

Beyond the Chemical
Beyond the Chemical

We are drawing upon our strengths in the chemical field, whose growth we have nurtured so far, and moving toward even greater development in the future.

High-purity chemical
business field

Transportation
business field

Medical business
field



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