Taking on Challenges without Limits Will Change the Future

At the end of 1915, when Sumitomo Chemical began manufacturing fertilizer, the company only had about 160 employees. Since then, five business sectors have been born from the wide range of technologies we have developed over many years, as we grew into a diversified chemical manufacturer with about 30,000 employees. The following pages introduce each business sector's initiatives.

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Change in Business Sector Classification Methods

As of April 1, 2015, the Basic Chemicals Sector was eliminated and businesses in this sector were split and transferred to the Petrochemicals & Plastics Sector and the Energy & Functional Materials Sector that was established as a new business sector. In addition, a part of businesses in the Petrochemicals & Plastics Sector was transferred to the Energy & Functional Materials Sector. Inorganic chemicals, raw materials for synthetic fibers, organic chemicals, and methyl methacrylate that had been included in the Basic Chemicals Sector were transferred to the Petrochemicals & Plastics Sector. Alumina products, aluminum, functional materials, additives, and dyes that had also been included in the Basic Chemicals Sector were transferred to the Energy & Functional Materials Sector. In addition, synthetic rubber that had been included in the Petrochemicals & Plastics Sector was transferred to the Energy & Functional Materials Sector. The business sector categorization of one of the consolidated subsidiaries has been changed. For comparison, the figures for fiscal 2014 have been adjusted to reflect the organizational revision as of April 1, 2015, except for return on assets in the Petrochemicals & Plastics Sector, the Energy & Functional Materials Sector, and the Health & Crop Sciences Sector.

To further strengthen the Energy & Functional Materials business, as of April 1, 2016, battery materials and engineering plastics that had been included in the IT-related Chemicals Sector were transferred to the Energy & Functional Materials Sector. For comparison, the figures for fiscal 2015 have been adjusted to reflect the organizational revision as of April 1, 2016, except for return on assets in the Energy & Functional Materials Sector, and the IT-related Chemicals Sector.

*1 Percentages exclude "Others" and various adjustments.

*2 Figures on top of each bar in the graph include eliminations. *3 Sumika Sustainable Solutions

Each Sector Situation



Energy & Functional Materials











J-GAAP Net Sales (left axis)























Petrochemicals & Plastics

Provide Customers with New Solutions Based on High Value-added Products

竹下 第-昭

Noriaki Takeshita Representative Director & Senior Managing Executive Officer



Business Activities

Sumitomo Chemical's Petrochemicals & Plastics Sector manufactures such products as polyethylene (PE), polypropylene (PP), and methyl methacrylate (MMA) using the various strengths of its manufacturing locations in Japan, Singapore, and Saudi Arabia, and offers them to a wide variety of industries, including automobiles, electric appliances, and food products.

Core Competence

We are developing high value-added products in anticipation of customer needs, and we also provide a stable supply of high-quality products at our locations in Japan and Singapore. Our relationships of trust with core customers in the Asian market, cultivated over many years, are also a major strength of Sumitomo Chemical. In Saudi Arabia, we are manufacturing cost-competitive products, taking advantage of the low prices of raw materials and fuel in that region.

Fundamental Strategy

Currently, we are working to enhance our ability to offer solutions through high value-added products in Japan and Singapore and to achieve stable plant operations in Saudi Arabia.

Priority Initiatives in Fiscal 2018

In fiscal 2018, we began shipping all products at our Rabigh Phase II plant in Saudi Arabia. In Singapore, we also promoted higher value-added products by remodeling polypropylene facilities, replacing some of our previous general-purpose products, such as automobile components, with high value-added products, such as food packaging.

Issues in the Future

Our greatest issue at present is getting production at the Rabigh Phase II Project in Saudi Arabia on track as soon as possible to mobilize its initially planned capabilities. We aim to ensure the completion of technology transfer to local personnel and to achieve stable plant operations. Moreover, in Japan and Singapore, we are continuing to put effort into developing high value-added applications for polyolefin, while enhancing our licensing business. In addition, we will work on research and development in carbon cycle chemistry in order to realize a sustainable society.

Long-term Vision

Going forward, Sumitomo Chemical will not only continue to enhance our strengths in these three locations, but will also aim to consistently achieve a return on assets in excess of our cost of capital by working to streamline assets, including working capital.

Corporate Business Plan for FY2019-FY2021

Action Plan

- Strengthen domestic business
- Expand capacity and enhance profit-
- ability of Singapore business
 Maintain stable operations at PRC phase I and make PRC phase II into a business that constantly contributes
- to the sector's performance • Strengthen technology licensing business

 Restructuring of underperforming businesses

Major Issues

 R&D into carbon cycle chemistry, including carbon capture and utilization technologies, to create a sustainable society

(Billions of yen)	FY2018	In Comparison to FY2017	Corporate Business Plan for FY2019-FY2021: Sector Goals FY2021 Target
Sales revenue	757.5	+83.4	910.0
Core operating income	61.6	-33.0	49.0
Sales revenue of SSS*	72.0	+4.6	88.0
		* Sur	nika Sustainable Solutions

- Global operation by leveraging the competitive advantages of the three bases in Japan, Singapore, and Saudi Arabia
- Strong relations with prominent customers in the Asian market
- Access to low-cost ethane feedstock
- Capabilities to develop high value-added products
- Large and deep markets
- Steady growth in demand

 Relatively small business size compared to the global majors

• Dependence on naphtha, a more expensive feedstock than ethane / shale gas

Establishment of more cost-competitive new plants

- Cyclical business environment
- Country risks

Overview of the Major Businesses

Polyolefin Business (Polyethylene and Polypropylene)

We operate polyethylene (PE) and polypropylene (PP) manufacturing facilities in Japan, Singapore, and Saudi Arabia with a combined production capacity of 1.66 million tons per year for PE and 1.68 million tons per year for PP.

Market Situation

Global PE demand is estimated at 100 million tons per year, and that of PP is estimated at 70 million tons per year. Demand for both PE and PP is expected to grow at an annual rate of 4%.

Business Situation

We aim to further enhance the profitability of our PE business by expanding our business in high value-added applications, such as water-resistant laminate for paper and protective films for LCDs. We are enhancing our PP business in high value-added applications, such as PP compounds for use in automotive components, film materials for high-quality electronic components, and film materials for food packaging.

MMA Business

nities Threats

We manufacture and sell MMA monomers and polymers, and MMA sheets. MMA polymer, which offers outstanding transparency and weather resistance, is an excellent material for a broad range of uses, such as light-guide plates for LED televisions and other optical components, as well as automotive applications, showcases, and outdoor signboards.

Market Situation

MMA monomer demand is estimated at 3.7 million tons per year, and is expected to grow at an annual rate of 3% to 4%.

Business Situation

As Asia's major MMA producer, we continue to enhance the competitiveness of its entire MMA product chain, from monomers and polymers to the sheet business.



Products made using polyethylene



A large aquarium tank made using MMA

Petrochemicals & Plastics

Value Creation Model: Rabigh Project

Major Management Resources (Input)



Operations at Petro Rabigh

Competitive Advantages of Rabigh Project

Competitive Conditions in the Market

Because the field of petrochemical products is extremely broad, connected with the necessities of life – food, clothing, and shelter – the market is incredibly vast, with massive numbers of players. Petro Rabigh's ethylene production capacity is 1.6 million tons per year.

Competitive Advantages

Among a large number of players, Petro Rabigh has outstanding cost competitiveness compared to other companies using naphtha as a feedstock by sourcing cost-competitive ethane from Saudi Aramco for its major feedstock. In addition, because it is a world-scale integrated complex, the company has a low unit cost as another competitive advantage.

Cost Difference of Petrochemical Feedstocks



System for Providing Added Value

Value Chain



Major Processes Generating Competitive Advantages

Production: Petro Rabigh produces products such as PP, PE, and PO (propylene oxide), using technology licenses from Sumitomo Chemical, which boasts world-class technology. Moreover, the local staffs' operational technique is improving dramatically by receiving training at overseas facilities, particularly in Singapore.

Sales: Sumitomo Chemical Asia has taken on the role of supplying products produced by Petro Rabigh in Saudi Arabia to countries across Asia. The company has shortened delivery times and reduced logistics costs by establishing stocking points throughout Asia.

Earnings Structure and Role in Driving Income

The margins for petrochemical products change depending on the supply and demand balance for each of the various products. On the other hand, because the prices for ethane feedstock are fixed, margins for petrochemical products produced at Petro Rabigh expand when product prices increase, compared with companies that use naphtha as a feedstock. In order to increase the profitability of Petro Rabigh, the company is endeavoring to continue safe and stable operations. In addition, the Phase II plant has begun production of all its products, and we are working to achieve stable operations, with the aim of contributing to earnings as soon as possible. Petro Rabigh produces a variety of petroleum and petrochemical products using crude oil and cost-competitive ethane from Saudi Aramco as its primary feedstocks.



Customer and Consumer Needs

There are cases when customers in regions in Asia and the Middle East have to maintain a significant amount of inventory because there is a risk of difficulty in procuring petrochemical products due to unstable logistic arrangements in this region. Moreover, in cases when customers switch suppliers, it is a burden on customers to adjust the products' processing methods used in customer factories. For these reasons, customers demand accurate and stable product deliveries.

Providing Customer Value

Sumitomo Chemical Asia, which sells products from Petro Rabigh, offers more reliable product deliveries than the competition, as well as short delivery times, because it has warehouses in locations near its customers. This means it is able to provide a stable supply, and to earn a high degree of trust from customers. In addition, while it has the flexibility to change a certain volume of sales and customers according to market conditions in each region, by focusing more on continued sales to core customers, the company further increases the reliability of its stable supply. Through these efforts, Sumitomo Chemical Asia is working to build long-term relationships with customers.

Added Value Provided to Society



Supporting the Foundation of **Peoples' Daily Lives and Strengthening Friendly Relations** between Japan and Saudi Arabia

Products produced by Petro Rabigh form the foundation of a wide range of industries, including automobiles, electric appliances, food products, and other daily necessities. In addition, the company is not only contributing to the development of Saudi Arabia by creating employment in the country, it is also contributing to the strengthening of friendly relations between Japan and Saudi Arabia, the world's largest oil producer.

Sumika Sustainable Solutions

The propylene oxide-only (PO-only) process has been designated as one of the Sumika Sustainable Solutions. This PO-only technology is a groundbreaking, environmentally friendly process that uses heat effectively and limits wastewater, without producing byproducts.



Propylene oxide-only process plant (Chiba)

Energy & Functional Materials

Contribute to Solving Environmental and Energy Issues through Research and Development with a Long-term Perspective and the Resulting Innovative Technologies

新强金吾

Kingo Akahori Representative Director & Managing Executive Officer

Business Activities

The Energy & Functional Materials Sector was created in 2015 by integrating related businesses that had been spread across multiple business units within Sumitomo Chemical, with the goal of developing and strengthening businesses in the fields of the environment and energy. By selling high-performance materials, such as battery materials and super-engineering plastics, we provide solutions that contribute to improving the performance of eco-friendly products such as electric vehicles.

Core Competence

A major core competency of this sector is its global business development capability, as shown by products where we hold the top global market share, such as high-purity alumina and resorcinol, and also by our separators for lithium-ion secondary batteries, which offer world-class heat resistance. The above products are also results of our other core competencies: our research and development capabilities as well as our evaluation, manufacturing, and process technologies.

Fundamental Strategy

This sector's medium-term strategy is to continue to expend every effort in investing its management resources specifically in those fields in which Sumitomo Chemical can offer comparative advantages technologically, and where growth can be expected in those businesses. At the same time, we are working to restructure businesses that have become unprofitable.

Priority Initiatives in Fiscal 2018

In fiscal 2018, we expanded sales of separators, which are experiencing rapid growth due to demand for electric vehicle applications, and began shipments from our new plant of polyether sulfone, which is experiencing growth in demand for aircraft and automotive applications. In addition, we increased production capacity at our resorcinol plants, which continue to operate at high levels, by modifying their facilities in response to strong demand.

Primary Focus SDGs

13 CLIMATE ACTION

Issues in the Future

By focusing management resources on new research and development in the fields where Sumitomo Chemical has comparative advantages, and where long-term growth can be expected, we will actively work to develop the core businesses of this sector. In addition, to reliably record profits we are continuing our efforts to improve our earnings capacity for all businesses. Moreover, in our efforts to develop core businesses from a medium to long-term perspective, we aim to promote the development of our CO₂ separation membrane business, which is a promising technology for reducing greenhouse gas emissions, a major global issue. Long-term Vision

Long-term Vision

Our aim is to contribute to solving global environmental and energy issues through research and development with a longterm perspective and the resulting innovative technologies.

Corporate Business Plan for FY2019-FY2021		
Action Plan	Major Issues	
 Expand sales of core products (battery materials, super engineering plastics, etc.), accelerate R&D Shift to high value-added products Improve profitability in underperforming businesses and products 	 Create new businesses in the fields of environment and energy and high-performance materials (CO₂ separation membranes, etc.) 	

(Billions of yen)	FY2018	In Comparison to FY2017	Corporate Business Plan for FY2019-FY2021: Sector Goals FY2021 Target
Sales revenue	282.9	+31.9	390.0
Core operating income	23.0	+3.8	31.0
Sales revenue of SSS*	54.7	+15.8	95.0
		* Sur	nika Sustainable Solutions

Superior product performance using differentiated technologies
Reliability of products proved in use by customers
Strengths
Weaknesses
Cost competitiveness
Cost competitiveness
Sophistication of performance requirements against the backdrop of increasing battery capacity
Expansion of the environment- and energy-related markets

Overview of the Major Businesses

Advanced Polymers Business

Sumitomo Chemical manufactures and sells super engineering plastics, including liquid crystal polymer (LCP) and polyethersulfone (PES). LCP is used mainly in connectors and other electronic components, and PES is used mainly in carbon fiber composite materials in aircraft, because of their heat resistance, dimensional stability, fluidity, and flame retardance.

Business Situation

Demand for LCP and PES is expanding, as they are expected to reduce the weight of products for downstream applications and reduce the cost of processing. In addition, we are pioneering new applications that take advantage of these features, including use in automotive components.



Super engineering plastics

Resorcinol Business

We manufacture and sell resorcinol, which is used as a bonding agent between tire rubber and reinforcing materials, and as a raw material for a wood adhesive used in construction.

Business Situation

Worldwide demand for resorcinol is estimated at 60,000 tons per year. As the world's top manufacturer of resorcinol, we have an

annual production capacity of over 30,000 tons and supply highly cost-competitive resorcinol by taking advantage of our outstanding manufacturing technology and production capacity.



Resorcinol

Inorganic Materials Business

We manufacture and sell high-purity alumina for lithium-ion secondary battery components, low-soda alumina for glass substrates for products such as liquid crystal displays, aluminum hydroxide for artificial marble, and high-purity aluminum for electrolytic capacitors and semiconductor wiring materials.

Business Situation

Alumina, a high-performance inorganic material that uses advanced technologies to control physical

properties such as particle size and shape, is being used in lithium-ion secondary batteries, which are indispensable for the widespread use of eco-friendly cars, such as electric vehicles, and we are working to expand sales.



Alumina products

Battery Materials Business

We manufacture and sell separators for lithium-ion secondary batteries and cathode materials.

Business Situation

Our separators have been highly esteemed by battery manufacturers for their outstanding heat resistance, reliability and safety, and demand is growing for applications such as electric vehicles, because they are particularly suited for high-capacity batteries. At the SSLM plant in South Korea, established in the fall of 2016, we have expanded production capacity in stages. With regard to the

cathode materials, we converted Tanaka Chemical Corporation into a subsidiary company in 2016. We are pushing forward with an expansion of production capacity and development of new products with high capacity and low electric resistance for applications in eco-friendly vehicles.



Pervio[®] separators for lithium-ion secondary batteries

Energy & Functional Materials

Value Creation Model: Separators

Major Management Resources (Input)

Intellectual Capital	Sumitomo Chemical holds a basic patent for the aramid coating process. With this patent, we are able to provide added value to customers that is unlike that of ceramic separators from other companies.
Human Capital	Sumitomo Chemical has operators with advanced techniques and experience to produce high quality products. We are focusing on technical guidance from veteran to novice operators so as to pass on the techniques.

Sumitomo Chemical's Competitive Advantages

Inspecting separators at the Ohe Works

Competitive Conditions in the Market

The use of coated separators has become mainstream for automotive lithium-ion secondary batteries. In addition to Sumitomo Chemical's aramid separators, coated separators also include ceramic separators, and the majority of the several dozen separator manufacturers around the world manufacture ceramic separators. However, there are only a limited number of manufacturers capable of producing separators used for high capacity automotive batteries like ours.

Competitive Advantages

Since our aramid separator is superior to ceramic separators in safety (heat resistance) and can reduce the overall weight of an electric vehicle by a couple of kilograms, it is highly regarded by customers.

Initiatives to Enhance Competitive Advantages

In order to further strengthen the superiority of our aramid separator, we are conducting research to enhance the strength of the separators and reduce their thickness. In addition, we are working on development to improve the performance of the separators by using the optimal composition of aramid resin.

System for Providing Added Value

Value Chain



Major Processes Generating Competitive Advantages

Production: Sumitomo Chemical is not only conducting research and development of separators but also working on improving productivity. We are capable of applying a uniform aramid coating with industry-leading speed, while maintaining high quality. Productivity at the plant of SSLM in South Korea has tripled since 2015 due to factors such as more advanced techniques, accumulated experience, and improvements in coating equipment. We expect further productivity improvement in the future.

Earnings Structure and Role in Driving Income

With the spread of eco-friendly vehicles, the separator market is also expanding. Sumitomo Chemical aims to expand sales through increased demand from existing customers and through reaching out to new customers. In addition, we are considering increasing the production capacity of our in-house base film, which offers outstanding cost competitiveness. Sumitomo Chemical purchases raw materials such as base film and aramid resin, and produces aramid separators by coating the base film with aramid resin. Battery manufacturers combine them with other materials to produce lithium-ion secondary batteries. The final product is widely used in applications like electric vehicles and ESS (energy storage systems).



Customers and consumers are demanding ecofriendly vehicles with long cruising ranges and low fuel consumption. Safe, high capacity batteries are indispensable for that sort of vehicle. For this reason, our direct customers, the battery manufacturers, seek to manufacture batteries that provide that performance at the lowest possible cost.

Providing Customer Value

In order for battery manufacturers to make safe, high capacity products, Sumitomo Chemical provides thin separators with high heat resistance. Furthermore, we strive to improve productivity in order to provide products with outstanding cost competitiveness. In addition, the company elicits new needs from customers in regular meetings, and works to develop products to meet those needs.

Added Value Provided to Society



Contributing to Climate Change Countermeasures and the Spread of Eco-friendly Vehicles through the Separator Business

The shift to eco-friendly vehicles is accelerating due to the strengthening of environmental regulations around the world. Under these circumstances, separators are indispensable to the spread of these vehicles. Sumitomo Chemical contributes to climate change countermeasures through our separator business.

Sumika Sustainable Solutions

Separators, essential components in producing high density, high capacity and safe lithium-ion secondary batteries, have been designated as one of the Sumika Sustainable Solutions. Eco-friendly vehicles featuring lithium-ion secondary batteries can reduce energy consumption in comparison to gasoline-powered cars.



Pervio® separators for lithium-ion secondary batteries

IT-related Chemicals

Deliver New Value that Responds to the Changes in the ICT Industry by Leveraging Our Material Development Capabilities in Collaborative Development with Customers



Masaki Matsui Representative Director & Managing Executive Office

B

Business Activities

Primary Focus SDGs

Sumitomo Chemical's IT-related Chemicals Sector contributes to innovation in display technology by providing display manufacturers with highly functional materials that contribute to improved display performance. In addition, the sector contributes to improving semiconductor performance and productivity by providing high-quality semiconductor materials to semiconductor manufacturers.

Core Competence

Locating our production centers near customer manufacturing sites, we strive to foster good relationships with customers, to be quick to apprehend their needs, and to build market needsdriven supply chains that reflect these needs in the development and supply of products. The advantages our company brings to this field are this development and supply approach, our material development capability as a diversified chemicals manufacturer, our product development ability, as well as our processing technology in the display materials business.

Fundamental Strategy

Now, in order to respond to the generational shift in display technology from LCD to OLED, we are working to expand our OLED business and transform the cost structure of our LCD components business. In addition, we are also focusing on developing semiconductor materials that support increasingly sophisticated semiconductor manufacturing technologies, as well as expanding our production capacity.

Corporate Business Plan for FY2019-FY2021Action PlanMajor Issues• Structural reform of polarizing film
business• Develop next-generation businesses
• Smart mobility
• Next-generation handsets
• Sensor material• Expand touchscreen panel product
portfolio• Sensor material

Priority Initiatives in Fiscal 2018

In fiscal 2018, we not only expanded sales of polarizing films for OLED displays, we also made progress in the development of components for flexible displays. As for LCD components, we expanded sales of polarizing films for TVs, which are becoming increasingly large in size, and expanded sales of polarizing films for full-screen smartphones.

Issues in the Future

Going forward, by developing new products and expanding production capacity at the appropriate times, we aim to expand our polarizing film businesses and touchscreen panel business for OLED displays. As for LCD components, we will continue to improve our cost competitiveness, and we also aim to expand our business in the Chinese market, which is expected to grow. Moreover, we are working to pioneer new applications and develop new customers in the semiconductor materials business. We will also nurture next-generation businesses, such as smart mobility and next-generation devices.

Long-term Vision

In this way, utilizing Sumitomo Chemical's strengths, we will expand the scale of our business and increase profitability by providing new materials and solutions that anticipate developments in the ICT industry.

(Billions of yen)	FY2018	In Comparison to FY2017	Corporate Business Plan for FY2019-FY2021: Sector Goals FY2021 Target
Sales revenue	396.8	+28.1	520.0
Core operating income	26.2	+13.9	35.0
Sales revenue of SSS*	139.8	+19.5	158.0
		* Sur	nika Sustainable Solutions

- Offering a wide range of display materials
- Established market needs-driven global supply chains
- Material development capabilities as a diversified chemical company
- Nano-level micro surface analysis technology

Heavy reliance on some specific products
High sensitivity to exchange rate movements

- Fast-growing organic LED displays market
- Rising demand for flexible displays
- Expanding Chinese semiconductor market

 Intensifying competition in the maturing LCD market

Overview of the Major Businesses

OLED-related Materials Business

Sumitomo Chemical provides OLED components, such as touchscreen panels, circular polarizing films, and Ag etchant.

Business Situation

The use of OLED displays in smartphones is expanding, and we are focusing on expanding sales of touchscreen panels and circular polarizing films. We have a high market share in these products. In addition, we are working to develop materials for foldable displays, which are attracting attention as next-generation displays. In addition to materials such as window films, which replace cover glass, flexible touchscreen panels, and polarizing films, we are working to develop products that will integrate the functions of multiple materials into a single material in the future, aiming to further expand our OLED materials business. We are also working to commercialize polymer OLED materials that will enable the manufacture of large-scale OLED displays at low cost.



LCD-related Materials Business

Sumitomo Chemical offers a wide range of LCD components, including polarizing films, color filters, and color resists.

Business Situation

We operate production facilities in various countries in East Asia, and have forged strategic partnerships as a prime supplier for major LCD manufacturers. We are focusing on expanding sales of high value-added products, such as polarizing films for ultralarge TVs, by utilizing competitive in-house materials, such as acrylic polarizer protective films. We are also working to improve

the productivity of polarizing films by consolidating production items between production sites.



Polarizing films

Semiconductor Materials Business

Sumitomo Chemical offers a variety of semiconductor materials, such as photoresists, aluminum sputtering targets, compound semiconductor materials, and high-purity chemicals used in semiconductor manufacturing, including sulfuric acid, hydrogen peroxide solution, and ammonia water.

Business Situation

Photoresists are photosensitive resins used in semiconductor manufacturing processes. As semiconductor manufacturers are adopting processes to etch finer circuits, we are working to develop cutting-edge ArF immersion photoresists, and have the largest share of the global market for this product. We also anticipate growth in sales of GaN epiwafers and GaAs epiwafers for high frequency devices used in 5G communication wireless base stations and 5G devices.



IT-related Chemicals

Value Creation Model: Circularly Polarizing Film for OLED Displays

Major Management Resources (Input)

Intellectual Capital and de synthes the dev produc manufa Social and We cor grasp c shince

Capital

Sumitomo Chemical conducts research and development based on compound synthesis technology developed through the development of a wide range of products as a diversified chemical manufacturer.

We connect product design with a timely grasp of customer needs, using relationships of trust with customers developed over many years.



Sumitomo Chemical's Competitive Advantages

Competitive Conditions in the Market

Several companies that manufacture polarizing film are competing to improve quality in anticipation of adoption for use in flexible OLED displays.

Competitive Advantages

Sumitomo Chemical's unique strength is a liquid crystal material that can be used for circularly polarizing film for OLED displays. This liquid-crystal material, developed in-house, offers outstanding functionality, including preventing reflections from light sources such as sunlight or indoor lighting, and displaying real blacks that do not change color no matter what angle they are viewed from. For this reason, they contribute to the creation of OLED displays with extremely high image quality.

Initiatives to Enhance Competitive Advantages

Sumitomo Chemical is pushing ahead every day on the development of liquid crystal materials that will contribute to even better image quality for OLED displays. In addition, in order to meet demand that is expected to grow in the future, the company is considering economically superior synthesis processes and manufacturing facility, with the goal of also improving cost competitiveness.

System for Providing Added Value

Value Chain

[OLED Displays Currently on the Market]

Sumitomo Chemical manufactures liquid crystal coated-type retardation film based on proprietary technology, processes it into the final product, circularly polarizing film, and ships it to customers.



Major Processes Generating Competitive Advantages

Research: Sumitomo Chemical is conducting research on liquid crystal materials that can coat films. In order to produce phase contrast and polarizing functionality using liquid crystal materials, the liquid crystal molecules that are the raw material must be systematically oriented in a specific direction. Sumitomo Chemical is working to develop molecular designs that will achieve this. Moreover, the company is also devising production processes to manufacture the newly developed liquid crystal material and coat it onto film without harming its functionality.



Earnings Structure and Role in Driving Income

The market for OLED displays (on a revenue basis) is expected to expand even further going forward. It is anticipated that in 2025, the OLED TV market will be five times its current level, while the market for smartphones using OLED displays will be about 1.4 times its current level. Sumitomo Chemical will increase its earnings capacity by expanding sales and improving productivity.

[Next-generation Flexible Displays]

We provide panel manufacturers with circularly polarizing film featuring liquid crystal coated-type retardation film, and the panel manufacturers work to develop foldable displays, which are expected to be the next-generation display technology.



Customers are continuing to develop foldable smartphones, which have not yet been launched, and devices using panels that can be rolled up like paper or cloth. Because this cannot be done using existing circularly polarizing films, panel manufacturers need a next-generation circularly polarizing film.

Providing Customer Value

Customers are designing next-generation displays in order to create entirely new devices. For this reason, Sumitomo Chemical is working with customers to repeatedly conduct trial and error process for circularly polarizing film, which is a component of these new devices, in an effort to provide the performance customers need in terms of thinness and

strength when bent.



Added Value Provided to Society



Creating More Affluent and Convenient Lives for People

By developing and manufacturing circularly polarizing films for OLED displays, Sumitomo Chemical is contributing to the creation of entirely new products. The company will continue to provide new materials and solutions going forward, enabling people to lead more affluent and convenient lives.

Sector Information

Sumika Sustainable Solutions

The UV adhesive curing process in polarizing film manufacturing has been designated as one of the Sumika Sustainable Solutions. Manufacturing polarizing film, which is made by pasting together multiple sheets of film, previously used a great deal of electricity in the heated drying process for the water-soluble glue. By adopting a UV adhesive curing process that uses ultraviolet curing technology, Sumitomo Chemical was able to significantly reduce the amount of power consumed in this process.



Polarizing films

Health & Crop Sciences

Contribute to Solving Global Issues related to Food, Health, Hygiene, and the Environment by Leveraging Our **Excellent Research and Development** Capabilities

Business Activities

Sumitomo Chemical's Health & Crop Sciences Sector contributes to improving food productivity around the world by providing such specialized solutions as crop protection and enhancement products and agricultural materials, and methionine.

Core Competence

Sumitomo Chemical globally distributes not only excellent chemical crop protection products developed in-house, but also unique biorational crop protection/enhancement products and post-harvest solutions with high market shares. In addition to our range of unique crop protection products and the research and development capabilities that have been creating them, the strength of Sumitomo Chemical's Crop Protection and Enhancement business lies in its global distribution channels. And in our methionine business, Sumitomo Chemical offers a stable supply, with integrated production from raw materials using advanced production technology.

Fundamental Strategy

Currently, Sumitomo Chemical is working on further enhancing the strength of our crop protection products and agricultural materials, expanding our global footprint (our own distribution network), and maximizing earnings of existing products. In addition, we have expanded our methionine production capacity, in an effort to solidify our position as the leader in this business in Asia.

Priority Initiatives in Fiscal 2018

Representative Director & Executive Vice President

Primary Focus SDGs 3 GOOD HEALTH

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Ray Nishimoto

In fiscal 2018, we continued development of next-generation crop protection products and submitted registration applications in various countries. We also further strengthened our research and development capabilities, beginning operations at the newly established Chemistry Research Center in Japan, which serves as our global discovery and innovation base, and at the Biorational Research Center in the U.S., which serves as a research and development base for our biorational business. In addition, the new methionine plant was completed and began shipments.

13 CLEMAT

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Issues in the Future

Sumitomo Chemical aims to accelerate the development of nextgeneration crop protection products to enable the earliest market launch and will also work on expanding our biorational and post-harvest businesses where we have competitive advantages. Furthermore, we will seek to expand our business opportunities further by strengthening collaborations with our partners from which we have acquired shares or with which we have formed alliances. We are also working to further strengthen our global sales structure for methionine, as we have increased its production capacity.

Long-term Vision

We continue to aim to expand the scale of our businesses by contributing to solving global issues related to food, health, hygiene, and the environment by leveraging our research and development capabilities.

Corporate Business Plan for F	Y2019-FY2021
Action Plan	Major Issues

Action Plan

- Strengthen and expand biorationals business Develop and launch
- new crop protection chemicals steadily Expand methionine sales and
- strengthen earnings power
- Accelerate the global expansion of the environmental health business
- Develop the nucleic acid medicine business and expand the application of the technology

 Establish a global footprint in the crop protection business • Further strengthen the crop protection

business (agriculture-related supplies, precision agriculture)

(Billions of yen)	FY2018	In Comparison to FY2017	Corporate Business Plan for FY2019-FY2021: Sector Goals FY2021 Target
Sales revenue	338.1	-1.6	480.0
Core operating income	19.7	-24.2	75.0
Sales revenue of SSS*	114.7	-1.8	184.0
		* Sur	nika Sustainable Solutions

- Excellent research and development capabilities and the robust development pipeline of crop protection chemicals and the biorationals
- Differentiated technologies and products in niche areas
- Products with high market share
- Alliances with major overseas agrochemical companies
- Offering total solutions
- Increasing food demand due to the growing global population
- Growing agriculture-related businesses
- Opportunities in peripheral and downstream segments of the household insecticide business

• Relatively small business size compared to the competing majors

- Need to strengthen global sales channels
- Tightening of the regulations on crop protection chemicals
- Increased competition with
- off-patent crop protection chemicals Consolidation in
- the major agrochemical companies

Overview of the Major Businesses

AgroSolutions Business

We offer various crop protection products around the world, such as insecticides effective on a range of insects causing damage to crops, herbicides for a variety of crops, fungicides to help control diseases, and plant growth regulators which improve yields and the quality of crops.

Business Situation (Crop Protection and Fertilizer Business in Japan) In our crop protection and fertilizer business in Japan, we are aiming to increase our market share and broaden the scope of our business by developing attractive new products in-house, in-licensing new products, etc. We also offer comprehensive support for farmers' operations, from production to sale, by providing a wide range of agriculture-related supplies, technologies, and know-how. As part of our business as a total solutions provider, we engage in the rice business to produce and sell rice.

Business Situation (Overseas Agrosolutions Business)

We are enhancing collaboration and increasing investments to expand our overseas agrosolutions business. Besides mutually distributing crop protection products with Australian crop protection company Nufarm Limited, in which Sumitomo Chemical has a stake, in 31 countries (as of June 2019) we are actively collaborating with several major crop protection companies in both distribution and development. In India, we have decided to merge our two Group companies, aiming to increase our presence in the fast growing crop protection market there.



Aarosolution products

Environmental Health Business

Our environmental health business offers household and public hygiene insecticides, products for control of infectious diseases, and ectoparasiticides for use in the animal health field, thus contributing to safe and comfortable living environments through Household insecticides our worldwide businesses.



Feed Additives Business

Our feed additives business engages in the manufacture and sale of methionine, which is an essential amino acid used primarily as a feed additive in chicken and other poultry farming.

Business Situation

The global methionine market is estimated at 1.3 million tons annually, and is expected to grow at an annual rate of about 6% due to

the growth of the world population and the spread of meat-eating cultures in emerging countries. In fiscal 2018, we increased our methionine annual production capacity by 100,000 tons, to 250,000 tons. We will expand sales to new customers and further solidify our position as Asia's top supplier.

DL-methionine, Methionine hydroxy analog

We supply pharmaceutical companies in Japan and overseas with APIs and their intermediates. We aim to further expand our business by conducting contract manufacturing of oligonucleotides

for nucleic acid therapeutics. (Nucleic acid therapeutics are an emerging class of therapeutics for treating unmet medical needs. They are capable of targeting a disease at the genetic level by preventing the expression of disease-causing proteins.)



Active pharmaceutical ingredients (APIs)

Health & **Crop Sciences**

Value Creation Model: **Global Agrosolutions Business**

System for Providing Added Value

Major Management Resources (Input)

Sumitomo Chemical is conducting research and development based on Intellectual the knowledge regarding chemical and Capital biorational crop protection products, which it obtained after its many years of research and development activities. Personnel located around the world are Human conducting research and development Capital using a global network.

The Chemistry Research Center, a global discovery and innovation base for the Health and Crop Sciences Sector

Sumitomo Chemical's Competitive Advantages

Competitive Conditions in the Market

There are many producers in the global crop protection market, from major producers in the U.S. and Europe to comparatively small producers. Crop Protection products differ significantly in needs by region and crops. Sumitomo Chemical pursues unique positioning in various markets around the world, by using its product portfolio consisting of chemical and biorational products for crop protection and enhancement.

Competitive Advantages

Sumitomo Chemical is committed to research and development, working on everything from the discovery of novel lead compounds to the product development for end users from a long-term perspective in order to provide new solutions. These efforts enable Sumitomo Chemical to obtain proprietary products and technologies, which is the foundation of its competitive advantages.

Initiatives to Enhance Competitive Advantages

In 2018, Sumitomo Chemical established the Chemistry Research Center, a synthesis research building at the Health & Crop Sciences Research Laboratory, integrating research functions ranging from novel compound discovery to commercial manufacturing process development. In the U.S., a new biorational research and development facility started operations, thus promoting more efficient and accelerated development. In addition, the company established a research center in Brazil in 2016, a field testing station in the western U.S. in 2017, and a new test facility at Makabe Agriculture Research Center in Japan in 2018, where tests are conducted in a wider range of environments, thereby accelerating development of new products.

Value Chain





Biosciences LLC, Osage Plant

Valent Sumitomo Chemical Group Production of compounds and formulations

Major Processes Generating Competitive Advantages

Research: In discovery research, Sumitomo Chemical searches for active ingredients for new crop protection products. In this process, we evaluate not only a compound's efficacy but also its safety for people and the environment. We utilize our global research and development network so as to develop new solutions as soon as possible. In addition, we are also putting effort into product development for new formulations and applications of existing active ingredients.



Health & Crop Sciences Research Laboratory

Earnings Structure and Role in Driving Income

The scale of the global crop protection market is about USD60 billion, and it is expected to grow at an annual rate of about 3%. In order to improve its earnings rate, Sumitomo Chemical aims to continuously launch highly effective products that meet the needs of the market, using the advanced technology obtained in research and development. In 2018, we continued development of next-generation crop protection products and submitted registration applications in various countries. We plan to launch these products in 2020 and beyond.

Sumitomo Chemical provides crop protection products through research and development, registrations, and manufacturing. These products are sold through wholesalers and retailers, and are used by farmers.



Customer and Consumer Needs

Farmers use crop protection products as they hope to improve the quality and yield of their agricultural crops. In addition, they also expect to make farming work more efficient, and improve profitability. At the same time, they also pursue safety and security, hoping that the crop protection products will not harm either their health or that of the consumers of the agricultural products.



Sumitomo Chemical offers unique, effective products that meet customer needs and creates solutions that match the needs of every region and crop, which contribute to developing new, sustainable agricultural technologies.



Training on using biorationals

Added Value Provided to Society



Contributing to a Stable Food Supply by Improving Agricultural Productivity

With the growth in the world population and the development of the global economy, the need for a safe and secure food supply has been increasing. The crop protection and enhancement products Sumitomo Chemical provides around the world are aiming to contribute to a stable food supply by improving agricultural productivity.

Sumika Sustainable Solutions

Plant growth regulators (PGRs), a set of the products from a Sumitomo Chemical's global agrosolutions business, have been certified as Sumika Sustainable Solutions. PGRs have such effects as improving fruit set, size and quality of fruits and vegetables. In addition, as the timing of flowering and ripening of crops can be adjusted by PGRs, they are effective in cultivating crops in areas where cooling or droughts caused by climate change has progressed, thereby contributing to an increase in food production around the world.



From Valent Biosciences' product summary

Pharmaceuticals

Contribute to the Improvement of People's Quality of Life through the Development of Innovative Medical and Healthcare Solutions

Primary Focus SDGs

3 GOOD HEALTH AND WELL-BEIN



Major Issues

Enhance drug development capabilities

and improve the success rate in R&D

 Maintain earnings power after Latuda's loss of exclusivity

Action Plan

- Strengthen innovation through new drug discovery approaches
- Launch new products in oncology
- Explore frontier fields
- Develop Theranostics business and strengthen the competitiveness of existing radioactive diagnostics business

Overview of the Major Subsidiaries

Sumitomo Dainippon Pharma

Sumitomo Dainippon Pharma Co., Ltd. is reshaping the foundations of its business by establishing growth engines and building a flexible and efficient organization as it prepares for future changes and the "post-LATUDA[®]" era, after it loses exclusivity in the U.S.

Management Vision

Sumitomo Dainippon Pharma aims to continually discover excellent pharmaceutical products, conducting research and development activities not only in such focus areas as psychiatry & neurology, oncology, and regenerative medicine/cell therapy, but also in infectious diseases and vaccines. Furthermore, the company is exploring frontier businesses in healthcare areas not limited to pharmaceuticals so as to contribute to the wide-ranging well-being of people. Thus, the company aspires to establish a position as a global specialized player in the focused areas.

Business Situation

 Sales of the company's blockbuster product LATUDA®, an atypical antipsychotic agent, were robust in the U.S., at approximately 1.7 billion USD in fiscal 2018. Generic versions of LATUDA® may enter the market commencing February 2023 pursuant to the

Corporate Business Plan In Comparison for FY2019-FY2021: FY2018 to FY2017 Sector Goals FY2021 Target (Billions of yen) 590.0 Sales revenue 492.1 -8.1 Core operating 80.8 -14.0 94.0 income

settlements of the consolidated patent infringement lawsuit regarding abbreviated new drug applications. The company is continuing to develop products, preparing for the loss of exclusivity of LATUDA[®].

- The company aims to launch dasotraline (binge eating disorder (BED)) and apomorphine (OFF episodes associated with Parkinson's disease) in the U.S. during fiscal 2020.
- Sumitomo Dainippon Pharma is also developing napabucasin, which was added to its development pipeline by the 2012 acquisition of Boston Biomedical, Inc. and is conducting a Phase 3 trial in colorectal cancer. The company expects it to become a blockbuster product, with launch targeted in the U.S. and Japan in fiscal 2021.
- SEP-363856 is an antipsychotic agent with a novel, non-D2 mechanism of action, distinct from currently marketed antipsychotics. It has received Breakthrough Therapy Designation* from the U.S. Food and Drug Administration (FDA), based on positive results from its Phase 2 trial for the treatment of schizophrenia. Development is underway with the goal of launching in fiscal 2023 in the U.S.

^{*} Breakthrough Therapy Designation is intended to expedite the development and review of drugs for serious or life-threatening conditions.

- Drug research platform in the areas of psychiatry & neurology and oncology
- Development capabilities and manufacturing know-how for cellular medicine derived from allogeneic iPS cells
- Network with academia and biotech companies
- Pipeline in development for psychiatry & neurology, oncology, and regenerative medicine/cell therapy
- Strong development and manufacturing capabilities for radioactive isotope labeling agents
- Innovation in healthcare technology
- Increasing health awareness

- Limited capabilities to bear the burden of R&D costs
- Emergence of generic drugs due to the loss of exclusivity for major products
- Accelerated implementation of medical expense control measures in Japan
 Changes in the health insurance systems overseas
- Consolidation in the pharmaceutical industry

Initiatives with Cutting-edge Technology

- Sumitomo Dainippon Pharma is applying iPS cell technology to drug discovery, while also working on research and development of regenerative medicine/cell therapy. In the U.S., it is working with SanBio Inc. Their Phase 2b clinical trial for a cell therapy product for chronic stroke has been completed, and future development plans are under consideration.
- The company is also working with universities and research institutes to develop cell therapy products using iPS cells for age-related macular degeneration, Parkinson's disease, retinitis pigmentosa, and spinal cord injury. The company also began joint research and development of a renal regenerative medicine using iPS cells.
- In March 2018, the world's first commercial manufacturing plant dedicated to allogeneic iPS cell-derived regenerative medicine/cell therapy products, called the Sumitomo Dainippon Manufacturing Plant for Regenerative Medicine & Cell Therapy (SMaRT), began operations.



Sumitomo Dainippon Manufacturing Plant for Regenerative Medicine & Cell Therapy (SMaRT)

Nihon Medi-Physics

Nihon Medi-Physics Co., Ltd. (NMP) is a leading company in Japan in the highly specialized field of nuclear medicine.

Overview of the Company

NMP engages in the development, manufacture, and sale of radiopharmaceuticals, which are used for diagnosis to identify disease conditions and affected areas, chiefly for malignant tumors, cerebrovascular disease, and heart disease. In addition to diagnostic pharmaceuticals, NMP also offers therapeutic products, such as a medical device for brachytherapy for prostate cancer.

Main Products

Threats

The company's main product is FDG scan Injectable for PET (positron emission tomography) procedures, which are effective in the early detection of malignant tumors. The half–life of the radioisotope (¹⁸F) used in this product lasts for about 110 minutes, and therefore NMP established the 11th manufacturing facility for PET products so as to ensure reliable delivery to various medical institutions across Japan. Shipments began in January 2019.

Business Situation

- In November 2017, NMP began sales of Vizamyl[®], an imaging agent used in amyloid PET scans, which visualizes β-amyloid neuritic plaque density in patients with cognitive impairment who are suspected to have Alzheimer's disease.
- When the Japan Agency for Medical Research and Development (AMED) was accepting projects under its Cyclic Innovation for Clinical Empowerment (CiCLE) program, one of the research topics adopted for support was "Development of therapeutic agents with alpha-emitting radionuclide and companion diagnostic agents in parallel with establishment of new drug development base to make the concept of Theranostics into a reality," and NMP aims to develop new radiopharmaceuticals that bring together diagnostics and therapeutics (Theranostics), using the characteristics of nuclear medicine.
- The construction of the CRADLE building, a drug discovery facility to put into practice the Theranostics concept, has begun and will be completed in September 2019.
- NMP is also working to develop new business areas beyond its existing business, such as enhanced medical solution services

using digital technology and creating partnerships to advance the market for nuclear medicine in Asia.



Completion image of the CRADLE building

Pharmaceuticals

Value Creation Model: Sumitomo Dainippon Pharma

Major Management Resources (Input)

Intellectual Capital	Research and development capabilities, in ord to discover new drugs, and intellectual proper such as patents and licenses, are the source of income.	
Social and Relationship Capital	Besides good relationships with universities and other institutions that contribute to the development of new drugs, good relationships with authorities and healthcare professionals support global business development.	
Human Capital	Outstanding personnel support all business activities, including the research and develop- ment of new drugs, production, and sales.	

Sumitomo Dainippon Pharma's Competitive Advantages

Competitive Conditions in the Market

The global pharmaceutical market is over 1.1 trillion USD, and has grown at an annual rate of about 3% over the last five years.* Within that, significant market growth is expected in the specialty pharmaceutical market, aimed at specific illnesses and requiring a prescription from a specialist. Numerous pharmaceutical manufacturers are participating in this massive market, particularly in the U.S. and Europe, engaging in fierce competition in the development of new drugs.

Competitive Advantages

Although the scale of Sumitomo Dainippon Pharma is small compared to major global pharmaceutical manufacturers, the company has strong research and development capabilities in the psychiatry & neurology area, where it has built up knowledge over many years. In addition, by concentrating management resources into research and development in the oncology area, where there are many unmet medical needs, the company aims to discover revolutionary new drugs. Moreover, the company is a global leader in research and development in regenerative medicine and cell therapy, which is attracting attention as a next-generation treatment method.

Initiatives to Enhance Competitive Advantages

Sumitomo Dainippon Pharma is leveraging its core competencies to forge ahead with drug discovery research based on its proprietary drug discovery platforms established by constantly incorporating cutting-edge technologies in the psychiatry & neurology area. In oncology, the company accelerates research and development by promoting a networked approach to drug discovery that integrates internal (Sumitomo Dainippon Pharma and its U.S. subsidiary) and external parties, and that also integrates research and development. In the regenerative medicine and cell therapy area, the company aims to achieve early commercialization by developing a unique growth model where we pursue advanced industrialization/manufacturing technologies and cutting-edge science through the open innovation strategy, and is promoting multiple R&D projects.

System for Providing Added Value

Value Chain



Manufacturers of drug raw materials

and intermediate materials



Sumitomo Dainippon Pharma

Major Processes Generating Competitive Advantages

Research: By searching for candidate compounds for new drugs, Sumitomo Dainippon Pharma takes on the first step of drug discovery. It not only works to promote innovation within the company, but also actively promotes joint research with research institutions, such as universities inside and outside Japan, as well as alliances with biotech companies, working to discover revolutionary treatments.

Development: The company scientifically evaluates the effectiveness and safety of development candidates discovered in the laboratory through preclinical and clinical studies. It aims to efficiently promote development, and obtain speedy approval of new drugs.

Production and Quality Management: The company provides stable supplies of pharmaceuticals of reliable quality. In addition, it maintains a quality assurance system supporting the safety and security of its pharmaceuticals.

Sales and Information Provision: The company has sales locations in Japan, the U.S., and China, providing information necessary for the proper use of its pharmaceuticals.

Earnings Structure and Role in Driving Income

While pharmaceuticals discovered in-house can provide high returns in the period when exclusive sales are possible due to patents or other intellectual property, profitability deteriorates significantly once a patent has expired. For this reason, Sumitomo Dainippon Pharma hopes to maintain and improve income by continually developing and launching new drugs.

* (Source) Created based on the IQVIA World Review 2008-2018, Copyright © 2019 IQVIA (unauthorized reproduction prohibited) (Source) Japan Pharmaceutical Manufacturers Association DATA BOOK 2019 Sumitomo Dainippon Pharma manufactures the pharmaceuticals it has developed using medical raw materials and intermediate materials, and then supplies them to hospitals and pharmacies via pharmaceutical wholesalers. In addition, it provides pharmaceutical information to medical professionals so that its pharmaceuticals will be used properly.



Medical professionals and patients demand pharmaceuticals with higher therapeutic effectiveness, fewer adverse reactions, and in easier to use forms. In addition, there is a strong demand for the development of new drugs for diseases that have no effective treatment method at the present time. Moreover, it is also essential to provide information leading to safer and more effective treatment of illnesses, enabling medical professionals to properly use the pharmaceuticals.

Providing Customer Value

Sumitomo Dainippon Pharma is concentrating research and development resources into the fields of psychiatry & neurology, oncology, and regenerative medicine/cell therapy, where unmet medical needs are high. By discovering new revolutionary drugs, the company aims to contribute to the advancement of medical science and the improvement of quality of life of patients. In addition, the company earns the trust of medical professionals by both providing a stable supply of the pharmaceuticals it discovers, and by providing timely and accurate information about those pharmaceuticals.

Added Value Provided to Society



Contributing to the Advancement of Medical Science and the Improvement of Quality of Life of Patients

Sumitomo Dainippon Pharma contributes to the treatments of patients with a variety of illnesses by providing high-quality pharmaceuticals and pharmaceutical information. In addition, the company contributes to the development of medicine by generating further innovation through collaboration with organizations in academia and with biotech companies. Furthermore, the company also works to provide healthcare in countries and regions where receiving necessary medical treatment is difficult, both through research and development of its own products and through collaboration with such bodies as government institutions and international organizations.

