Review of Operations by Domain

At a Glance—Portfolio by Growth Model

In fiscal 2013, which represents Step 2 in our APTSIS 15 medium-term management plan, we have introduced growth models that categorize businesses according to the degree of fluctuation in their profitability. Focusing on the average and range of fluctuation in our operating income over the past 10 years, we have divided the Group’s operations into three broad business domains and are planning appropriate management and business strategies for each.

Performance Products Domain

In the Electronics Applications segment, we provide a wide range of high-value-added products, including recording media and electronics-related products. In addition, based on solid technological capabilities, the Designed Materials segment offers a range of products including food ingredients, films, polymer processing products, carbon fiber and composite materials, and inorganic chemical products.

Health Care Domain

We are working to create value as a diversified chemicals manufacturer through our mainstay pharmaceuticals as well as diagnostic reagents and instruments, clinical testing, and support for new pharmaceutical development. We are also developing fuller and more wide-ranging healthcare solutions to meet the needs of an aging society, going beyond the focus of only treating sickness to include healthcare services.

Industrial Materials Domain

The Industrial Materials domain comprises the Chemicals segment, which handles diverse basic chemical products and carbon products, and the Polymers segment, which provides synthetic resin able to meet advanced needs. Aggressively leveraging our proprietary development and manufacturing technologies as well as marketing and the collective strength of our product chain for raw materials and derivatives, we are providing global support for sustainable development.

Note: In addition to the five reporting segments above, the other business segment, which mainly comprises engineering, transportation, and warehousing operations, accounts for 6% of net sales.
### At a Glance—Portfolio by Growth Model

<table>
<thead>
<tr>
<th>Stable Businesses</th>
<th>Growth Driver Businesses</th>
<th>Volatile Businesses</th>
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<tr>
<td>These are businesses that are relatively unaffected by changes in the market and are expected to provide stable income in the medium-to-long term. We are bolstering profitability by focusing management resources, maintaining and increasing our competitive edge, boosting productivity, and expanding operations overseas.</td>
<td>These are businesses where the Group is targeting strategic sales growth. We are aiming to gain an effective share in new markets with our thorough knowledge of the business, effective investment, accelerated R&amp;D, and development and sales expansion in the new fields.</td>
<td>These are businesses in which significant volatility due to external factors is unavoidable. We are striving to limit fluctuations and ensure stable profitability by thorough cost-cutting, countermeasures against spread volatility, and readjustment of portfolios.</td>
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#### Stable Businesses
- Polyester film
- Optical PVOH film and others
- Food ingredients
- Specialty chemicals
- Engineering plastic products
- High-performance films

#### Growth Driver Businesses
- White LED lighting and materials
- Organic photovoltaic modules and materials
  - For additional details, please see Performance Products on p. 17.
- Carbon fiber and composite materials
- Water treatment systems and services
- Lithium-ion battery materials
- Organic photo-semiconductors
- Advanced performance products (AQSOA and others)
- Agribusiness solutions

#### Volatile Businesses
- Electronic and industrial films
- Fibers
- Performance molding products

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For additional details, please see Performance Products on p. 17.
For additional details, please see Industrial Materials on p. 21.
Main Products

Electronics Applications
- Recording media
- Imaging materials

Designed Materials
- Polyester film
- Optical PV0H film and others
- Engineering plastic products
- Specialty chemicals
- High-performance films
- Food ingredients
- Carbon fibers and composite materials
- Lithium-ion battery materials
- Display materials
- White LED lighting and materials
- Water treatment systems and services
- Fibers
- Inorganic chemicals

Business Lines

The Performance Products domain comprises the Electronics Applications segment and the Designed Materials segment. In these segments, we advance businesses based on unique, highly competitive products in global markets as well as products and technologies that have the leading shares of niche markets. With realizing more advanced performance, heightening added value, and customization as its key focuses, the MCHC Group combines multiple technological capabilities as it works with customers to create diverse solutions and manufacture environment-friendly products that it supplies globally.

The Electronics Applications segment capitalizes on technology for designing and processing materials and creating materials for devices to provide high-value-added products in a wide array of areas, including information and communication technology and electronics. The Designed Materials segment provides an extensive lineup of polymer processing products, film products, and carbon materials as well as products based on technological capabilities accumulated over many years in the areas of the environment, energy, designed materials for food ingredients, processing technology and combined technology for polymers, and carbon chemistry.

In the Performance Products domain, which requires products with higher quality and functionality, we depend on specific regions or suppliers for raw materials. As a result, being unable to source raw materials in a timely manner can affect business results. Going forward, however, we intend to strengthen efforts to ensure the timely development and marketing of products that reflect demand and meet the need for more advanced functionality in markets worldwide.

APTSIS 15 Step 2

Basic Business Strategies

Stable Businesses
- Expand high-performance and high-value-added businesses
- Accelerate global expansion

Growth Driver Businesses
- Nurture and develop next-generation growth businesses with an eye to the future
- Expand green businesses

Volatile Businesses
- Strengthen competitiveness through cost cutting

Fiscal 2012 Business Summary

Electronics Applications Segment

Recording media net sales decreased significantly due to the contraction of the DVD market and lower sales volumes for external hard disk drives. As for information and electronics-related materials, net sales were steady overall as sales volumes of display materials and phosphors for LEDs increased. Meanwhile, net sales of imaging supplies declined substantially, reflecting lower sales volumes of such business equipment-use printing supplies as organic photo conductor (OPC) drums and toners.

As a result, the segment’s net sales decreased ¥15.5 billion year on year, to ¥118.1 billion. However, operating loss improved ¥0.2 billion year on year, to ¥5.0 billion.

Furthermore, Mitsubishi Kagaku Media Co., Ltd., launched tuning/dimming-type organic light emitting diode (OLED) lighting panels with enhanced luminance and power efficiency in October 2012.

Designed Materials Segment

Net sales for designed materials for food ingredients trended steadily overall. As for battery materials, net sales decreased sharply due to lower sales volume, accompanying the end of substitute demand stemming from the Great East Japan Earthquake, and lower sales prices. Meanwhile, fine chemicals saw net sales grow thanks to steady sales of automobile coating materials and the inclusion of Chuo Rika Kogyo Corporation as a consolidated subsidiary in December 2011. Net sales for polymer processing products were approximately unchanged year on year, as sluggish overseas demand for non-optical polyester film sheets and engineering plastics and the sale of the piping materials business in December 2012 offset a marked increase in the sales volume of film sheets for flat panel displays (FPDs) and brisk sales of film sheets for...
touch panels. Among composite materials, while net sales for alumina fiber were generally solid, net sales for carbon fiber were down, which reflected slumping demand and falling market prices. Despite lackluster demand, net sales for inorganic chemicals were approximately unchanged year on year due to the absence of the previous fiscal year’s drop in sales volume as a result of the Great East Japan Earthquake. Net sales for fibers declined due to lower sales volume.

As a result, the segment recorded year-on-year decreases of ¥10.1 billion in net sales, to ¥689.7 billion, and ¥3.1 billion in operating income, to ¥22.5 billion.

Furthermore, Mitsubishi Plastics transferred its piping materials business to Sekisui Chemical Co., Ltd., in December 2012. In the same month, Mitsubishi Rayon decided to acquire Aldila, Inc., of the United States, which manufactures and sells carbon fiber prepreg and carbon fiber golf club shafts.

### Organic Photovoltaic Modules and Materials

We believe that in order to bequeath coming generations with a sound environment and a prosperous future, changing over from existing energy consumption that burdens the environment to sustainable new energy cycles that use nature’s bounty is essential. Aiming to provide solutions that will help society solve problems and achieve this transformation, the MCHC Group is developing a broad spectrum of materials for energy creation, energy storage, and energy saving.

**Viewpoint: MOS**

The organic photovoltaic (OPV) modules Mitsubishi Chemical is currently developing are thin sheets that can be bent or rounded into various shapes. Consequently, these OPV modules can be attached in diverse ways, including vertical walls and vehicle bodies. Due to this ability to be installed in places unsuitable for existing modules, our OPV modules make effective use of inexhaustible solar energy to generate power, helping create local production and consumption energy cycles that do not burden the environment and reduce CO₂ emissions.

**Viewpoint: MOT**

As of 2012, the OPV modules we are currently developing achieve a conversion efficiency of 11.7%—a world-leading level for organic thin-film single cells. Moreover, we are exploiting core technologies for organic synthesis and material design to combine OPV modules with barrier films and other high-performance materials to create products that are even more efficient, durable, and economic. At the same time, we are developing processing technologies, such as roll-to-roll printing, incorporating OPV devices that capitalize on the properties of OPV materials.

**Viewpoint: MOE**

While developing OPV modules as next-generation photovoltaic (PV) with numerous potential applications, the MCHC Group is creating new applications for thin-film PV modules. For example, we are pioneering markets for amorphous silicon thin-film PV modules that can be integrated with a variety of building materials, trucks, and automobiles and installed in such locations as vertical walls or truck roofs. Also, Mitsubishi Plastic is marketing high gas barrier film that continues to perform well even over long periods.

With our sights set on starting up commercial manufacturing of OPV products, we are targeting sales of ¥15 billion for OPV modules and materials in fiscal 2015.
Mitsubishi Chemical Holdings Corporation

Business Lines
Capitalizing on the Group’s comprehensive capabilities and network, the Health Care domain develops businesses for pharmaceuticals, pharmaceutical ingredients and pharmaceutical intermediates, diagnostic reagents and instruments, clinical testing, capsules for pharmaceuticals, and pharmaceutical processing equipment. Furthermore, we are taking on the challenge of combining the Group’s technology to create businesses dedicated to personalized medicine.

In healthcare businesses, we are not only strengthening our development pipeline for pharmaceuticals on a global scale but are also pursuing ambitious initiatives to respond to unmet medical needs by using biomarkers and other leading-edge technology.

Mindful that these businesses affect people’s lives and health, we are advancing health care businesses that contribute to patients’ quality of life (QOL) with a view to enable more people to live contentedly.

The pharmaceuticals business is likely to face challenging business conditions due to such factors as regular National Health Insurance (NHI) price revisions based on a government policy aimed at curbing medical treatment costs in Japan. In response, we intend to strengthen R&D further to develop new pharmaceuticals and market mainstay products overseas, thereby establishing positions in markets worldwide.

Fiscal 2012 Business Summary
Pharmaceutical net sales rose because higher net sales for Remicade, an anti-TNFα monoclonal antibody; contributions from such new products as Simponi, a treatment agent for rheumatoid arthritis (RA), and Tetrabik, a DPT-IPV vaccine; and increased royalty revenues from a therapeutic agent used to treat multiple sclerosis (MS) more than compensated for the NHI price revisions in April 2012 and the increased effect of generic pharmaceuticals. However, net sales for diagnostic reagents and instruments and clinical testing declined due to lower sales in the pharmaceutical development support businesses.

As a result, the segment’s net sales increased by ¥11.8 billion year on year, to ¥514.3 billion, but operating income declined ¥1.4 billion year on year, to ¥74.9 billion, reflecting the effect of NHI price revisions and lower revenues from pharmaceutical development support businesses.

In addition, in October 2012 Mitsubishi Tanabe Pharma launched Tetrabik, a DPT-IPV vaccine that prevents acute poliomyelitis, pertussis, diphtheria, and tetanus, for which BIKEN (The Research Foundation for Microbial Diseases of Osaka University) has obtained manufacturing and marketing approval.
Delivering Solutions to Unmet Medical Needs

While advances in medicine and pharmaceuticals have established treatments for previously incurable diseases, such as rheumatoid arthritis (RA), there are diseases for which treatments remain unsatisfactory and advances in treatment based on new pharmaceuticals are hoped for. Mindful of this, in the ethical pharmaceuticals area of the Health Care domain, we aim to launch “inspiring pharmaceuticals” that meet to unmet medical needs in global markets.

Viewpoint: MOS

Multiple sclerosis (MS) is an autoimmune disorder of unknown cause. Previously, the only pharmaceuticals for MS were interferon injections. The resulting side effects, such as reddening, induration, and other injection site reactions, caused patients significant physical and emotional stress.

In 2011, Mitsubishi Tanabe Pharma Corporation launched an MS treatment, Imusera, with a novel mechanism of action. Because it is taken once a day orally, Imusera has greatly mitigated the burden placed on patients and improved their quality of life (QOL) significantly.

Viewpoint: MOT

As a sphingosine-1-phosphate (S1P) receptor functional antagonist, Imusera has an innovative mechanism of action. Moreover, it is the world’s first oral pharmaceutical for MS. Testifying to the favorable reception of this innovation, the new pharmaceutical has received the Pharmaceutical Society of Japan Award for Drug Research and Development in March 2012, the Inoue Harushige Award from the Japan Science and Technology Agency in July 2012, and an invention award from the Japan Institute of Invention and Innovation in June 2013.

Viewpoint: MOE

We rapidly provided Imusera to patients worldwide as a new pharmaceutical by leveraging strategic alliances at an early research phase to license-out it overseas we had discovered. Overseas, Novartis Pharma AG sells this product under the product name, Gilenya. Although only two years after launch, Gilenya has already become a blockbuster—meaning it generates annual sales of at least US$1 billion. Consequently, it has made a major contribution to the Company’s royalty revenues.
**Industrial Materials Domain**

**Main Products**

**Chemicals**
- Basic petrochemicals
- Terephthalic acid
- Ethylene oxide/glycols and ethanol
- Acrylonitrile
- Coke
- High-performance graphite

**Polymers**
- Polypropylene
- Polyethylene
- Phenol and polycarbonate chain
- Performance polymers
- Methyl methacrylate and polymethyl methacrylate

**Business Lines**

The Industrial Materials domain has two segments. The Chemicals segment comprises such basic chemicals as basic petrochemicals and materials for synthetic fibers, including ethylene and propylene derived from naphtha, and coke and other carbon products. While the Polymers segment includes polyolefins and performance polymers and acrylic and its raw material methyl methacrylate (MMA) monomer. Through this domain, we provide high-value-added products and technologies with advanced functionality to an extremely wide range of areas, including electronics, automotive manufacturing, construction materials, and industrial applications.

In the Chemicals segment, our basic chemical businesses have established a diverse product chain, including a wide range of solvents and plastic products. This chain is based on our olefin center, which has heightened competitiveness by constructing an optimal manufacturing system. Furthermore, in the Polymers segment we have particular expertise in basic technology for polymer design and processing. Therefore, we exploit the superiority of our original polymer solutions to develop businesses.

The Industrial Materials domain is subject to the effect of changes in raw material prices, the balance of supply and demand for raw materials and naphtha, and exchange rate fluctuations. Furthermore, changes in demand from business customers can affect products that are reliant on specific business customers, thereby affecting the domain’s business results.

Going forward, with emphasis on self-help, we will strengthen organizations to make them less susceptible to market fluctuation. At the same time, we intend to step up the pace of globalization by optimizing regional manufacturing to reflect demand. In addition, plans call for expanding businesses that offer high-value-added products with advanced performance and creating new raw materials and industrial materials that benefit the global environment.

**APTSIS 15 Step 2**

**Basic Business Strategies**

**Stable Businesses**
- Expand global operations and shift to high-performance products
- Expand high-performance, high-value-added businesses

**Growth Driver Businesses**
- Deliver new materials that contribute to the environment and the “sustainable carbon society”

**Volatile Businesses**
- Stabilize earnings and reinforce business structure

**Fiscal 2012 Business Summary**

**Chemicals Segment**

Production volume of ethylene as a basic raw material for petrochemical products was up 16.3% year on year, to 1.13 million tons, reflecting the resumption of operations at an ethylene plant at Mitsubishi Chemical’s Kashima Plant, which were halted in the previous fiscal year due to the Great East Japan Earthquake, and periodic maintenance on a smaller scale than those of the previous fiscal year. These factors more than offset a downward adjustment in production due to lower demand. Net sales for basic petrochemicals and chemical derivatives rose year on year due to the absence of the previous fiscal year’s drop in sales volume as a result of the Great East Japan Earthquake, which counteracted slumping demand. Terephthalic acid, a raw material for synthetic fiber, saw net sales decrease significantly due to falling market prices, resulting from a softening of the supply–demand balance as supply capacity increased, and overseas subsidiaries’ recording of net sales for 15 months in the previous fiscal year as a result of a change in accounting period. Among carbon products, net sales for coke were down substantially due to lower sales prices accompanying a decrease in the price of coking coal.

As a result, the segment’s net sales declined ¥103.8 billion year on year, to ¥903.6 billion. The segment recognized an operating loss of ¥0.2 billion (down ¥15.0 billion year on year), which was primarily attributable to a significant narrowing of the difference between raw material prices and product prices for terephthalic acid.

Furthermore, as part of structural reform of the basic petrochemicals business, in June 2012 at its Kashima
Plant, Mitsubishi Chemical decided to shut down the No. 1 ethylene production facility and the No. 1 benzene production facility and ramp up production at the No. 2 ethylene production facility.

**Polymers Segment**

In synthetic resins, net sales were approximately unchanged year on year, as the absence of the previous fiscal year’s steep decline in the sales volume of phenol-polycarbonate chain and polyolefin due to the Great East Japan Earthquake compensated for a fall in market prices that stemmed from a softening of the supply–demand balance amid slumping demand.

As a result, this segment posted a ¥17.0 billion year-on-year rise in net sales, to ¥675.6 billion. However, operating income declined ¥23.6 billion year on year, to ¥0.1 billion, because a significant overall contraction of the difference between raw material prices and product prices counteracted steady sales to the automotive industry by the performance resin business.

In addition, in June 2012 Mitsubishi Chemical decided to shut down one of Japan Polyethylene Corporation’s high-density polyethylene production lines and one of Japan Polypropylene Corporation’s polypropylene production lines at the respective plants of its subsidiaries in Kawasaki. Also, in February 2013 Mitsubishi Chemical decided to acquire the thermoplastic elastomer and vinyl chloride compound operations of Tessenderlo Group with a view to strengthen the performance resin business.

**Sustainable Resources**

Using limited resources effectively, without exhausting them, so that we can pass them on to future generations is one of the tasks we must address in the current era. Aiming to contribute to the realization of a sustainable carbon society, we will draw on our extensive expertise in chemistry to diversify chemical raw materials.

**Viewpoint: MOS**

While plastic plays an important role in industrial development and society’s convenience and comfort, depletion of fossil resources—the raw material for plastic—and environmental burden are causing concern.

We see making plastic raw materials sustainable and more biodegradable as providing a solution for one of society’s problems. Accordingly, we are commercializing a variety of differentiated leading-edge plastics.

**Viewpoint: MOT**

Boasting a leading position in the global market for MMA, Mitsubishi Rayon is researching and developing a new method for producing sustainable MMA from biomass. In another initiative, MCHC is developing practical applications for an artificial photosynthesis system that produces basic chemicals by using the raw materials hydrogen—generated using photovoltaic energy and a photocatalyst to electrolyze water—and CO₂, which has increased due to human activities. This is an extremely promising solution that could help realize the sustainable carbon society we advocate.

**Viewpoint: MOE**

Mitsubishi Plastics sells plastics that use plant-derived polyactic acid as a raw material under the product names ECOLOJU and PLABIO. Used to make packaging materials and various plastic cards, these plastics have earned a favorable reputation among customers with high environmental awareness. Meanwhile, Mitsubishi Chemical’s biodegradable polybutylene succinate (PBS) is increasingly being adopted for single-use plates and garbage bags. Furthermore, we are growing sales of a new engineering plastic called DURABIO that uses plants as a raw material.

Through all of our sustainable resources businesses, we aim to generate sales of ¥10 billion in fiscal 2015.