Innovation strategy

Growth through new business creation projects and Smart Materials

Koichiro Magara
Director and Executive Officer,
Head of Research & Development Division
Sakai Chemical Industry Co., Ltd.

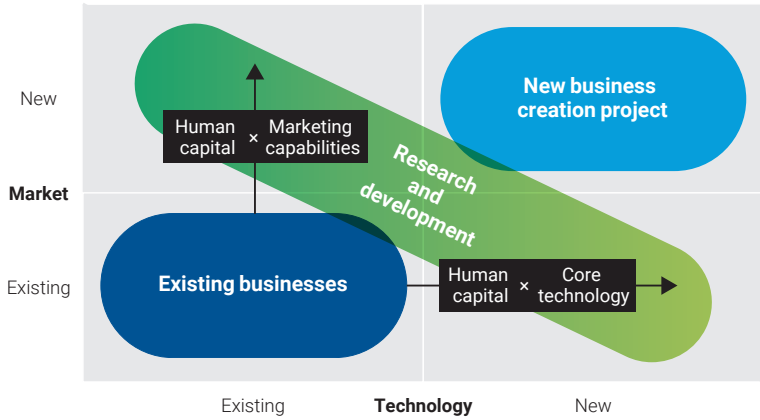
Over the next three years, the Sakai Chemical Group will focus on our electronic materials business, cosmetic raw materials business, and organic chemicals business. To achieve our goal of becoming an excellent company capable of contributing to society with Smart Material, it is essential for us to create new businesses to augment existing businesses. Until now, the Company had based development on materials used as our products. In the future, we will accelerate our solution-based business for solving customer issues based on the core technologies of the Sakai Chemical Group. With this goal in mind, the Company will strengthen marketing activities aimed at collecting information from the market. Based on the collected information, we will challenge ourselves to create innovation through two pillars: research and development utilizing the core technologies of the Sakai Chemical Group and projects for creating new businesses. The Company will reform our organization to create new businesses that will lead the Sakai Chemical Group going forward. We will focus our management resources on strengthening marketing and short- and medium-term priority themes.

We will also build relationships with customers through research and development, pursue expanding markets into the next business domain, and lead the way in creating Chemistry for a Friendly Future.

Smart Materials

The Sakai Chemical Group aims to be an "excellent company capable of contributing to society with Smart Material" in the three fields of environment and energy, electronics, and life sciences and healthcare. In these three fields, Smart Materials are products and services that meet evaluation criteria in two areas: "degree of contribution to our ideal future" and "degree of contribution through the Sakai Chemical Group's technology." The degree of contribution

Initiatives for innovation



of each developed product and service is evaluated and reviewed by our Research and Business Steering Committee, and the Sustainability Committee certifies it as a Smart Material. We have set the following KPIs to achieve by 2030: sales of ¥2 billion in research and development products and services, gross profit margin of 50%, and launch of five products and services certified as Smart Materials.

Instead of simply pursuing profits, the Sakai Chemical Group places importance on solving environmental and energy problems, as well as reducing energy consumption and waste during manufacturing.

Fostering awareness toward commercialization

People are at the heart of creating innovation. It is important to cultivate promoters who plan strategies and lead projects to commercialization.

At the Sakai Chemical Group, our basic human resource development policy is to heighten awareness toward commercialization. Cultivating themes and progressing through the research and development stage at the Research and Business Development Department is an experience that increases awareness toward commercialization. Of course, a sales perspective is also required. Accordingly, as an initiative for fostering a culture of awareness toward commercialization, the Company has placed diverse human resource in our Research and Business Development Department, which we established in 2021.

New business creation project (Kachi-Pro)

With the aim of creating new businesses that are not limited by existing businesses, we have launched a project named Kachi-Pro for implementing the unprecedented concept of *kachi* creation marketing. *Kachi* is a Japanese word which means both "value" and "victory." *Pro* is an abbreviation for "project." Our goal is to capture 30% of the ¥10 billion global market by 2030 and create three businesses with an operating profit margin of 30%. We are refining our selection of promising themes based on Sakai Trading Co., Ltd.'s agility in entering new businesses and Sakai Chemical Industry Co., Ltd.'s knowledge of chemistry. With capital investment (including M&A) in mind, we will discuss monthly progress with our president and achieve steady business creation.

Leveraging group synergy

When pursuing the creation of new businesses, we gather a huge amount of information and search for business seeds every day.

We will continue to cooperate with many parties to give birth to wonderful businesses.

Norimune Hirata
Sakai Chemical Industry Co., Ltd.

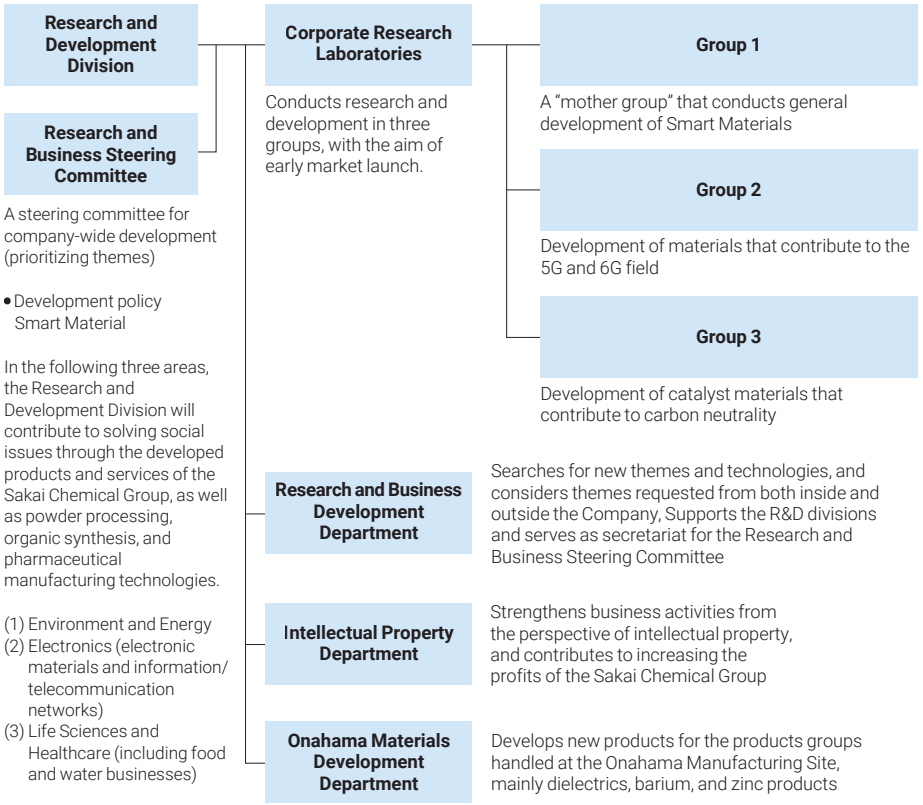
Hiromasa Kawaminami
Sakai Trading Co., Ltd.

Organizational structure of the Research and Development Division

Sakai Chemical Industry Co., Ltd. serves as the innovation center for research and development in the Sakai Chemical Group. In 2021, we established a new Research and Business Development Department. The main aim of the Company's organizational change is to transform from an organization that conducted development based on seeds, such as materials, to one that conducts development based on information on needs from the market. Previously, we had mainly received information on needs from the sales divisions. However, by integrating part of the sales divisions into the Research and Development Division and collaborating with the Research and Business Development Department, we are able to more smoothly incorporate information from outside the Company.

The Research and Business Steering Committee determines the priorities of R&D themes and selects focus areas. Currently, the areas of focus are 5G and 6G materials, catalyst materials related to carbon neutrality, and organic materials related to organic sulfur compounds. The Company has created a system in which three groups will promote development on themes identified by the Research and Business Development Department. For 5G and 6G materials, the Research and Business Development Department will propose themes and the Corporate Research Laboratories will assign dedicated personnel to advance development. Business growth is expected in the area of catalyst materials related to carbon neutrality. The Company has supplemented the dedicated personnel at the Corporate Research Laboratories with additional personnel from the catalyst business, and established a system in which the Research and Development Division leads development. For organic materials related to organic sulfur compounds, we established a system for accelerating R&D by integrating SC Organic Chemical Co., Ltd. into Sakai Chemical Industry Co., Ltd.

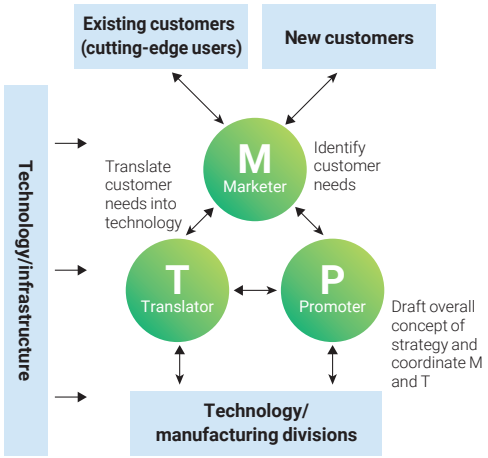
Research and Development Division organization chart (research and development structure)



Strengthening marketing

Previously, our development had focused on existing products of Sakai Chemical Industry Co., Ltd. However, the Company is now identifying the necessary materials according to market demands and exploring themes in which the Sakai Chemical Group's technologies can be utilized. By incorporating a marketing perspective, we will strengthen the functional collaboration of MTP (M: Marketer, T: Translator, P: Promoter). The Research & Business Development Department fulfills a central role in this transformation. The department formulates business strategy hypotheses and increases their accuracy through verification activities with existing and potential customers. At an early stage, the department considers hypotheses for business strategy. Based on technological trends and customer trends, we will confirm the situations of our customers, the products and services we offer, the added value we can provide to our customers, and barriers to entry for our competitors. Confirming these areas enables the department to create research themes that utilize the Company's strengths.

MTP concept

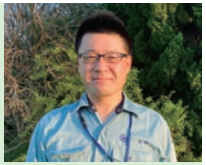


Role	
M Marketer	**Understand the market and needs** ● Obtain insight into market changes ● Establish contact points with new customers ● Understand the market/industry and customer needs
T Translator	**Translate into technology** ● Translate customer needs in an easy-to-understand manner from a technical perspective ● Convert company merchandise and technologies into added value and differentiation
P Promoter	**Strategic prioritization and involvement of other divisions** ● Control overall activities through unique discernment ● Maintain a high-level perspective on business and management ● Plan and promote business model transformation

Source: Diagram created based on Knowledge Creation and Integration (April 2016 issue, page 63), Nomura Research Institute

Commercialization and innovation

The Research and Business Development Department is considering commercialization for over 30 development themes and selecting the most promising ones. The department also organizes corporate networking events to explore the seeds (technology and know-how) of innovation by combining our customers' technologies and issues with the technologies of the Sakai Chemical Group.

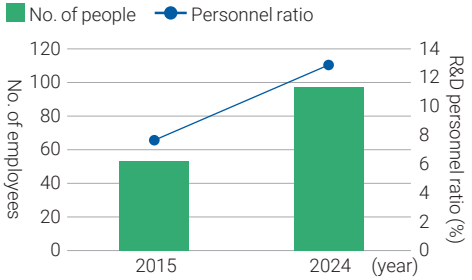


Yuichi Kimura
Sakai Chemical Industry Co., Ltd.
Research and Business Development Department

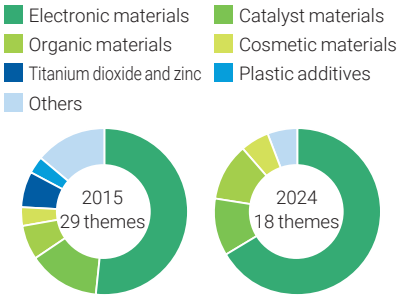
Trends in R&D investment and development theme portfolio

In order to focus investment on specific themes which should be addressed, Sakai Chemical Industry Co., Ltd. has consolidated the development organizations of its business divisions into the Research and Development Division and assigned priorities to themes. Compared to fiscal 2015, we increased the number of employees in the R&D divisions by 5% and narrowed down the number of themes to two-thirds.

Trends in R&D personnel



Trends in research themes



Stage gate management system

The Corporate Research Laboratories uses the stage gate method to manage R&D themes. The institute sets and reviews requirements for passing each stage. From fiscal 2023, the institute set stricter timescales and continues to set the number of stage changes as a KPI to prevent stagnation in stages.

Theme progress management using the stage gate method

If a theme clears the requirements for each stage (development stages), it can proceed to the next stage.

Development stages	Name	Content (excerpt)
ST-0	Explore themes, create ideas, and conduct research	Investigate whether or not the theme is feasible with the Company's technology and products Prior technology: research patents and identify markets (estimate)
ST-1	Consider themes to be raised, conduct beaker test	Conduct preliminary experiments, performance evaluations, and competitive product research and comparison; set target performance; estimate production cost
ST-2	Conduct lab experiments and small-scale manufacturing tests	Provide samples to customers and collect feedback; extract mass production specifications and issues; design mass production equipment
ST-3	Consider increase in scale and begin full-scale development: perform bench plant testing	Establish quality standards for mass-produced products with scaled-up prototypes
ST-4	Consider transfer to actual production and conduct full-scale development: transfer to plants	Identify manufacturing and technical issues/measures for full-scale production

Voice of researchers

Toward the realization of a 5G/6G society

Hiroki Tanikawa

Corporate Research Laboratories
Sakai Chemical Industry Co., Ltd.

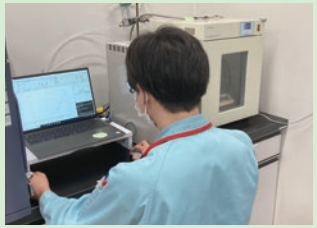
The evolution of semiconductor technology is essential to realizing the high-speed communications that support society. The institute is contributing to the evolution of semiconductor technology through powder processing technology. High-speed communications require even lower transmission loss, so we are working to lower the dielectric tangent of powder.

Aiming for carbon neutrality

Yuki Kohama

Corporate Research Laboratories
Sakai Chemical Industry Co., Ltd.

The institute is developing a water electrolysis catalyst that uses renewable energy to generate hydrogen from water. Through the Sakai Chemical Group's catalysts, we seek to achieve "affordable and clean energy." Our team is working every day to realize a hydrogen society.



SAKAINNOVATION Presentation

The Sakai Chemical Group holds the SAKAINNOVATION Presentation every year with the aim of creating new innovations through interaction within the Group. In 2023, eight oral presentations and 23 poster presentations were held. Experience with various technologies and initiatives leads to collaboration within the Group, and helps sprout the seeds (technology and know-how) of many innovations.

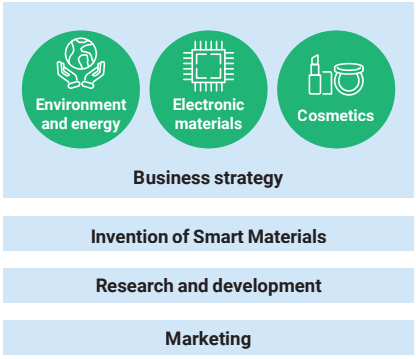
Presentation being held

Intellectual property strategy

Sakai Chemical Industry Co., Ltd. works to promote the establishment of intellectual property rights, manage intellectual property based on business strategy, manage intellectual property risk, and utilize intellectual property information. One effort to align business strategy and intellectual property management is the intellectual property meetings that are held regularly with the research and development team. These meetings are held to check whether or not the patents held are consistent with our business strategy. From 2023, we will focus on patent mining by using the CyberPatent Desk system provided by Cyber Patent, Ltd.

Initiatives related to intellectual property

Chemistry for a friendly future



Total management of intellectual property (IP)

- IP management based on business strategy (IP meetings)
- IP risk management
- Utilization of IP information
- Promotion of establishing IP rights
- Strengthening IP literacy (seminars and IP Times)
- Utilization of IP information

Strengthening intellectual property intelligence

To strengthen intellectual property intelligence, the Company is working to enhance intellectual property education, train personnel on using databases, and publish the Intellectual Property Times. We held three training sessions to promote the use of the CyberPatent Desk system that the Company had already introduced in fiscal 2023.

Before visiting customers, we conduct trend surveys of customer patent applications. This aids us in creating innovation with customers. The Intellectual Property Times is a newsletter which aims to make people more familiar with intellectual property. We launched the newsletter in 2022 and have currently published 10 issues.

Example of page in the Intellectual Property Times