

AsahiKASEI

Intellectual Property Report 2023

Asahi Kasei Group

Asahi Kasei Corporation

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We, the Asahi Kasei Group,
contribute to life and living for
people around the world.

Note

The scope of this report is Asahi Kasei Corp. and its consolidated subsidiaries. The plans, forecasts, and strategies described in this report are based on information available at the time of its preparation and represent our future outlook. These plans are reviewed based on changes in the business environment and progress in technological innovation, and do not represent a commitment or guarantee of future plans or results.

Message from the President



President and Representative Director

工藤 幸四郎

In fiscal 2022, we started our three-year medium-term management plan for fiscal 2024 focused on the theme “Be a Trailblazer,” and we are just now at the mid-point of the plan. The global economy is currently difficult to predict, and we are urgently pressed to address complex geopolitical risks and environmental issues. It is becoming increasingly difficult to steer the Company in this environment.

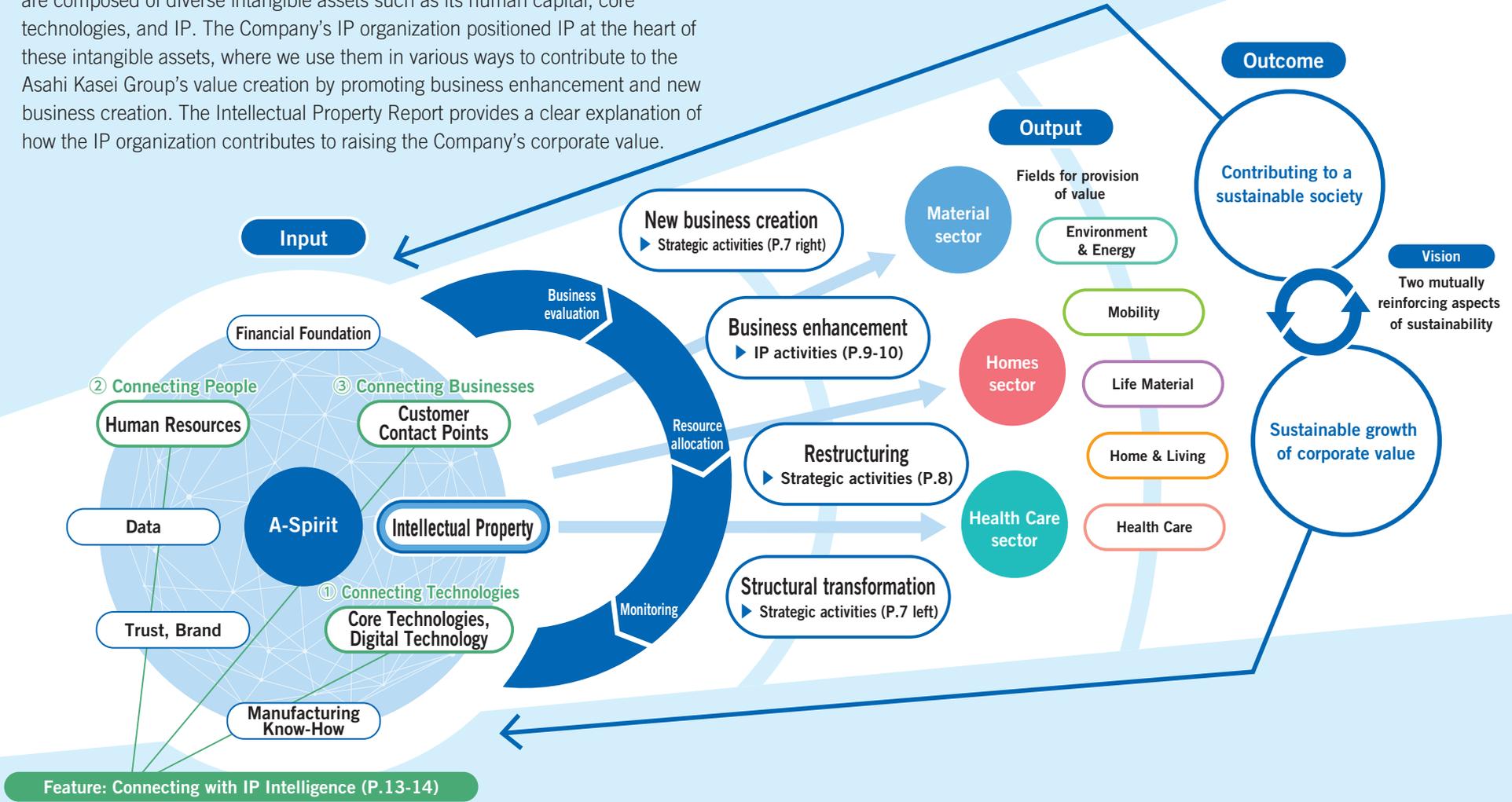
In particular, it is essential for Japanese companies to review their strategies with a view to future developments. A new approach is required for responding to a changing environment and maintaining competitive advantage. Under these conditions, it has become even more important to deploy a management strategy that effectively utilizes intellectual property and intangible assets. Japanese companies have their own knowledge and brand value cultivated through years of research and development and technological innovation. These need to be leveraged to retain a distinct identity and competitive advantage in the face of international competition.

The Company also views these changes in the management environment as an opportunity to leap forward into the future. We will look to utilize our intangible assets to an even greater extent, such as reevaluating the importance of IP and strengthening our competitive advantage through human resource development. By combining these elements, we will build a robust business model that I believe can achieve sustainable growth.

In this report, we will move between examples in the three sectors of Material, Homes, and Health Care to clearly explain how the Company’s IP activities contribute to increasing its corporate value. I hope that the report will help to further your understanding of the Company’s IP strategy.

Position of IP Within the Value Creation Model

In the Company's value creation model, the Asahi Kasei Group's growth sources are composed of diverse intangible assets such as its human capital, core technologies, and IP. The Company's IP organization positioned IP at the heart of these intangible assets, where we use them in various ways to contribute to the Asahi Kasei Group's value creation by promoting business enhancement and new business creation. The Intellectual Property Report provides a clear explanation of how the IP organization contributes to raising the Company's corporate value.



Intellectual Property of the Asahi Kasei Group

IP Organization of the Asahi Kasei Group

The Company's IP organization comprises two bodies: Corporate IP, which is established within Corporate Research & Development, and the Intellectual Property Intelligence Department, which was established under the Executive Officer for Corporate Strategy in fiscal 2022. Corporate IP helps to maximize the value of the Company's core technologies and brands—the sources of its corporate value—by managing and utilizing their IP. The Intellectual Property Intelligence Department takes a cross-divisional company-wide approach to contribute to strengthening the strategic functions that utilize IP and intangible assets. The two IP organizations collaborate to help maximize the value of the Company's IP and intangible assets.

➤ Sustainable IP Goals (SIPGs)

Our IP Organization, as a whole, operates under the mission of “Protecting profits and maximizing the value of businesses by providing support corresponding to evolving business environments with IP expertise.” Considering this to be a permanent mission, we have named it our “Sustainable IP Goals (SIPGs).”

➤ Mission of Corporate IP

While enhancing strategic functions for SIPGs, Corporate IP operates with the mission of strengthening activities for SIPG 1 through 5, the five focus activities it has pursued thus far.

➤ Mission of the Intellectual Property Intelligence Department

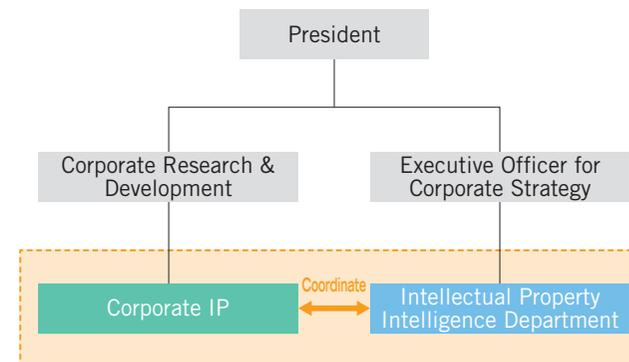
The Intellectual Property Intelligence Department's vision is “to realize further increase in corporate value through intangible assets,” based on activities that contribute to management and business strategy formulation within the SIPGs. The department is engaged in the following two missions, using IP Landscaping (IPL) as a tool.

1 Based on the standpoint of an IP expert, the Intellectual Property Intelligence Department designs strategy models that utilize intangible assets, and uses IP to contribute to the formulation of management strategy models and business models and to the creation of new businesses.

- 1) The Intellectual Property Intelligence Department provides corporate management planning functions with strategy models and information that contribute to promotion of the medium-term management plan
- 2) The Intellectual Property Intelligence Department provides specific proposals to each strategic business unit to aid in the evaluation of business models.

2 By disclosing IP information that contributes to enhanced corporate value, the Intellectual Property Intelligence Department strengthens relationships with stakeholders.

IP Organization



Mission of the whole IP Organization: SIPGs

SIPGs	Protecting profits and maximizing the value of businesses by providing support corresponding to evolving business environments with IP expertise	
Strategic functions	0 Contributing to the formulation of business strategies and IP strategy	
Focus activities	1 Construction of an IP network that contributes to businesses based on a scenario for IP rights utilization	2 IP clearance to assure business execution
	3 Implementation of IP activities to support globalization of businesses	4 Contribution to business innovation, from the perspective of IP, by digital transformation
	5 Implementation of systematic human resource development plans over the medium- to long-term	

The Process from IP Activities to Corporate Value Increase

Activities related to IP and intangible assets based on the mission of our IP organization are connected to corporate value through various business activities. To illuminate how this connection exists and contributes to increasing corporate value, we have mapped out the process from the Company's IP activities to increasing its corporate value. Considering this process, we can clearly observe a structure in which the Company's IP activities contribute to increasing corporate value by strategic activities supported by the IP foundation and IP procedures and utilization.

As an example, (1) IPL analysis of the industry contributes to formulation of business strategy. Next, to realize this strategy, (2) we formulate an IP strategy and through strategic use of rights, (3) increase the value provided to customers, which contributes to increasing corporate value.

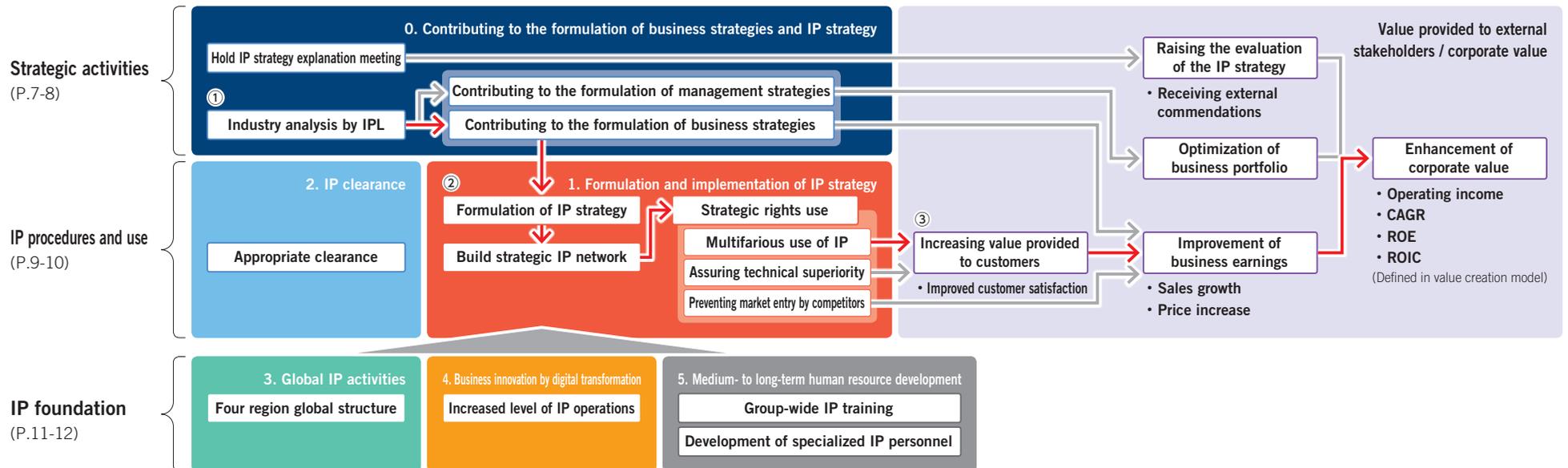
In addition, stakeholders today expect a clear presentation of how a company's IP and intangible asset investment and utilization is connected to and contributes to its management and business indicators. Our expression of this process also helps to meet such needs.

Verification of the process of increasing corporate value through IP activities

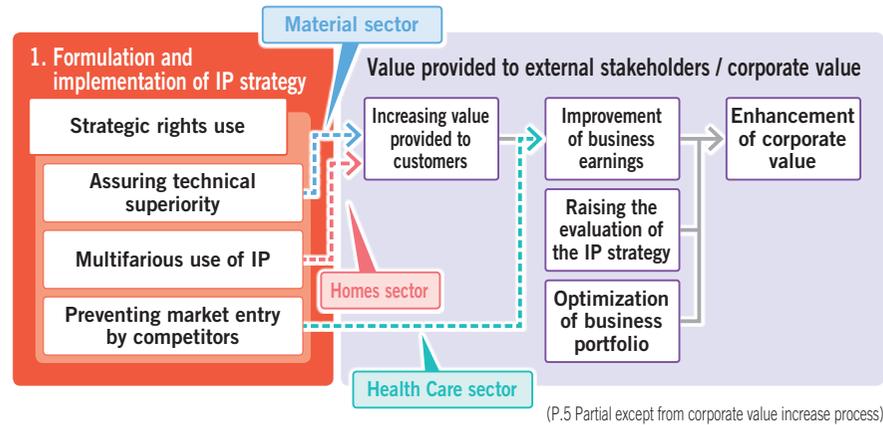


We have conducted an objective verification of our process of corporate value creation through IP activities with the cooperation of external specialists (ABeam Consulting Ltd.) We focused in particular on the connection from IP activities to corporate value, examining it to ascertain the presence of a mutual relationship between the two. We evaluated the authenticity of the process.

The connection between IP activities and increase in corporate value is broadly seen in two processes. The first is to contribute to management and business strategy planning by conducting industry analysis with IPL, and the second is to help increase business earnings by strategically using rights in accordance with the IP strategy, based on these management and business strategies. In verification with outside specialists, for example we confirm the existence of a correlation with regard to the connection from strategic use of rights (patent value evaluation) to an increase in business earnings (net sales).



Characteristics of Corporate Value Increase Process by Business Sector



The connection from strategic rights use to increased corporate value in the corporate value increase process has different characteristics in each business sector due to the different market environments and trading practices. The Company's IP organization builds and executes IP strategies with different characteristics for each business sector.

Utilization of IP expertise related to multiple business domains

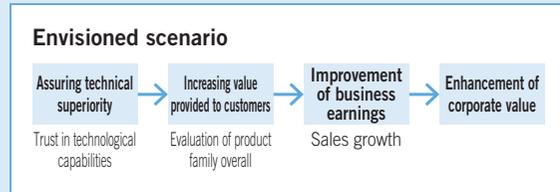
The Company's IP organization has the IP expertise to handle multiple business sectors, enabling flexible revision of the IP strategy in response to changes in the market environment. Going forward, as it promotes new businesses across multiple business sectors, for example combining the Homes sector and the Material sector, the Company will utilize its IP expertise in each sector and focus on building systems and strategies for maximizing IP value.

Characteristics of the Material sector

In the Material sector, one of the important factors for business activities is obtaining customer trust for the Company's technological capabilities. Customer trust in the Company's technological capabilities helps to enhance the overall evaluation of the Company's products, leading to increased business value.

We estimate the future value (needs) of the customer and continue to provide new value, thereby winning trust in the Company, and further eliciting needs as we build sustainable relationships through a beneficial cycle.

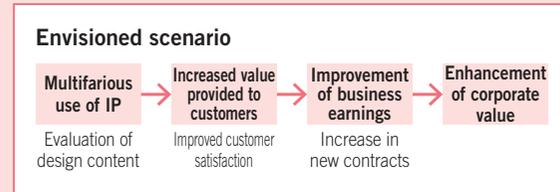
By strategically obtaining and preserving IP rights for the new technologies (inventions) that are continuously produced by the Company, we can further enhance customer trust in our technological capability, which contributes to increased corporate value.



Characteristics of the Homes sector

In the Homes sector, customer satisfaction is an important factor for business activities. Analyzing the results of survey of customers who purchased the Company's homes with a focus on technical elements, customers who gave a high evaluation of the Company's technologies (design content) were found to have a high overall degree of satisfaction, which indicates that the Company's technological excellence is helping to improve its business activities.

The Company's technologies (inventions and designs) and brands contribute to customers' satisfaction levels. We protect them using an IP strategy that combines patent rights, design rights, and trademark rights, and contribute to the increase of corporate value by providing customers with value that is unique to the Company.



Characteristics of the Health Care sector

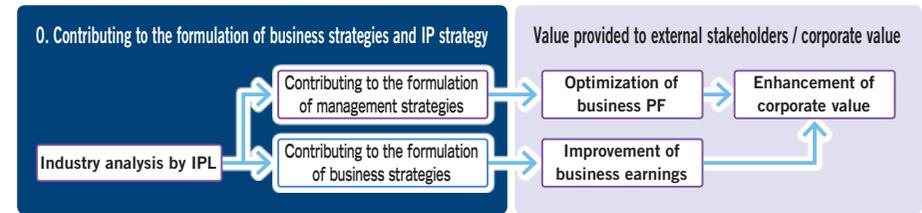
In the Health Care sector, particularly in the pharmaceutical field, IP rights are directly related to business activities, and strategic acquisition of patent rights is essential for business continuity. The Company strategically builds groups of patents for each pharmaceutical product that it is researching and developing, and strives to maximize the profit it can receive as an original product manufacturer, which contributes to increased sales performance.

Furthermore, through communication between the Company and Veloxis Pharmaceuticals, Inc., we will contribute to maximizing the profits received as a global specialty pharmaceutical company by sharing both company's knowledge and strategies.



IPL Contributing to the Formulation of Business Strategies

In portfolio transformation, which is an important element of the Company's medium-term management plan, taking an overview of technology and business using IPL contributes to verification of management strategy. Furthermore, in formulating commercialization strategies, analyzing the Company's competitive position using IPL contributes to increasing the effectiveness of the Company's strategies.



Contributing to business portfolio optimization

The Company utilizes intangible assets not only for the creation of new businesses, but also for the strengthening and structural transformation of existing businesses. When making the decision to establish a joint venture in the spunbond nonwovens business, we identified a way to outperform the competition through a combination by utilizing IP information (IP landscaping), among other means.

The figure below is an overview map of the two companies' patents. Each dot represents one patent. A close distance between the dots shows that their technological content is similar. Through various analyses of IP information, including this overview map, we showed objectively that technological synergies existed between the two companies. We also conducted a simulation of the advantages of the two companies over their competitors if they were to combine the businesses. Through this approach, we made strategic decisions to realize a structural transformation of its business.

Evaluation of technologies possessed by major players

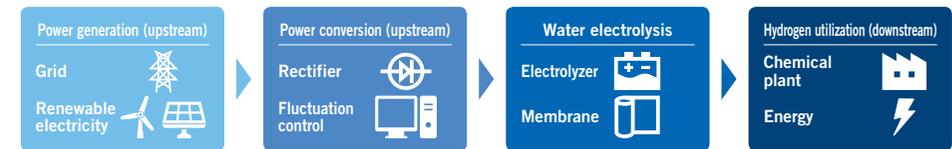


Contribution to accelerating commercialization

By analyzing IP information and other publicly available information, we are able to organize elemental technologies for each value chain that makes up our business, and we are also able to identify the key players in each technology element. Moreover, we can use the number of patents and patent scores, which are IP information, to ascertain the technological strengths and weaknesses of each player.

For example, the hydrogen business value chain can be organized as shown in the figure below. From this analysis of strengths and weaknesses, we are able to see that the Company is the only one with technology 4 related to water electrolysis, and that this is a strength that is absent in other companies. It therefore appears to be important to utilize this strength. Furthermore, the Company does not possess technologies 7 and 8, which are possessed by companies A and D. Therefore, co-creation with these companies should accelerate commercialization.

Value chain of hydrogen business (example)



Evaluation of strengths and weaknesses of major players

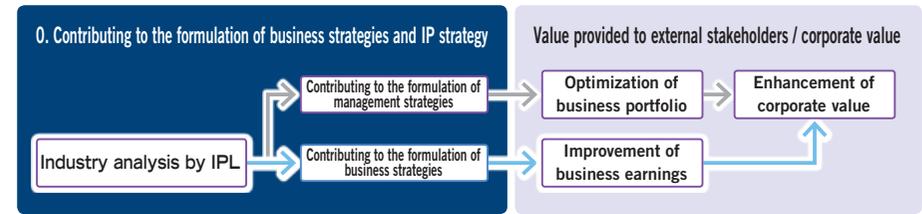
	Upstream side			Water electrolysis			Downstream side		
	Technology 1	Technology 2	Technology 3	Technology 4	Technology 5	Technology 6	Technology 7	Technology 8	Technology 9
Asahi Kasei		○		○		○			○
Company A	○	○					○		
Company B					○	○			
Company C		○			○				
Company D			○					○	

Strong point of the Company

Prospective partners

IPL Contributing to Increased Earnings

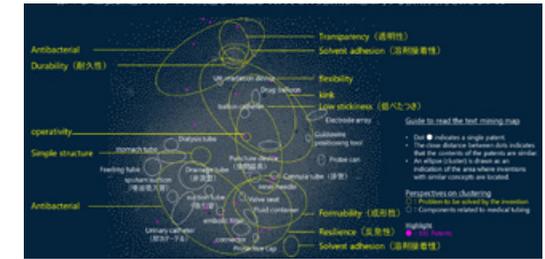
IP information is also used in formulating and promoting marketing and development strategies, which are the execution phase of business strategy. It contributes in areas such as identifying promising customers for the Company's products based on customer candidates' IP information.



➤ Exploration and identification of promising customers

We can identify the materials currently used by customer candidates through analysis of patent information and general information on potential customers of the Company's products. Moreover, as we are also able to explore materials that might be used in the future based on patent information, we can also explore potential customers for the Company's products. We identify promising customers by comparing information on customer candidates with front-line information of marketing personnel.

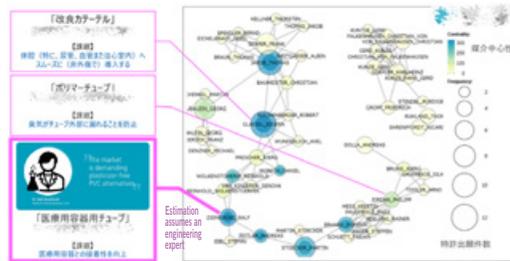
to the characteristics of the Company's products that deliver solutions for these customers' technological issues, and have them understand the value that the Company can provide, leading to new business development.



➤ Identification of technology key persons

To ensure correct evaluation of the value of the Company's products it is essential to have dialogue with engineers with high-level expertise at the customer company. By analyzing the inventors of the customer company's patents, we can ascertain the network structure of engineers at the company and identify the core engineers in its technology development (technology key persons).

By building up communication with technology key persons, we can ensure a fair evaluation of the value provided by the Company's products, which can lead to business transactions.



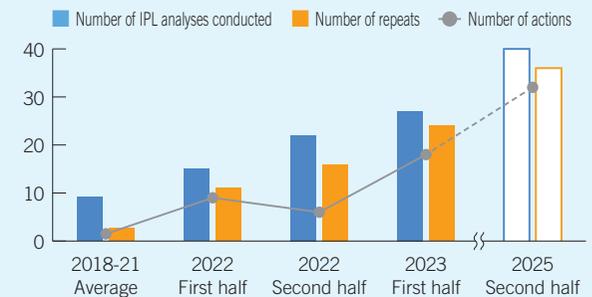
➤ Development of new business by identifying customers' important technological challenges

By analyzing the patent information of target customers and visualizing their technological challenges, we are able to grasp what value the customer needs to have provided. In addition, by narrowing down specific technology key persons as targets for analysis based on network building by engineers as mentioned above, we are also able to identify technological challenges that are especially important to customers. We appeal

Value of contribution of IPL to corporate value increase

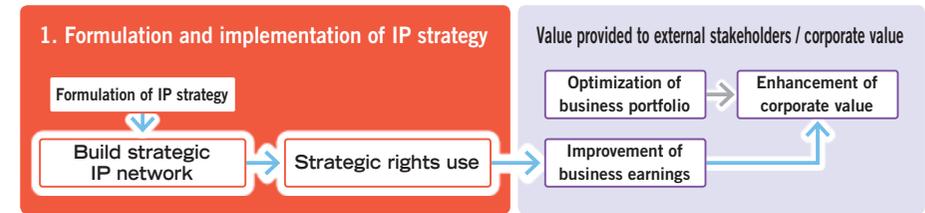
The Company has set KPIs for the contribution of IPL to formulation of management and business strategies, one of the IP activities that is closely connected to increasing corporate value. The level of contribution of IPL is measured by focusing on three essential elements: volume, quality, and productivity. Specifically, volume indicates the number of IPL analyses conducted, quality is evaluated by the repeat rate and action rate, and productivity is calculated as the number of IPL analyses conducted per analyst. By incorporating the quality perspective, the indicator accurately reflects the level of

contribution to business activities and also corporate activities. The Company aims to further increase the level of contribution of IPL to increasing corporate value, having set a target of at least double the level of FY2022 for FY2025.



Initiatives Related to IP Procedures and Use

In the area of IP procedures and use, we will formulate IP strategies in accordance with the business environment and strategy, then build strategic IP networks to utilize rights. Continuously reviewing the business environment and reflecting it in IP activities contributes to sales expansion and the creation of new business.



Initiatives for maximizing IP value

IP value maximization cycle

At Asahi Kasei, to build a patent portfolio that contributes to our business and to maximize our IP value, we run an **IP value maximization cycle**. This cycle consists of five activities, and in each area of activity, we always work with an awareness of the contribution to our business. By implementing this cycle continuously, we aim to build the optimal portfolio for the business environment.

1. Formulation of IP strategy

Formulation of IP strategy in accordance with business environment and strategy

2. Application of IP rights (patents/design/trademarks)

Construction of a strategic IP network (patent network) based on IP strategy

3. Addition of value / Creation of rights

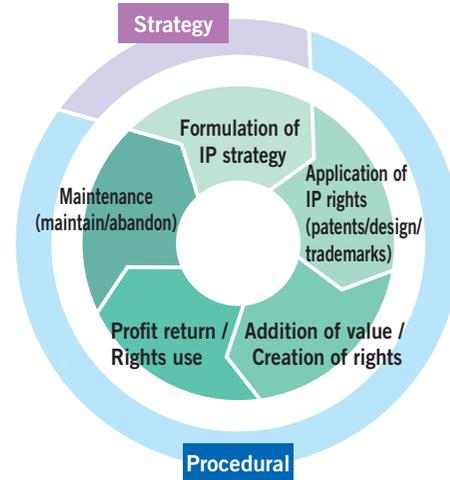
Acquisition of rights that contribute to business

4. Profit return / Rights use

Rights use aimed at profit return (litigation, licensing, etc.)

5. Maintenance (maintain/abandon)

Reviewing rights (maintaining/abandoning) to optimize portfolio



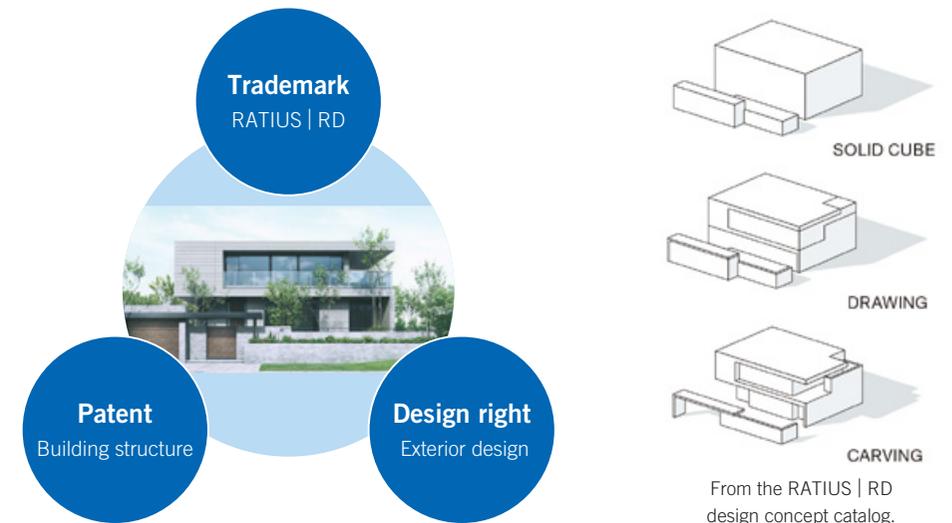
Diversification of business

In recent years, business has been diversifying, including a shift from selling products to selling services, and co-creative business across organizational boundaries. Asahi Kasei is building an IP strategy that aligns with the business model for contributing to new business creation.

Strategic IP network building case study: IP rights mix for RATIUS | RD®

The Company proposed and executed an IP mix strategy for the Hebel Haus RATIUS | RD, a 50th anniversary commemoration product of Asahi Kasei Homes. The strategy was comprised of patents, design rights, and trademarks and aimed to ensure stable sales and protect and strengthen the brand by preventing copying, including variations.

Details of protected rights	Details
Patents: Building structure	New housing frame “Heavy Steel Seismic Control Dual-Tech System Rahmen Structure”
Design rights: Exterior design	Design variations according to customer needs
Trademarks: RATIUS RD	A new product brand for two-story homes



➤ Rights use case study

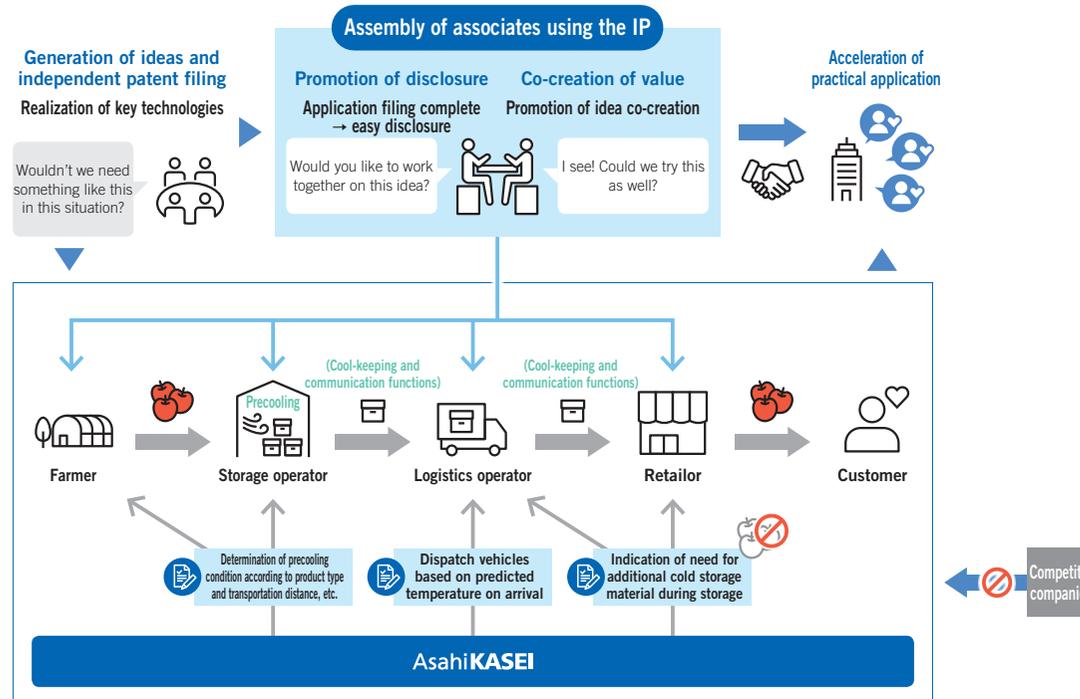
Accelerating co-creation of new business—Fresh produce delivery support service Fresh Logi®

The Company is promoting commercialization of Fresh Logi, a service for delivering shipped fresh produce efficiently to retailers without losing its freshness. With the concept of “reducing food loss and CO₂ emissions,” the service aims to provide value to society through co-creation of supply chains closely related to multiple industry types, including storage, logistics, and retail.

To bring together partners from different industries and achieve commercialization quickly in this way, the Company needs to realize the necessary technologies for mutual cooperation as quickly as possible.

In the development of Fresh Logi, Corporate IP participated actively from the concept stage, filing for patent rights on the key technologies for supply chain co-creation to bring the idea from a simple concept up to application level, and clarifying the sales points for the Company’s service to help advertise and coordinate them. By filing patent applications for key technologies at an early stage, it was possible to disclose information outside the Company, which led to early successful formation of partnerships, and trials are now proceeding steadily towards commercialization.

We will continue IP activities that contribute to cooperation between different industries in order to enable the co-creation of new social value.



➤ Rights use case study

Design of a lithium-ion capacitor next-generation energy storage device and manufacturing technology license activities

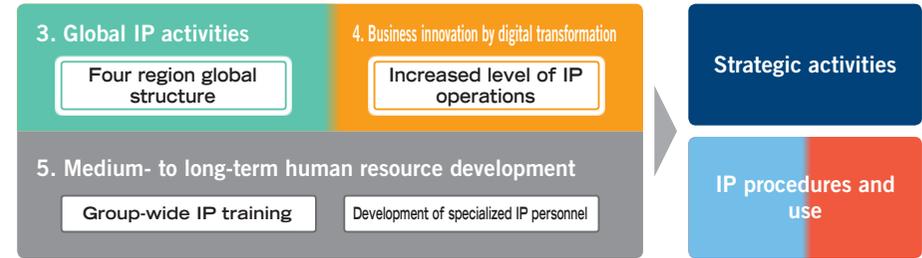
The Company has started licensing activities for the design and manufacturing technology of a lithium-ion capacitor (LiC). This technology, centered on the Company’s proprietary lithium pre-doping technology, enables the manufacture of an LiC with high capacity and input/output characteristics at low cost using generally available materials and equipment. The patent and technological expertise form a license package, which can shorten the development period for licensees in Japan and overseas. Demand for LiCs is increasing in applications such as electric mobility and renewable energy storage systems. We will support the adoption of LiCs and development of their applications to help realize a sustainable society.



- Asahi Kasei’s proprietary lithium pre-doping
 - ➔ Increased capacity and input/output performance
- Enables manufacture of low-cost LiCs using generally available materials and equipment
- In the field of electric mobility, cycle life can be extended, while in renewable energy storage systems, the combined use of LiCs can extend the life of lithium-ion batteries.

Initiatives Related to Strengthening the IP Foundation Function

To strengthen the foundation supporting IP activities that lead to corporate value increase, we are working to build a global IP system and to increase IP operation efficiency using DX. The Company is building a global IP system by dispatching employees on assignment to the three regions of Europe, the United States, and China. In addition, we are developing IP specialists in each country through human resource rotation. Moreover, we are increasing the level of IP operations by promoting DX, such as the introduction of AI technology.



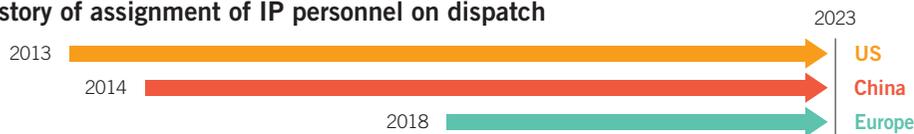
➤ Establishment of a four region global structure

Since the mid-2000s, the Company has been working to strengthen its global IP capabilities by dispatching IP Department personnel to front-line locations, centered on Europe and the United States. As the share of overseas business has grown, it has become more important to deal with IP tasks overseas, (dealing with M&A, contribution to business expansion through IP rights use, support for activities of local subsidiaries, etc.). We have therefore built a four region structure comprising the United States, China, Europe, and Japan, starting with the dispatch of personnel on assignment in the United States in 2013.

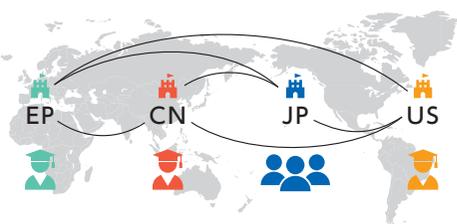
Since the business environment is different in each area, by responding to the inherent IP issues of each area and communicating IP and business information from each area to Head Office in Japan, we are helping to increase the level of the Asahi Kasei Group's global IP strategy.

Furthermore, through overseas assignment activities, we will develop IP human resources with a global business perspective, and increase such human resources by rotating their assignments. In this way, we will realize the formulation of IP strategies with an awareness of overseas business at Head Office in Japan.

History of assignment of IP personnel on dispatch



Four region global cooperation



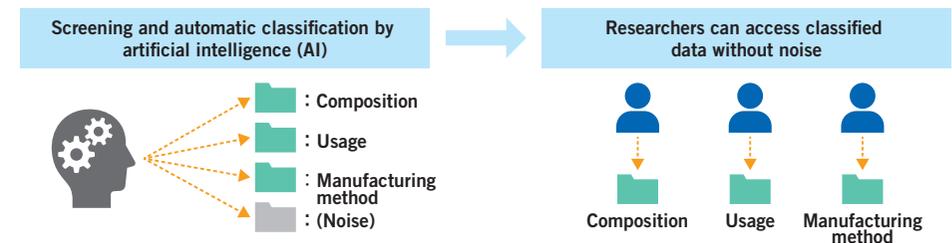
➤ Increased level of IP operations

The Company started construction of a full-fledged internet technological information search system in earnest in 2004, aiming to provide an IP database that can be freely used by researchers, engineers, and people in charge of patents. We conducted pre-filing prior technology surveys, freedom-to-operate (FTO) surveys to prevent infringement of other company's rights, technology trend surveys, and selective dissemination of information (SDI) surveys, using various kinds of patent search databases with functions such as patent search, SDI, and sharing of information with business departments, R&D departments, and Corporate IP.

Recently, in our patent screening operations, we have been conducting screening and automatic classification using artificial intelligence (AI). Researchers are able to access pre-classified data (for example data classified by invention) without noise. Therefore, the time spent in screening operations can be allocated to higher-level operations such as R&D and other IP operations. Furthermore, we introduced AI-powered IP search tools into the system, creating an environment where researchers can conduct patent information searches more efficiently.

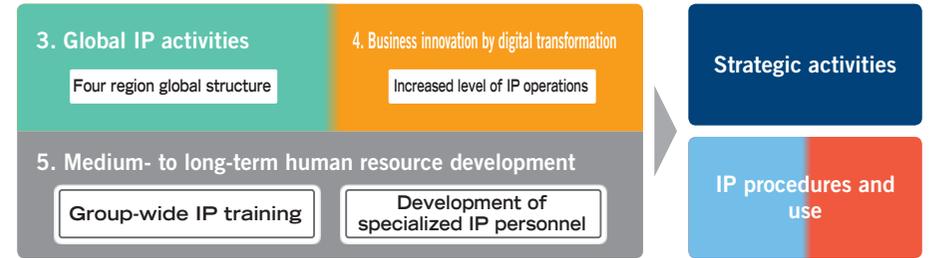
In addition, in IP business operations, we have begun to implement new robotic process automation (RPA), and we are using digitalization to increase the efficiency and sophistication of operations, including processing of paper forms using OCR, and IP data aggregation and analysis by business intelligence (BI) tools.

Patent screening and automatic classification by AI



Initiatives Toward IP Personnel Development

The Company’s dual-layered approach to human resource development is the most important foundational activity supporting all IP activities. The first layer is the development of all employees as human resources that support IP. The second layer is the development of Corporate IP members as IP specialists. We have designed IP training courses tailored to business operations for all employees, and we use these to conduct systematic education. We encourage Corporate IP members to increase their expertise through Group Masters system.



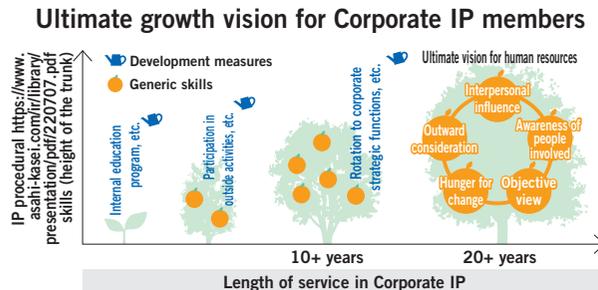
Development of human resources on the outskirts of IP (companywide IP training)

The Company has established the IP skills needed for each role for all employees and provided the necessary training venues for acquiring them (held every year). We constantly review the content of the training, and recently we have established new courses specialized in DX invention.

Target	Group-wide training			Training by business field		
	In-person		E-learning	In-person		
Managers	Strategic Course	DX Inventions	Basic Knowledge	Patent Drafting		
Practical-level personnel	Clerical				Technological basics	Designed for each business area
	Technical					
New employees	New employee training					

Development of specialized IP personnel (development policies)

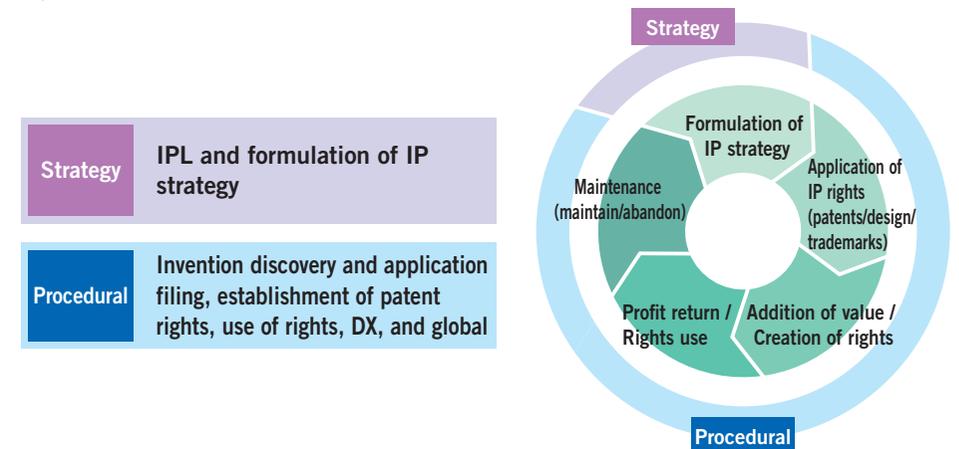
To keep up with the diversification of IP operations in recent years, we have provided the Corporate IP members with a personal growth model for them to achieve the ideal condition, established this ideal condition as human resources with both IP procedural skills and generic skills, and set about systematically developing them.



Development of specialized IP personnel (Group Masters on IP)

The Company has developed human resources with a high level of expertise who will actively contribute to new business creation and reinforcement through the Group Masters system. This system provides five categories with clear roles: Executive Fellow, Senior Fellow, Principal Expert, Lead Expert, and Expert. We use this system to promote the growth of human resources and incorporate talented external human resources.

IP is also positioned as professional abilities, and we systematically produce Group Masters in this area (20% of Corporate IP members). We develop high-level human resources divided between strategic roles (IPL, IP strategy formulation) and procedural roles (IP procedures and utilization) to cover the aforementioned IP value maximization cycle. We also execute strategies to increase our competitive advantages, effectively promote the IP activity cycle, and contribute to the sustainable growth of the organization.



Feature Connecting with IP Intelligence —Contributing to New Business Creation—

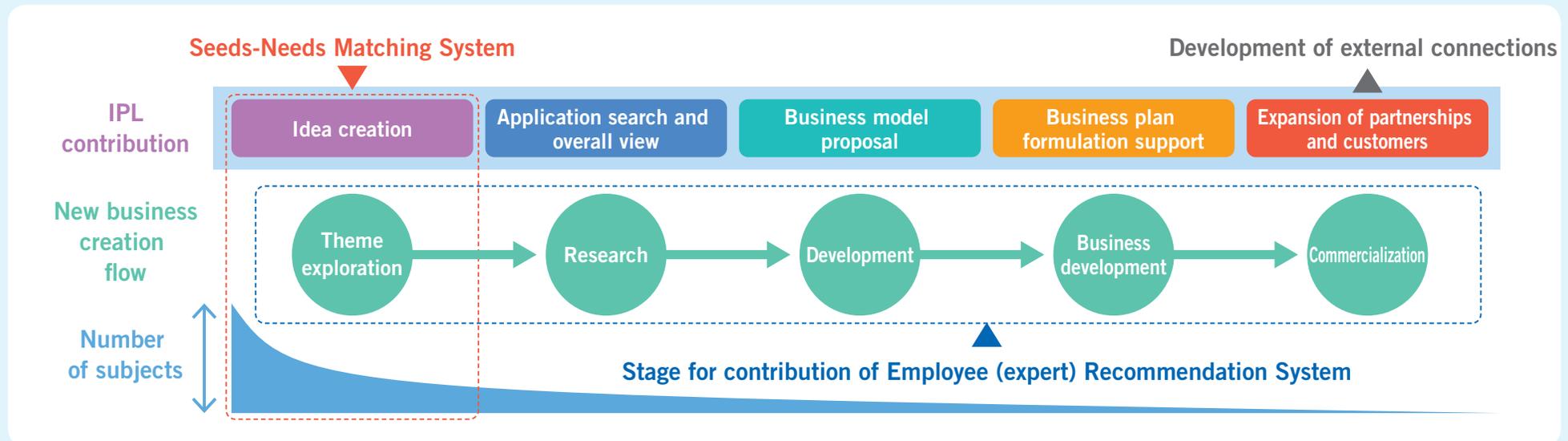
New contribution to new business creation through IP intelligence

As the business environment grows increasingly complex, it is becoming essential for the Company to combine its many core technologies in order to create new businesses. To create and accelerate new businesses, in addition to internal collaboration, co-creation with outside organizations is also essential. The Company will connect internal and external parties with IP intelligence, driving co-creation and contributing to the creation and acceleration of new businesses.

The first stage in the new business creation process is searching for subjects. This requires a wide overview of society and the use of backcasting to generate numerous ideas that can leverage the Company’s technologies. The Company has developed a Seeds-Needs Matching System to link its core technologies with new technologies, so-called emerging technologies, and will promote idea creation for searching for subjects by providing it to researchers

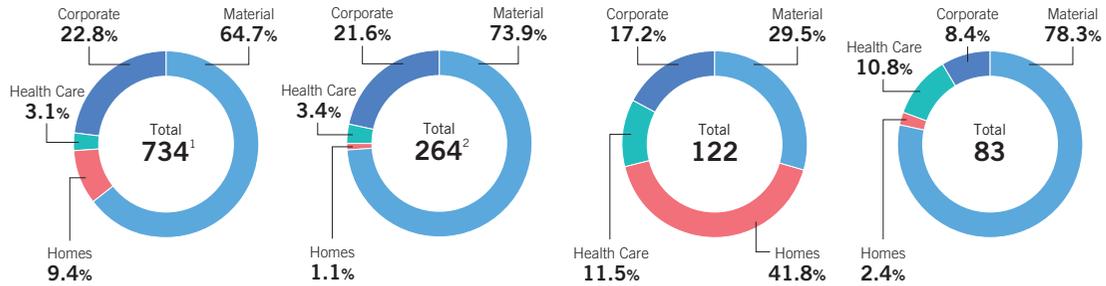
throughout the Company. The ideas created in this way progress through the subsequent stages of research, development, business development, and commercialization, after which we conduct an objective technological overview and market analysis using IPL, and provide support for new business creation activities.

At every step from searching for subjects to commercialization, we seek to make effective use of internal knowledge and resources to accelerate new business creation. To this end, we provide an Employee (expert) Recommendation System, which recommends internal human resources with the necessary specialization for research and development (including knowledge outside of technology). Moreover, to accelerate the Company’s business growth by collaborating with other companies, we have started activities aimed at strengthening our connections with other companies based on IPL, by communicating our IPL activities to them.



Number of IP Applications in 2022 and Practice Status of Patent Rights

Japanese Patent Applications Overseas Patent Applications Japanese Trademark Applications Overseas Trademark Applications



■ Material sector (Chemicals, Fibers, Electronics) ■ Homes sector (Homes, Construction Materials)
 ■ Health Care sector (Pharmaceuticals, Medical Care) ■ Corporate
 (From January 1, 2022, to December 31, 2022)

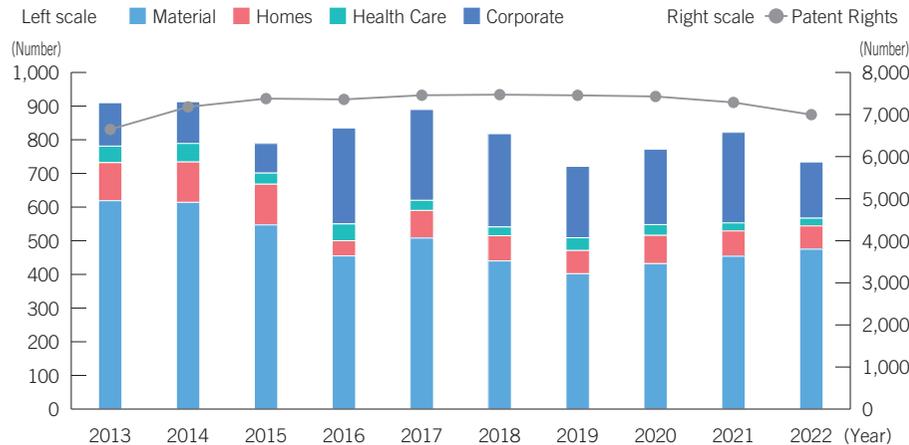
¹ May not equal the sum of figures by segment due to sharing of certain IP rights among more than one segment.
² Overseas applications for a single patent family are counted as one.

Practice status of patent rights in Japan and overseas

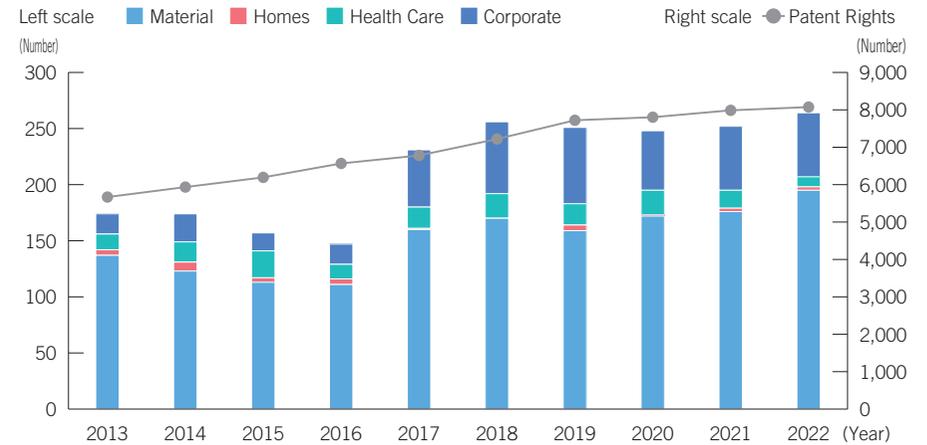
As of August 2023

		Material	Homes	Health Care	Corporate	Average
Japanese Patents	In practice	52%	40%	45%	12%	43%
	Scheduled to be in practice	14%	11%	7%	65%	22%
	Defensive & other	34%	49%	48%	23%	35%
Overseas Patents	In practice	50%	83%	41%	14%	42%
	Scheduled to be in practice	15%	10%	20%	61%	25%
	Defensive & other	35%	7%	39%	25%	32%

Number of Japanese Patent Applications



Number of Overseas Patent Applications



Data by Sector

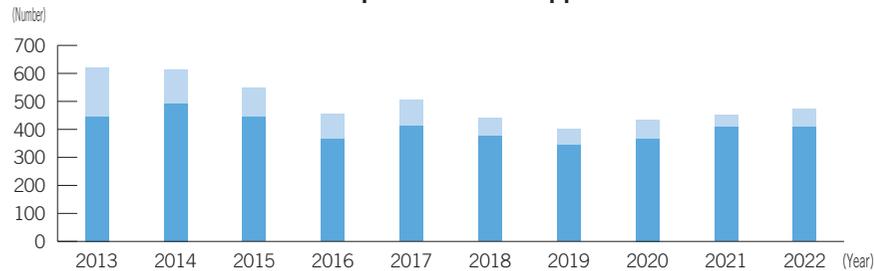
Material Sector

In the Material Sector, the Company has filed patent applications without fail to establish rights for its R&D results to support the continuous development of business.

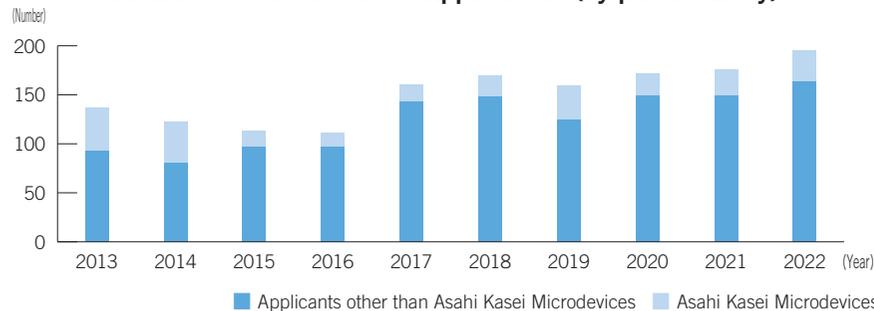
In addition, by widely acquiring rights related to future trends and peripheral technologies, we strive to secure the competitive advantages of the Company's businesses.

The Company has filed applications for 400-500 patents in Japan, and overseas filings are increasing in number as the Company's overseas businesses develop, under a policy of filing applications in countries that have key markets and manufacturing bases for each technological field.

Number of Japanese Patent Applications



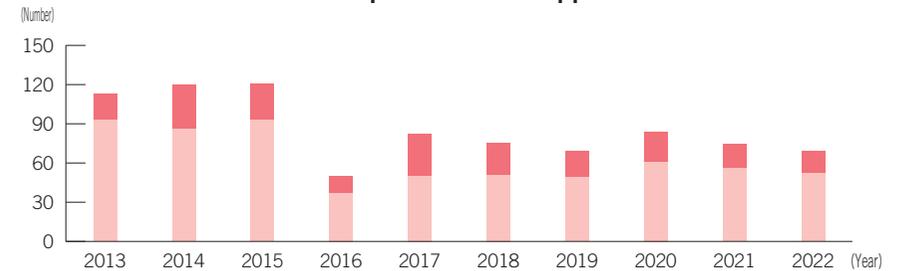
Number of Overseas Patent Applications (by patent family)



Homes Sector

We are promoting the acquisition of multi-faceted patent rights combining patents and design registration applications. At Asahi Kasei Homes, these are centered mainly on shelter technology, which is the core technology of Hebel Haus and Hebel Maison, residential technologies such as living styles based on family structure, and implementation technologies such as services related to wellness, lifestyles and resilience. At Asahi Kasei Construction Materials, these are centered mainly on implementation technologies such as construction and construction materials-related technologies, including insulation material and autoclaved aerated concrete. Furthermore, recently, in the Homes Sector, we have reinforced our patent applications for technologies such as CO₂ emissions reduction technology, which contributes to sustainability.

Number of Japanese Patent Applications



Number of Japanese Design Right Applications

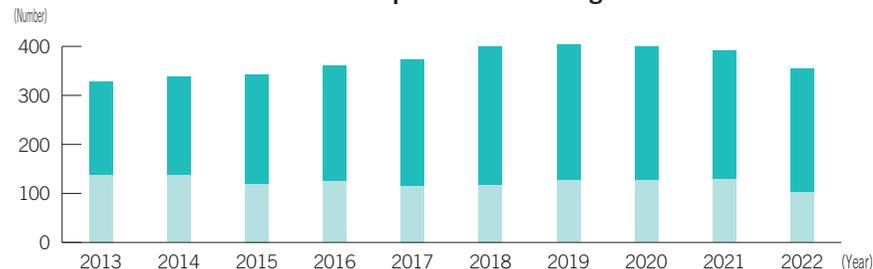


Health Care Sector

In ethical pharmaceuticals, we have produced a number of new drugs for fields such as emergency and intensive care, and immunology, mainly focused on orthopedics. In addition, as an R&D-based specialty pharmaceutical company, we strive to create new drugs. We have built a multifaceted and mutually complementary patent network and hold a number of patents that contribute to pharmaceutical lifecycle management. We also conduct R&D on reagents used for in vitro diagnosis, and hold patents for related technologies.

We hold a large number of overseas patents and trademarks for technologies related to blood purification products to treat chronic and acute kidney failure, as well as manufacturing process products for new drugs such as biotherapeutics, since a larger proportion of these businesses are overseas.

Number of Japanese Patent Rights



Number of Overseas Patent Rights

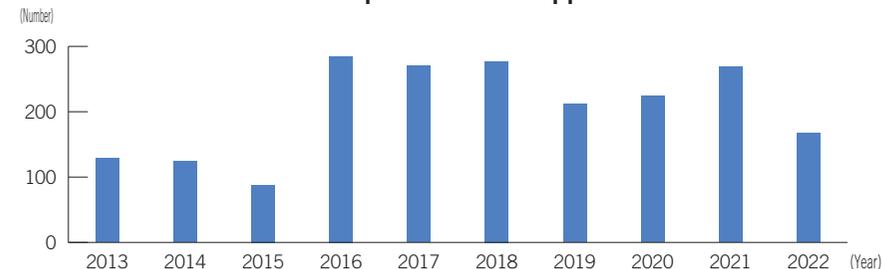


Corporate

In the Corporate category, we have built an IP network related to medium-to long-term group-wide R&D subjects, mainly at Corporate Research & Development. When building the IP network, we filed applications not only for commercialization by our Company, but also in the expectation that their publication will stimulate co-creation with companies, universities and research institutes in Japan and overseas.

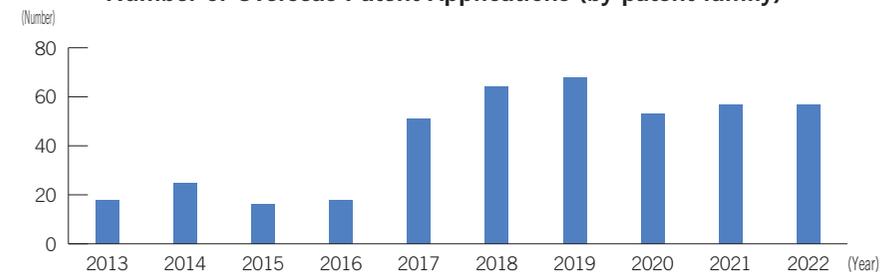
The Company's overseas sales ratio is higher than 50%, and it is expected to develop its global business even further going forward. To make the maximum use of intangible assets, the Company will seek to drive global value creation through them by actively filing applications overseas even for research subjects at the initial stages.

Number of Japanese Patent Applications



Note: The fluctuation in the number of applications in 2016 is due to organizational changes.

Number of Overseas Patent Applications (by patent family)



Note: The fluctuation in the number of applications in 2017 is due to organizational changes.

Major External Commendations

Fiscal Year	Commendation	Organization	Recipient and Title
2022	Okochi Memorial Technology Prize	Okochi Memorial Foundation	Hidenori Hinako, Satoru Komada, Haruhiko Watanabe, Toshihiko Fukuzono, Shunya Kirino Development of propane ammoxidation catalyst and acrylonitrile manufacturing technology utilizing the catalyst
2020	Medal with Purple Ribbon	Government of Japan	Hajime Nagahara Development of the cyclohexene production process for nylon intermediate
2019	The Nobel Prize in Chemistry	Royal Swedish Academy of Sciences	Akira Yoshino The development of lithium-ion batteries
	The Order of Culture	Government of Japan	Akira Yoshino The development of lithium-ion batteries
	European Inventor Award, Non-EPO Countries	European Patent Office	Akira Yoshino The development of lithium-ion batteries
	Awards for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology	Ministry of Education, Culture, Sports, Science and Technology	Ken Suzuki Use of Au nanoparticle catalysts in a commercial chemical production process
	The Chemical Society of Japan Award for Technical Development	(PIIA) The Chemical Society of Japan	Yoshifumi Nishimura, Takahiko Kondo, Shinya Kawasoe, Sumio Ikejiri, Takashi Nozaki Development of separator for high-safety and high-performance lithium-ion secondary batteries

Local Commendations for Invention (Japan Institute of Invention and Innovation)

Fiscal Year	Commendation	Area	Title
2022	The Encouragement for Invention Prize	Kanto	Hydrogenation catalyst for conjugated diene polymer
2021	The Encouragement for Invention Prize	Kanto	Hydrogenated elastomer used in high-performance shoe midsoles
2020	The Prize of the Chairman of Shizuoka Institute of Invention and Innovation	Kanto	Low-temperature curable photosensitive resin composition for use as a protective film for semiconductors

Receipt of the 69th Annual Okochi Memorial Technology Prize

▶ Development of propane ammoxidation catalyst and acrylonitrile manufacturing technology utilizing the catalyst

The Company received the 69th Annual Okochi Memorial Technology Prize for its development of a propane ammoxidation catalyst and acrylonitrile manufacturing technology utilizing the catalyst.

Presented by the Okochi Memorial Foundation, which was established in 1954, Okochi Prizes have a prestigious tradition of honoring excellence in production engineering and advanced production technology. The Okochi Memorial Prize is the highest award among the Okochi Prizes, and is awarded to recognize particularly outstanding achievements.

The Company received the award this time in recognition of the originality and precedence of its achievement, its academic excellence and its social and economic contribution through the practical application of “the development of a propane ammoxidation catalyst and acrylonitrile manufacturing technology using the catalyst.” This technology uses propane derived from natural gas as a raw material, enabling effective utilization of resources.

The Company has been working on development of the catalyst aiming to commercialize an acrylonitrile manufacturing process that uses propane as the raw material. We designed the catalyst based on catalyst manufacturing analysis, to find a catalyst with a high yield, longevity, and fluid bed reaction compatibility. We also developed a technology for precise control of the degree of catalyst redox at mass production scale. In addition, we also developed precision temperature control technology for the fluid bed reactor, and in 2013 we became the first in the world to successfully commercialize acrylonitrile manufacture using propane as the raw material.



PTT Asahi Chemical Company Limited
(acrylonitrile production plant in Thailand)

AsahiKASEI

Asahi Kasei Corporation

Hibiya Mitsui Tower, 1-1-2 Yurakucho,
Chiyoda-ku, Tokyo, Japan 100-0006
www.asahi-kasei.com/

Contact

Corporate IP, Corporate Research & Development
Phone: +81-3-6699-3060

Intellectual Property Intelligence Department
Phone: +81-3-6699-3080