



Intellectual Property Report **2022**

Contents

1 Management of Intellectual Property

1-1. Intellectual Property Strategy of FEC Group...3

1-2. Risk Minimization: Intellectual Property Risk Management...4

1-3. Chance Maximization: IP Landscaping...5

Activity Reinforcing and Creating of Business with Intellectual Assets...6

2 Intellectual Property Activity Framework

2-1. Promotion Framework...10

2-2. Activity Bases...11

Activity Intellectual Property Education and Awards System...12

3 Intellectual Property Analysis Report

3-1. Intellectual Property Portfolio...13

3-2. Sustainability Indicator (IP Landscaping Implementation Rate)...15

Activity Visualization of Strengths by Competitive Technology Map...16

4 Interviews on Utilization of Intellectual Assets

Creating New Business that Contributes to Carbon Neutrality..17

Creating Life Science Business...19

5 Topics

- Participation in the Intellectual Property and Intangible Asset Management Forum...21

- Informal Meeting with the Commissioner of the JPO...21

Introduction

I would like to welcome you to the intellectual property report by the Furukawa Electric Group. This report introduces, as part of the promotion of intellectual property management in our Group, our activities to reinforce and create business with intellectual assets and activities with respect to human resources and organizations that utilize the intellectual asset.

Based on his wish to “brighten Japan,” Ichibei Furukawa, the founder of Furukawa Group, said that we must “Value employees, Value customers, Value new technology, and Contribute to society.” Since its foundation in 1884, Furukawa Electric has treasured and passed on these words in its DNA as it has grown.

In order to inherit this DNA as our Group’s values, we must accumulate and reinforce the use of intellectual assets, and we must reinforce human capital and organizational execution abilities that generate intellectual assets. This is our Group’s basic concept of promoting intellectual property management.

Until now, our intellectual property management has been based solely on the concept of “defensive intellectual property,” but from now on, we will also incorporate the concept of “aggressive intellectual property” into our intellectual property management. Furthermore, we will place more importance on the utilization of intellectual assets than ever before as we strive to contribute to the resolution of contemporary issues such as carbon neutrality and circular economy.

I hope this Intellectual Property Report will provide you a better understanding of the intellectual property activities of the Furukawa Electric Group.

July 2023
Chairman of the Board
Keiichi Kobayashi



1 Management of Intellectual Property

1-1. Intellectual Property Strategy of FEC Group

The Furukawa Electric Group has adopted the basic policy of defining and utilizing intellectual property as an important management resource. We promote group-wide and global intellectual property activities with an understanding that business, R&D, and intellectual property are one and the same.

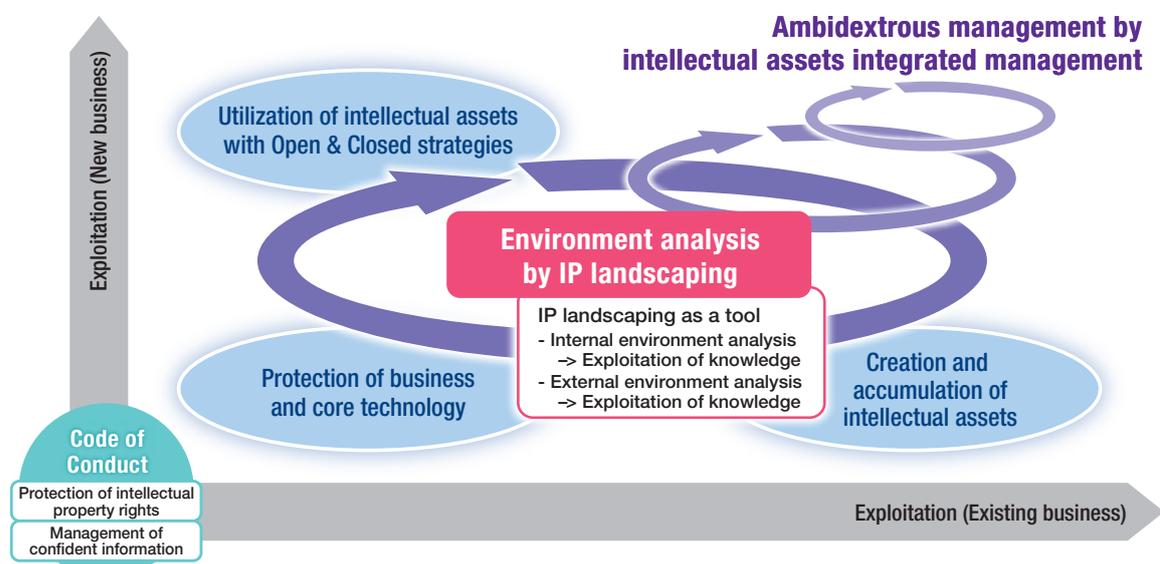
Our basic policy consists of the following three pillars:

1	Reinforcing management and business strategy planning capabilities by IP Landscaping	Reinforce management and business strategy planning capabilities by IP Landscaping that incorporates, analyses and utilizes intellectual property information into strategy planning processes.
2	Utilizing intellectual assets with Open & Closed strategies	Run a cycle* ¹ that starts from analysis utilization of intellectual property (analysis <--> utilization -> creation -> protection), and formulate/implement Open and Closed strategies to reinforce business strategies.
3	Stabilizing business by reducing intellectual property risks	Identify four categories of risks, which are infringement risk, technology outflow risk, contract risk, and counterfeit risk, as frequent risks with a significant impact, and continuously reduce such risks to stabilize business.

*1 The basic concept of promoting intellectual property management: In order to enhance our business, we implement intellectual property strategies for our unique differentiating technologies and run a cycle starting from the utilization of intellectual property.

To promote intellectual property management and reinforce our business, we implement intellectual property strategies for our differentiated proprietary technologies and run a cycle starting with “analysis <--> utilization” of intellectual property. While understanding changes by environment analysis using IP landscaping, we run a cycle of activities starting from utilization of intellectual assets with Open & Closed strategies, followed by creation and accumulation of intellectual assets, and protection of business and core technologies.

To contribute to the realization of a truly prosperous and sustainable society through continuous technological innovation, we will establish this IP landscaping as a tool for ambidextrous management (management that takes as its two wheels, “Exploitation,” which exploits existing business, and “Exploration” which develops new business). In other words, among environment analyses by IP landscaping, internal environment analysis is used for the Exploitation and external environment analysis is used for the Exploration. With these activities, we will strive for the integrated management of intellectual assets, including not only conventional intellectual property but also management assets such as human resources, organizational capabilities, and customer networks.

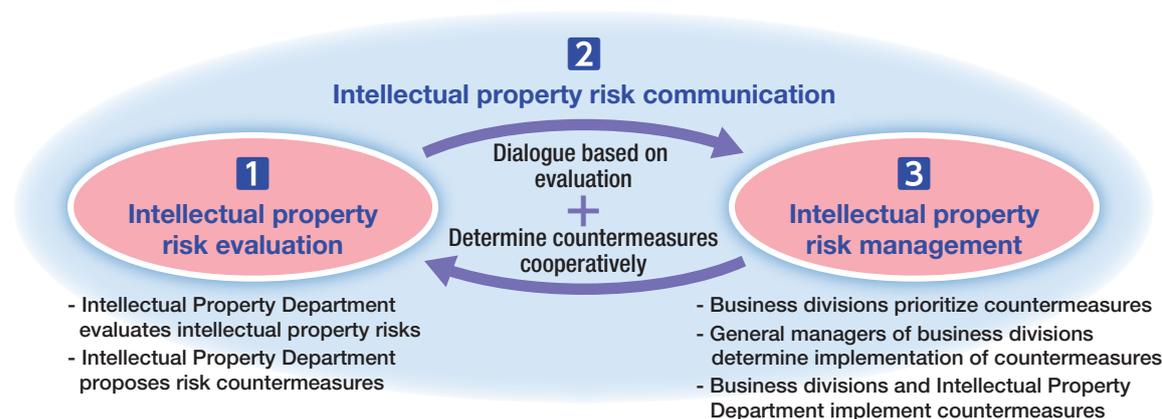


1-2. Risk Minimization: Intellectual Property Risk Management

The Furukawa Electric Group's Code of Conduct stipulates two actions: (1) protection of intellectual property rights and (2) management of confidential information.

In accordance with the Code of Conduct, we make sure that the intellectual property portfolios are built and utilized based on detailed competitor analysis and the promote activities to globally reduce intellectual property risks, such as activities to prevent technical information outflow.

As a system for such risk minimization, we implement intellectual property risk management procedure that consists of three steps which are shown below:



In the step of intellectual property risk evaluation, each priority product of business divisions subject to intellectual property activities is visually evaluated from the viewpoints of whether: (1) an intellectual property portfolio has been built to prevent any disruption to the business; (2) any rights of other companies are not infringed by the product; (3) countermeasures for technical know-how leakage are being implemented for the product; and other viewpoints.

We define the following four categories to classify intellectual property risks and continuously call attention to risk management to stabilize business execution.

Infringement risk

Regularly and continuously search for other companies' rights information to ensure that our products do not infringe other companies' intellectual property rights.

Avoid risks of direct damage to businesses and loss of opportunity.

Technology outflow risk

Manage technologies at development and manufacturing sites and use a timestamp system to reinforce information preservation. Regularly check external announcements, including news releases.

Avoid risks of unintended disclosure of confidential information and other risks.

Technology counterfeit risk

Obtain patent rights, utility model rights, design rights, and trademark rights to protect our products. Bring an action for injunction or damages if another company counterfeited our product.

Avoid risks of loss due to declined market share or other.

Contract risk

Ensure that every technical contract is reviewed by the Intellectual Property Department before being signed.

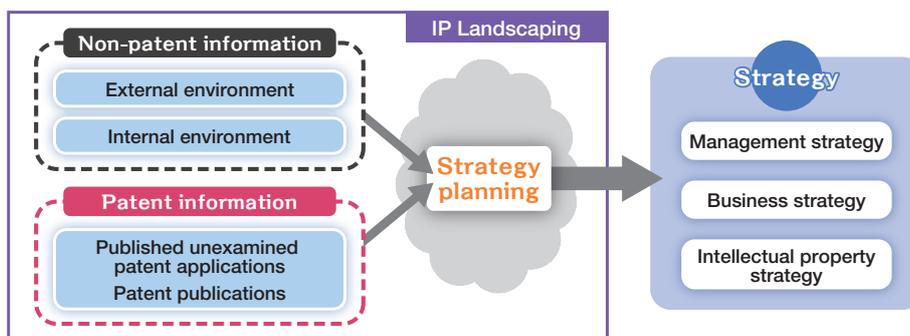
Avoid risks of future disputes concerning the terms of technical contracts, including non-disclosure agreements, joint research agreements, purchase and sale agreements.

1-3. Chance Maximization: IP Landscaping

The Furukawa Electric Group lists “Reinforcing management and business strategy planning capabilities using IP Landscaping” as the first pillar of its intellectual property strategy.

To promote activities to seek new business fields and business models, we analyze the competitive environment and market environment using the intellectual property information of our own and other companies.

As a tool for such chance maximization, we implement this IP Landscaping in the following process.



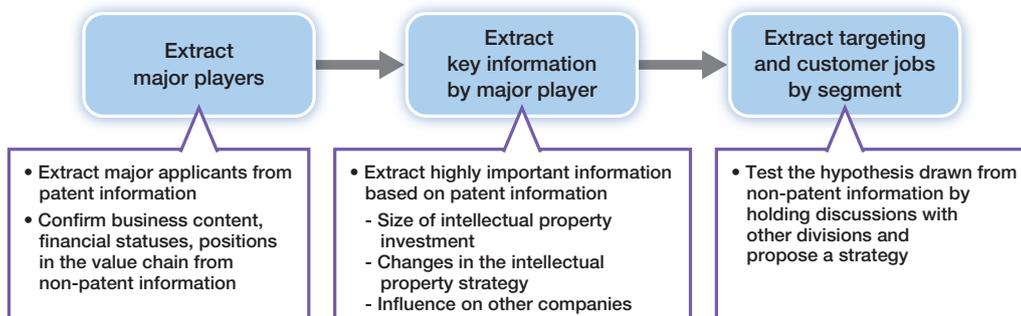
What is IP Landscaping?

IP Landscaping has been gathering attention since its listing in “Intellectual Property Personnel Skills Standard Version 2.0” released in April 2017 by the Ministry of Economy, Trade and Industry. This standard defines IP Landscaping as follows:

As opposed to patent maps, IP Landscaping includes research and development information, trends in management strategies, technical information on individual patents, and other information on your company, competitors, and markets. IP Landscaping provides a broad view of the current status and future perspectives with respect to the market positioning of your company.

In 2021, the FEC has established a dedicated section in the Intellectual Property Department that utilizes IP Landscaping to predict market trends, analyze the value in customers’ need and propose strategies for new business through co-creation with business divisions. To promote co-creation with business divisions, we apply IP Landscaping to activities (such as marketing activities) which have been regularly conducted by each business division to ensure effectiveness. We repeat analysis, evaluation, and hypothesis testing based on patent and non-patent information in accordance with the purposes of management and businesses and reinforce our strategy planning capability in tandem with marketing activities.

Flow of IP Landscaping (Example)



Please refer to “3-2. Sustainability Indicator (IP Landscaping Implementation Rate)” and “4 Interviews on Utilization of Intellectual Assets” for more information on IP Landscaping.

Activity

Reinforcing and Creating Business with Intellectual Assets

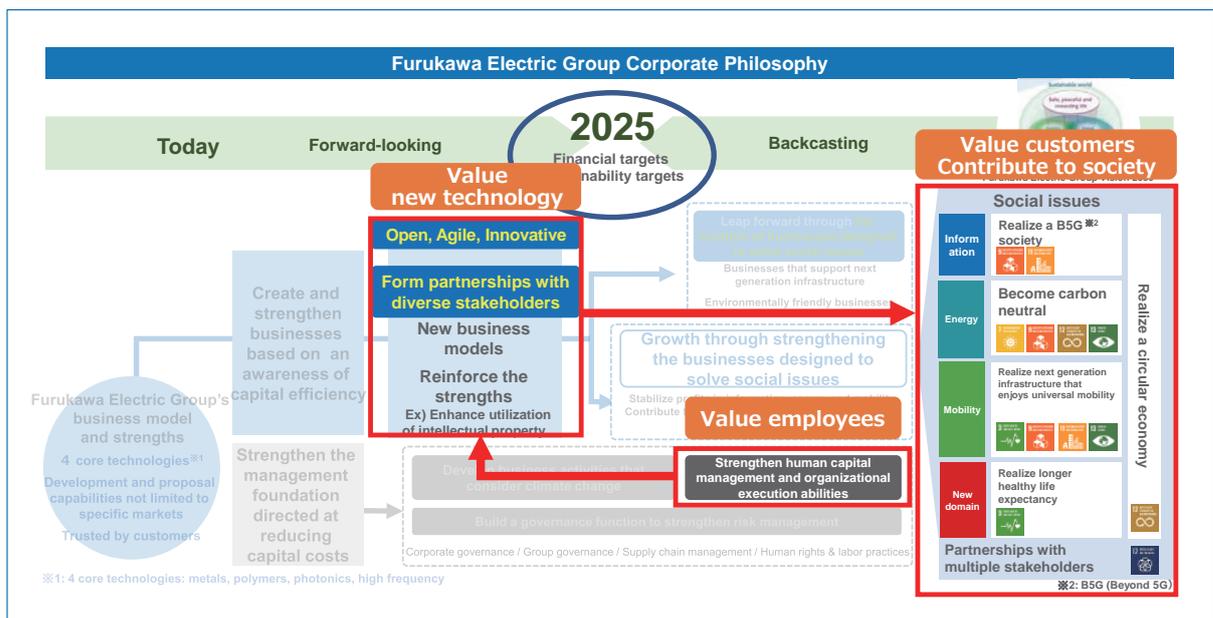
This year marks the 138th anniversary of its foundation of Furukawa Electric Group. Ichibei Furukawa, the founder of the Furukawa Group, introduced the then latest technologies from Western countries to the mining industry, and started a cable business based on his wish to “brighten Japan.”

“Value employees, value customers, value new technology, and contribute to society.” These are the words that we have inherited as DNA from our founder.



To realize Furukawa Electric Group Vision 2030, we are determined to become an indispensable company for solving social issues. The three important things valued by Ichibei Furukawa direct us: “Value customers” and “contribute to society”; To contribute to society, “value new technology,” namely, reinforce the use of intellectual assets; To “value new technology”, “value employees,” namely, reinforce human capital and organizational execution abilities. These words represent the basic concept of our intellectual property management promotion.

We believe that using intellectual assets created by human capital is essential for solving social issues.



Excerpt from Furukawa Electric briefing materials for individual investors (2022)

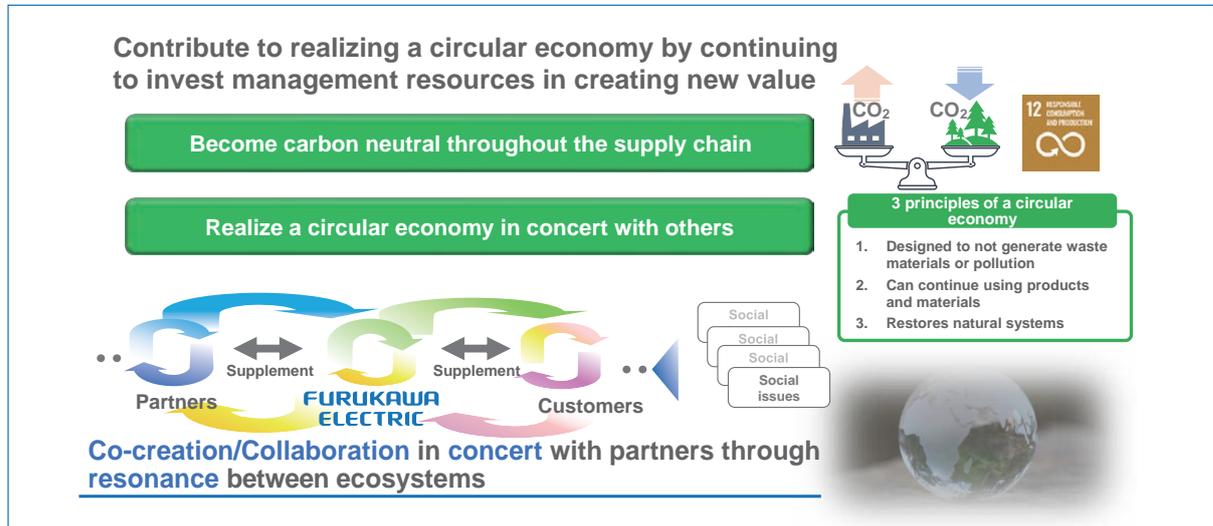
Our Group's business segments include Communications Solutions, Energy Infrastructure, Automotive Products & Batteries, and Functional Products. This section introduces the intellectual assets related to fiber cables, which are major products of Communications Solutions, with a specific focus on rollable ribbon cables, which are high value-added products.



Excerpt from Furukawa Electric briefing materials for individual investors (2022)

< Value customers and contribute to society >

Furukawa Electric Group believe that, to achieve a circular economy, we need to collaborate, rather than to compete, like an orchestra making music in concert, by resonating our ecosystem with our customers' and partners' ecosystems. Intellectual assets act as strengths in this co-creation with partners, and now we embrace the idea of "aggressive intellectual property" including the use of IP landscaping in addition to the idea of "defensive intellectual property".



Excerpt from the medium-term management plan briefing (2022)

In the information sector, we aim for business that supports and leads the evolution of information transmission and the realization of a sustainable society. As our Vision 2030, we support, through photonics technology, increased data traffic following the realization of a beyond 5G (B5G) society, and we build social infrastructure. Toward this end, as our 2025 Goal, we will realize growth by strengthening the business designed to solve social issues.



Excerpt from the medium-term management plan briefing (2022)

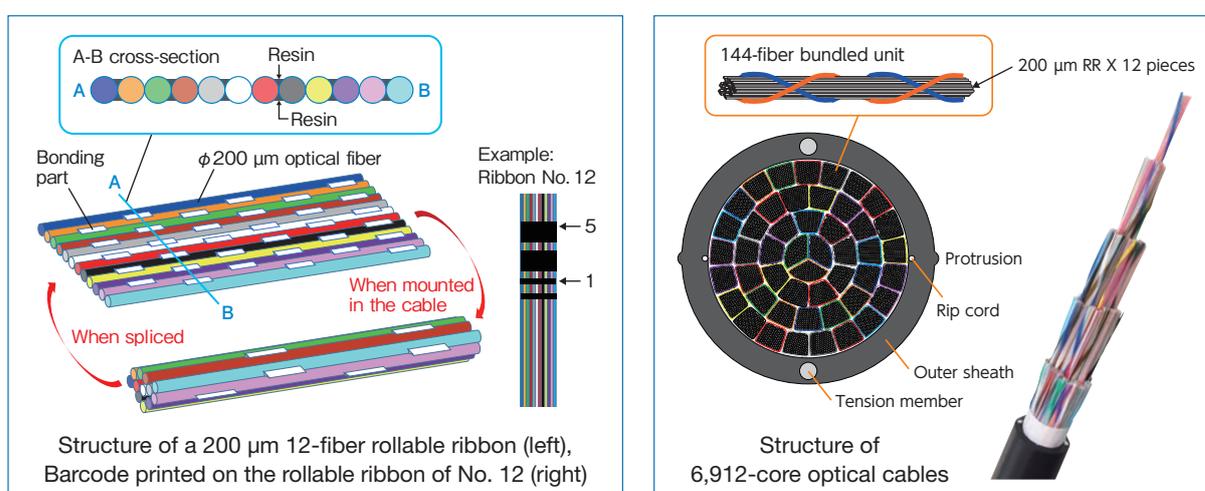
In response to the rapid increase in the amount of data traffic to be handled, data centers and metropolitan networks require optical fiber networks of even higher capacity. So-called multi-core optical fiber cables, which include multiple optical fibers in a cable, are useful in building efficient high-capacity networks. The conventional technologies, however, are limited in terms of increased density, and the maximum number of cores is limited by the size of the pipe conduit installed in transmission paths.

< Value new technology: reinforce the use of intellectual assets >

We have solved these problems by constructing rollable ribbon that can be made into a rolling form by bonding, at intervals, 12 pieces of optical fiber which have a smaller outer diameter than conventional optical fibers. As illustrated in the following diagram, our rollable ribbon is constructed by bonding, at intervals, fibers arranged in parallel with resin, and thus can be made into a compact rolling form. This technology has been achieved thanks to our high technical capabilities and know-how. We have obtained multiple patent rights, including Japanese Patent No. 7084449. We have filed over 100 patent applications, domestic and foreign, in relation to this product, and are filing more foreign applications, specifically with North American patent offices.

This technology can drastically increase the core density of optical cables, realizing thin 6,912-core optical cables, the world's highest level, and making it possible to install an ultra-high number of fibers in a single installation in existing pipe conduits.

With global demands expanding especially in North American countries, we are focusing on rollable ribbon cables as high value-added products.



Excerpt from Furukawa Electric Review (No. 51)

< Value employees: reinforce human capital and organizational execution abilities >

Overseas expansion for high value-added products cannot be achieved without reinforcing intra-Group cooperation. Specifically, we are reinforcing cooperation with OFS, which is a subsidiary in the United States.

We are also increasing patent applications to America, Europe, and Asia in close cooperation with OFS's intellectual property bases. Cooperation with FEL, which is a subsidiary in Brazil, is also underway with respect to global trademark applications for the promotion of brands.

Our Optical Fiber and Cable Products Division and Intellectual Property Division work closely with each other to promote timely creation and application of inventions. Intellectual Property Analysis Section, a newly established section in the Intellectual Department, plays part in this co-creation, analyzing the market environment and value chain by using IP landscaping.

As described in the following "2-1. Promotion Framework," such intellectual property activities for "Risk Minimization" and "Chance Maximization" involves a team led by an intellectual property manager, assigned to each business division or research division, who formulates intellectual property strategies. The strategy is then subject to co-creation and shared through strategy dialogues with business division general managers. Furthermore, utilization strategies, including IP landscaping, are proposed and reported through strategy meetings with executives—including the President—who supervise business execution.

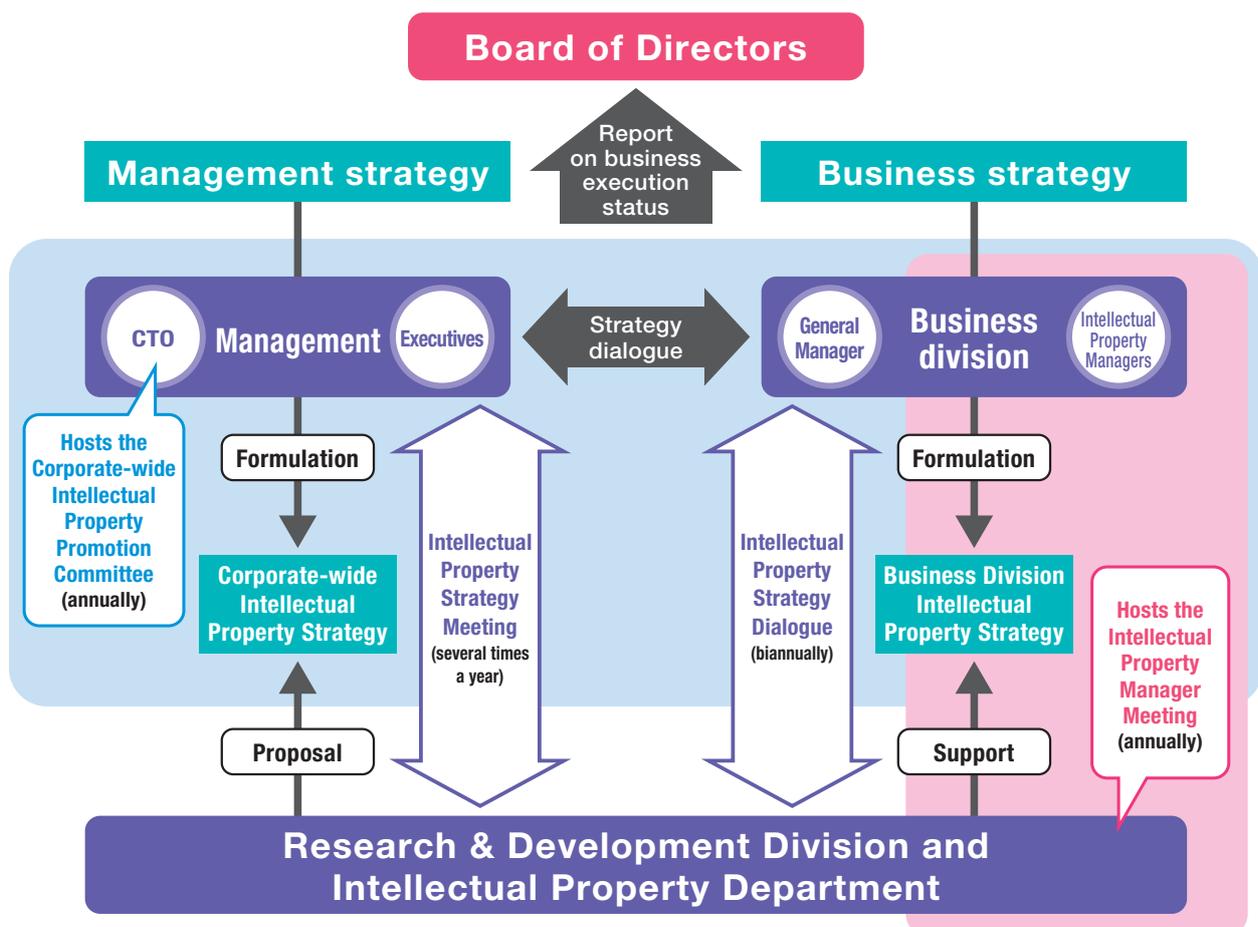
2 Intellectual Property Activity Framework

2-1. Promotion Framework

Our Group has established the Corporate-wide Intellectual Property Promotion Committee, which is chaired by the General Manager of the Research & Development Division. This committee determines cooperate-wide intellectual activity policies and promotes activities led by intellectual property managers who are assigned to each business and research division.

Corporate-wide intellectual property strategies are proposed and reported to executives who supervise business execution—including the President—at an Intellectual Property Strategy Meeting hosted by the General Manager of the Research & Development Division. Activities aligned with the corporate-wide intellectual property strategies are determined at an Intellectual Property Manager Meeting hosted by the Intellectual Property General Manager. Intellectual property strategies of individual business divisions are subject to co-creation and shared with business division general managers through Intellectual Property Strategy Dialogues hosted by the Intellectual Property General Manager.

Such business execution statuses are regularly reported to the board of directors.



2-2. Activity Bases

Activity bases of Furukawa Electric Co., Ltd.

- Intellectual Property Managers (assigned to each business unit and research laboratory)
- Bases of the Intellectual Property Department (Yokohama, Chiba, Hiratsuka, and Shiga)
- Intellectual property education
- Patent awards, invention compensation, etc.

Furukawa Electric assigns an Intellectual Property Manager to each business unit and research laboratory, and implements a three-part strategy of business, research and development, and intellectual property, led by a team consisting of members from the business units, research centers, and intellectual property departments. The Intellectual Property Department has four offices in Japan, and conducts activities in close daily communication with business units and research laboratories.

Intellectual property education is organized and continuously implemented in-house. We encourage inventions through patent-award and invention compensation and other means.



Activity bases of the Furukawa Electric Group

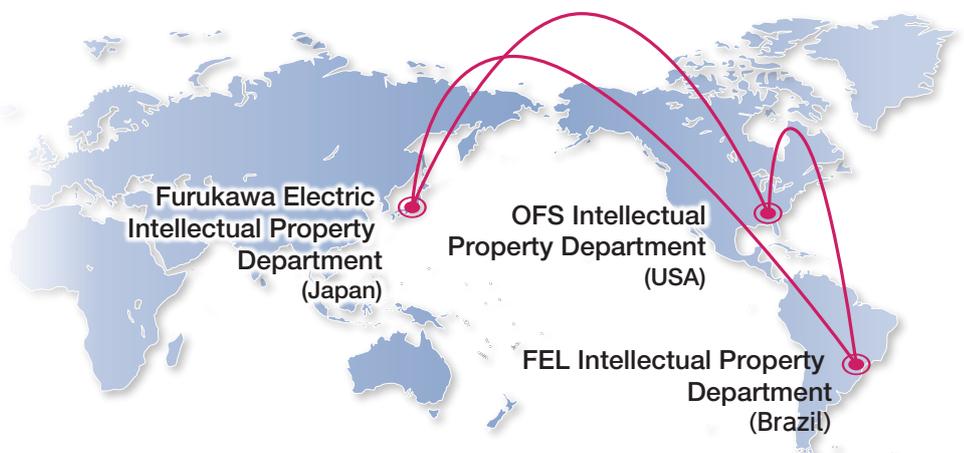
- Designated persons in charge of intellectual property activities (domestic and overseas group companies)
- Intellectual Property Department bases (USA, Brazil)
- Promoting intellectual property activities

We share Furukawa's intellectual property policy across all group companies in Japan and overseas.

Each domestic group company has a designated person who promotes intellectual property activities in cooperation with Furukawa's Intellectual Property Department.

Furukawa's Intellectual Property Department also interacts with the Intellectual Property Departments of OFS (USA) and FEL (Brazil) and holds regular meetings.

In addition, we are promoting intellectual property activities throughout the Group by providing intellectual property education tailored to each company's needs and providing patent-award for domestic and overseas group companies.



Activity

1 Intellectual Property Education

To improve skills of individuals, we provide training to gain a better appreciation of the importance of intellectual property and enable strategic intellectual property activities. That includes:

- Five training courses that allow trainees to systemically learn the knowledge they need according to their work experience
- Lectures by leading experts in the field of intellectual property
- Proprietary e-learning materials that allow trainees to learn at any time
- Basic training for sales divisions

For overseas group companies, we provide individual training sessions tailored to local conditions and needs to raise awareness of the intellectual property. We also regularly deliver an intellectual property newsletter (IP-Newsletter) to all group companies to raise awareness of intellectual property risks and assist them in promoting their intellectual property activities.



Education program	Content	New employee	Middle-level employee		Managerial employee	Management
		Technical, Administrative	Technical	Administrative		
(1) Introductory course	Outline of intellectual property system	←→				
(2) Prosecution basic course	Patent application		←→			
(3) Prosecution advanced course	Foreign application prosecution practice		←→			
(4) Contract basic course	Basics of contract		←→	→		
(5) Intellectual property management course	Strategy planning and Use of IP Landscaping				←→	
Lecture by intellectual property expert	Lecture by invited outside lecturer		←→	→		→

2 Awards System

To enhance team motivation, we have President's Patent Awards system in place for excellent intellectual property activities that will contribute to the growth of our group.

- [Invention award] for patents that are recognized as having high value.
- [Intellectual property activity award] for excellent intellectual property activities such as strategic patent application and technical know-how management.

Other than the Patent Awards, we have various President's Awards such as Technology Awards, Sales Division Awards, ESG Awards, and Health and Safety Activity Awards. We receive application from our overseas group companies every year. Awards ceremonies are global opportunities for technology exchange where people can share their achievements.

Award		Candidate	Evaluation	FY2021
Invention award	Excellent patent award	Patented inventions recognized as having high value.	Availability, technical value, strength, etc. of patents and others.	2
	(1) Strategic application activity division	Divisions that strategically filed patent applications by conducting searches for and analysis of patents of ours and other companies.		1
	(2) Technical know-how proposal activity division	Divisions that proposed concealment of technical know-how, which is recognized as having high value.		1
	(3) Counterfeit product countermeasure activity division	Divisions that achieved outstanding results with countermeasures for counterfeit products using trademark rights, design rights, and copyrights.		None
Intellectual property activity award				

3 Intellectual Property Analysis Report

3-1. Intellectual Property Analysis Report

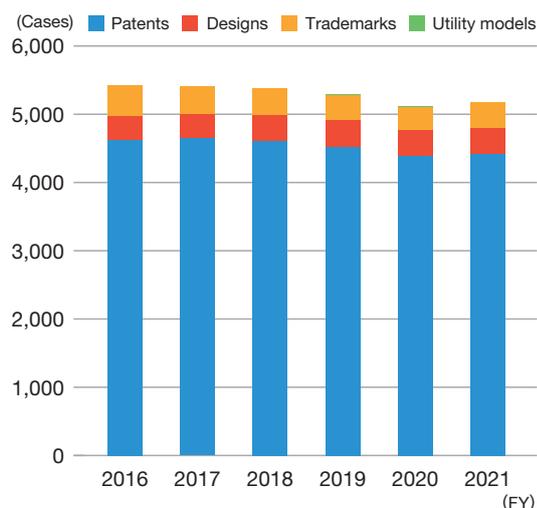
We strive to minimize business risks by protecting our group's proprietary technologies that differentiate our products from those of other companies with intellectual property rights and technical know-how.

To achieve growth by reinforcing social issue solving businesses, we build an intellectual property portfolio based on detailed competitor analysis in the information, energy and mobility sectors. We thoroughly utilize this portfolio to maximize the revenue of existing business, with a focus on capital efficiency toward 2025.

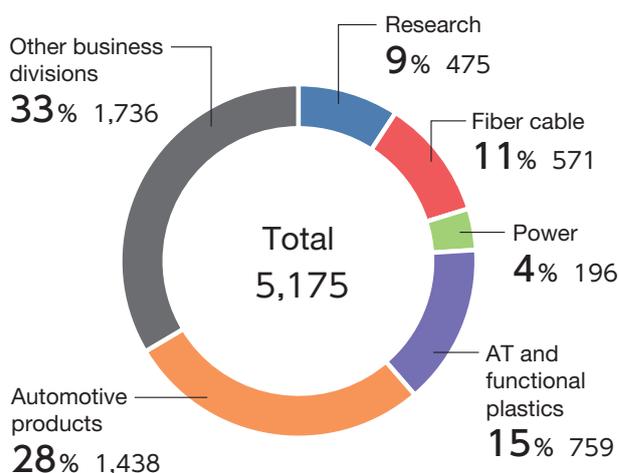
Expand the intellectual property portfolio

Approximately half of the intellectual property rights (patent rights, utility model rights, design rights, and trademark rights) held by Furukawa Electric belongs to a portfolio relating to either optical fiber cables (Optical Fiber and Cable Products Div.), power cable systems (Power Cable Div.), wire harnesses (Automotive Products Div.), or tape for semiconductor manufacturing (AT and Functional Plastics Div.). In these businesses, we will implement Open and Close strategy for the intellectual property and stabilize business execution by reducing intellectual property risks.

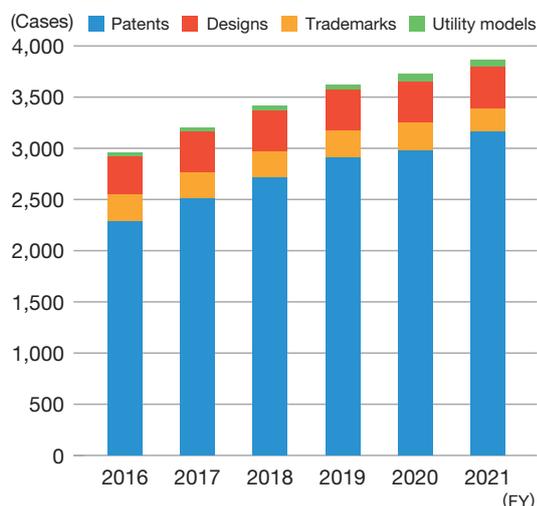
Number of rights held in Japan



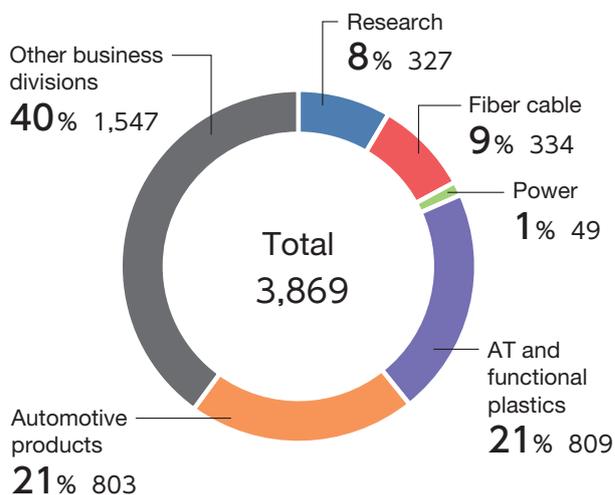
Number of domestic intellectual property rights held



Number of foreign rights held



Number of foreign intellectual property rights held

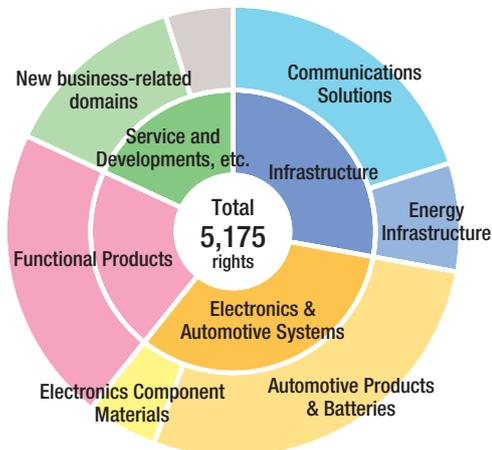


Intellectual property (patent) data

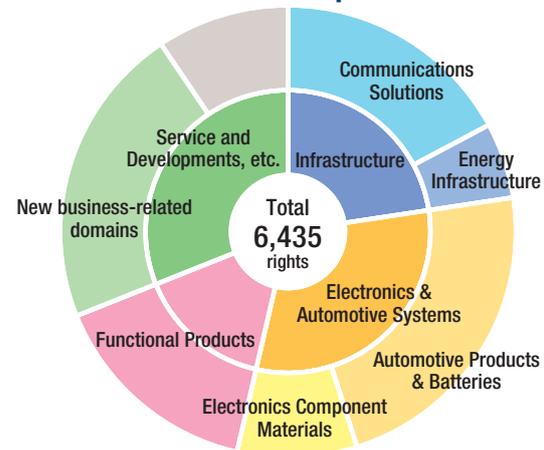
		Patents	FY2017	FY2018	FY2019	FY2020	FY2021
Furukawa Electric	Number of patents held in Japan	Cases	4,644	4,605	4,523	4,388	4,423
	Number of patents held overseas	Cases	2,507	2,712	2,910	2,976	3,160

* The increase or decrease in the number of patents includes the results of abandonment of rights for cost efficiency reason which is done periodically.

Number of rights held in Japan as of FY2021

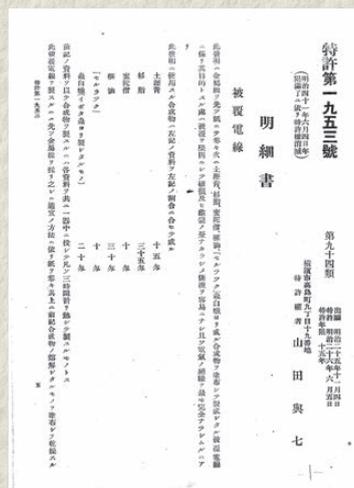
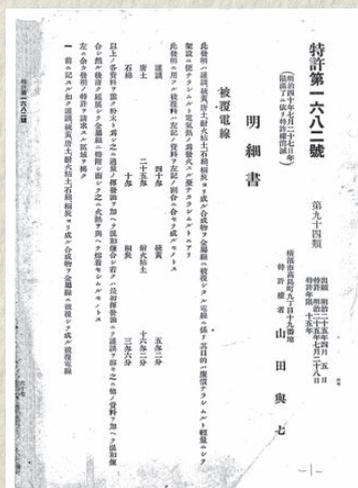


FY2012-FY2022 cumulative number of technical reports



column

The year of the foundation of the Furukawa Electric Group is recognized as 1884 when Honjo Copper Smeltery—which was the basis of our Group—and Yamada Cable Works opened. Yoshichi Yamada, the founder of Yamada Cable Works, was an excellent inventor. He is said to be the inventor who obtained Japan's first patent for cables, and he obtained two patents for covered cables in 1892. Ichibei Furukawa, the founder of the Furukawa Group, directed his attention to Yamada's inventions—that is, the innovations.



Patents of covered cables invented by Yoshichi Yamada (No. 1682 and No. 1953, in the year 1892)

For some time since 1920 when Furukawa Electric was established, we had developed many new products by actively introducing foreign technology. This was what is known today as open innovation. Records from those days indicates that after entering the Showa era, we successively developed a record number of products including insulated wires, power cables compliant with high voltages, and communication cables. The number of patents we obtained also rapidly increased.

The intellectual property portfolio of our Group is an asset that has been accumulated by such innovations since our foundation.

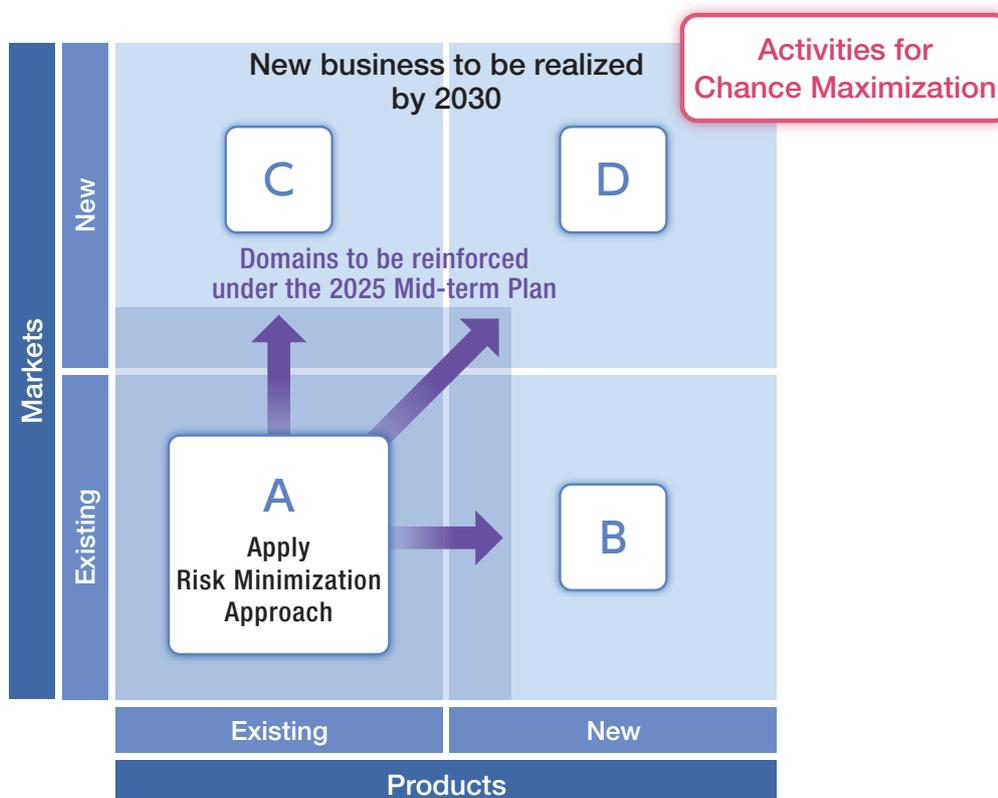
3-2. Sustainability Indicator (IP Landscaping Implementation Rate)

We seek new business fields and business models through IP Landscaping, which analyzes the competitive environment and market environment including intellectual property information of our own and other companies.

In order to realize a leap forward through the creation of businesses that solve social issues, we will promote the use of IP landscapes in businesses that support next-generation infrastructure and environmentally friendly businesses while supporting the development of foundations for the creation of new businesses toward 2030.

Implementation of IP landscaping

We have been expanding our intellectual property portfolio and reducing business risks in domain A of Ansoff's growth matrix. Going forward, we will put more focus on business reinforcing and/or new business creating themes in the other three domains B to D. We will use IP landscaping to reinforce our ability to formulate management and business strategies to create new value and acquire revenue opportunities.



Indicators and Targets

Materiality: “Open, Agile, Innovative” and “Building partnerships with various stakeholders”

Indicator (*: Sustainability indicator)	Result	Target	
	FY2021	FY2022	FY2025
The Furukawa Electric Group * IP landscaping implementation rate for business reinforcing and/or new business creating themes* ¹	17%	30%	100%* ²

*¹ The business reinforcing and new business creating themes include: i) maximizing the profitability of existing business (e.g., fiber optic cables, power cable systems) with a focus on capital efficiency toward 2025; and ii) establishing a foundation for creating new business (e.g., bipolar lead storage batteries) by 2030.

*² This means that all projects with respect to the business reinforcing and/or new business creating themes set as of 2022 have been implemented.

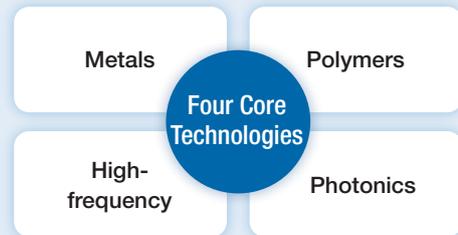
Activity

1 Visualization of Strengths by Competitive Technology Map

Our Group's materiality of revenue opportunities, "Open, Agile, Innovative," includes innovation and the use of intellectual assets. We will make great strides forward and create social issue solving businesses through open innovation and co-creation with diverse stakeholders by leveraging our four core technologies—metals, polymers, photonics, and high-frequency—which have been cultivated over many years with our materials capabilities at core.

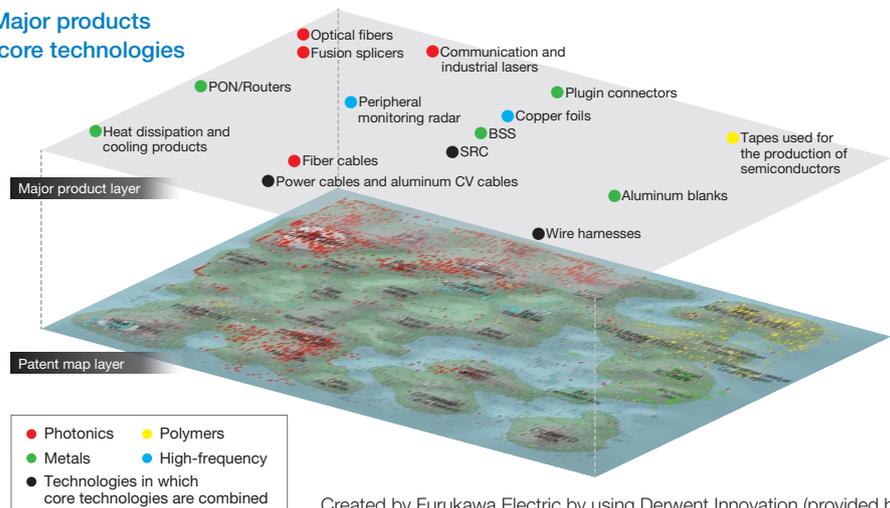
Four Core Technologies

Since its foundation in 1884, the Furukawa Electric Group has accumulated material technologies by expanding from copper smelting and electrical cables to a wider range of fields. Today, we have added high-frequency electronics technology to materials technologies, and maintain four core technologies: metals, polymers, photonics, and high-frequency.



We visualize our Group's patent groups supporting our major products and core technologies using a competitive technology map (CTM). The dots on the patent map layer indicate patent families filed by our Group, the analysis results of which are expressed by contour lines. The areas where patents are concentrated look like islands in an ocean. Dots located close to each other have stronger technical relationships, providing an overview of the portfolio of product development that employs core technologies. The points on the major product layer indicate where the products are located on the patent map layer. The four related core technologies are indicated in their four respective colors. Black dots indicate technologies in which two or more core technologies are combined. Comparing our Group's data with other companies' data using the CTM contributes to building new partnerships.

Patent groups/Major products supporting four core technologies



2 Creation of a Technology Roadmap by Professional Human Resources and Creation of Intellectual Assets

To continue solving social issues, it is very important to ceaselessly evolve core technologies, or our strengths. Furukawa Electric is widely sharing and disseminating a technology roadmap created mainly by our professional human resources having high degrees of expertise to actively share and disseminate the direction of evolution in our technologies that will solve the social issues expected to arise in the future. We expect that this activity will help us evolve our core technologies following the roadmap and create and accumulate new intellectual properties.

4 Interviews on Utilization of Intellectual Assets



Creating New Business that Contributes to Carbon Neutrality

Sustainable Energy Succession Project Team
General Manager, Development Department

Masayuki Fukushima

interview

A researcher's perspective and a manager's perspective

Fukushima uses two measures when he considers a new research theme.

One measure is whether it is something that has never been done by anyone before. As a researcher, Fukushima is strongly attracted to pouring his energy into the development of products and technology, rather than into competing with other companies.

The other measure is whether it is marketable. He thinks that it is much more valuable to provide products that have never existed before, and which are needed by society and bought by people, by developing unprecedented technology.

Commercialization of new technology

Fukushima had engaged in developing unconventional catalyst technology for fixing a metal catalyst inside a porous material, a fusion of polymer and metal technologies, both of which are Furukawa Electric's strengths. While developing this special catalyst, Fukushima had thoroughly explored the values this technology can deliver.

Then, he struck a rich vein in the form of green LP gas. Currently, LP gas is derived from fossil fuels, recovered from oil and gas fields or separated during the refining of crude oil. Although Japan and the world, aiming for a carbon neutral society, understand that the current production method for LP gas exerts a high environmental load, this is something that is hard to object to.

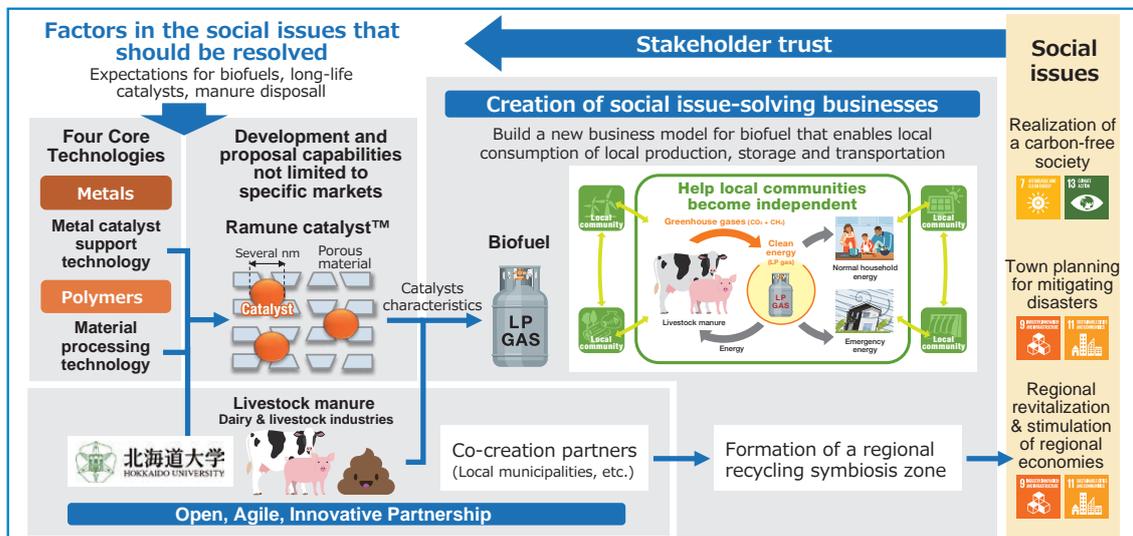
However, this new catalyst, which enables the production of LP gas from carbon dioxide and methane gas as raw materials, can cause a stir on this social issue. Fukushima has started seeking a way to commercialize the production of LP gas from livestock manure that is treated as waste in dairy and livestock industries.

Dairy and livestock industries are not fields which Furukawa Electric is familiar with. Can we secure raw materials? Can we find a profitable line? Faced with a multitude of problems, we should carefully do what we can to solve them, one by one, and increase our options.

Fukushima encourages development team members to report and share small mistakes because he believes that small changes in direction can be a way of avoiding a major failure.



Fukushima fully utilized IP landscaping in marketing and acquiring the rights to technologies. Patent applications, no more than 10 of which could be filed by the team, were increased five-fold with the cooperation of the Intellectual Property Department. Reviewing the registered patents, Fukushima finds a number of ideas and technologies that can be used for future businesses. This, he recalls, is something for which he cannot thank the Intellectual Property Department enough.



Business model for Green LP Gas with Ramune Catalyst™
 Technology details: https://www.furukawa.co.jp/en/rd/review/fr053/fr53_02.pdf

Team building

Fukushima exerts his efforts in concentrating the energy of the people involved. He believes that being teammates with internal development members and external co-creation partners will generate driving force. Thus, technologies, rights, and even troubles are shared. Problems are exhaustively discussed, and these discussions find the best options and the best landing points. He believes this open-minded team building will be the source of excitement.



These efforts bore fruit at the Ichigo Ichie Tochigi National Sports Festival. Green LP gas made from biogas derived from cow manure in Tochigi Prefecture was provided as part of the fuel for the torch (a symbol of the Sports Festival, similar to the Olympic flame).

Fukushima always kept in mind when would be the time to stop this development if it was necessary to do so. He promoted this project by setting targets with deadlines, determined to cancel it if any target was not achieved.

Although the path to commercialization of this new business looks rocky, Fukushima is beginning to see the way ahead.

A few words from Intellectual Property Department staff

Seika Onozaki

I am pleased that our intellectual property activities can contribute to building a team with internal and external members, so that the development team can realize its thoughts to value new technology and co-create with partners by using intellectual property. The Intellectual Property Department will continue its efforts to help our Group expand social issue solving business.



Creating Life Science Business

Social Design & New Business Development Department
Manager, Life Science Section
Junichi Hasegawa



interview

Marketing-centered selection of development themes

Hasegawa is currently seeking ways to commercialize the application of photonics technology to the medical field. Light has a wide range of possibilities, such as enabling analysis and classification while minimizing damage to an irradiated object, and exerting intense energy to cut or burn an object.

Hasegawa, who is responsible for creating new business, has been conducting extensive marketing activities to realize those possibilities. As part of his efforts, he regularly holds study meetings on marketing with all members of the technology development team, so that every member can fit their theme in a framework and explore the direction of a product that matches a market. Hasegawa believes that engineers developing a new product must bear in mind “the product a market demands”; they should consider, for example, which company needs the product, whether or not the specifications are sufficient, and whether the cost is reasonable.

He specifically emphasizes voice of the customer (VOC). The process of matching the needs of medical sites with the seeds of Furukawa Electric is one of his priorities. At the same time, building a network that enable us to hear what doctors really think is one of his important marketing activities.

The new product Tellumino[®] is the fruit of these activities.



Tellumino under development for market launch
Tellumino website: <https://www.furukawa.co.jp/en/product/development/lifescience/tellumino.html>

An internal transfer that elevated my perspective

Now, Hasegawa is an explorer of a new business, building up everything from scratch with the exception of photonics. His marketing-emphasizing perspective, however, was cultivated at his former job in the Strategic Planning Department.

Since joining the company, he had been engaged for 20 years in the development, design, and manufacture transfer of optical components called optical waveguides. An optical waveguide is a glass component including optical wiring formed on a wafer by applying a semiconductor manufacturing process. This component plays an important role in miniaturizing laser devices and requires a high level of expertise to manufacture.

Then, Hasegawa was suddenly ordered to transfer to the Strategic Planning Department. The transfer came as a bolt out of the blue, but it turned out to be a turning point for him.

Hasegawa spent two valuable years in the Strategic Planning Department, getting an overview of all research and development activities in Furukawa Electric. He recalls that at that time, he was thoroughly educated in the importance of marketing.

The Social Design & New Business Development Department to which he currently belongs places the utmost importance on market orientation, in other words, whether or not a business can be commercialized. In this department, he has been practicing the theories that he learned in the Strategic Planning Department in actual businesses with other parties, and improving the accuracy of market orientation.



STP analysis and IP Landscaping

In analyzing a market in terms of Segmentation, Targeting, and Positioning, it is crucial to know how to interpret the data. New business themes tend to diverge, and there are moments when every one of them seems promising. It is not possible, however, to promote all of them. So it is necessary to decide on a prompt withdrawal as soon as a theme is seen as hard to commercialize. Hasegawa regards the IP landscaping provided by the Intellectual Property Department as a valuable information source because it highlights not only technological information but also possible customers, guiding the course of product development he is to take and helping his decisions of selection.

Shaping the future

Hasegawa recognizes that a vision for the new business creating division involves nurturing next-generation business while making sales. He repeats the processes of excavating and narrowing down to sort out possible future technologies, and envisions future product lines while looking for the right time to launch. Hasegawa expects that connecting the dots of businesses into lines and then into bundles will provide a vision of product business as the destination of component business. With a sense of conviction that the foreseeable future can be shaped, he has been striving to present a model case of new business creation in Furukawa Electric.

A few words from Intellectual Property Department staff

Hideki Aizawa

I feel that these attractive approaches will lead our Group's core technology of photonics to creating new business. We will implement IP landscaping in an agile way, contributing to the strategy formulation and business environment analysis needed for decision-making.

We aim to realize the shape of the future through co-creation with the development team.



5 Topics

Participation in the Intellectual Property and Intangible Asset Management Forum

The Intellectual Property and Intangible Asset Management Forum was established on October 24, 2022. This forum is a place where managers from listed companies discuss the utilization of intellectual property and intangible assets, and President Kobayashi of the Furukawa Electric Group was appointed as vice-chairman. We decided to participate in this forum in great support of the Forum's founding purpose, which is to provide a forum for discussion for Japanese companies that are trying to change their management style and implement management utilizing intellectual property and intangible assets.

Learning from other Japanese companies through dialogues and proposals in the forum, we will work on "aggressive intellectual property" and contribute to achieving innovation and regeneration that will revitalize Japan with intellectual property.

■ For details, please visit the Intellectual Property and Intangible Asset Management Forum website of Human Resources Governance Leaders Co., Ltd.

<https://www.hrgl.jp/service/ipforum/>

Informal Meeting with the Commissioner of the JPO

An informal meeting between Koichi Hamano, Commissioner of the Japan Patent Office (JPO), and President Kobayashi was held on December 14, 2022, where they talked about intellectual property strategies and other topics.

President Kobayashi explained our specific efforts in terms of the following two perspectives: risk minimization to stabilize business through the formation and utilization of IP portfolio; and chance maximization to better formulate management and business strategies through the utilization of IP landscaping.

Commissioner Hamano shared the sentiment of our group's message: "IP is at the core of our business strategy." The informal meeting was a very valuable opportunity for us to reaffirm that intellectual property is an indispensable part of our Group's management strategies.

■ For details, please visit the photo gallery on the JPO website

<https://www.jpo.go.jp/news/ugoki/202301/2023012301.html>



Along with the statue of Furukawa Ichibei, the founder of the Furukawa Group
From left: President Kobayashi, Commissioner of the Patent Office Hamano

On the occasion of issuing the Intellectual Property Report 2022

"IP is at the core of our business strategy" is the phrase by which President Kobayashi expressed his commitment to "valuing new technology", which is one of the three important things that we value. To realize of this slogan, our Group will promote intellectual property activities in terms of both risk minimization and chance maximization.

As to chance maximization in particular, IP landscaping implementation rates for important projects have been set as a sustainability indicator to use IP landscaping as a driving force toward the 2025 Mid-term Plan. We sincerely hope that these activities will result in our

enhanced corporate value, and furthermore, contribute to solving social issues.

We hope that this report will provide you with a better understanding of the intellectual property activities of the Furukawa Electric Group.

July 2023

Senior Fellow, General Manager,
Intellectual Property Department

Michio Ohkubo





Drawing on more than a century of expertise in the development and fabrication of advanced materials, we will contribute to the realization of a sustainable society through continuous technological innovation.

