

## Basic Philosophy

# The company making lives better by co-creating value

### Sustainable Value Together

In the 1900s, Japan began producing raw materials for celluloid, which was applied to a broad range of household items that improved the quality of people's lives. However, the special procurement boom caused by World War I led to a proliferation of domestic celluloid manufacturers and intense competition, resulting in a decline in quality from the mass production of inferior products and the indiscriminate felling of camphor trees.

Eight leading manufacturers concerned about the situation sought to restructure the industry by merging to form Dainippon Celluloid Co., Ltd., the predecessor of today's Daicel Corporation.

This merger made it possible to manage raw material resources, stabilize production and quality, and nurture processing companies in the downstream industry, thereby laying the foundation for a manufacturer boasting the top share of global celluloid shipments.

Furthermore, research for fireproofing celluloid, which was conducted alongside the merger, laid the foundation for developing a chemical industry in Japan that generates diverse materials.

While Daicel's business and organization have significantly changed since its founding a hundred years ago, the spirit of applying the power of chemistry to improve daily life has remained unchanged.

Just as the eight celluloid companies joined hands to enrich society, Daicel will work with customers and partners to develop a sustainable society.

Moreover, we will continue to change the future for the better through the power of chemistry by remaining true to our aspirations as a company that make lives better by co-creating value.

## Sustainable Management Policy

Upon a firm foundation of safety, quality and compliance, the Daicel Group will realize our basic philosophy by both contributing to the establishment of a sustainable society and pursuing business growth with integrity, tireless efforts and self-transformation.

We create and provide people with new values to achieve better quality of life.

We construct a circular process with all our stakeholders to make harmonious coexistence with the environment.

We promote "human-centered management" that enables diverse employees to grow while establishing their own presence and achieving fulfillment.

Photograph: compression process at the Aboshi Plant

# Value Creation, Past and Present

Ever since its founding in 1919, Daicel has been achieving growth by meeting the needs of society as it changes over time and developing and providing products that contribute to sustainability. Let us take a look back at the course of over 100 years of value creation as Daicel has challenged itself to achieve the ideal of *monozukuri* manufacturing.

## 1919-

Celluloid

Enrichment of daily life

As a pioneer in the field of plastics, we played an integral role in the development of the Japanese chemical industry.



Cellulose acetate

Securing safety

1938 Commercialized cellulose acetate, offering a solution to flammability concerns associated with cellulose nitrate.



Development of Our Celluloid Business and Creation of a New Organic Chemicals Business



Daicel was founded in 1919 through the merger of eight celluloid companies. From the beginning Daicel worked to make celluloid less inflammable and ended up developing acetate plastic. After establishing the Arai Plant in 1935, we then in 1938, laid the foundations for our cellulose and organic chemicals businesses by setting up a system for consistent production of the raw material cellulose acetate from acetic acid.

## the 1950s

Tri-Acetate Cellulose (TAC)

Fireproofing films for movies and photography and adding advanced properties

1953 We began producing TAC and after 2000, this business grew significantly as the material came to be used for optical film.



Full-Scale Production in Our Cellulose Business and Starting Our Pyrotechnic Devices Business



Production of acetate plastic went into full operation at our Aboshi Plant in 1950, and in 1953, joint research with Fuji Photo Film Co., Ltd.\* led to the beginning of production of TAC, and in 1958 our Sakai Plant began production of acetate toe, which is used in cigarette filters, rounding out our cellulose business. Since cellulose nitrate is a raw material for pyrotechnics, our pyrotechnic business developed, and we established the Harima Plant in 1954.

\*Now known as Fujifilm Corporation

## the 1960s

Polyacetal (POM)

Taking on the challenge of Metal Replacement

1964 Daicel began manufacturing engineering plastics, which serve as metal substitutes in automobiles and other products. Their use has contributed to the development of lightweight components and contributed to a reduction in the environmental load.



Entry into the Petrochemical Business



During the 1960s, Daicel participated in Japan's first petrochemical complex and began its petrochemical business with the construction of the Ohtake Plant. In the synthetic resins business, in addition to manufacturing AS resin and ABS resin, Daicel entered into a joint venture with the U.S. company Polyplastics, Co. Ltd.\* and went into the engineering plastics business.

\*Polyplastics, Co. Ltd. became a wholly owned subsidiary of Daicel in FY2021/3.

## the 1980s

Acetic acid using the methanol carbonylation process

Realignment of the acetic acid sector

1980 Introduced the methanol carbonylation process to produce acetic acid, our core material, which led to the realignment of the acetic acid sector.



Strengthening the Foundations of Our Acetic Acid Business



In order to deal with a structural slump and to strengthen our main businesses, we went into the methanol carbonylation business, which was the cutting-edge technology at the time, as part of an effort to switch to raw materials that do not depend on petroleum. Participating in the C1 Chemistry Project\*, we played a role in reorganizing the acetic acid industry. \*C1 Chemistry was a national project which aimed to break away from over-reliance on oil during the 1970s energy crisis.

Chiral columns

Provision of safe medicine

1982 Started producing chiral columns, which are used to separate substances that may otherwise cause adverse side effects.



Automobile airbag inflators

Provision of safety and security

1988 Started supplying the key component for automobile airbag systems that protect passengers in the event of a collision.



Proactive Expansion of Our Businesses Overseas



During the 1980s, we established local subsidiaries in Europe, the United States, and Asia. In 1988, we established a subsidiary for manufacturing inflators for automobile air bags. In 1990, we set up a manufacturing base for optical isomer separation in the United States, and in 1992, we began manufacturing acetate toe at a joint venture company in China.

## 2000 and beyond

Autonomous Production System

Improvements in productivity

2000 Daicel Production Innovation Established.

2020 Daicel made use of artificial intelligence to develop the Autonomous Production System, a more evolved version of Daicel Production Innovation.



Expansion of the Inflator and TAC Businesses and Lateral Development of Daicel Production Innovation



We have expanded our inflator business and established bases for that purpose in six countries around the world. We have also expanded our display business by taking TAC, originally a raw material for movie and other films, and using it for manufacturing optical film. In the area of technology, we are opening the Daicel Production Innovation system that we established at the Aboshi Plant and gradually extending it to the entire company and accelerating our process innovations. In 2017, we opened Innovation Park as a center for research and development and concentration of production technology.

FY2022/3 Mid-Term Management Strategy

## Launch of "Accelerate 2025"

Uncovering new needs, starting new businesses in order to co-create value with our customers and business partners, and constructing new biomass product trees with environmentally-friendly new technology, we will contribute to construction of a circular society with Daicel's unique efforts and determinations.

Marine biodegradable cellulose acetate

Solution for marine plastic

We have noticeably improved marine biodegradability of naturally derived and biodegradable cellulose acetate, and we are continuing to develop other environmentally-friendly products.



Product Deployment with One Time Energy™

Pioneering new uses through reinterpretation of the functions of existing technology

We are taking the technologies that we have developed safely, accurately, and instantaneously by generating a single burst of optimal energy and adapting them to uses in industries such as health care and automobiles.

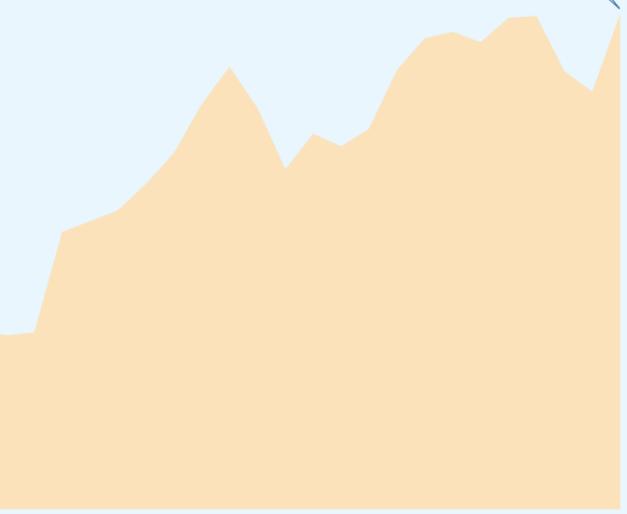


Actranza™ lab



Pyro-fuse

FY2022/3: Consolidated net sales  
¥467.9 billion



## Message from the President and CEO



*Y. Ogawa*

Yoshimi Ogawa  
President and CEO,  
Daicel Corporation

## With “technology for melting wood” we will contribute to building a circular society where ecology and economy are aligned

Since its foundation more than 100 years ago, when the term “SDGs” or “sustainable” had not yet been used with today’s meaning, Daicel has been committed to an essentially similar concept. As a pioneer in biomass chemistry that has always handled wood resources, we are contributing to building a circular society with partners that share our aspirations.

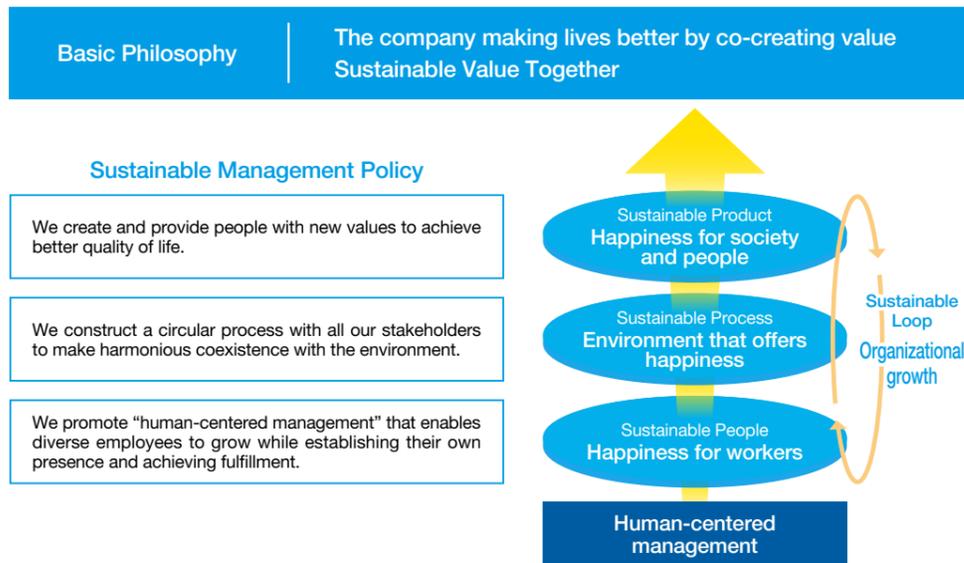
### After securing a foothold, major transformations have begun

FY2022/3 was the first year of our “Accelerate 2025” Mid-Term Management Strategy, in which we embarked toward major changes. We, as a group, have made a good start by changing our organizational structure to a customer-in approach, retreating from unprofitable products, relocating and consolidating production sites, and making other major changes in the way we work and our work content. Consequently, our FY2022/3 results showed a year-to-year increase in both sales and profit, thanks to record-high sales and profits achieved by Polyplastics Co., Ltd. (Polyplastics), which became our wholly owned subsidiary in FY2021/3 as well as to cost reductions and sales expansions in existing businesses. Numerically we have returned to pre-pandemic levels, and we are making steady progress, as evidenced by the improvement in our management indicators.

One of the highlights of FY2022/3 was Daicel Group’s Business Contest (DAICON ㊦ P.23), which was planned and carried out by our younger employees. DAICON aims at providing an opportunity for employees to present their ideas openly to management and hone their power to produce something out of nothing. This is important since the ability to create a new business model is essential for developing new technologies and products into a business. The theme of the first contest was to identify

internal issues, following our culture of uncovering problems based on a CAPD cycle, rather than a PDCA cycle. Some members of management expressed their concern that employees might hesitate to point out negative aspects of the Company in front of management. However, I thought that even if it did not work, we could change our minds and try again. As a result, 51 teams participated and we were able to listen to voices from the frontline, including home truths, and discuss them with outside directors. I also see signs that a major transformation is progressing well as shown by changes in the awareness and behaviors of employees. For example, younger employees now inform me directly of the suggestions that come out of study sessions they hold of their own initiative.

In the face of these uncertain circumstances, due in part to the COVID-19 pandemic and the situation in Ukraine, I believe it is important not to shrink back when we think, make decisions, and take appropriate risks that will lead to our growth. We will continue our efforts to transform ourselves together with the approximately 11,000 employees of our Group working all over the world.



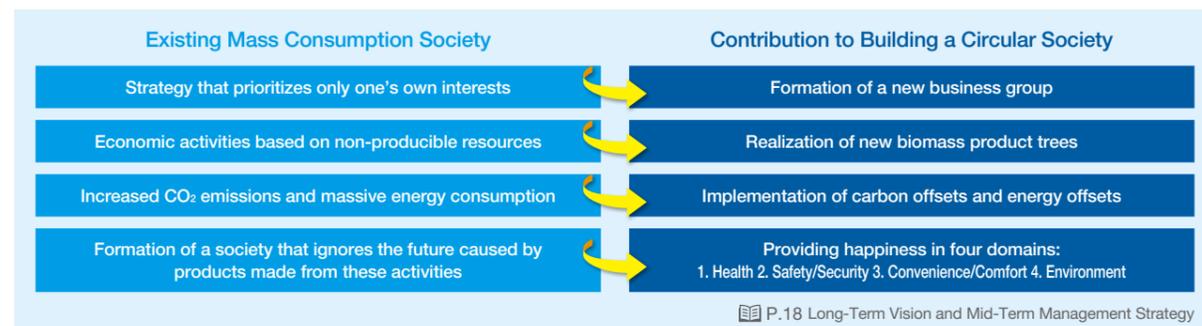
**Daicel's abiding spirit since its foundation**

In FY2020/3 we established the Sustainability Management Policy. As a materials manufacturer, we believe it is not enough for Daicel to contribute to society by simply making good products; the manufacturing process itself must be sustainable. Products made by people (employees) with a sense of fulfillment will bring happiness to everyone and society as a whole. Moreover, the products should be made through a process both people and environmentally-friendly. We are convinced this will create a sense of pride and confidence among workers and create new value. By achieving Sustainable Products, Sustainable Processes, and Sustainable People, we will create a sustainable society and further the growth of our Group. Thus, our Fourth Long-Term Vision and Mid-Term Management Strategy set a goal to make Daicel's unique

contribution to building a circular society, replacing the existing mass-consumption society.

Daicel's spirit of sustainability for the entire society has been consistent since its foundation in 1919. In those days, the special procurement boom caused by the First World War led to a proliferation of celluloid manufactures in Japan, resulting in excessive competition in the industry and overcutting of camphor trees, the raw material for celluloid. Concerned about that situation, eight leading manufacturers merged to reorganize the industry, giving birth to Daicel. Since its inception, we have been committed to the proper management of raw material resources as well as to the promotion of new materials for the world by supporting processors and creating markets together. Our interest has always been not only in our own profits, but also in coexistence and co-prosperity with all our stakeholders, including the natural environment,

**Social shift to a circular society proposed in our Long-Term Vision and Mid-Term Management Strategy**



through a win-win relationship in manufacturing. Even before the terms "SDGs" and "sustainable" gained their current definition, Daicel has long embraced this spirit.

**Daicel's unique contribution to building a circular society**

Daicel is a pioneer in naturally derived chemical products that has always handled wood resources. Moreover, when we participated in a national project named C1 Chemistry, which aimed to break away from over-reliance on oil during the 1970s energy crisis, we were the first to synthesize non-petroleum-based organic compounds from one-carbon compounds such as carbon monoxide and methanol. Currently, methanol-based products account for 50% of our sales of chemicals. We are proud to be a chemical company capable of switching to biomass products by converting raw materials into bio methanol.

In order to give rise to Daicel's unique contribution to building a circular society, our Mid-Term Management Strategy has the goal of the formation of new biomass product trees.

**The key to transforming society is our technology for melting wood**

Cellulose, which represents one of Daicel's strengths, is a naturally derived biomass material. However, the process of separating cellulose from pulp consumes an enormous amount of energy, which creates a challenge. Solving this problem by creating an innovative production method is our mission.

The key to realizing new biomass product trees is a technology for melting wood. The reason why petroleum resin is preferred over wood-derived celluloid is that liquid petroleum is more soluble and produces a variety of reactants more easily than solid wood. Moreover, the manufacturing process that uses hard-to-melt wood as raw material is energy-intensive. In order to move away from over-reliance on oil and generate a circular society, we must create a technology for melting wood while reducing energy load and costs. We are conducting joint research with Kanazawa University and Kyoto University to develop a technology that melts wood using less energy. Once this method is established, new biomass product groups will be created in a wide range of fields. This will make it possible for biomass products to replace or complement petrochemical products.

Beyond that, we propose the Biomass Value Chain concept, which uses our technology for melting wood to make efficient use of wood, revive the forestry industry, restore Japan's original natural vegetation or deciduous broadleaf forests on the sites where trees have been logged, reduce the risk of landslides through the forest's water retention capacity, and allow the decaying leaves to circulate nutrients to river basins and the ocean. This concept is aimed at producing a sustainable ecosystem and society for Japan, where forests still now cover approximately 70% of its land.

Furthermore, by melting down and recycling wastes generated in agriculture and fisheries, we will be able to build a new sustainable industrial ecosystem in which primary and secondary industries work together. Once we can dissolve various biomass materials, we would like to create and publish complete data on solvent formulation and solubility to develop a new environmental business model. We believe that this will stimulate the emergence of diverse biomass products worldwide, and thus help all society be less dependent on petroleum.

To fulfill this concept, in April 2022, we formed a new internal organization that strengthens collaboration between industry, academia, and government. This fall, we plan to open a new research institute at Kanazawa University through our financial contribution. Located at a highly public national university, the institute is expected to be used for joint research between various companies and research institutions.



### Seeking technological innovation through the application of technology for melting wood

The microfluidic device plant, which applies our melting technology to a chemical plant, is a manufacturing method that fundamentally overturns the concept of the chemical industry. Previously it has been considered heavy, bulky and energy intensive. To realize this, we have completed a pilot plant through joint research with the University of Tokyo and National Tsing Hua University in Taiwan. The combination of our technology for melting wood, along with the chemical plant unit operations developed through DAICEL Production Innovation, enables the precise mixing, reaction, and purification in ultra-fine channels drawn on a glass chip as small as a business card. By increasing the number of glass chips, we can create an extremely compact, lean, environmentally-friendly and innovative chemical plant with an annual production capacity over several tons. Our final goal is to achieve sustainable manufacturing that produces only the quantities a customer needs and only when they require it in their factory. We plan to implement the microfluidic system in our plants in Japan during FY2025/3 (P. 26).

To achieve carbon neutrality, we need to become carbon negative by converting CO<sub>2</sub> into chemical raw materials through reduction reactions. We are conducting joint research with Kanazawa University on the possibility of enhancing the effectiveness of this technology by combining diamond synthesis and electrochemical technologies. It is certainly possible to protect the ecology and grow the economy at the same time. Otherwise, the sustainability of corporations and society would never be achieved. With confidence and pride in process innovation, which is our forte, we will fully demonstrate our presence as a chemical company.



### Accelerating growth by co-creating value chain

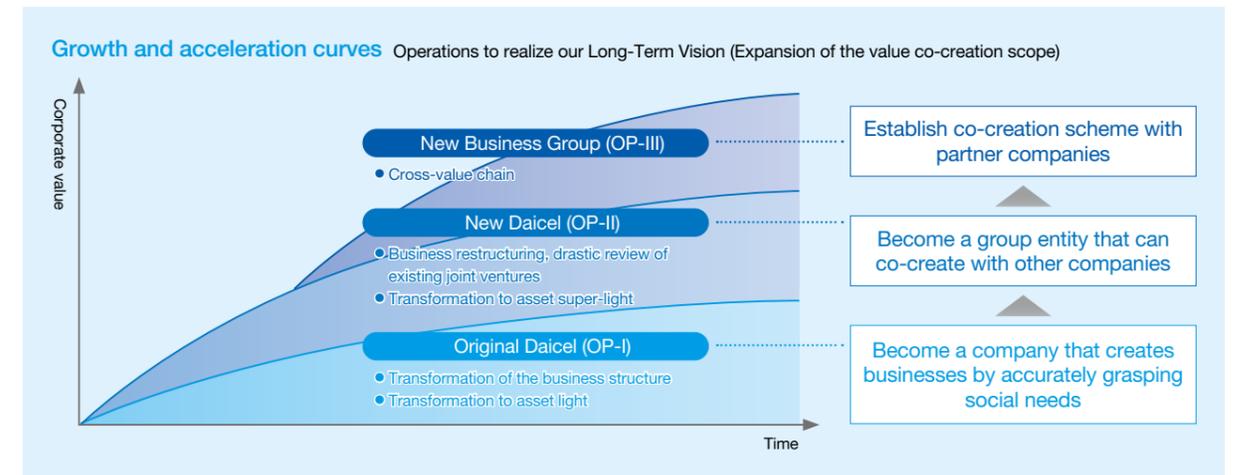
In my early 30s, I was involved in the production of organic synthetic products at the Ohtake Plant. Since we are a BtoB intermediate material manufacturer, we cannot reach the final product without connecting a considerable number of supply chains. While it was difficult to get a sense of whether we were creating valuable products for our customers, it was a great pleasure for me when a customer at that time told me, "We have created such and such a final product. From there, not only our developers but also our manufacturing engineers and factory operators began to visit our customers, and this also led to a real sense of manufacturing and achievement for us.

This experience made me want to form more of a win-win relationship between us and our suppliers who engage in previous and subsequent manufacturing processes. One of the reasons for creating the DAICEL Production Innovation was to remove the barriers between different departments and different plants that remained in Daicel at the time, and to share information in order to create an environment that enabled us to mobilize all available resources. After the internal reform, the next step is to collaborate with suppliers and business partners in previous and subsequent processes. By expanding this effort further throughout the supply chain, we will be able to form a more beneficial value chain that links everyone from the raw material providers to end customers.

Although we are a medium-sized chemical company, we have unique technologies and unique talent. In order to make the best use of these resources to contribute more to society and demonstrate the significance of our existence, it is essential for us to actively disclose information, visit our customers, and add value to our supply chain. Each of our measures to contribute to building a circular society is significant in scale and cannot be accomplished by us alone. Co-creation with customers, as well as our supply chain, universities, research institutes, government agencies, and industry peers is indispensable. Our Long-Term Vision seeks to create greater value by transcending the conventional concept of company and forming a value co-creation entity with partners who share our aspirations.

### Our current initiatives to create a bright future

Our Mid-Term Management Strategy targets 500 billion-yen sales by FY2026/3, but we are considering revising



this upward because achievement of this goal is already in our sight. Despite external factors, many investment projects for the mid-term strategic period are in the pipeline. We will not misjudge the timing to invest.

In FY2023/3, we will continue to implement a thoroughly asset-light strategy by identifying appropriate inventories and investment amounts, while at the same time, we will reduce costs rigorously, regarding Material business as our foundation business as the demand for chemicals is steady. In the Safety business, we are proceeding with structural reforms such as relocation and consolidation of production sites and integration of product models, while building a new base in the growing market of India. In the Smart business, we are developing functional films with newly acquired coating technology, and plastic lenses for sensing, which are expected to grow rapidly. We are also investing to increase production of electric solvents and resist materials to meet strong demand. In the Medical/Healthcare business, we will strengthen our global development and sales capabilities with the aim of operating a new plant for our core products, as well as transforming the life science field into an SBU. A series of investments to increase production are underway in the Engineering Plastics business, which continues to be in full production. We will boost profitability by maximizing the advantages of the acquisition of Polyplastics as our wholly owned subsidiary in FY2021/3.

### Human-centered management

We believe that the value of a company's existence is to promote the happiness of everyone involved in every area

of our business, including products, the manufacturing process, and working people. Thus, our sustainable management policy is also based on human-centered management. It is people (employees) who fulfill our Long-Term Vision and Mid-Term Management Strategy and uphold our sustainable growth. We are striving to be a group of professionals who are self-reliant amid a diverse range of career options. This fiscal year we reviewed our personnel system and changed it to a multiple-track job grade system. The previous single-track grading system was based on equality in theory, but in reality, it screened employees and divided them into different tracks in some cases. We cannot say that this valued people in the way they deserved. We must become a company where employees proactively think what they want, act, and achieve fulfillment. By respecting the freedom of each employee and delegating authority to them, we strive to be an autonomous and self-driven organization that can respond to the market and customers quickly and flexibly. For this purpose, we have prepared as many career options as possible for employees to make the most of themselves, such as permission to have a side job and offer a job posting system, in addition to the multi-track career planning. I believe that a professional is a person who makes their own choices and fulfills the responsibility that comes with it. An organization that attracts such professionals is more interesting for the workers and stronger as a company. Through our working style that respects diversity and encourages each employee to take on challenges with vigor, we will contribute to the realization of a sustainable society.

# Value Creation Process

Under its basic philosophy and priority foundations of corporate activity (safety, quality, and compliance), the Daicel Group will continue to contribute to the happiness of people and society by expanding the scope of value co-creation based on its Sustainable Management Policy.

