

Japan Paper Association  
Sustainability Report  
2021





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# Preface



The so-called SDGs, the international goals for a sustainable and better world by 2030, were unanimously adopted by member countries at the UN Summit in September 2015, with the main message of "leave no one behind" and are currently being implemented at the national, corporate, and citizen levels. For us in the pulp and paper industry as well, we believe that one of the most important management issues is how much we can contribute to this goal and how we can contribute to building a sustainable society beyond it.

The Japan Paper Association summarized the relevance of the SDGs targets to the Japanese pulp and paper industry, through its SDGs Working Group (now expansively reorganized as the SDGs Committee) comprised of its member companies, in the report "Towards 2030" in March 2021. The report reaffirms that the pulp and paper industry is contributing to many of the SDGs targets through its production and sales activities, and recommends the importance of more strongly disseminating to society our voluntary and progressive efforts and achievements, particularly in the environmental field.



Wood, the raw material of our pulp and paper industry, is not only a renewable resource, but also an excellent resource that absorbs and fixes CO<sub>2</sub>, which is considered the main cause of global warming. Also, when paper and paperboard products made from wood finish their temporary role, many of them are collected as recovered paper and are transformed into new products again as raw materials for paper and paperboard. Taking advantage of these industry characteristics, the pulp and paper industry of Japan has been making efforts, especially since the 1990s, to establish voluntary action plans and numerical targets related to the environment, and to realize and achieve them. In addition, paper mills scattered across the country are creating a large number of jobs, and are fulfilling their role in coexistence with society as bearers of local economies.

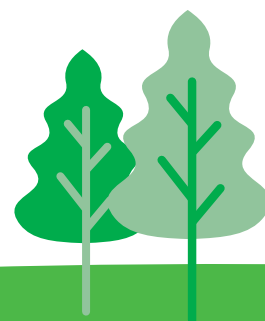
In this publication, we have reiterated our efforts and progress in relation to other SDGs targets, in the hope that not only industry participants but also the general public will gain a deeper understanding of the actual state of the pulp and paper industry in Japan.

The pandemic caused by covid-19 seems to have accelerated changes in lifestyles as well as brought about a slowdown in the economic activity. The accompanying demand for paper and paperboard is on a declining trend, with shades of increase or decrease among varieties becoming clearer, but this does not imply that their role has been impaired. We are convinced that they can continue to play a role as a partner in our daily lives, both now and in the future, by making the most of the characteristics of each variety.

The SDGs target year of 2030 is just around the corner. And the year of 2050, when the international community aims for a carbon neutral world, is not far away. We, the pulp and paper industry, will continue to move toward the goals for carbon neutrality and sustainable development.

Japan Paper Association  
Chairman

*Tom Nozawa*

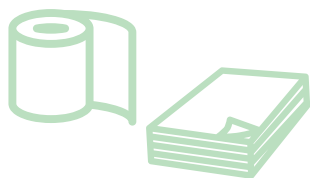


# 2 Value Creation Model of the Pulp and Paper Industry

The pulp and paper industry is an essential industry<sup>※1</sup> that contributes to a sustainable society.

**Supply of products that support economic development and social life through production activities**

The pulp and paper industry produces and supplies many essential products<sup>※2</sup> that support industrial activities and home life, such as newsprint and printing paper for information use, cardboard and kraft paper for packaging use, toilet paper and tissue for hygiene use, and paper and paperboard including insulation paper for industrial use.



Also, in recent years, we have been actively involved in the development of new materials such as cellulose nanofibers<sup>※3</sup> that utilize wood fibers, as well as various products that are substitutes for plastics, contributing to climate change issues through the development and production of products that make the most effective use of renewable wood resources and energy-saving measures.



**Contribution to environmental conservation through appropriate management of natural capital, such as forest resource circulation and recovered paper recycling**

The raw material for paper is "wood," a renewable resource. Under the philosophy of "sustainable forest management," the pulp and paper industry has focused on protecting, utilizing, and nurturing these precious forest resources for future generations. Through these efforts, we are contributing to environmental conservation by preserving the biodiversity nurtured by forests and adapting to climate change through CO<sub>2</sub> absorption.



The pulp and paper industry has also taken advantage of the fact that paper is a recyclable material, and has created a trend of collecting used paper (recovered paper) and making it into paper again. As both producers of paper and consumers of recovered paper, the pulp and paper industry is committed to fulfilling its role in this trend by using as much recovered paper as possible, improving its recycling technologies, and making further efforts to expand the use of recovered paper products.



**Proactive efforts to counter global warming through the effective use of energy**

The pulp and paper industry actively utilizes biomass energy such as by-products (black liquor), wood chips, and paper sludge (organic sludge containing fine fibers) generated when producing pulp from wood, as well as combustible waste such as waste tires and RPF (a type of waste fuel), and plays a role in the effective utilization of energy generated in the papermaking process and in waste recycling.

Thus, the pulp and paper industry is working to reduce the use of fossil energy sources such as heavy oil and coal, which contribute to global warming, and in January 2021 we were one of the first to declare "virtually zero CO<sub>2</sub> emissions by 2050" in an effort to build a carbon neutral<sup>※4</sup> industry.



※1) Essential industries are industries that supply products essential to people's lives.

※2) Essential products are products that are essential to people's lives.

※3) Cellulose Nano Fiber is a material made from wood fibers micronized to the nano-order (one millionth of a millimeter), and is an excellent material that is transparent, light, strong, resistant to deformation, and has a high thickening effect.

※4) Carbon neutral means that the total CO<sub>2</sub> emissions minus CO<sub>2</sub> absorption/removal is zero (neutral).

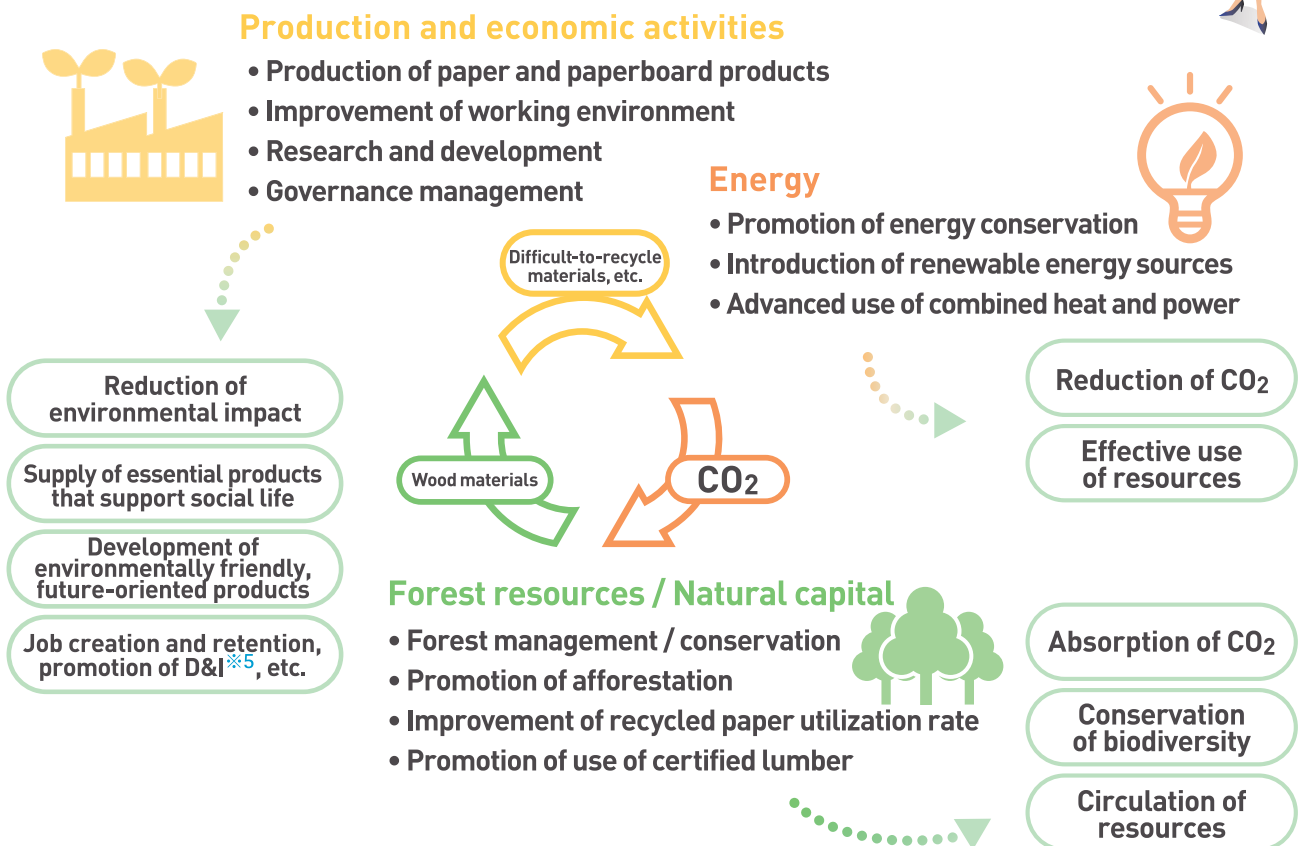


## Pulp and paper industry resources

- Human capital
- Intellectual capital
- Manufacturing capital
- Financial capital
- Social relations capital
- Environmental countermeasure technology
  - ✓ Energy conservation / low-carbon
  - ✓ Wastewater and flue gas treatment
  - ✓ Waste treatment
  - ✓ Chemical substance measures



## Value creation process in the pulp and paper industry



## Contribution to Society

### Major SDGs<sup>※6</sup> to which we will contribute



### Strategic initiatives ▶ p.16

- ✓ Realization of the establishment of a carbon neutral industry
- ✓ Contribution to the circular economy of waste paper utilization system
- ✓ Contribution to green recovery
- ✓ The role of paper in a digital society

※5) D&I stands for Diversity & Inclusion, which means respecting and acknowledging each individual and making the most of their good points, regardless of external attributes such as gender, age, disability, and nationality, as well as internal attributes such as lifestyle, work history, and sense of values.

※6) SDGs stands for Sustainable Development Goals, an action plan consisting of 17 goals and 169 targets unanimously adopted by the United Nations. Also, "Major SDGs to which we will contribute" refers to the eight SDGs targets analyzed and organized in the "Towards 2030" report by the Japan Paper Association (<https://www.jpaa.gr.jp/about/sdgs/index.html>).

# 3 Snapshot

## Overview of the pulp and paper industry in Japan

### Production and economic activities

#### Supply of essential products<sup>※1</sup>

Annual production of paper and paperboard(2019)

**25.4** million tons

Percentage to the world's production volume

**6.2%**

Paper and paperboard consumption per capita(2019)

**202.7** kg/person

Value of manufactured goods shipped(2018)

**7.5** trillion yen



#### Development of future-oriented products

Research and development expenses<sup>※2</sup>

**24.8** billion yen



Domestic production capacity of cellulose nanofibers (2020)<sup>※3</sup>

**950** tons/year

#### Job creation and retention, promotion of D&I

Number of employees<sup>※4</sup>  
(as of July 2020)

**25,833**



Percentage of female employees<sup>※4</sup>  
(as of July 2020)

**9.7%**

Intensity rate for occupational accidents<sup>※5</sup>

**0.41**

Number of paper, paperboard, and pulp manufacturing establishments in Japan(2019)

**343** locations<sup>※6</sup>

#### Reduction of environmental impact

Emissions reduction rate of volatile organic compounds(VOC)<sup>※7</sup>  
(compared to FY2000)

**-89.9%**



※1 Source: "The Current Status of the Pulp and Paper Industry (2021 Edition)," Japan Paper Association (coverage is nationwide)

※2 Source: Listed member companies' annual securities reports for FY2020 (coverage includes 9 out of 30 regular members)

※3 Surveyed by Yano Research Institute Ltd. (coverage is nationwide)

※4 Source: "Wage-related Survey," Japan Paper Association (coverage includes 27 out of 30 regular member companies)

※5 Intensity rate is an index that represents the severity of occupational accidents.

※6 Source: Industrial Statistics Table 2020, Ministry of Economy, Trade and Industry (coverage is nationwide)

※7 VOC stands for Volatile Organic Compounds, a generic term for organic compounds that are volatile and become gaseous in the atmosphere. VOCs include toluene, xylene, ethyl acetate, and a wide variety of other compounds.



Reporting period for numerical values is FY2020, unless otherwise noted.



Reporting range for numerical values is 30 regular member companies of the Japan Paper Association, unless otherwise noted.



## ..... Environment / Energy .....

### Reduction of CO<sub>2</sub> emissions

Reduction of CO<sub>2</sub> emissions originating from fossil energy (compared to FY2005)

**9.6 million tons**

Percentage reduction in use of fossil energy (compared to FY2005)

**-40.6%**



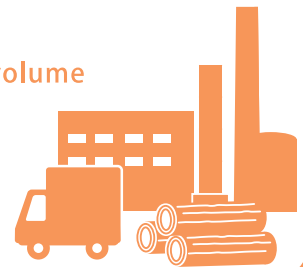
### Effective use of resources

Composition ratio of renewable energy

**40.5%**

Reduction rate of the volume of final waste disposal (compared to FY2000)

**-87.2%**



## ..... Forest resources / Natural capital .....

### Absorption of CO<sub>2</sub>

Increase in area of afforestation in Japan and abroad over 30 years (compared to FY1990)

**245,000 ha**

≒340,000 soccer court surfaces

≒Area of Saga Prefecture (3 times the size of New York City)

1990



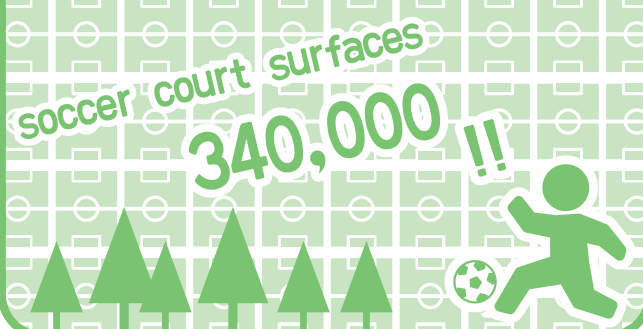
275,000ha

2020



520,000ha

+245,000ha



### Resource Circulation<sup>※8</sup>

Recovered paper utilization rate

**67.5%**

Recovered paper recovery rate

**84.4%**

FY1990



FY2020



### Conservation of Biodiversity

Percentage of companies that have positioned it in their management plan

**84.6%**

Percentage of legality-confirmed wood used

**100%**



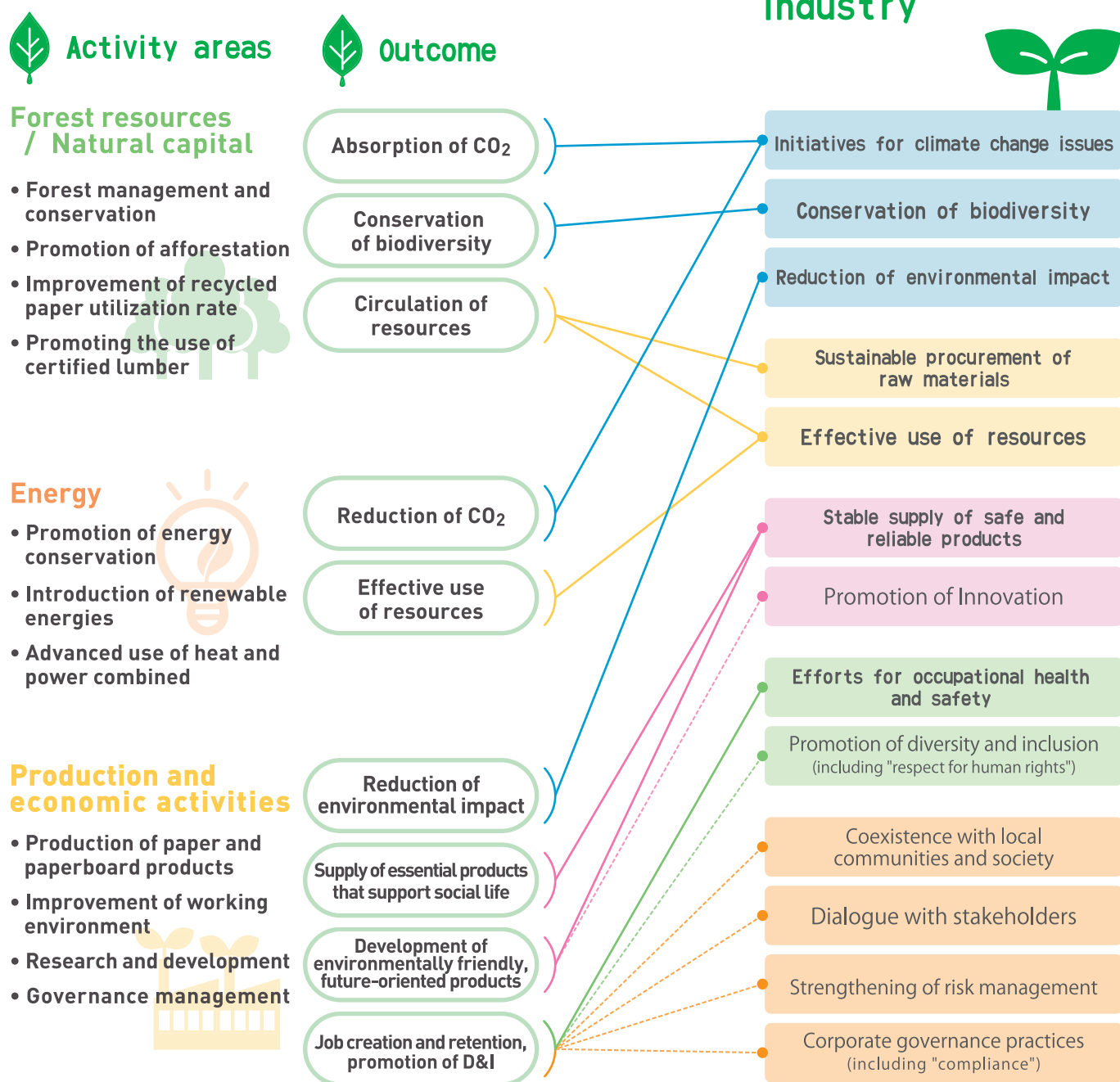
※8) Source: Annual Report of Current Production Statistics, Ministry of Economy, Trade and Industry, and Trade Statistics, Ministry of Finance (coverage is nationwide)

# 4 The Challenge to Sustainability

## Initiatives to improve sustainability and materiality<sup>※1</sup> in the industry

### Value creation process in the pulp and paper industry

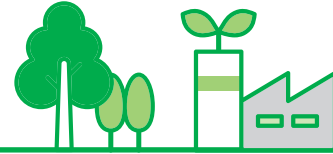
### Materiality<sup>※2</sup> of the industry



※1) Materiality refers to events that have a significant impact on the value creation of a company, industry, etc., and are matters that the concerned parties (companies, industries, etc.) place importance on and respond to in order to solve social issues.

※2) Materiality of the industry refers to the 13 materialities analyzed and organized in the "Towards 2030" report by the Japan Paper Association.

For materialities **in bold**, their goals and progress are described on the next page (p.7).



## Goals and progress toward improving sustainability

Materiality	Goals	FY2020	Remarks
Initiatives climate change issues	Reduce CO <sub>2</sub> emissions by 4.66 million tons <sup>※3</sup> by FY2030 compared to FY2005 BAU	15.59 million tons Progress rate 67%	From the target of the "Carbon Neutral Action Plan"
	Increase the area of plantation forests to 650,000 ha by FY2030	520,000 ha	From the target of the "Carbon Neutral Action Plan"
	Aim for virtually zero CO <sub>2</sub> emissions from production activities by 2050	15.59 million tons	From the target of the "Long-Term Vision 2050"
Conservation of biodiversity	For domestic and foreign forests owned or managed by the company, clearly position the conservation of biodiversity in the management and operation plan.	84.6% (11 out of 13 companies)	From the follow-up survey in the "Japan Paper Association Action Guidelines for Biodiversity Conservation"
	Illegally harvested wood will not be used.	100%	From the monitoring project in the "Japan Paper Association Action Guidelines for Illegal Logging Issues"
Reduction of environmental load	Work to ensure that the VOC reduction rate does not worsen compared to FY2010 results	89.9%	From a follow-up survey on volatile organic compounds (VOCs)
Sustainable procurement of raw materials	Strive to achieve the goal of 65% recycled paper utilization rate by FY2025	67.5%	From the target in the "Environmental Action Plan"
Effective use of resources	Reduce the volume of final disposal of industrial waste to 60,000 tons by FY2025	69,000 tons	From the target in the "Environmental Action Plan"
	Strive to maintain the current effective utilization ratio(FY 2019 result: 98.4%)	98.4%	From the target in the "Environmental Action Plan"
Stable supply of safe and reliable products	Conformity to voluntarily established standard values for paper and paperboard intended to come in contact with foodstuffs from a hygienic standpoint (maximum allowable elution limit of heavy metals: 1μg/ml or less)	100% <sup>※4</sup>	From the voluntary standards of "Voluntary Standards for Paper and Paperboard Intended to Come into Contact with Food"
Efforts for occupational health and safety	Zero fatalities at workplaces of member companies and group companies	1 case of member 3 cases of cooperative association	From the goals of the "Action Plan for the Prevention of Occupational Accidents"

※3) Target reduction 4.66 million t-CO<sub>2</sub>/year = BAU emissions 19.6 million t-CO<sub>2</sub>/year — Emissions forecast 14.94 million t-CO<sub>2</sub>/year  
 BAU emissions 19.6 million t-CO<sub>2</sub>/year = production forecast 21.56 million t/year × emissions basic unit in FY 2005 (base year) 0.909 t-CO<sub>2</sub>/t  
 Note that BAU is an abbreviation for "Business As Usual," meaning "if no action is taken."

※4) The target group consisted of 4 companies and 5 establishments that were sampled and surveyed by the Japan Paper Association.

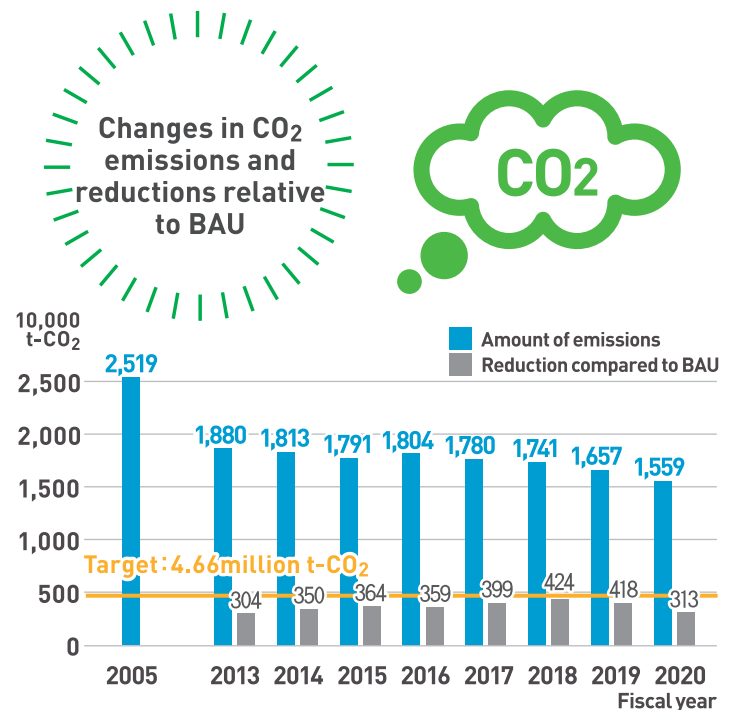
# Responding to global environmental conservation

## Initiatives for climate change issues

### Goal | 01

**Reduce fossil energy-derived CO<sub>2</sub> emissions by 4.66 million tons by FY2030 compared to FY2005 BAU**

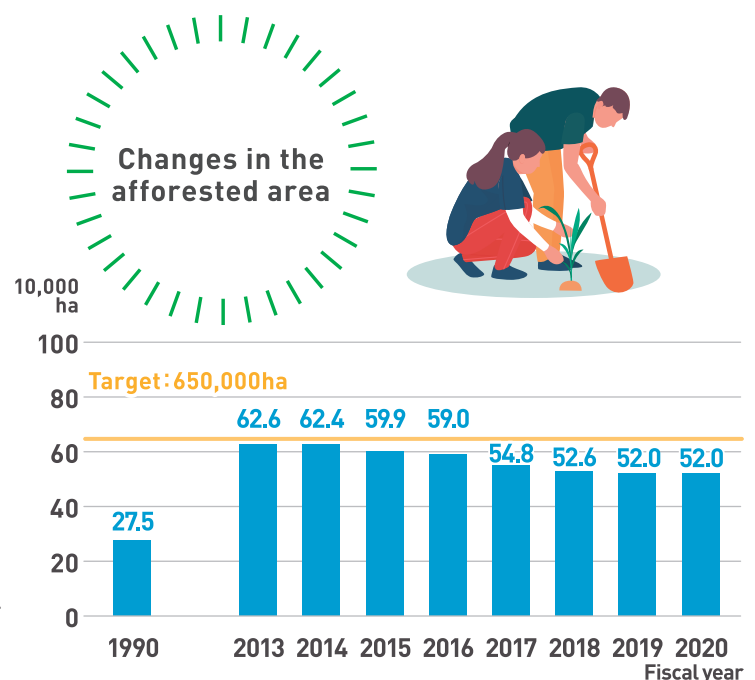
- The Japan Paper Association has been a pioneer in voluntary efforts to reduce greenhouse gas (GHG) emissions. The "Voluntary Action Plan for the Environment" from FY2008 to FY2012 was completed with results exceeding the targets.
- In 2013, we formulated the "Low Carbon Society Action Plan," and furthermore, in 2019, we raised the 2030 target of Phase II to 4.66 million tons reduction compared to the 2005 base BAU, and we are making steady progress in our efforts.
- In addition, in 2021, we declared our "Countermeasures against Global Warming aiming at Net Zero GHG emission from the Paper Industry-Long-Term Vision 2050" to aim to build a carbon-neutral industry by 2050.
- Factors that have made it possible to steadily reduce CO<sub>2</sub> emissions thus far include switching to fuels with lower carbon intensity and adoption of energy-efficient products. In addition, carbon neutral biomass fuels have been continuously used.



### Goal | 02

**Increase the area of domestic and overseas plantation forests by 375,000 hectares to 650,000 hectares by FY2030 compared to FY1990**

- In addition to reducing fossil energy-derived CO<sub>2</sub> emissions, the pulp and paper industry, which uses wood, a renewable resource as raw material, is also working to expand sinks of CO<sub>2</sub>.
- In 2020, as part of "Phase II of the Low Carbon Society Action Plan," we revised the target for sink creation by FY2030 to 650,000 ha, an increase of 375,000 ha from FY1990.
- In implementing the project, in order to increase CO<sub>2</sub> absorption in the areas appropriate for afforestation, we are actively promoting sustainable forest management, selecting the most suitable tree species for planting, developing seeds and seedlings with high growth potential, implementing effective fertilizer application, and so on.
- In FY2020, the increase in afforested area was 245,000 ha, which is equivalent to 340,000 soccer courts, about the same area as Saga Prefecture (three times the area of New York City).







※1

## Goal | 03

## Virtually zero CO<sub>2</sub> emissions in production activities by 2050

(guideline: reduce 21 million tons of CO<sub>2</sub> emissions from FY2013 levels)

As mentioned earlier, the Japan Paper Association has declared its goal of establishing a carbon neutral industry by 2050 through its "Long-Term Vision 2050".

In our "Long-Term Vision 2050," we have set a target (guideline) of reducing CO<sub>2</sub> emissions by 21 million tons, including CO<sub>2</sub> from waste as well as fossil energy, to virtually zero in our production activities, and we will further contribute to the realization of a carbon neutral society through additional efforts to reduce CO<sub>2</sub> emissions outside of our production activities.

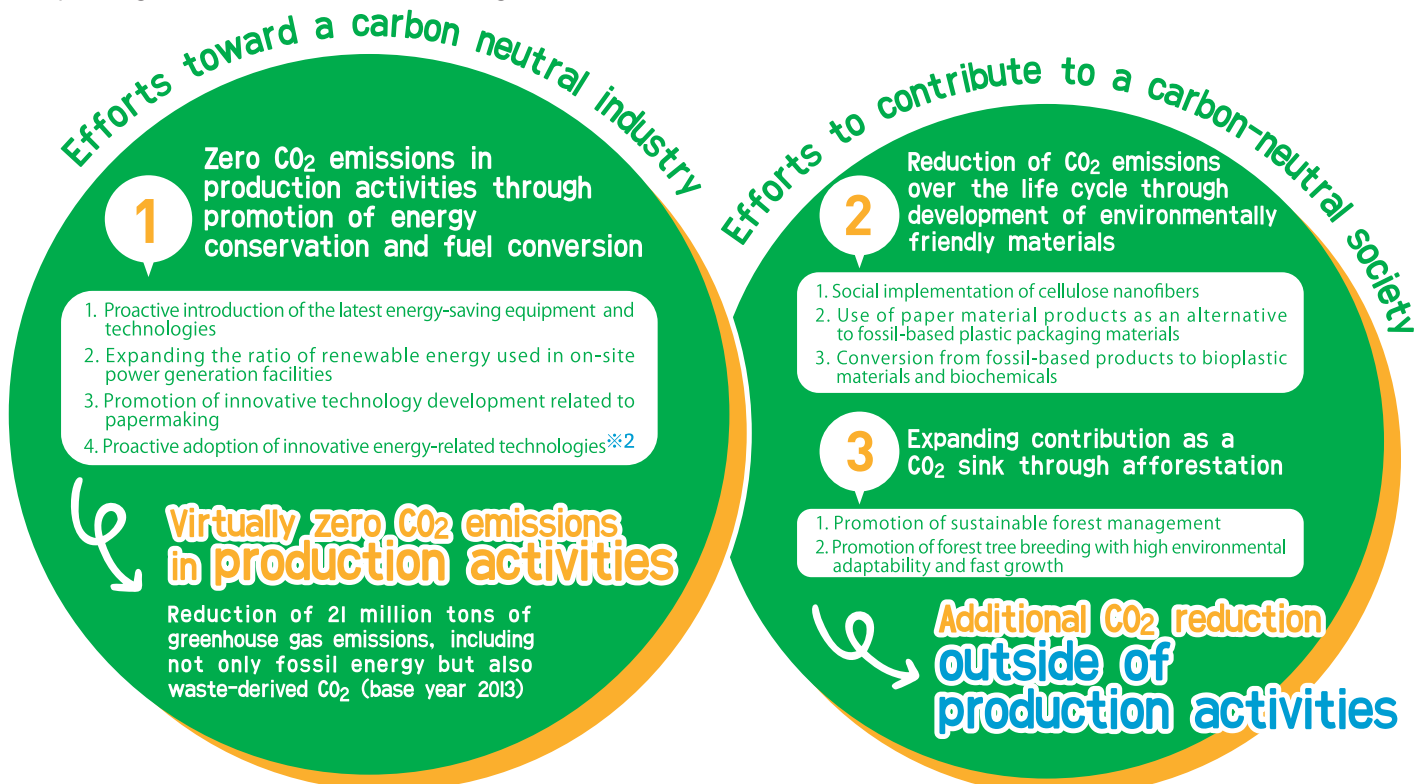
### Initiatives of the Japan Paper Association

## Overview of the "Countermeasures against Global Warming aiming at Net Zero GHG emission from the Paper Industry-Long-Term Vision 2050"

In support of the "Carbon Neutral by 2050" declaration announced by the government in October 2020, we formulated our "Long-Term Vision 2050" in January 2021, aiming to maintain a sustainable global environment and realize a decarbonized society as a pulp and paper industry, and to realize a carbon neutral industry with virtually zero greenhouse gas emissions in terms of CO<sub>2</sub>.

The "Long-Term Vision 2050" sets forth the following three areas in which the pulp and paper industry can make further contributions in the future, based on a vision of an uncertain future in the year 2050 and the shape and direction in which the industry should be heading.

1. Reduction of CO<sub>2</sub> emissions by promoting energy conservation and fuel conversion in production activities
2. Reduction of CO<sub>2</sub> emissions over the life cycle through the development of environmentally friendly materials
3. Expanding contribution as a CO<sub>2</sub> sink through afforestation



※1) The SDGs icons listed outside the upper columns of pages 9 to 15 indicate the SDGs targets for each materiality as analyzed and organized in the "Towards 2030" report (<https://www.jpa.gr.jp/about/sdgs/index.html>) by the Japan Paper Association.

※2) If CO<sub>2</sub> emitted from biomass boilers is recovered by CCS/CCUS (technology for capture, storage, and effective utilization of carbon dioxide), it becomes a "negative emission" (absorption of CO<sub>2</sub> from the atmosphere).





## Conservation of biodiversity

### Goal | 01

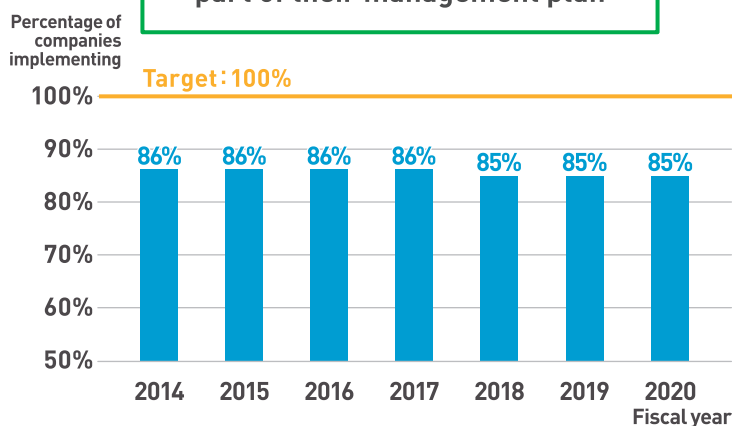
**For domestic and foreign forests owned or managed by the company, clearly position the conservation of biodiversity in the management and operation plan.**

Forests, which are home to many plants and animals, are the core of biodiversity, and the pulp and paper industry, which uses these forests as a source of raw materials, is closely related to biodiversity. Therefore, it is a natural social obligation for the pulp and paper industry to actively engage in biodiversity conservation.

Thus, given the extreme importance of biodiversity conservation to the pulp and paper industry, the Japan Paper Association formulated the "Japan Paper Association Action Guidelines for Biodiversity Conservation" in 2014, and has been implementing these guidelines.

The Action Guidelines set forth guidelines for a total of 21 items in five areas, such as "sustainable forest management" and "responsible raw material procurement," and since FY2014, we have been promoting member companies' initiatives through follow-up surveys.

**Changes in the percentage of companies that have positioned conservation of biodiversity as part of their management plan**



### Goal | 02

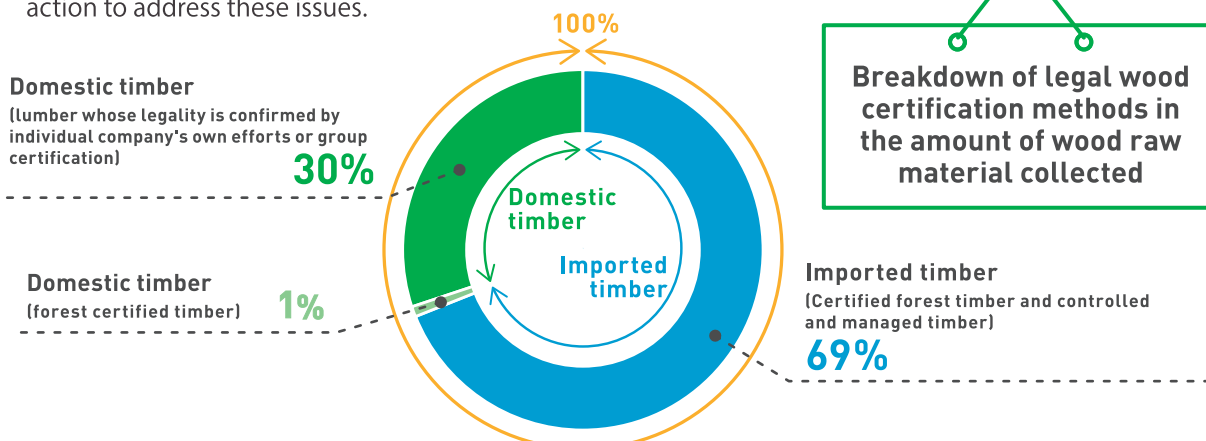
**Illegally harvested wood will not be used.**

Forests play an important role in supplying timber, maintaining ecosystems, and preventing global warming, among others.

In 2006, the Japan Paper Association formulated the "Japan Paper Association Action Guidelines for Illegal Logging Issues" as a measure to combat illegal logging and illegal timber trade, which undermine the sustainable fulfillment of forest functions, and has since been taking action to address these issues.

In addition, in accordance with the guidelines of the Forestry Agency, the Japan Paper Association confirms the certification methods used by its member companies to confirm the legality of timber. As a result, the amount of legal timber used reached 100% of the total amount of timber raw material collected in FY2020, and no illegally logged timber is used.

**Breakdown of legal wood certification methods in the amount of wood raw material collected**





## Reduction of environmental impact

### Goal | 01

Work to ensure that the VOC reduction rate does not worsen compared to FY2010 results



The Air Pollution Control Law, which went into effect in April 2006, stipulates effective control of emissions of volatile organic compounds (VOCs), which are considered to be the cause of photochemical oxidants and suspended particulate matter. In response, the Japan Paper Association has included "chemical substance risk management" in its Environmental Action Plan as a response to environmental risk issues, and is working to reduce VOC emissions.

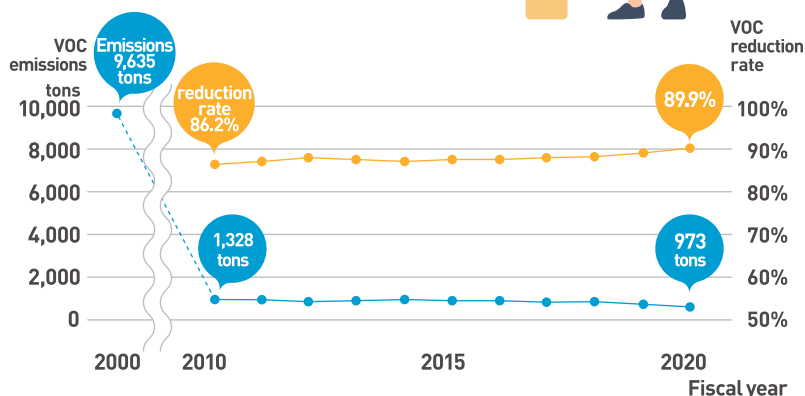
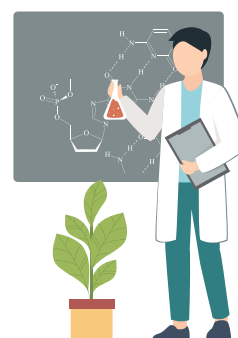


The Japan Paper Association conducts annual follow-up surveys of all VOCs with the aim of "working to ensure that the reduction rate does not worsen compared to fiscal 2010."



From FY2020 onward, we will continue our efforts to reduce all VOC emissions and maintain and improve the reduction rate by replacing chemicals with those containing fewer VOC components and strengthening management of manufacturing processes.

### Changes in VOC emissions and reduction rate



### Initiatives of the Japan Paper Association

## Countermeasures for hazardous air pollutants

Based on the "Guidelines for the Promotion of Voluntary Control of Hazardous Air Pollutants by Businesses" (formulated in 1996), the Japan Paper Association formulated a "Voluntary Control Plan for Hazardous Air Pollutants" covering three substances: formaldehyde, chloroform, and benzene. We have achieved strict voluntary control targets for each of these substances by introducing alternative chemicals and improving processes.

## Flue gas treatment

We are working on measures to control sulfur oxides (SOx) and nitrogen oxides (NOx) generated from heavy oil and coal used as fuel, which are considered to be one of the causes of acid rain.

SOx control measures include the use of fuels with low sulfur content and the installation of flue gas desulfurization equipment, while NOx control measures include the use of low-NOx burners, two-stage combustion, improved combustion methods with flue gas recirculation, and the installation of denitration equipment.

## Soot and dust control

Soot and dust generated from recovery boilers was a problem for a while, but it has now been solved by enhancement of wet scrubbers (a device that removes soot and dust from flue gas by spraying it with water) and electrostatic precipitators.

## Odor control

Odors have been a common occurrence at chemical pulp (especially kraft pulp) mills. Since there are individual differences in perception, we believe that simply complying with laws and agreements is not enough. Therefore, we thoroughly investigate the sources of odor emissions, and at the same time, implement the most appropriate odor countermeasures for each source, such as collecting and burning the odor.

# Addressing raw material procurement



## Sustainable procurement of raw materials

### Goal | 01

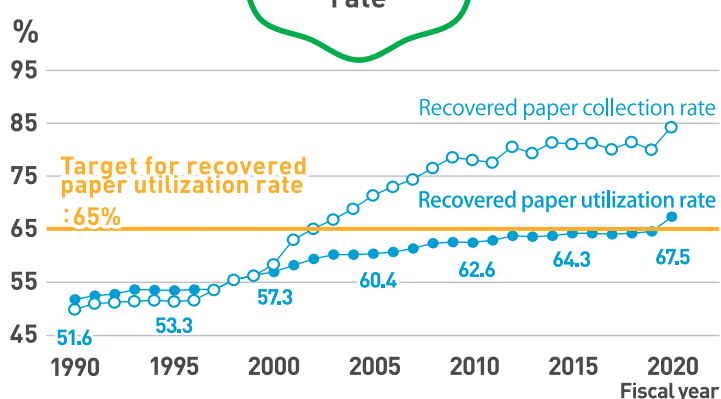
Strive to achieve the goal of 65% recycled paper utilization rate by FY2025

Paper is an indispensable commodity in modern society, and at the same time, it supports industry and culture from the side. With the development of society and the economy as well as the improvement of lifestyle and culture, the uses of paper are diversifying, and it is being used more and more in various fields. In addition, the value of recovered paper is becoming increasingly important from the perspective of securing raw materials.

Japan's recovered paper utilization rate is among the highest in the world. It is not easy to increase the utilization rate that is already at the highest level in the world. In order to achieve this goal, it is essential that the pulp and paper industry and the recovered paper industry, as well as consumers, demand industries, and local governments, work together to make strong efforts to achieve this goal.

Specifically, we will continue to focus on expanding the use of recovered paper for printing and information paper, securing raw materials such as used office paper, and taking energy-saving and fuel conversion measures to reduce CO<sub>2</sub> emissions from the recycling of recovered paper.

Changes in recovered paper utilization rate and recovered paper collection rate



※The difference between the recovered paper collection rate and the recovered paper utilization rate indicates the paper that is exported mainly to the Asian region and effectively recycled as high-quality recovered paper in the international market.

### Initiatives of the Japan Paper Association

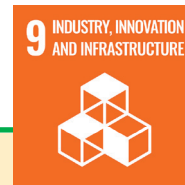
## Support for the establishment of waste paper collection and recycling systems in Asian countries

Recovered paper is a valuable raw material for the pulp and paper industry, and the advancement of recovered paper collection and recycling systems is a common challenge for the pulp and paper industry worldwide. In Japan, the government, the public, and the industry have worked closely together to achieve an advanced recovered paper collection and recycling system earlier than in other countries.

Global demand for paper and paperboard is increasing year after year, especially in China, Southeast Asian countries, and other Asian regions. However, these Asian regions have not yet developed a system for collecting and recycling recovered paper, and the early advancement of this system is an urgent issue.

The Japan Paper Association is actively cooperating with the Ministry of Economy, Trade and Industry's project to support the establishment of a recovered paper collection and recycling system in the Asian region, and is providing the know-how it has accumulated through the project. In the project targeting India, an organization similar to Paper Recycling Promotion Center in Japan is being established.





## Effective use of resources

### Goal | 01

### Reduce the volume of final disposal of industrial waste to 60,000 tons in tangible form by FY2025



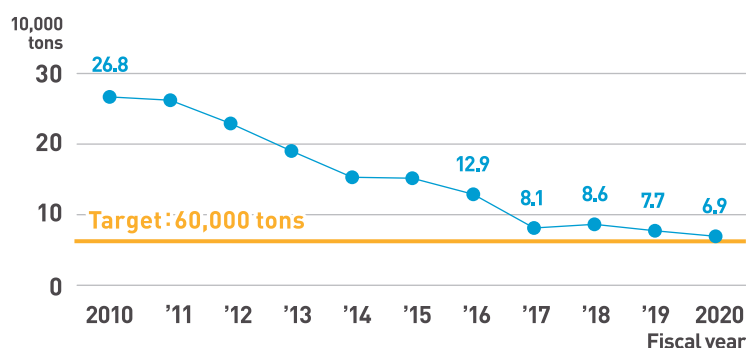
Sludge makes up the majority of waste from paper mills, along with waste wood, waste paper, and waste plastic. Most of this waste is incinerated, and much of it is used as energy for the mill. The remaining ash is also effectively used as a raw material for cement and other purposes.



The pulp and paper industry set a numerical target to reduce final waste disposal to 130,000 tons by FY2020, and achieved the target by reducing the volume to 69,000 tons in FY2020. In addition, we have set a numerical target of reducing final waste disposal to 60,000 tons by FY2025 as a new numerical target for FY2021 and beyond, and we are continuing our efforts to reduce waste.



#### Changes in the final disposal volume (tangible volume) of industrial waste



### Goal | 02

### Strive to maintain the current rate of effective utilization of waste (FY 2019 result: 98.4%)



In addition to reducing the final disposal volume of industrial waste as mentioned above, the Japan Paper Association has set the industry's own target of striving to maintain the current rate of effective utilization (FY2014 result: 97.0%) in order to realize a recycling-oriented society, and has achieved this target every year since FY2015.



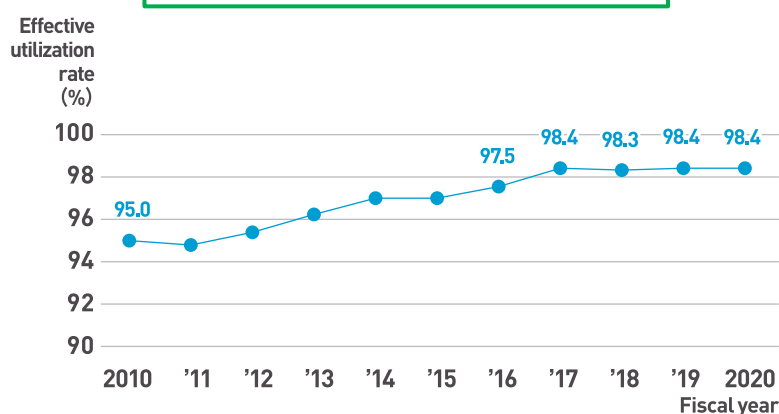
In the "Environmental Action Plan" revised in October 2020, we set the target fiscal year to 2025 in line with the government's Fourth Basic Plan for the Promotion of a Recycling-Oriented Society, and raised the new target value to 98.4%.



In order to achieve our new goals, we will continue our efforts under the three policies of "expanding recycling of by-products by promoting inter-industry collaboration," "promoting volume reduction of organic waste and its conversion into fuel," and "promoting research and surveys for the development of new applications."



#### Changes in effective utilization rate of waste





# Addressing production and sales of products



Stable supply of safe and reliable products

## Goal | 01

**Conformity to voluntarily established standard values for paper and paperboard intended to come in contact with foodstuffs from a hygienic standpoint.**  
(maximum allowable elution limit of heavy metals present in paper and paperboard : 1μg/ml or less (as lead))

Based on the Ministry of Health, Labour and Welfare's directive to establish voluntary standards to ensure the safety of paper containers and packaging for food products, the Japan Paper Association established the "Voluntary Standards for Paper and Paperboard Intended to Come into Contact with Food" in May 2007 and started its operation in October of the same year.

In addition, the Japan Paper Association has prepared a Negative List<sup>※1</sup> (NL) based on domestic and international regulations and hazard information, and updates the list annually to keep it in line with subsequent changes in regulations and hazard information. Furthermore, we have constructed and operated a chemical substance information retrieval system, "JPA Chemi-net", which is used by member companies to register chemical substances they use in the manufacture of papermaking chemicals and to confirm safety information.

The NL updated in October 2020 counts 3,002 substances and 2,367 substances are registered in JPA Chemi-net.



Paper food container as an alternative to plastic



Recyclable paper cup

## Initiatives of the Japan Paper Association

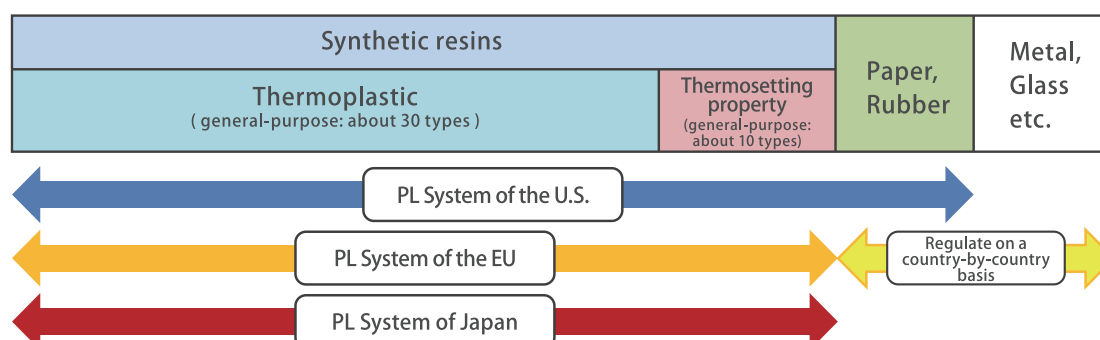
### Creation of a voluntary Positive List

The Positive List (PL) is a list of chemical substances that have been confirmed as safe. By limiting the substances used in paper and paperboard that come into contact with food to those listed in the PL, it is possible to ensure the safety of products derived from raw materials.

In Europe and the U.S., legislation for PL management has been progressing, and in Japan, a PL system targeting synthetic resins came into effect in June 2020.

The Japan Paper Association is also studying the possibility of establishing a voluntary positive list by FY2022.

### Comparison of Japanese and Western regulations<sup>※2</sup>



※1) Negative list is a list of substances whose use is, in principle, permitted, although their use is prohibited or regulated.

※2) Source: Ministry of Health, Labour and Welfare, "Introduction of a Positive System for Food Utensils, Containers and Packaging"

# Addressing the working environment

## Efforts for occupational safety and health



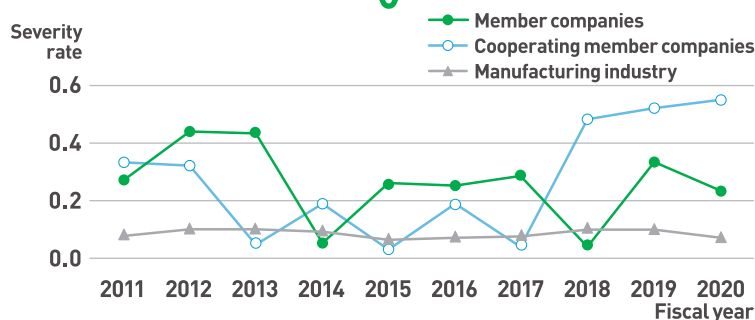
### Goal | 01

## Achieve zero fatalities at member companies and group company workplaces

In order to protect the safety and health of all working companions of the pulp and paper industry and to realize better workplace environment, our Association is engaged in various cross-industry and cross-sector programs, such as sharing information on best practices and accident cases among member companies, and conducting various educational activities.

Adhering to the belief that "it is the responsibility of the head of the workplace and of the top management to ensure that anyone who is received into the company's workplace fulfills the purpose of entering and leaves uneventfully," we set out an action plan in February 2018 aiming to achieve the ultimate goal of "eliminating fatal accidents." In this regard, the effort in the action plan is consistent with the activities of the "Public-Private Council for Safety Measures in the Manufacturing Industry."

However, fatal accidents are still occurring every year throughout the cooperating member companies. Therefore, the severity rate, which expresses the severity of accidents, tends to be higher than that of the manufacturing industry.



### Initiatives of the Japan Paper Association

## National Pulp and Paper Safety and Health Convention

The event has been held continuously every year since 1961, and celebrated its 60th anniversary in 2020.

It consists of safety and health awards, lectures, and breakout sessions.

In FY2020, the on-site event was cancelled due to the covid-19 disaster, but a convention booklet was prepared, safety and health awards were presented, and lectures (in a hybrid format) were held.



Scene of the Safety and Health Convention (FY2019)

## Safety and health award

The purpose of this award is to contribute to the improvement of safety and health standards and the eradication of accidents in the pulp and paper industry by recognizing workplaces and contractors that have excellent safety and health performance and serve as models for others.

In addition to the awards presented by the Association, we also recommend the "Green Cross Award" given by the Japan Industrial Safety and Health Association, and the "Outstanding Safety Supervisor Commendation" given by the Minister of Health, Labor and Welfare.

## Response to the Public-Private Council for Safety Measures in the Manufacturing Industry

The Public-Private Council for Safety Measures in the Manufacturing Industry was established on March 6, 2017 by the Ministry of Health, Labor and Welfare, the Ministry of Economy, Trade and Industry, and the Japan Industrial Safety and Health Association, together with the top management of major manufacturing industries, in order to further strengthen safety measures in the manufacturing sector and to disseminate relevant information. This is the first time that an inter-sectoral public-private council has been formed in order to conduct cross-industry studies and dissemination activities.

Our Association has been actively participating in the Council's various activities, including serving as the Council's first Acting Chair in fiscal year 2017.

## Educational activities

We provide training sessions, plant tours in different industries, and educational materials as needed for managers and staff in charge of health and safety at member companies.

# 5 Four Strategic Initiatives for the Future<sup>※1</sup>



## Realization of the establishment of a carbon neutral industry

~Contribution to climate change issues through forest CO<sub>2</sub> absorption and reduction of CO<sub>2</sub> emissions in the production process~

The pulp and paper industry has been working not only to provide a stable supply of paper, but also to maintain a sustainable global environment and realize a low-carbon society by recycling and revitalizing forests and increasing CO<sub>2</sub> absorption through "sustainable forest management," recycling paper through "recovered paper utilization," and reducing fossil energy through the active use of biomass energy and combustible waste.

Additionally, the pulp and paper industry agrees with the government's declaration of "achieving virtually zero greenhouse gas emissions by the year 2050," and will aim to realize the establishment of a carbon-neutral industry by 2050 by actively working on various measures for reducing CO<sub>2</sub> emissions in order to maintain a sustainable global environment.



## Contribution to green recovery

"Green Recovery" is a recovery strategy to achieve a more sustainable future while preventing global warming and conserving biodiversity in the recovery from the covid-19 disaster.

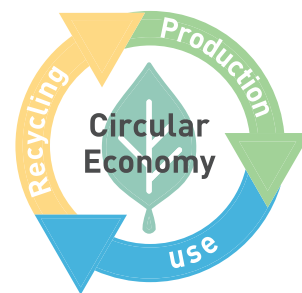
Because the pulp and paper industry's business itself is based in forests and has a wide range of interfaces with forests, we can directly contribute to the prevention of global warming and the conservation of biodiversity, which are the two pillars of "Green Recovery," and through these efforts, support economic recovery from the covid-19 disaster and the enrichment of society.



## Contribution to the circular economy of waste paper utilization system

A "circular economy" means an economic system that preserves and maintains the value of products, materials, and resources for as long as possible and minimizes the generation of waste, and is a concept that aims to break away from the conventional "linear economy" of one-way use of goods.

The pulp and paper industry's advanced system for recovered paper utilization is the very essence of this circular economy, and we will continue to contribute to a virtuous cycle of resources and the economy by further improving our recycling technologies as well as our recovered paper utilization rate and recovered paper collection rate.



## The role of paper in a digital society

Recent developments in ICT<sup>※2</sup> technology have led to the digitalization of media, such as the replacement of paper media with digital media. On the other hand, research results to date have shown that there are differences in brain activity and learning effects between paper and digital media. For example, in the field of education, it is believed that the key to more efficient learning is a combination of using different media depending on the situation and using both concomitantly.

In this way, paper plays an important role also in the digital society, and the pulp and paper industry is committed to disseminating to society the role and importance of paper in the digital society.



※1) The four strategic initiatives are four themes that the industry should focus on in the future, as analyzed and organized in the "Towards 2030" report (<https://www.jpa.gr.jp/about/sdgs/index.html>) by the Japan Paper Association.

※2) ICT is an abbreviation for "Information and Communication Technology." It refers to technology that connects people to the Internet and people to each other using communication technology.

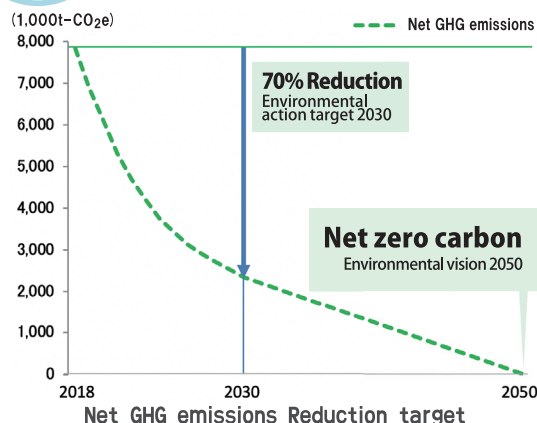


# 6 Examples of Member Companies' Efforts

The cases listed here are some of those submitted by SDGs Committee member companies. All cases are updated as needed and posted on the website of the Japan Paper Association (<https://www.jpa.gr.jp/about/sdgs/index.html>).

## Initiatives for climate change issues

Toward the realization of a low-carbon society  
~Establishment of environmental vision and environmental action goals



In September 2020, the Oji Group established "Environmental Vision 2050" with "Net Zero Carbon" at its core and "Environmental Action Goal 2030" as its milestone. To achieve these goals, the Group has positioned "promotion of CO<sub>2</sub> absorption and fixation capacity" through sustainable forest management and "reduction of CO<sub>2</sub> emissions" through conversion to renewable energy and other measures as two key components.

In addition, it has endorsed the "Task Force on Disclosure of Climate Change-Related Financial Information" and is strengthening its climate change-related disclosures.

## Initiatives for climate change issues

Torrefaction technology and the use of woody biomass



New woody biomass fuel produced by using torrefaction technology

Nippon Paper Industries Co., Ltd. has established a torrefaction technology that carbonizes woody biomass at relatively low temperatures. Woody biomass fuel produced using this technology can be used as an alternative fuel to coal. Furthermore, "Torrefied Bio Composite™," a resin composite material containing a high proportion of woody biomass that has been given heat resistance, hydrophobicity, and other properties through this technology, can reduce the amount of plastic use and contribute to the reduction of greenhouse gas emissions.

## Initiatives for climate change issues

Toward the realization of the Carbon Neutrality Council established in Shikokuchuo City

### 3. Process chart for achieving carbon neutrality by 2050



Marusumi Paper Co., Ltd. and Daio Paper Corporation have established the "Shikokuchuo City Carbon Neutrality Council" to study the area-wide energy conversion, etc. in the Shikokuchuo area toward the realization of carbon neutrality. (Ehime Paper Co., Ltd. is participating as the managing company). The Council will study realistic measures and a roadmap by gathering a wide range of information, such as understanding current policy trends and verifying the safety and economic efficiency of converted energy, while looking into the possibility of building a common energy infrastructure for the region.

## Conservation of biodiversity

Conservation activities for the natural monument "Alerce" in the forests owned by the Republic of Chile in South America



Alerce

Daio Paper Corporation is engaged in afforestation in the Republic of Chile and maintains about half of its forest holdings as natural forest to protect the Alerce (Patagonian cypress), a natural monument. In cooperation with the Chilean Forest Service and local NGOs, the company conducts surveys of habitat conditions by a specialized agency and promotes appropriate protection activities while referring to recommendations made by the agency.

## Examples of Member Companies' Efforts



Extermination of invasive alien plants in Iriomote Island

Alien plant that was exterminated, Bay Biscayne

In 2017, Nippon Paper Industries Co., Ltd. signed an agreement with the Okinawa Regional Forest Management of the Forestry Agency's Kyushu Regional Forest Office to conduct biodiversity conservation activities on Iriomote Island in collaboration with the "Iriomote Island Ecotourism Association," a non-profit organization. While Iriomote Island is home to valuable wild plants and animals, including national special natural monuments, it is necessary to take measures against the invasion of non-native plants. For this reason, Nippon Paper Industries, together with local residents, continues to carry out activities to exterminate the invasive alien plant, the Bay Biscayne.



Certification as a company that is involved in the "Eco-Rail Mark" program

Eco-Rail Mark

Hokuetsu Corporation has been certified as a company that is participating in the Eco-Rail Mark program established by the Ministry of Land, Infrastructure, Transport and Tourism and administered by the Japan Railway Freight Association. Rail freight transportation is an environmentally friendly means of transportation that emits much less CO<sub>2</sub>, a cause of global warming, than other means of transportation. Hokuetsu Corporation will continue to utilize rail transportation to realize a society that coexists in harmony with nature.

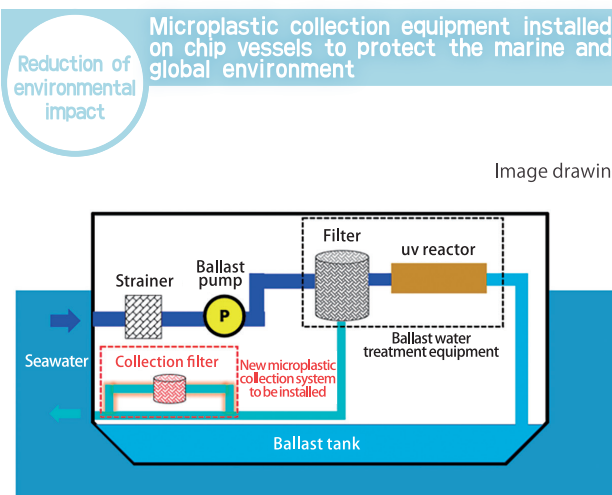


Image drawing

Image of microplastic collection device

Plastic waste such as PET bottles discharged into the ocean becomes microplastics, particles smaller than 5 mm, due to ultraviolet rays and ocean currents, and has become an international problem as it affects the entire ecosystem through the food chain. The microplastic collection device to be installed on board the new wood chip carriers of Marusumi Paper Co., Ltd. has been proven to efficiently collect microplastics collected by the backwash filter, which is part of the ballast water treatment system, before they are discharged overboard.



Responsible procurement of raw materials ~Ensure traceability

Forest certification audit for afforestation projects in Vietnam

To practice responsible procurement of raw materials, the Oji Group has established the "Oji Group Partnership Procurement Policy" and also laid down the "Guidelines for Procurement of Wood Raw Materials" to procure only raw materials produced from properly managed forests.

In addition, in order to assess ESG risks of domestic and overseas suppliers, Oji Group started a risk assessment survey on governance, human rights, labor, environment, etc. in FY2020, and is working to reduce supplier risks by continuously approaching suppliers.





Effective  
use of  
resources

## Processing boiler coal ash into building materials



JR Kesennuma Line Sakuragawa Bridge  
(Minamisanriku-cho, Miyagi Prefecture)  
(CfFA® used for bridge girders, arches, and longitudinal steel)

Nippon Paper Industries, Co., Ltd. heats and reforms coal ash generated by coal boilers operating for in-house power generation at its Ishinomaki Mill and markets it as "CfFA®," an admixture for concrete.

Mixing CfFA® as a concrete material improves workability and enhances the long-term strength of concrete. As a locally produced and locally consumed construction material, CfFA® has been used in earthquake reconstruction projects (bridges, breakwaters, etc.) in the Tohoku region.

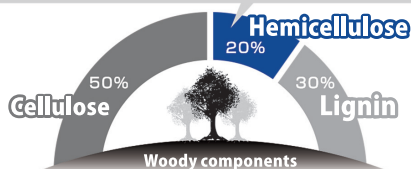
Promotion of  
innovation

## Entry into the medical field · Wood-derived pharmaceuticals

**Acidic hemicellulose**  
Practical application  
in cosmetics  
(Hydrolyzed xylan)

Chemosynthesis

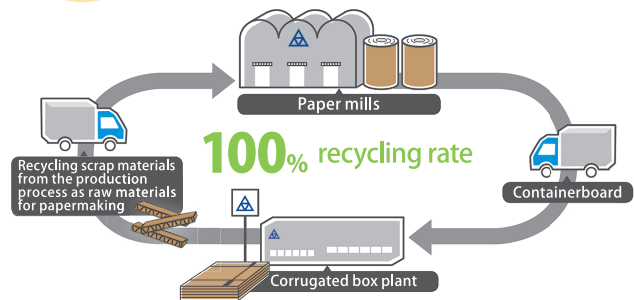
**Sulfated hemicellulose**  
Under development for  
pharmaceutical applications  
Osteoarthritis treatment/Blood anticoagulants



Hemicellulose extracted and purified by Oji Group's proprietary technology is used as a cosmetic ingredient named "hydrolyzed xylan," and "sulfated hemicellulose," which is chemically modified hemicellulose, is expected to be effective in reducing inflammation in joints and bladder and in inhibiting blood clotting. In April 2020, "Oji Pharma Co., Ltd." was established to take charge of business in the medical and healthcare field, and is promoting the development of wood-derived ingredients for use as active pharmaceutical ingredients in cooperation with pharmaceutical companies and universities.

Effective  
use of  
resources

## Effective use of scrap materials from corrugated box mills



The Rengo Group recycles 100% of the trimming waste generated in the production process at its corrugated box mills as raw materials for the Rengo Group's paper mills. For the transportation of the waste, trucks returning from paper mills carrying containerboard base paper are used, simultaneously promoting logistics efficiency and resource conservation.

In addition, corrugated box mills located far from the papermaking mills are engaged in barter trading of trimming waste with other companies in the same industry in the neighborhood to reduce cross-transportation of both parties.

Promotion of  
innovation

## Promotion of improvement proposal activities



### Presenting the best suggestions for improvement in the workplace once a year

"Don't think of it as difficult," "Don't be ashamed of any content," and "There are some rewards." With this mindset, Marusan Paper Mfg. Co., Ltd. has been promoting improvement proposal activities throughout the entire group with the president at the helm. In FY2020, 541 proposals, more than two per person, were implemented at workplaces.

This is a true innovation in which an idea give birth to another idea, each individual learns to realize his or her ideas, and the workplace works in unison.

## Examples of Member Companies' Efforts

Efforts for occupational health and safety

Achieving the goals of the mid-term safety action plan through the use of the ISO 45001 system



ISO 45001 Certificate of Registration

Hokuetsu Corporation promotes proactive safety and health activities aimed at eliminating occupational accidents. It has launched the "hSA25(hokuetsu Safety Action 2025)," a mid-term safety action plan with clear targets to be achieved by 2025. In addition, as a means of ensuring that hSA25 activities are promoted, the company has acquired certification under the international health and safety standard "ISO45001". The company is working to improve its health and safety performance by ensuring that the requirements of the standard are met.

Diversity and inclusion (including respect for human rights)

Active recruitment of foreign nationals and female new graduates



Diverse "human resources" are working with the right people in the right places

Tomoegawa Co., Ltd. believes that the presence of people with different values and perspectives energizes the organization and leads to flexible and creative corporate activities, and is actively creating an environment where diverse human resources can demonstrate their abilities in the right places and hiring foreign nationals and female new graduates.

Over the past 10 years (2012-2021), the company has hired a total of 90 new graduates, of which 18% are foreign nationals. Although 70% of its hired new graduates are in the engineering field, the company is also actively recruiting female engineers.

Diversity and inclusion (including respect for human rights)

Confirmation of human rights considerations of overseas chip suppliers



Scene of the inspection in Thailand

From the perspective of human rights considerations, the procurement staff of Nippon Paper Industries, Co., Ltd. directly visits chip suppliers in various overseas locations to conduct hearings on health, hygiene, safety, disaster prevention, and the local environment, as well as to conduct site inspections. The hearings, content of which is reviewed every year, are conducted sequentially in all countries where wood chips are procured, taking into account the volume of transactions and the level of risk involved. In FY2020, the hearings were conducted in Thailand, where the company's local representative conducted inspections and confirmations, taking the covid-19 disaster into consideration.

Coexistence with local communities and society

Local environmental, economic, and social contribution activities at overseas afforestation companies



Traveling clinic in Brazil

For sustainable forest management, it is essential to have a two-way understanding between plantation forest operators and local communities, and to share the "environmental, economic, and social" benefits for both parties.

As an example of the economic benefits, the Oji Group's overseas afforestation business company currently employs approximately 14,000 people locally. Furthermore, in cooperation with governments, NGOs, and others, the company is creating and sharing environmental and social benefits through biodiversity conservation programs in environmental conservation forests, support for local communities in terms of employment and education, and medical assistance to areas where access to medical services is difficult.





Coexistence  
with local  
communities  
and society

## Donation of Braille calendars



Mitsubishi Paper Mills Limited has produced a Braille calendar since the 1997 edition, now in its 26th year. The calendar has been well received by the recipients, such as welfare organizations, and has been improved each year to reflect the feedback from the visually impaired. It uses embossed Braille without the use of plastic, and uses FSC-forest certified paper, which is an environmentally friendly product and can be disposed of for recycling after use. The 2022 edition features the "Microwave-Friendly Standard Recipes" to make standard recipes easy to prepare in a microwave oven.



# 7 Editorial Note



At COP15 and COP26, held from October to November 2021, the conservation of biodiversity and response to climate change issues were discussed, and the two most pressing issues facing the world, "ecosystem conservation" and "global warming," were again highlighted. Since the pulp and paper industry is based on forests as the source of its business, it has a wide range of contacts with these two areas, which are the two wheels for building a sustainable society, and must respond to these issues responsibly.

To this end, in May 2021, the Japan Paper Association launched the SDGs Committee consisting of 22 member companies, and began activities to shed light on the activities of the pulp and paper industry from a sustainable perspective, analyze them, and seek to "visualize" industry activities in order to confirm and review progress within the industry and enhance the presence of the industry through public announcements to society.

In this Sustainability Report, we have created a "Value Creation Model," which is the engine of the industry's activities, and placed it at the center of the report as a compass for the pulp and paper industry as it moves forward into the future. Based on this value creation model, the report also features a 20-item cross-sectional "snapshot" of the industry and a list of "goals and progress" for each materiality to provide a comprehensive picture of the industry's activities. In addition, the report includes an "Examples" section at the end, which includes some of the specific initiatives taken by each company.

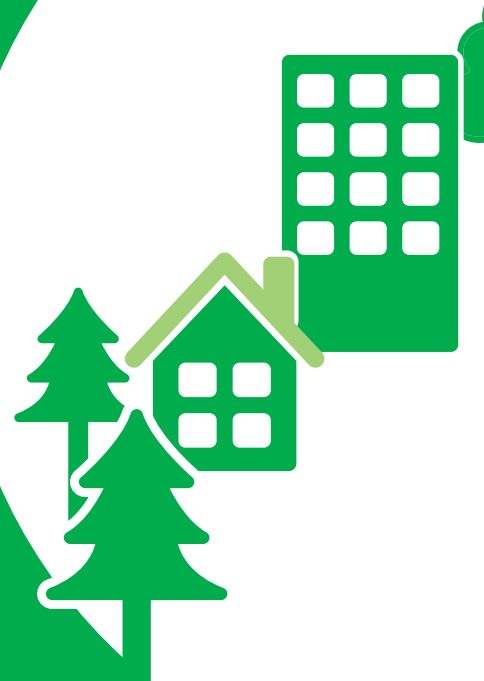
We at the Japan Paper Association would be delighted if we could further deepen dialogue with our stakeholders and contribute, even if only a little, to the creation of a sustainable society through this report, which provides a one-stop shop for understanding the sustainable activities of the pulp and paper industry.

### Reporting range on numerical values

In principle, this covers the 30 regular member companies of the Japan Paper Association (as of March 31, 2021). If the target group differs, it is stated as such.

### Reporting period on numerical values

This covers the period from April 1, 2020 to March 31, 2021. If the subject period differs, it is stated as such.



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