

JCIA

# ANNUAL REPORT 2021

## Reference Materials

As a supplement to the contents of JCIA Annual Report 2021, this pamphlet introduces various data and initiatives relating to the activities of JCIA. Please read it together with JCIA Annual Report 2021.



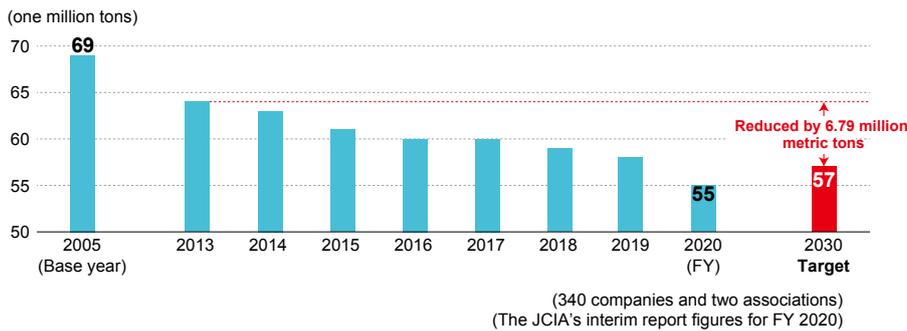
Japan Chemical Industry Association

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## 1-1 Environmental Protection (Prevention of Global Warming)

### CO<sub>2</sub> Emissions Index



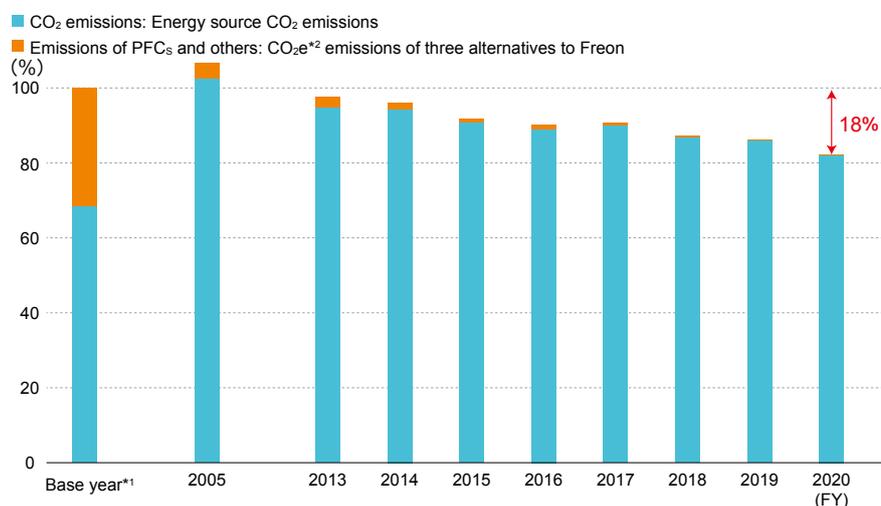
### CO<sub>2</sub> Emissions Index

CO<sub>2</sub> emissions have been decreasing with each passing year since the “Commitment to a Low Carbon Society” activities began in FY 2013, with emissions dropping by 13.7 million metric tons (19.9%) last fiscal year compared to the reference year of FY 2005.

In FY 2018, JCIA announced a new target of reducing the absolute quantity of CO<sub>2</sub> emissions before FY 2030, by 6.79 million metric tons compared to FY 2013.

During FY 2020, due to the stagnation of economic activities caused by COVID-19, we reduced CO<sub>2</sub> emissions by an additional 3.68 million tons from FY 2019, which makes for a total reduction of 8.74 million tons, and we have achieved our 2030 target ahead of schedule.

### Reduction of Emissions of CO<sub>2</sub> and Three Alternatives to Freon

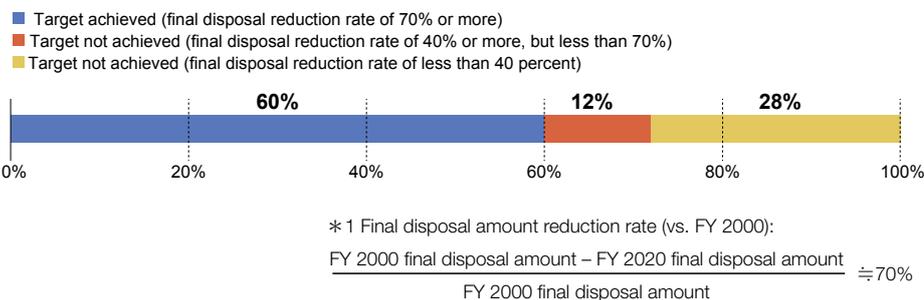


### Emissions of CO<sub>2</sub> and Three Alternatives to Freon

When the reduction of CO<sub>2</sub> emissions and the reduction of emissions in the manufacture of three alternatives to Freon (PFCs, SF<sub>6</sub>, NF<sub>3</sub>) are combined, emissions in 2020 were down 18% from the base years (=100%).

\* 1 Base years: The base year for CO<sub>2</sub> emissions is FY1990; the base year for estimated emissions associated with manufacturing of PFCs and others is 1995 (calendar year)  
\* 2 CO<sub>2</sub>e (CO<sub>2</sub> equivalent): Corresponding value of CO<sub>2</sub> emissions

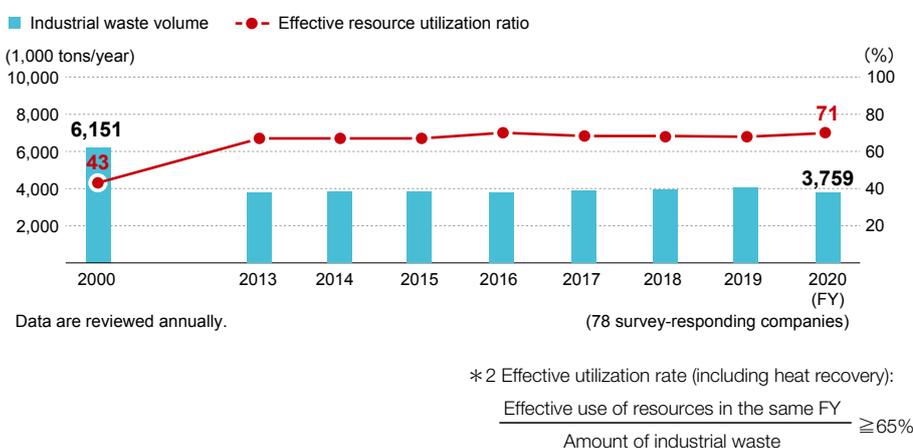
### Percentage of companies that achieved the FY2020 target for the final disposal volume reduction rate



### Status of achievement of FY2020 target for final disposal volume reduction rate

Starting from FY 2016, we have set a new target in accordance with the Keidanren Voluntary Action Plan for Establishing a Sound Material-Cycle Society (reducing FY 2020's final landfill disposal volume by about 70% from the volume in FY 2000) and are currently undertaking a process to achieve this target. The percentage of companies that achieved the volume reduction target of the final disposal\*1 in FY 2020, the final fiscal year of the target, was 60%.

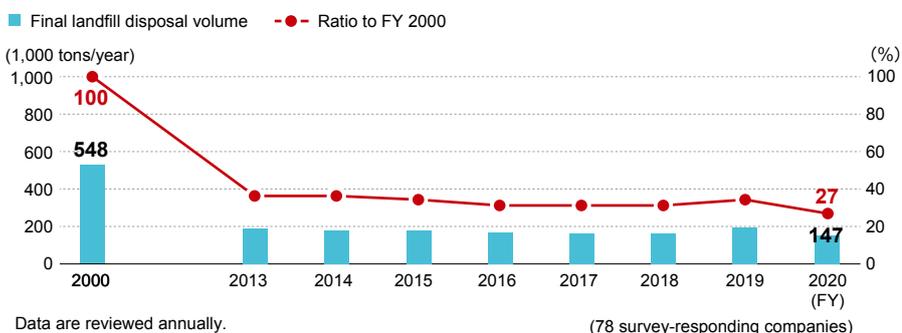
### Industrial Waste Volume and Effective Resource Utilization Ratio



### Industrial Waste Volume and Effective Resource Utilization Ratio

Industrial waste volume in FY 2020 was 3.759 million metric tons, down 39% from the level in the base year of FY 2000. We are also making positive efforts to encourage sorting and reuse. In addition, the effective utilization rate of resources including heat recovery, which had been 43% in FY 2000, was improved to 71% in FY 2020 by not only strengthening recycling with thorough sorting of the materials but also aggressively switching from simple incineration to heat recovery for items that are difficult to recycle. As a result, we have achieved a level that greatly exceeds the chemical industry's specific target of "increasing the ratio to 65% or more by FY 2020"\*2 in the Keidanren Voluntary Action Plan for Establishing a Sound Material-Cycle Society that started in 2016.

### Final Landfill Disposal Volume



### Final Landfill Disposal Volume

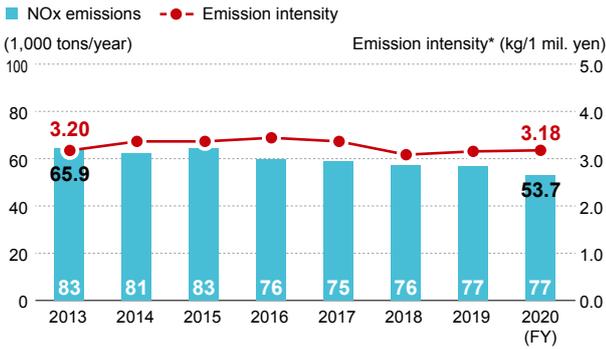
The final disposal of FY 2020 was 147,000 tons, which is an approx. 50,000-ton decrease from FY 2019, which ended in a 73% reduction from the base year FY 2000. In 2019, the domestic disposal volume temporarily increased due to import restrictions on waste plastics enforced in Asian countries, but returned to a declining trend in 2020. Not only did we achieve the target for the entire industry, namely "the 70% reduction (compared to FY 2000) by FY 2020" as per the Keidanren Voluntary Action Plan for Establishing a Sound Material-Cycle Society, but the reduction also contributed to reduce waste incineration volume. Furthermore, as well as reducing the final landfill disposal volume, member companies are strengthening their traceability concerning proper disposal of waste, through confirming the issuance, recovery and verification of industrial waste manifests, and the regular inspection of final disposal sites at contractors.

	Result of FY 2020	
	Relative to FY 2000	Relative to FY 2019
Industrial waste volume	Reduced by 39%	6% decrease
Effective resource utilization ratio	Improved by 28 points	Slight increase
Final disposal by JCIA members	Reduced by 73%	25% decrease

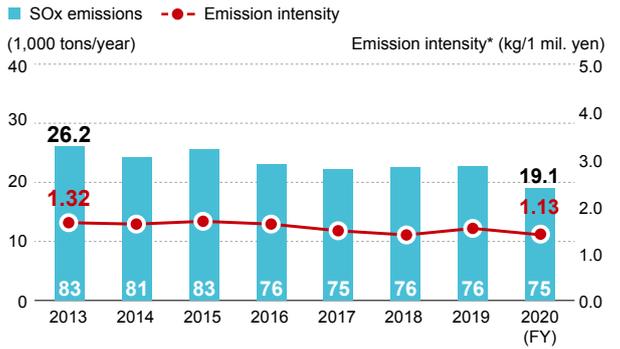
Prevention of Atmospheric Pollution and Water Pollution

Chemical industrial companies in Japan have significantly reduced their emissions of air and water pollutants compared to around 2000. In recent years, the rate of emissions decrease has become smaller, but members companies comply both with regulatory standards and agreements with municipalities. They also set their own voluntary management criteria, which are more rigorous than government standards, to intensify their ongoing efforts to reduce emissions.

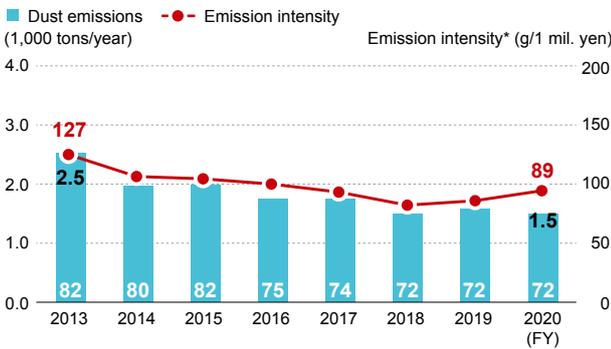
NOx Emissions



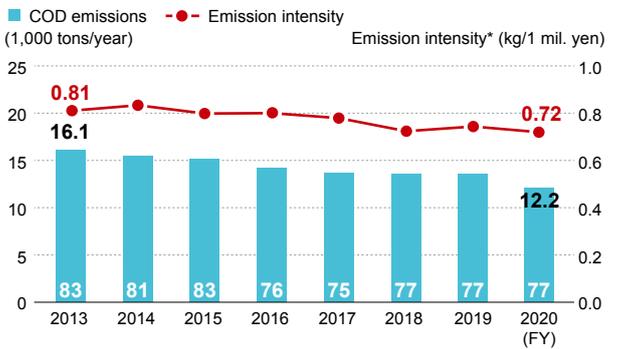
SOx Emissions



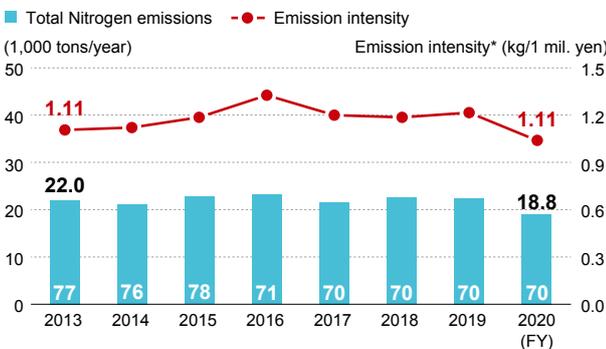
Dust Emissions



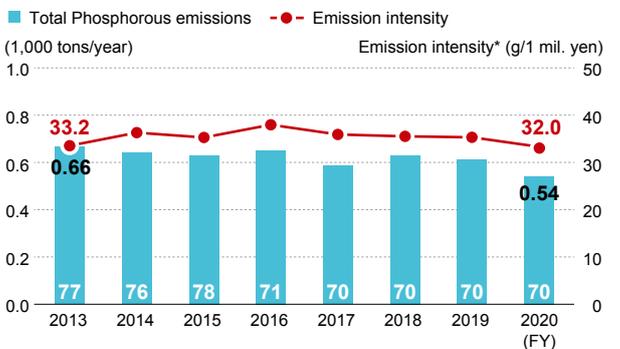
COD Emissions



Total Nitrogen Emissions



Total Phosphorous Emissions

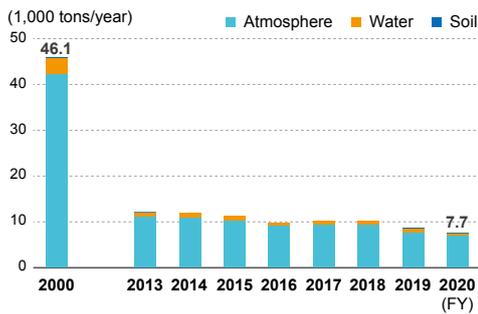


(\*Emission intensity: Emissions per ¥1 million sales, The figures in the bars indicate the numbers of companies that submitted data.)

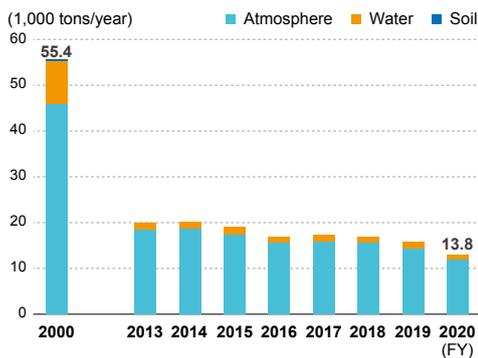
# 1-4

## Environmental Protection (Reduction of Chemical Emissions)

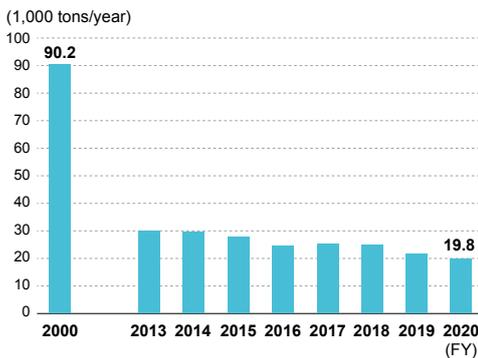
### Emissions of PRTR Substances



### Emissions of Voluntary Surveyed Substances



### VOC Emissions



### Emissions of PRTR\*1 Substances

The emissions of PRTR designated substances in FY 2020 was 7,700 metric tons, a reduction of approximately 83% compared to FY 2000. These have been decreasing year by year since FY 2013 and we have achieved our voluntary target\*3 for fiscal 2020. The breakdown of emissions is as follows: 92% into the atmosphere, 8% into water, and less than 0.1% into soil.

\*1 PRTR (Pollutant Release and Transfer Register): The PRTR system is designed to identify, collect and disseminate data on the amounts and sources of a variety of toxic chemicals released to the environment or transferred outside of facilities in the form of waste.

PRTR Law: Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

### Emissions of Voluntary Surveyed Substances

JCIA has independently established voluntary survey substances<sup>(†)</sup> and is working to further reduce the emission of chemical substances. There were 13,800 metric tons of substance emissions surveyed by JCIA voluntarily<sup>(†)</sup>, achieving a 75% reduction compared to FY 2000. We have continued to reduce the amount since FY 2013 and have achieved our voluntary target for FY 2020\*3. The breakdown of the emission quantities was 92% for emissions into the air and 8% for emissions into water areas. No emissions into the soil were reported.

(†) Change in the number of substances voluntarily surveyed by JCIA:

From FY 2000 to 2009: 126 substances

From FY 2010 to 2012: 106 substances

From FY 2013 to the current: 90 substances

### VOC\*2 Emissions

Member companies are making tremendous efforts to install equipment and improve the processes for controlling emissions of VOCs. The VOC emissions in FY 2020 amounted to 19,800 metric tons, a 78% reduction compared to FY 2000 and a 42% reduction compared to FY 2010, continuing to achieve significant reductions and achieving the FY 2020 voluntary target\*3.

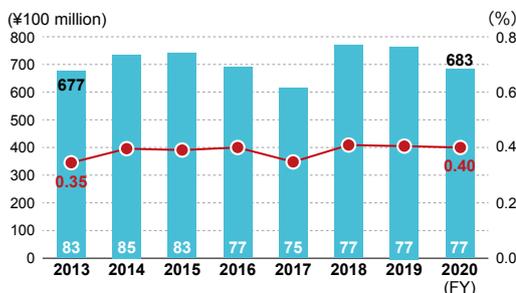
\*2 VOC (volatile organic compound): VOC is a collective term for a wide variety of volatile organic compounds that turn into gas and enter the atmosphere, including toluene, xylenes and ethyl acetate.

\*3 With regard to the voluntary surveyed substances in addition to the regulatory designated substances, JCIA has set the voluntary target for FY 2020 of "reducing emissions of PRTR substances and VOCs by 50% compared to FY 2000, and keeping them from worsening from FY 2010 and later. As for highly toxic substances, reduction efforts should be continued individually."

# 1-5

## Environmental Protection (Environmental Investment)

### Investment in Environmental Measures

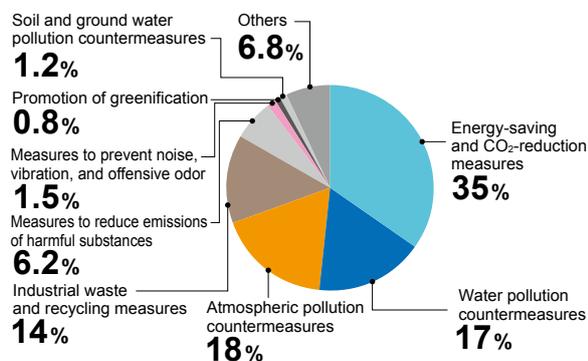


The figures at the bottom of the bars indicate the number of companies that submitted data.

### Investment in Environmental Measures

In FY 2020, the sum of investments in the installation and maintenance of environment-friendly equipment, such as energy saving and CO<sub>2</sub> reduction equipment, and investments in the development of environment-friendly products and technologies amounted to ¥68.3 billion. This represents a ratio of investment to sales of 0.40%. While it is estimated that the decrease in investment amount was due to the fact that many construction projects were forced to be canceled or postponed due to the spread of COVID-19, the ratio of investment to sales remains at roughly the same level every year. The planned investments in environmental protection measures by member companies have been steadily improving their environmental performance.

### Breakdown of Environmental Investment in FY 2019



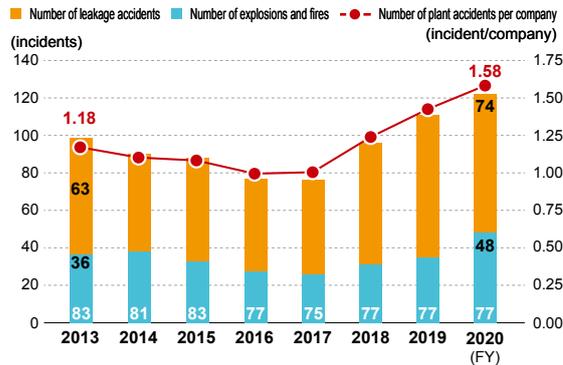
### Accident Occurrences

In FY 2020, the total number of accidents at plants (122) and the number of accidents at plants per company (1.58) significantly increased compared to FY 2019. In particular, the number of explosions and fire accidents has been on the rise since FY2018, which is thought to be due to the aging of equipment.

### Investment in Safety, Security, and Disaster-Prevention Measures

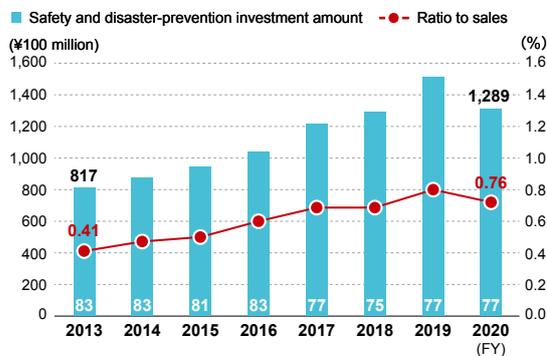
The investment in safety and disaster-preventive maintenance for FY 2020 was 128.9 billion yen (15% decrease compared with FY 2019), with the ratio of investment to sales being 0.76% (0.04% decrease compared with FY 2019), both of which decreased year on year. It is estimated that some plans were unavoidably postponed due to the spread of COVID-19 infection in the background of the decrease in investment for countermeasures despite the increasing number of disasters.

### Accident Occurrences (Explosions, fires, leakage, etc.)



The figures at the bottom of the bars indicate the number of companies that submitted data.

### Investment in Safety, Security, and Disaster-Prevention Measures

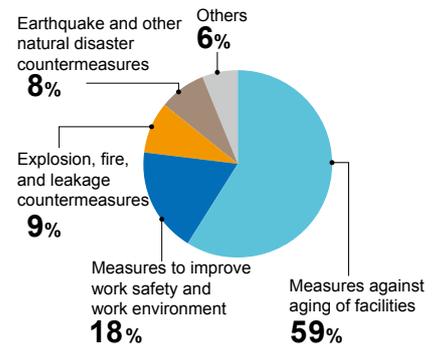


The figures at the bottom of the bars indicate the number of companies that submitted data.

### Breakdown of Safety and Disaster-Prevention Investment Amount

The breakdown of investment costs for safety and disaster-preventive maintenance in FY 2020 shows that the maintenance for aging facilities accounts for nearly 60% of this investment, increasing year by year. This trend is presumed to be resulting from this continuous increase in the expenses for the maintenance of aging facilities.

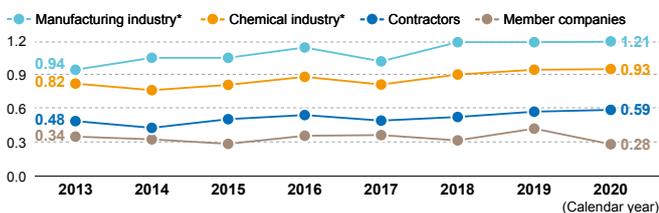
### Breakdown of Safety and Disaster-Prevention Investment Amount



### Occurrence of Occupational Accidents

#### LTIR\* (Lost Time Injury Rate) Trends

##### LTIR Trends



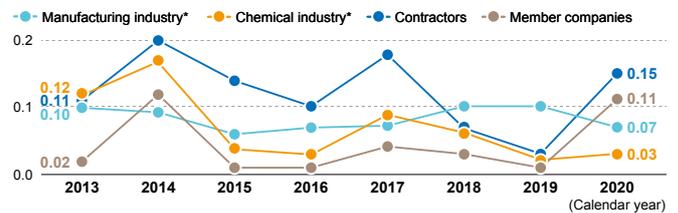
In 2020, the lost time injury rate for member companies and their subcontractors was lower than both the manufacturing industry as a whole and the chemical industry as a whole, although the figure is hovering at around the same level.

$$LTIR^{*1} = \frac{\text{Number of lost time injuries}}{\text{Total working hours (per one million hours)}}$$

\*1 LTIR: Indicator that shows the frequency of lost time injuries

#### Lost Time Injury Severity Rate\* Trends

##### Overall Severity Rates



In 2020, two fatal accidents occurred among member companies, and another two fatal accidents among their subcontractors. As a result, the severity rate was significantly higher than both the manufacturing industry as a whole and the chemical industry as a whole, which is considerably worse than 2019 when there were no fatal accidents.

$$\text{Lost Time Injury Severity Rate}^{*2} = \frac{\text{Number of work days lost}}{\text{Total work hours (per thousand hours)}}$$

\*2 Lost Time Injury Severity Rate: Indicator that shows the severity of occupational accidents

### Number of Fatalities from Occupational Accidents

	(Calendar year)									
	2013	2014	2015	2016	2017	2018	2019	2020		
Member companies	0	5	0	0	1	1	0	2		
Contractors	2	4	1	1	3	1	0	2		
Chemical industry*	17	11	22	12	12	18	12	10		
Manufacturing industry*	201	180	160	177	102	183	141	136		

\* Data publicly announced by Ministry of Health, Labour and Welfare (MHLW)

### Number of Fatalities from Occupational Accidents

Regarding the number of fatalities in 2020, there were two deaths among member companies, and another two deaths among their subcontractors. In addition, a fatal accident (1 case) occurred at a member company that did not report the statistics of subcontractors.

## 4 Social (Regional) Dialogue

### Implementation of Regional Dialogue Meetings

Areas of implementation in FY 2020	Eastern Yamaguchi, Hyogo, Aichi, Chiba (All were document-based meetings.)
Areas of implementation in FY 2019	Western Yamaguchi, Iwakuni & Otake, Sakai & Senboku, Kawasaki

### Implementation of Regional Dialogue Meetings

The Responsible Care Committee convened meetings and maintained a dialogue with the local communities once every two years until 2018 in each area where there is a concentration of member company sites, especially chemical complexes. Due to the impact of COVID-19, many of the regional dialogue meetings have been postponed since 2019. In 2020, those scheduled in Kashima, Yokkaichi, Osaka and Okayama were postponed.

## 5 Members' Self-Assessment

### Details of Self-Assessment Scores (Average scores for all member companies based on a five-level assessment system)

Code	MS	EP	PS	OSH	DS	CPS	SD
Assessed item	Important items						
Policy	4.8	4.7	4.6	4.7	4.4	4.6	4.5
Identification of striking environmental aspects, identification of dangerous and harmful factors, etc.	4.5	4.6	4.6	4.6	4.0	4.5	—
Legal and other requirements	4.6	—	—	—	—	—	—
Objectives	4.6	4.6	4.4	4.5	4.0	4.2	3.8
Plans	4.7	4.2	4.4	4.6	4.1	4.2	3.9
Organization	4.4	—	—	—	—	—	—
Education and training	4.3	4.2	4.4	4.4	4.1	4.2	3.7
Communication	4.3	4.1	3.9	4.7	4.3	4.3	4.0
Documentation and document management	4.3	—	—	—	—	—	—
Operation management	4.4	4.2	—	—	4.1	3.8	—
Response to emergency situations	4.5	—	4.2	—	3.6	—	—
Inspection and monitoring	4.5	4.5	4.4	4.4	3.9	4.4	3.7
Corrections and preventive measures	4.5	4.5	4.5	4.6	4.1	4.4	—
Collection of information and management of records	4.5	—	—	—	—	—	—
Auditing	4.5	—	—	—	—	—	—
Revisions by management	4.6	—	—	—	—	—	—
(Overall assessment)	4.5	4.4	4.4	4.6	4.1	4.3	3.9

### Details of Self-Assessment Scores (Average scores for all member companies)

On a scale of 5, scores in the 4-point range were recorded for all important items in the categories of management system, environmental protection, and occupational health and safety, showing that the PDCA cycle is rotating at a high rate in these categories.

In the category of process safety and disaster prevention, an enhancement in communication is desirable.

As for distribution safety, while emergency response and inspection/ monitoring have some outstanding issues, the other items all scored 4 points or higher.

In the category of social dialogue, there are still many issues with objectives, plans, education and training, in addition to inspection and monitoring.

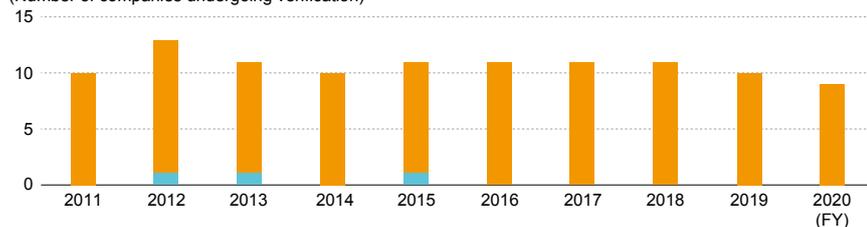
Abbreviation	Code	Abbreviation	Code	Self-assessment score	Classification
MS	Management system	DS	Distribution safety	4.5 points or over	Very satisfactory
EP	Environmental protection	CPS	Chemicals and product safety	3.5 to under 4.5 points	Just about satisfactory
PS	Process safety and disaster prevention	SD	Social dialogue	2.5 to under 3.5 points	Somewhat unsatisfactory
OSH	Occupational health and safety			Under 2.5 points	Unsatisfactory

## 6 Responsible Care Verification

### Companies Undergoing a Responsible Care Verification

■ Verification of actions ■ Verification of reports

(Number of companies undergoing verification)

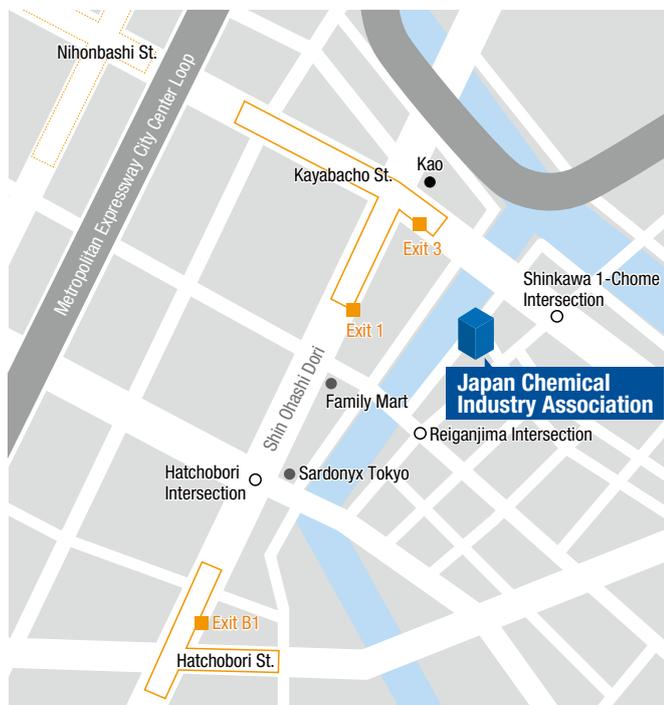


### Companies Undergoing a Responsible Care (RC) Verification

In FY 2020, 9 companies underwent an RC verification (all 9 for verification of reports and none for verification of actions). The total number of companies that have undergone an RC verification is 237 (192 for verification of reports and 45 for verification of actions).

Verification of reports (9 companies): Sanyo Chemical Industries, Ltd., Asahi Kasei Corporation, Ube Industries, Ltd., JSR Corporation, Shin-Etsu Chemical Co., Ltd., Sumitomo Seika Chemicals Company Ltd., Nippon Soda Co., Ltd., and Tokyo Ohka Kogyo Co., Ltd., Earth Corporation.

Please refer to the publications posted on the JCIA website regarding other information such as the aggregate results on the questionnaire for member companies.



### Access Information

Kayabacho St. (Tokyo Metro Hibiya Line, Tozai Line)  
 Approximately 3 minutes on foot from Exit 1 or Exit 3  
 Hatchobori St. (JR Keiyo Line)  
 Approximately 8 minutes on foot from Exit B1

### Contact

#### General Affairs Department

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 FAX 03-3297-2610

#### International Affairs Department

TEL 03-3297-2576  
 FAX 03-3297-2612

#### Labor Department

TEL 03-3297-2563  
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#### Environment and Safety Department

TEL 03-3297-2568  
 FAX 03-3297-2606

#### Responsible Care Department

TEL 03-3297-2583  
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#### Dream Chemistry 21 Committee

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#### Public Relations Department

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# ANNUAL REPORT 2021

## JCIA



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<https://www.nikkakyo.org/>

October 23 is  
**Chemistry Day**



Nikka-chan:  
 JCI's official character