

# JCIA Annual Report 2018



## Reference Materials

As a supplement to the contents of JCIA Annual Report 2018, this pamphlet introduces various data and initiatives relating to the activities of the Japan Chemical Industry Association. Please read it together with JCIA Annual Report 2018.



Japan Chemical Industry Association

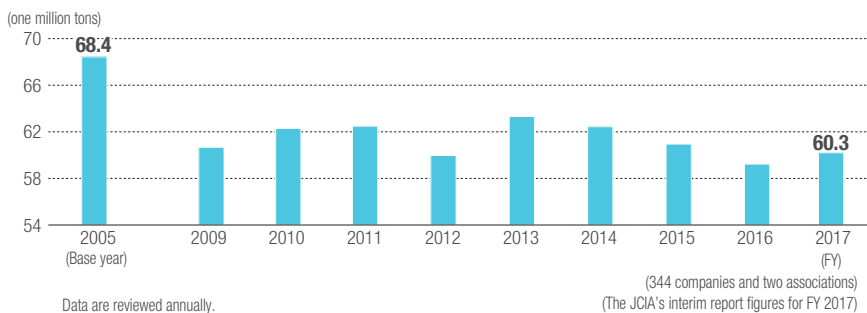
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## Environmental Protection (Prevention of Global Warming)

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

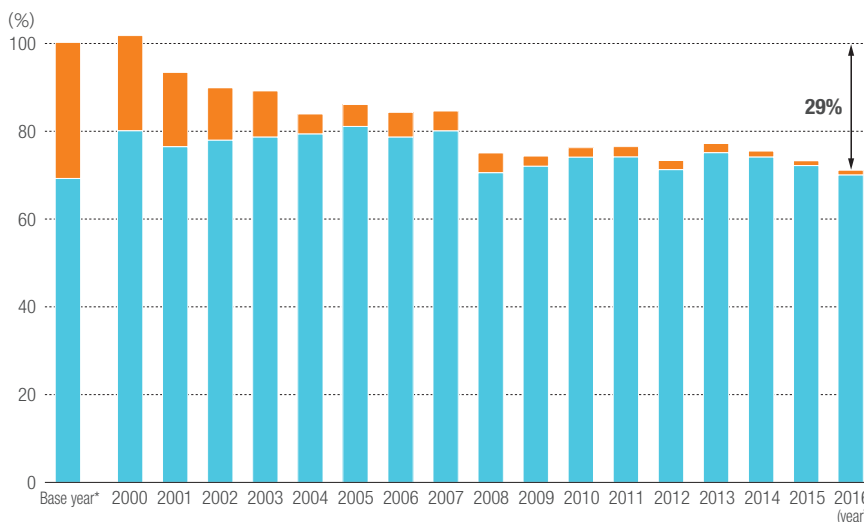


### CO<sub>2</sub> Emissions Index

Since the commencement of the "Commitment to a Low Carbon Society" activities in FY2013, emissions had been decreasing with each year. Although it increased slightly last fiscal year, when compared to the reference year of FY2005, CO<sub>2</sub> emissions have dropped by 8.1 million metric tons (12.0%).

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

■ CO<sub>2</sub> emissions (10,000 tons/CO<sub>2</sub>): Energy source CO<sub>2</sub> emissions  
 ■ Estimated emissions in manufacture of HFCs, etc.: CO<sub>2</sub>e\* emissions of four alternatives to Freon  
 \* CO<sub>2</sub>e (CO<sub>2</sub> equivalent): Corresponding value of CO<sub>2</sub> emissions



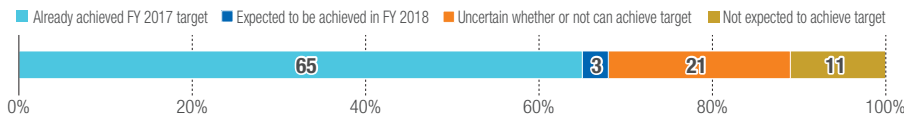
### Reduction of Emissions of CO<sub>2</sub> and Four Alternatives to Freon

When the reduction of CO<sub>2</sub> emissions and the reduction of emissions in the manufacture of four alternatives to Freon (HFCs, PFCs, SF<sub>6</sub>, NF<sub>3</sub>) are combined, emissions in 2016 were down 29% from the base years (= 100%).

# 1-2

## Environmental Protection (Industrial Waste Reduction)

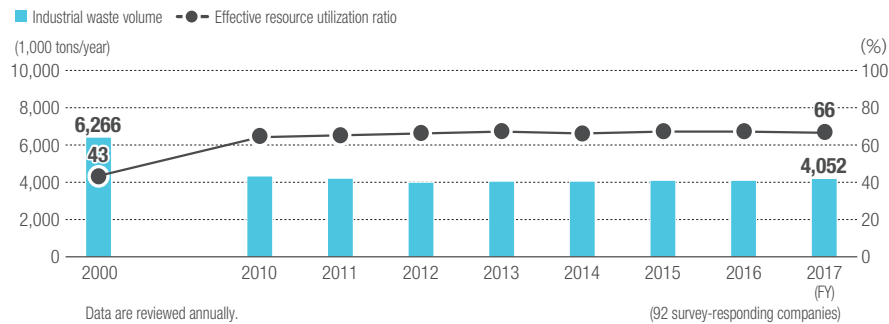
### Progress in Achievement of FY 2017 Target for Final Disposal Volume



### Progress in Achievement of FY 2017 Target for Final Disposal Volume

Starting from FY2011, we have set a target for FY2015 in accordance with the Keidanren Voluntary Action Plan on the Environment (reduce FY2015's final waste amounts by 65% relative to FY2000) and progressing with our initiatives.

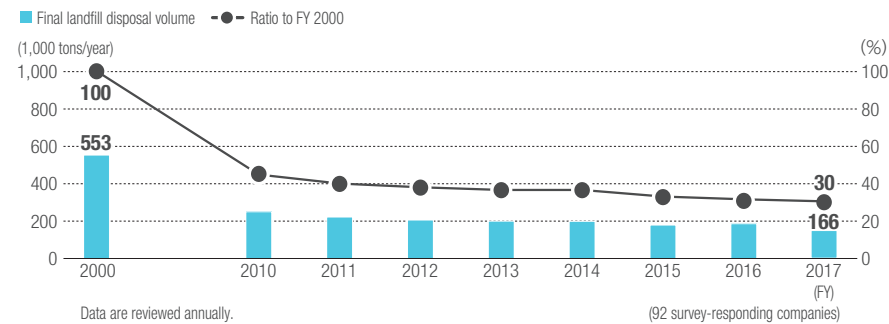
### Industrial Waste Volume and Effective Resource Utilization Ratio



### Industrial Waste Volume and Effective Resource Utilization Ratio

Industrial waste volume in FY 2017 was 4,052,000 tons, down 35% from the level in the base year of FY 2000. We are also making positive efforts to encourage sorting and reuse. The effective resource utilization ratio (the ratio to the volume of waste discharged by effectively used resources) increased from 43% in FY 2000 to 66% in FY 2017.

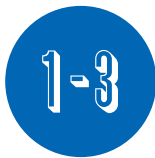
### Final Landfill Disposal Volume



### Final Landfill Disposal Volume

FY2017's final disposal amounts for waste were 166,000 metric tons, 5,000 metric tons less than FY2016, for a reduction of 70% compared to FY2000. Furthermore, as well as reducing the final landfill disposal volume, in accordance with legal revisions member companies are strengthening their verification of the proper disposal of waste by, among other things, the issuance, recovery, and verification of industrial waste manifestos and the inspection of final disposal sites.

	Result of FY 2017	
	Relative to FY 2000	Relative to FY 2016
Industrial waste volume	Reduced by 35%	Slight increase
Effective resource utilization ratio	Improved by 23 points	Slight reduction
Final disposal by JCIA members	30%	3% reduction

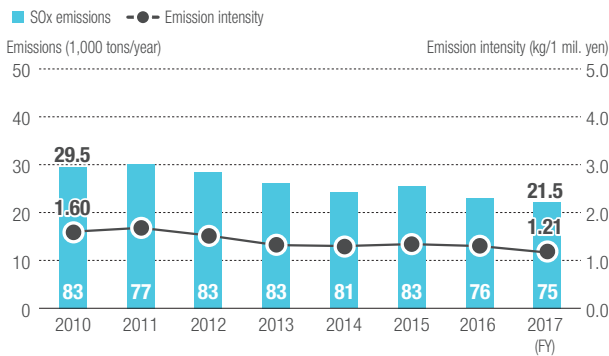


# Environmental Protection

## (Prevention of Atmospheric Pollution and Water Pollution)

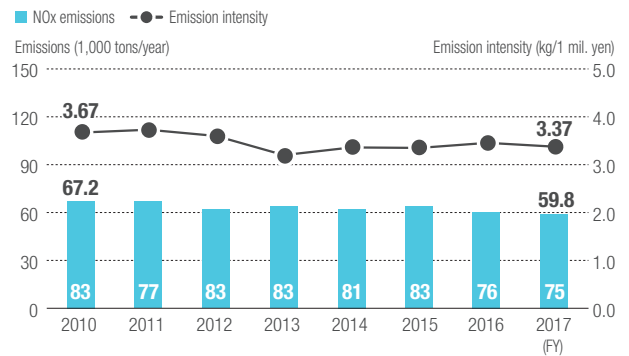
Chemical industrial companies in Japan have significantly reduced emissions of air and water pollutants. In particular, member companies not only comply with regulatory standards but also agreements with municipalities. They also set their own voluntary management criteria, which are more rigorous than government standards, to intensify their ongoing efforts to reduce emissions.

### SOx Emissions



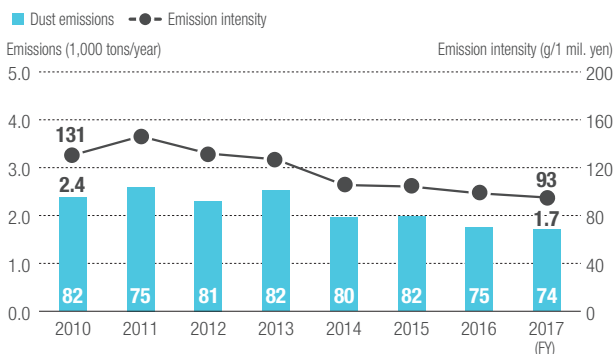
The figures in the bars indicate the numbers of companies that submitted data. Emission intensity: Emissions per ¥1 million sales

### NOx Emissions



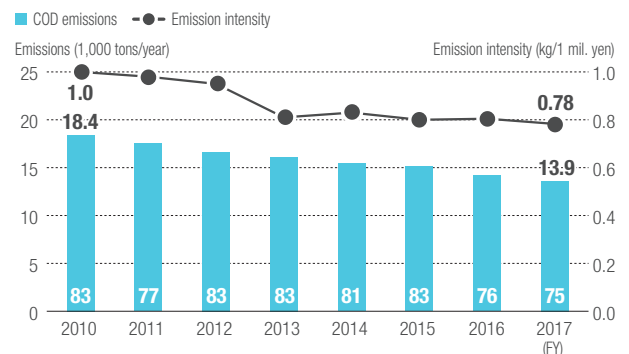
The figures in the bars indicate the numbers of companies that submitted data. Emission intensity: Emissions per ¥1 million sales

### Dust Emissions



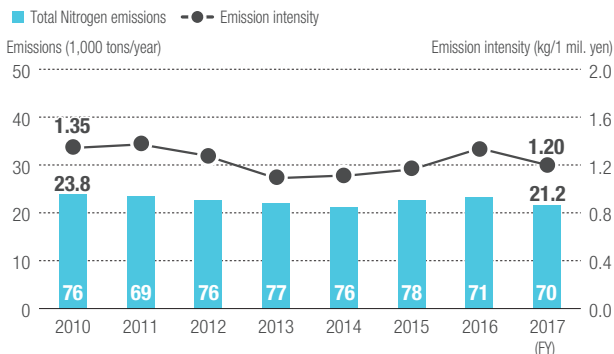
The figures in the bars indicate the numbers of companies that submitted data. Emission intensity: Emissions per ¥1 million sales

### COD Emissions



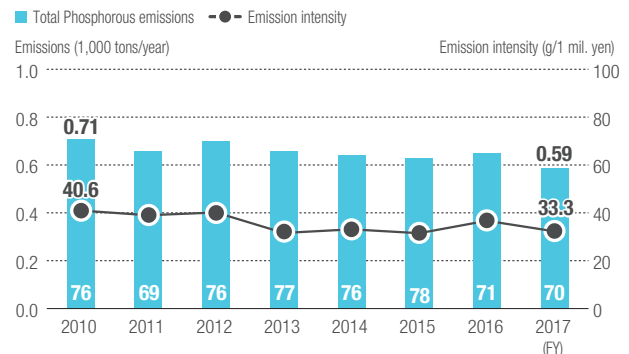
The figures in the bars indicate the numbers of companies that submitted data. Emission intensity: Emissions per ¥1 million sales

### Total Nitrogen Emissions



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

### Total Phosphorous Emissions

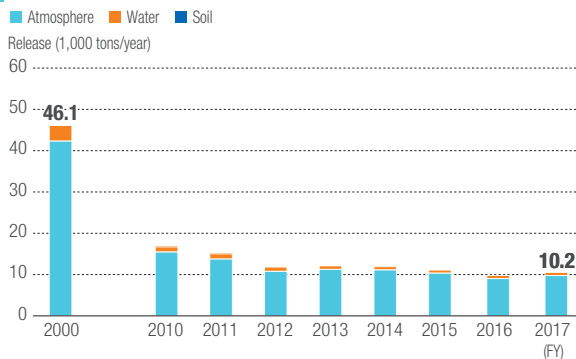


The figures in the bars indicate the numbers of companies that submitted data. Emission intensity: Emissions per ¥1 million sales

# 1-4

## Environmental Protection (Reduction of Chemical Emissions)

### Emissions of PRTR Substances

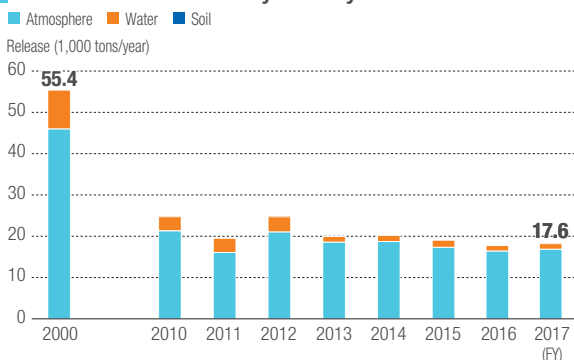


### Emissions of PRTR\* Substances

The emissions of PRTR designated substances in FY2017 was 10,200 metric tons, an approximately 78% reduction compared to FY2000. They have been decreasing year by year since FY2010, though that of FY2017 was slightly increased due to the large diminution in FY2016 caused by Kyushu earthquake. Emissions into the atmosphere accounted for 92% of the total, and emissions into water areas for 8%. No emissions to soil were reported.

\* 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

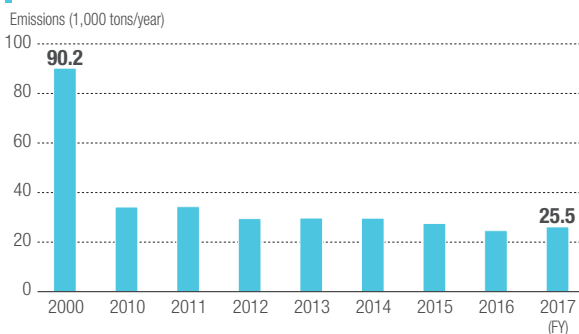


### Emissions of Voluntary Surveyed Substances

The emissions of voluntary surveyed substances was 17,600 tons, resulting in over 68% reduction compared to FY 2000. The breakdown of the emission quantities was 92% for emissions into the air and 8% for emissions into water areas. No emissions to soil were reported.

Note) 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 Emissions



### VOC\* Emissions

Member companies are making tremendous efforts to install equipment and improve processes for controlling emissions of VOCs.

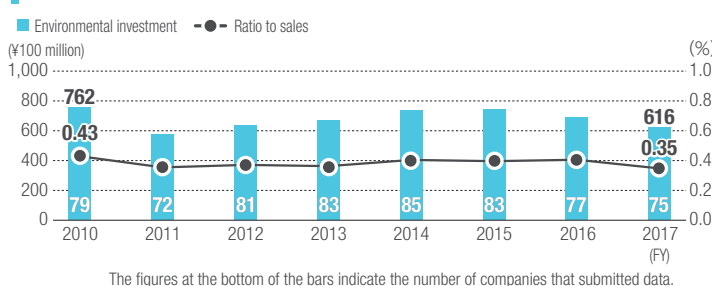
The VOC emissions in FY 2017 amounted to 25,500 tons, a 72% reduction compared with FY 2000 level, continuing a significant downward trend.

\* 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.

# 1-5

## Environmental Protection (Environmental Investment)

### Investment in Environmental Measures

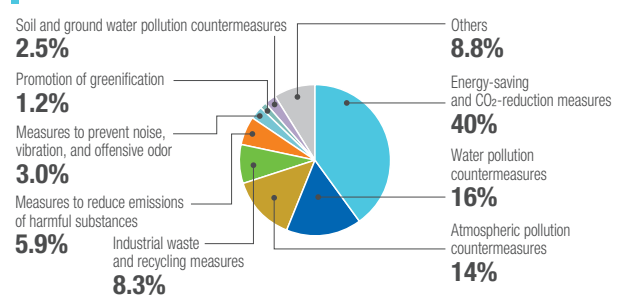


The figures at the bottom of the bars indicate the number of companies that submitted data.

### Investment in Environmental Measures

In FY 2017, investment for the installation and maintenance of environment-friendly equipment, such as energy-saving and CO<sub>2</sub>-reduction equipment, and for the development of environment-friendly products and technologies remained at roughly the same level as in recent years, amounting to ¥61.6 billion, or the equivalent of 0.35% of

### Breakdown of Environmental Investment in FY 2016

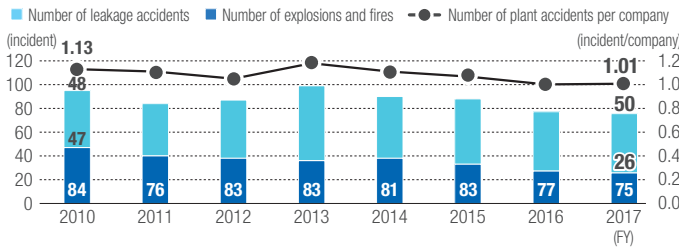


sales, with some yearly fluctuation in the amount of investment depending on the number of companies submitting the data. Member companies are implementing the planned investment in environmental measures and steadily linking that investment to sustained improvements in their environmental performance.

# 2

## Process Safety and Disaster Prevention (Efforts to Prevent Plant Accidents)

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

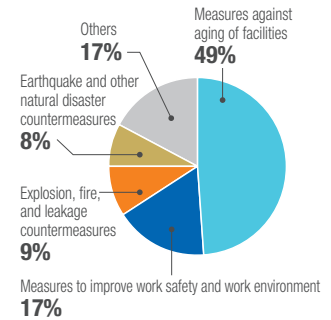


Note: The number of plant accidents is divided into leakage accidents and explosion/fire accidents. The figures in the bars indicate the number of companies that submitted data.

### Accident Occurrences

The total number of accidents at plants in FY2017 (76) and the number of accidents at plants per company (1.01) were comparable to those of FY2016. The number of explosion/fire incidents is trending downward over the long term.

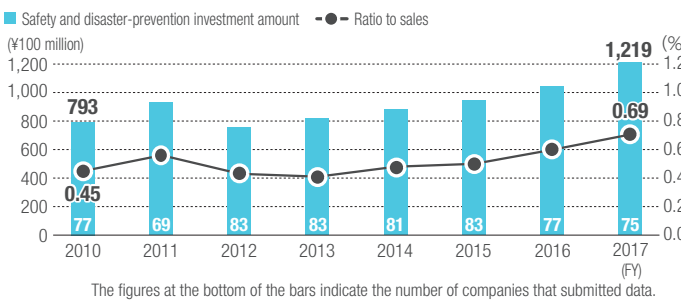
### Breakdown of Safety and Disaster-Prevention Investment Amount



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

Of the investment in safety and disaster prevention in FY2017, the investment in measures for the aging of facilities accounts for nearly 50% of the total.

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



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

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

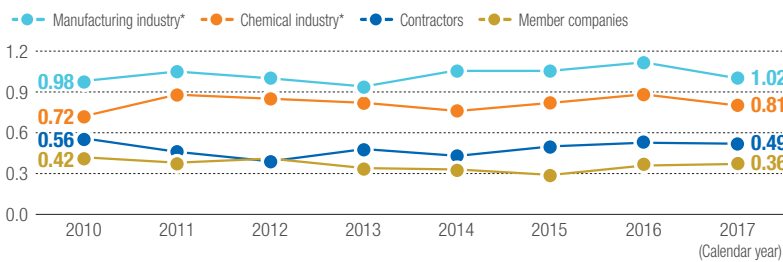
The investment in safety and disaster prevention in FY2017 was 121.9 billion yen (up 17% from FY2016) and the investment-to-sales ratio was 0.69% (up 15% from FY2016). They were drastically increased from the previous year. Member companies are implementing safety and disaster-prevention investment in a planned and sustained manner.

# 3

## Industrial Health and Safety

### Occurrence of Occupational Accidents

#### LTIR Trends



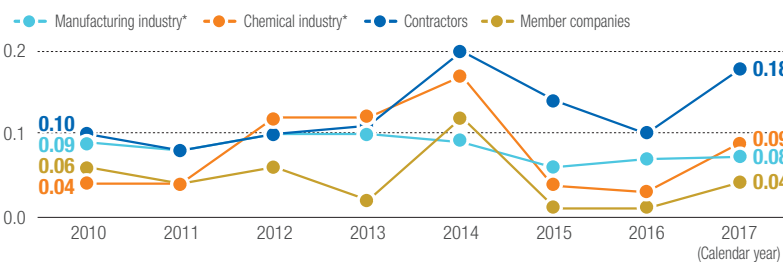
#### LTIR\* (Lost Time Injury Rate) Trends

In 2017 LTIR for member companies and their contractors was lower than in the manufacturing industry as a whole and in the chemical industry as a whole, although the figure is hovering around the same level.

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

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

#### Overall Severity Rates



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

As fatal accidents occurred for both members and their contractors in 2017, the severity rate has deteriorated compared to 2016. Improvement is required for both parties.

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

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

#### Number of Fatalities from Occupational Accidents

	2010	2011	2012	2013	2014	2015	2016	2017
Member companies	2	1	2	0	5	0	0	1
Contractors	1	1	2	2	4	1	1	3
Chemical industry*	11	13	17	17	11	22	12	12
Manufacturing industry*	211	182	199	201	180	160	177	102

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

#### Number of Fatalities from Occupational Accidents

The amount of fatalities for members and their partnering companies increased in 2017 from 2016.



## 4

## Social (Regional) Dialogue

### Implementation of Regional Dialogue Meetings

Areas where implemented in FY 2017	Oita, Western Yamaguchi, Iwakuni & Otake, Sakai & Senboku, Toyama & Takaoka, Kawasaki
Areas where implemented in FY 2016	Eastern Yamaguchi, Okayama, Hyogo, Osaka, Yokkaichi, Aichi, Chiba, Kashima

### Implementation of Regional Dialogue Meetings

The Responsible Care Committee convenes meetings and maintains a dialog with the local communities once every two years in each area where there is a concentration of member company sites, especially chemical complexes.

## 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	4.7	4.8	4.6	4.7	4.3	4.5	4.5
Identification of striking environmental aspects, identification of dangerous and harmful factors, etc.	4.5	4.7	4.7	4.7	4.0	4.5	—
Legal and other requirements	4.7	—	—	—	—	—	—
Objectives	4.7	4.6	4.4	4.4	4.0	4.2	3.8
Plans	4.7	4.2	4.5	4.6	4.0	4.2	3.9
Organization	4.4	—	—	—	—	—	—
Education and training	4.3	4.3	4.5	4.5	4.2	4.2	3.7
Communication	4.3	4.2	3.9	4.8	4.4	4.3	4.1
Documentation and document management	4.4	—	—	—	—	—	—
Operation management	4.4	4.3	—	—	4.1	4.0	—
Response to emergency situations	4.4	—	4.2	—	3.7	—	—
Inspection and monitoring	4.5	4.6	4.4	4.5	3.9	4.4	3.8
Corrections and preventive measures	4.5	4.5	4.5	4.6	4.1	4.5	—
Collection of information and management of records	4.5	—	—	—	—	—	—
Auditing	4.6	—	—	—	—	—	—
Revisions by management	4.7	—	—	—	—	—	—
(Overall assessment)	4.5	4.4	4.4	4.6	4.1	4.3	4.0

### 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 of the important items in the categories of management system, environmental safety, occupational health and safety, and the chemicals and product safety showing that the PDCA cycle is rotating at a high level in these categories.

In the category of process safety, enhanced communication is desirable.

In terms of logistical safety, there are challenges with responses to emergencies as well as inspection and monitoring.

In the category of social dialogue, there are still many issues, such as objectives, plans, education and training, and inspection and monitoring.

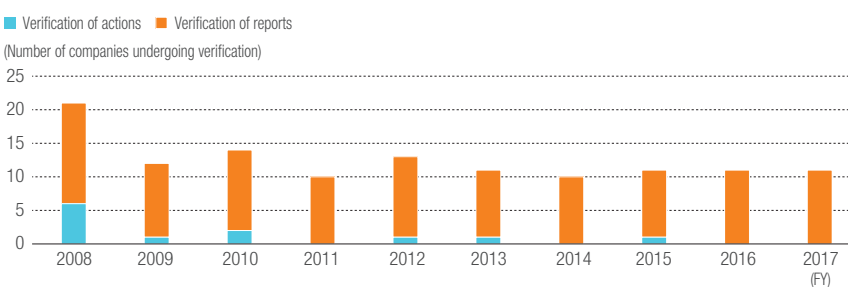
When compared to the previous fiscal year, self-ratings of chemical/product safety operation management have deteriorated significantly.

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

## 6

## Responsible Care Verification

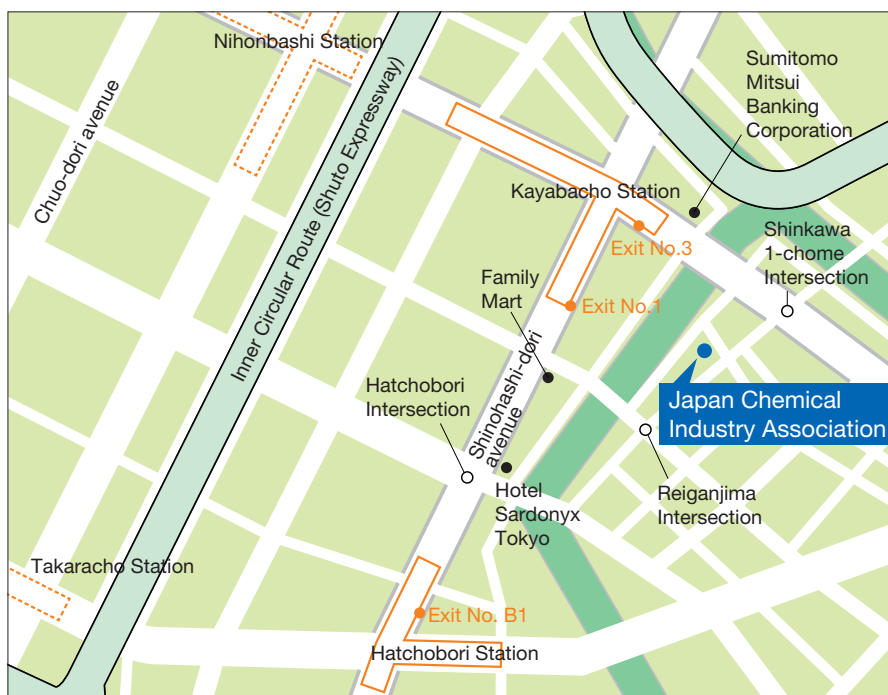
### Companies Undergoing a Responsible Care Verification



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

In FY 2017, 11 companies underwent a responsible care verification (11 for verification of reports and 0 for verification of actions). The total number of companies that have undergone an RC verification is 207 (162 for verification of reports and 45 for verification of actions). Verification of reports (11 companies): Sanyo Chemical Industries, Ltd., Daicel Corporation, Nippon Shokubai Co., Ltd., Asahi Kasei Corporation, Kaneka Corporation, Ube Industries, Ltd., JSR Corporation, Shin-Etsu Chemical Co., Ltd., Sumitomo Seika Chemicals Company Limited, Nippon Soda Co., Ltd., and TOKYO OHKA KOGYO CO., LTD.

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 Station.  
(Tokyo Metro Hibiya and Tozai Lines)  
Approximately 3 minutes on foot  
from Exit No.1 or Exit No.3

Hatchobori Station. (JR Keiyo Line)  
Approximately 8 minutes on foot  
from Exit No.B1

## Contact

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**Department of Business/  
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**Chemical Products PL Consulting  
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TEL 03 3297 2555  
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Nikka-chan:  
JCIA's official character

October 23 is  
**Chemistry Day**

JCIA Annual Report 2018 Reference Materials



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