JCIA

ANNUAL REPORT 2019

Reference Materials

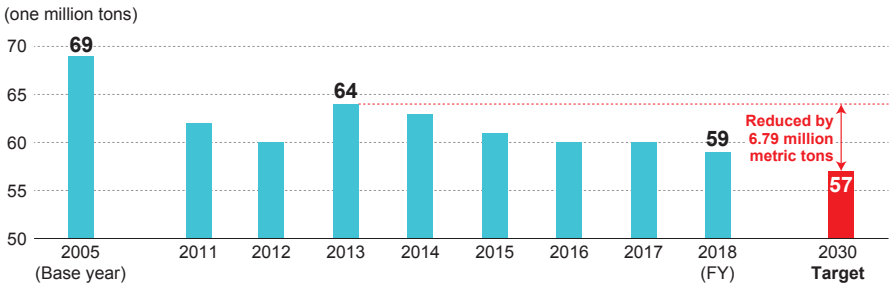
As a supplement to the contents of JCIA Annual Report 2019, this pamphlet introduces various data and initiatives relating to the activities of JCIA. Please read it together with JCIA Annual Report 2019.

Japan Chemical Industry Association

CONTENTS

1-1 Environmental Protection (Prevention of Global Warming)

CO_2 Emissions Index



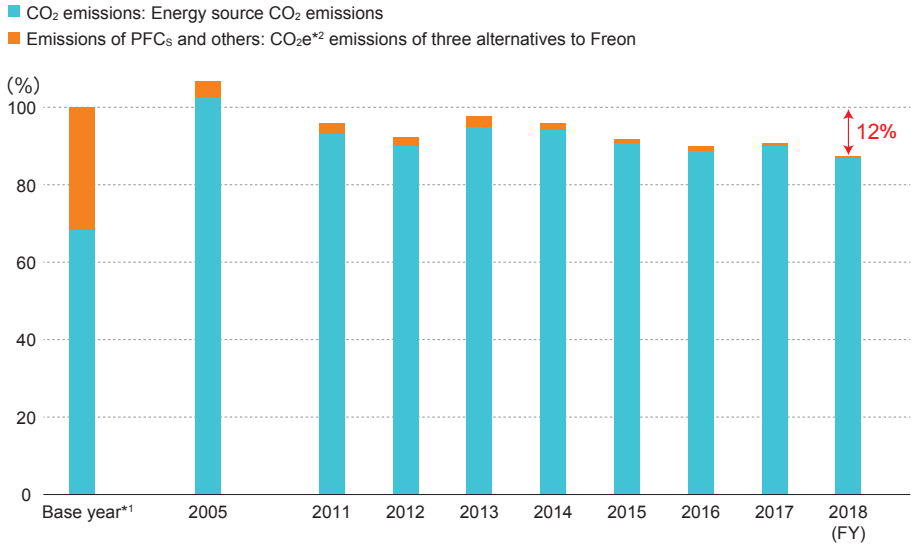
(337 companies and two associations)
(The JCIA's interim report figures for FY 2018)

Data are reviewed annually.

CO_2 Emissions Index

CO_2 emissions have been decreasing with each passing year since the "Commitment to a Low Carbon Society" activities began in FY2013, with emissions dropping by 9.9 million metric tons (14.5%) last fiscal year compared to the reference year of FY2005. In FY2018, JCIA announced a new target of reducing the absolute quantity of CO_2 emissions before FY2030, by 6.79 million metric tons compared to FY2013.

Reduction of Emissions of CO_2 and Three Alternatives to Freon



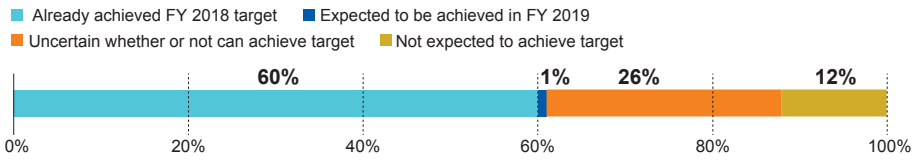
*1 Base years: The base year for CO_2 emissions is FY1990; the base year for estimated emissions associated with manufacturing of PFCs and others is 1995 (calendar year)
*2 CO_2e (CO_2 equivalent): Corresponding value of CO_2 emissions

Emissions of CO_2 and Three Alternatives to Freon

When the reduction of CO_2 emissions and the reduction of emissions in the manufacture of three alternatives to Freon (PFC_S, SF_6, NF_3) are combined, emissions in 2018 were down 12% from the base years (=100%).

1-2 Environmental Protection (Industrial Waste Reduction)

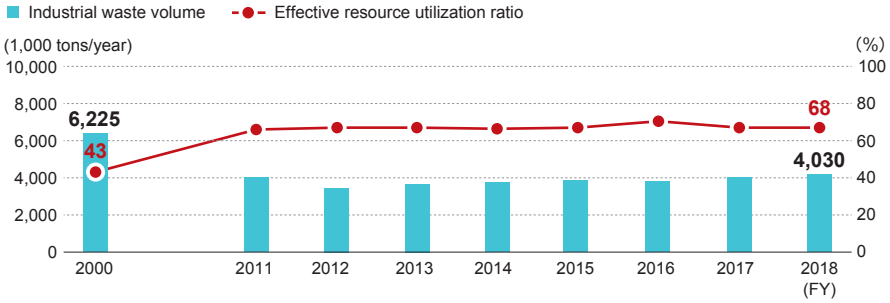
Progress in Achievement of FY 2018 Target for Final Disposal Volume



Progress in Achievement of FY 2018 Target for Final Disposal Volume

Starting from FY2016, we have set a new target in accordance with the Keidanren Voluntary Action Plan for Establishing a Sound Material-Cycle Society (reducing FY2020's final landfill disposal volume by about 70% from the volume in FY2000) and are currently undertaking a process to achieve this target.

Industrial Waste Volume and Effective Resource Utilization Ratio



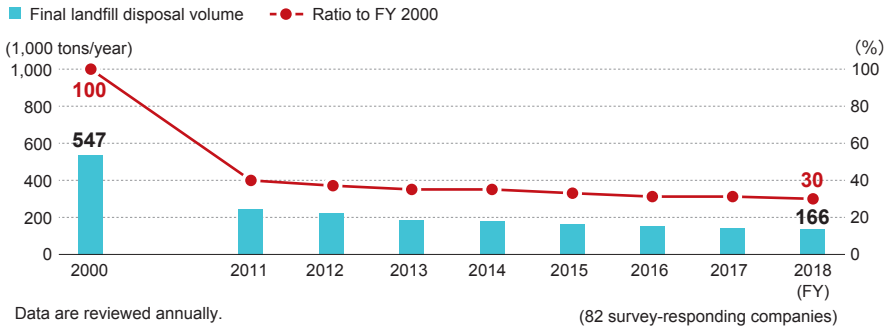
Data are reviewed annually.

(82 survey-responding companies)

Industrial Waste Volume and Effective Resource Utilization Ratio

Industrial waste volume in FY2018 was 4.03 million metric tons, down 35% from the level in the base year of FY2000. We are also making positive efforts to encourage sorting and reuse. The effective resource utilization ratio (the ratio of the volume of effectively utilized resources to the volume of waste generation) increased from 43% in FY2000 to 68% in FY2018, thus achieving the goal, ahead of the original schedule, of increasing the ratio to 65% by FY2020, which is stipulated in the Keidanren Voluntary Action Plan for Establishing a Sound Material-Cycle Society that started in 2016.

Final Landfill Disposal Volume



Data are reviewed annually.

(82 survey-responding companies)

	Result of FY 2018	
	Relative to FY 2000	Relative to FY 2017
Industrial waste volume	Reduced by 35%	Slight increase
Effective resource utilization ratio	Improved by 25 points	Slight reduction
Final disposal by JCIA members	Reduced by 70%	0.3% reduction

Final Landfill Disposal Volume

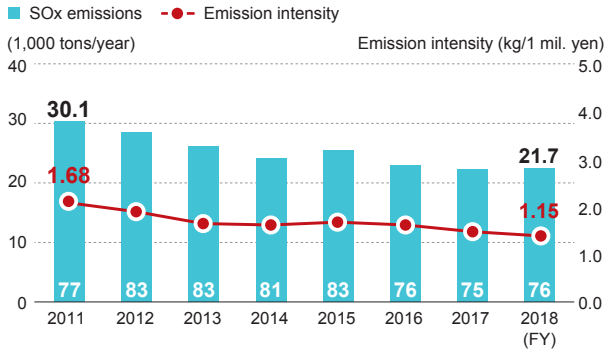
FY2018's final landfill disposal volume was 166 thousand metric tons which is 500 metric tons less than FY2017 and a reduction of 70% compared to FY2000. These results also show that, ahead of the original schedule, we have achieved the goal of reducing 70% of final landfill disposal by FY2020, which is stipulated in the Keidanren Voluntary Action Plan for Establishing a Sound Material-Cycle Society that started in 2016. Furthermore, as well as reducing the final landfill disposal volume, member companies are strengthening their verification of the proper disposal of waste in accordance with legal revisions, through the issuance, recovery and verification of industrial waste manifestos, and the inspection of final disposal sites.

1-3 Environmental Protection (Prevention of Atmospheric Pollution and Water Pollution)

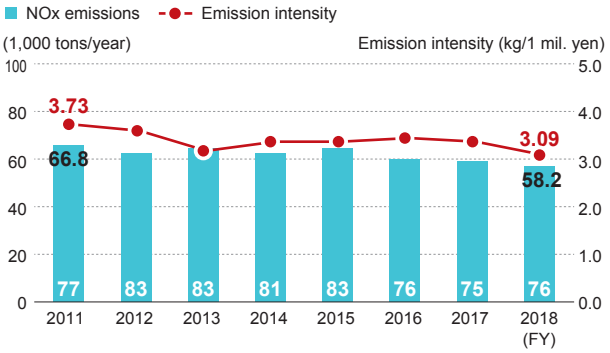
Prevention of Atmospheric Pollution and Water Pollution

Chemical industrial companies in Japan have significantly reduced their emissions of air and water pollutants. Member companies comply not only 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.

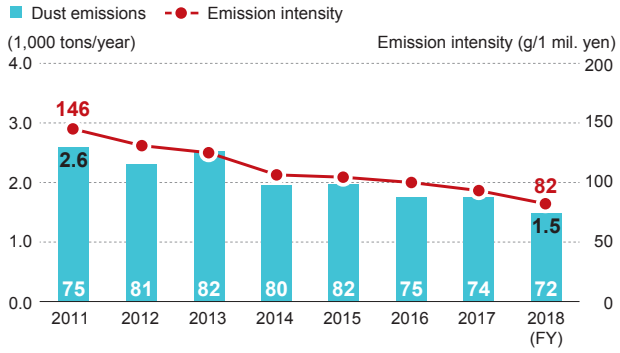
SOx Emissions



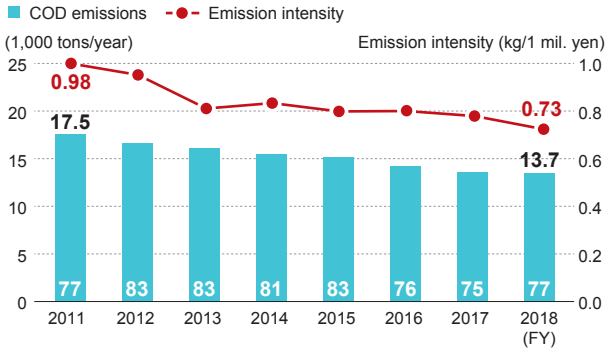
NOx Emissions



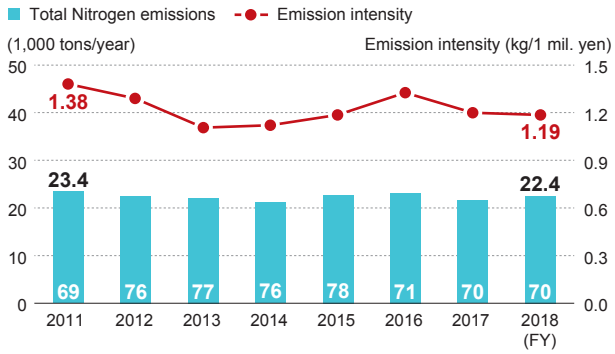
Dust Emissions



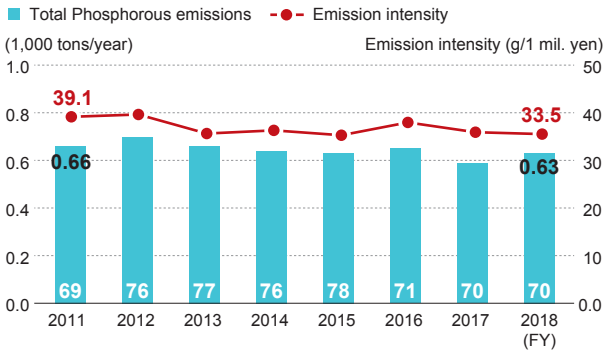
COD Emissions



Total Nitrogen Emissions



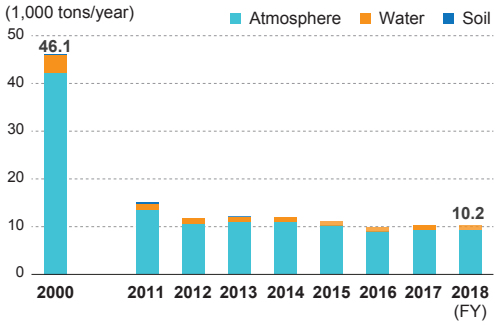
Total Phosphorous Emissions



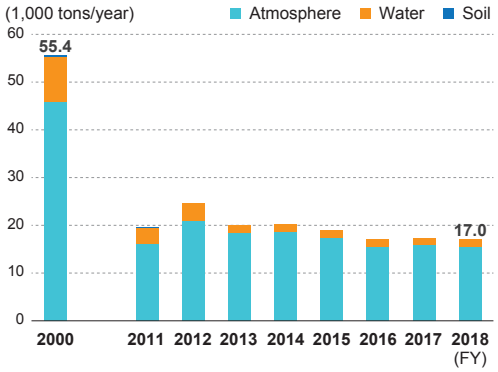
(Emission intensity: Emissions per ¥1 million sales, The figures in the bars indicate the numbers of companies that submitted data.)

1-4 Environmental Protection (Reduction of Chemical Emissions)

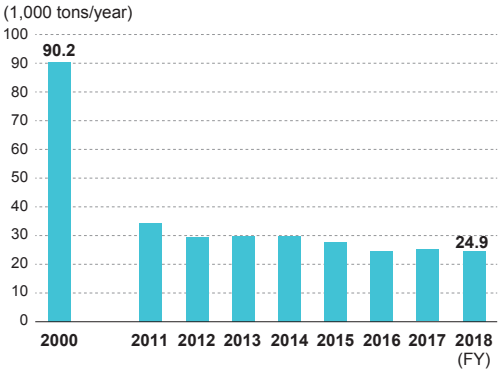
Emissions of PRTR Substances



Emissions of Voluntary Surveyed Substances



VOC Emissions



Emissions of PRTR* Substances

The emissions of PRTR designated substances in FY2018 was 10,200 metric tons, a reduction of approximately 78% compared to FY2000. These have been decreasing year by year since FY2011. The breakdown of the emission quantities was 93% for emissions into the air and 7% for emissions into water areas. No emissions into the 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

There were 17,000 metric tons of substance emissions surveyed by JCIA voluntarily, achieving a 69% 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 into the 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

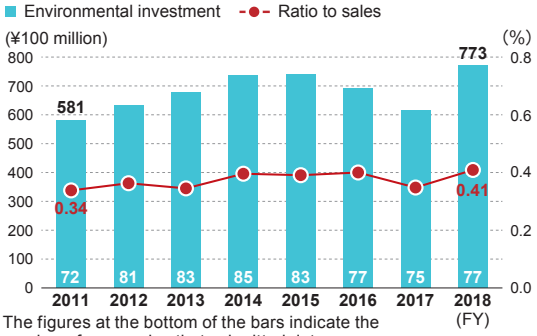
VOC* Emissions

Member companies are making tremendous efforts to install equipment and improve the processes for controlling emissions of VOCs.
The VOC emissions in FY2018 amounted to 24,900 metric tons, a 72% reduction compared to the FY2000 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.

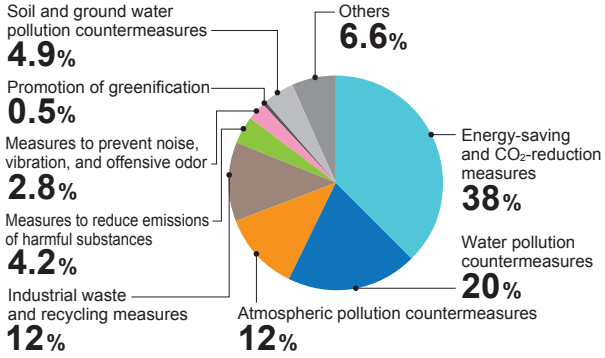
1-5 Environmental Protection (Environmental Investment)

Investment in Environmental Measures



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

Breakdown of Environmental Investment in FY 2018



Investment in Environmental Measures

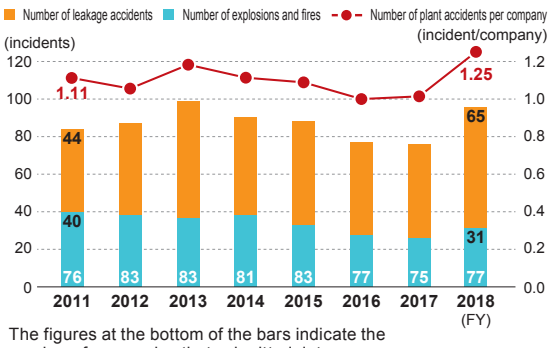
In FY2018, the sum of investments in the installation and maintenance of environment-friendly equipment, such as energy saving and CO_2 reduction equipment, and investments in the development of environment-friendly products and technologies amounted to ¥77.3 billion. This represents a ratio of investment to sales of 0.41%. While the investment amount fluctuates from year to year depending on the number of companies submitting data, 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.

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

Accident Occurrences

In FY2018, the total number of accidents at plants (96) and the number of accidents at plants per company (1.25) significantly increased compared to FY2017. Among other items, the number of leakage accidents increased by 30% from last year.

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

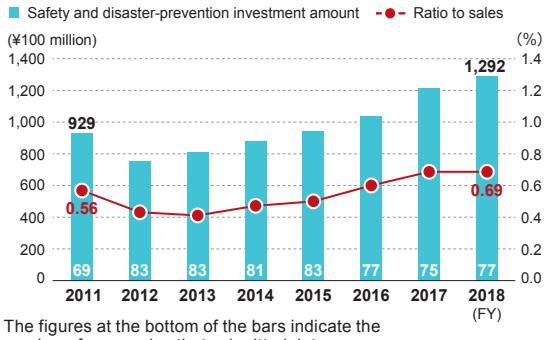


The figures at the bottom of the bars indicate the number of companies that submitted data.

Investment in Safety, Security, and Disaster-Prevention Measures

The investment in safety and disaster prevention, and the ratio of investment to sales in FY2018 were ¥129.2 billion (up 6% from FY2017) and 0.69% (no change from FY2017) respectively, remaining almost unchanged from last year. Member companies are investing in safety and disaster prevention measures in a planned and sustained manner.

Investment in Safety, Security, and Disaster-Prevention Measures

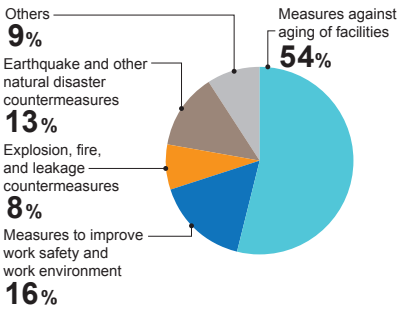


The figures at the bottom of the bars indicate the number of companies that submitted data.

Breakdown of Safety and Disaster-Prevention Investment Amount

The breakdown of investment amount in safety and disaster prevention in FY2018 indicates that more than half of this amount was spent on measures against aging facilities.

Breakdown of Safety and Disaster-Prevention Investment Amount

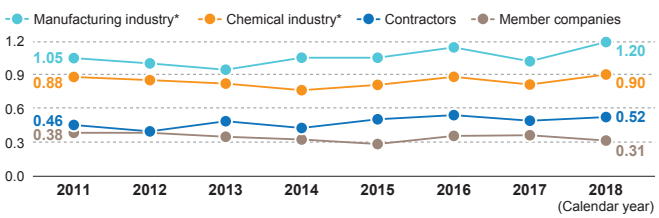


3 Industrial Health and Safety

Occurrence of Occupational Accidents

LTIR* (Lost Time Injury Rate) Trends

LTIR Trends



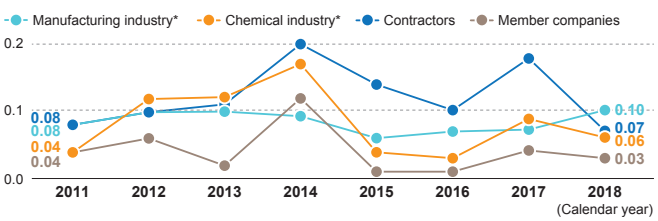
$$\text{LTIR}^{*1} = \frac{\text{Number of lost time injuries}}{\text{Total working hours (per one million hours)}}$$

In 2018, 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.

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

Lost Time Injury Severity Rate* Trends

Overall Severity Rates



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

While one fatal accident case each was reported from a member company and a subcontractor in 2018, the lost time injury severity rate was improved compared to 2017.

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

Number of Fatalities from Occupational Accidents

(Calendar year)

	2011	2012	2013	2014	2015	2016	2017	2018
Member companies	1	2	0	5	0	0	1	1
Contractors	1	2	2	4	1	1	3	1
Chemical industry*	13	17	17	11	22	12	12	18
Manufacturing industry*	182	199	201	180	160	177	102	183

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

Number of Fatalities from Occupational Accidents

While the number of deaths among member companies remained at one in 2018, unchanged from last year, the number of fatalities among subcontractors decreased from 2017.

4 Social (Regional) Dialogue

Implementation of Regional Dialogue Meetings

Areas where implemented in FY 2018	Eastern Yamaguchi, Okayama, Hyogo, Yokkaichi, Aichi, Chiba, Kashima
Areas where implemented in FY 2017	Oita, Western Yamaguchi, Iwakuni & Otake, Sakai & Senboku, Toyama & Takaoka, Kawasaki

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	4.7	4.6	4.7	4.2	4.5	4.5
Identification of striking environmental aspects, identification of dangerous and harmful factors, etc.	4.5	4.6	4.6	4.6	3.9	4.5	—
Legal and other requirements	4.7	—	—	—	—	—	—
Objectives	4.6	4.6	4.4	4.5	3.9	4.1	3.8
Plans	4.6	4.2	4.4	4.6	4.0	4.1	3.8
Organization	4.3	—	—	—	—	—	—
Education and training	4.2	4.2	4.4	4.4	4.1	4.2	3.6
Communication	4.2	4.1	3.9	4.7	4.3	4.2	4.0
Documentation and document management	4.3	—	—	—	—	—	—
Operation management	4.4	4.2	—	—	4.1	3.9	—
Response to emergency situations	4.4	—	4.1	—	3.6	—	—
Inspection and monitoring	4.4	4.5	4.4	4.5	3.8	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	4.4	—	—	—	—	—	—
Auditing	4.6	—	—	—	—	—	—
Revisions by management	4.7	—	—	—	—	—	—
(Overall assessment)	4.5	4.4	4.4	4.6	4.0	4.3	3.9

Abbreviation	Code
MS	Management system
EP	Environmental protection
PS	Process safety and disaster prevention
OSH	Occupational health and safety

Abbreviation	Code
DS	Distribution safety
CPS	Chemicals and product safety
SD	Social dialogue

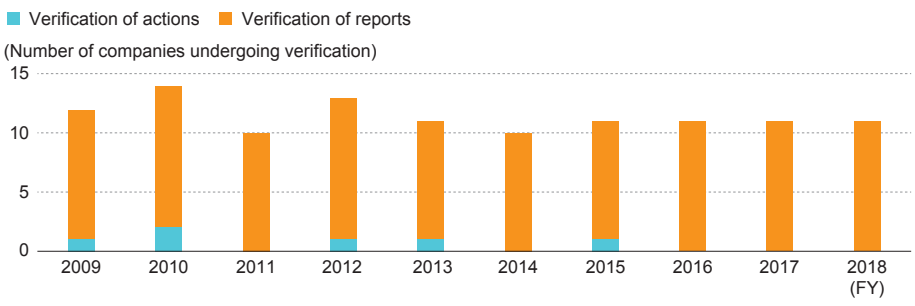
Self-assessment score	Classification
4.5 points or over	Very satisfactory
3.5 to under 4.5 points	Just about satisfactory
2.5 to under 3.5 points	Somewhat unsatisfactory
Under 2.5 points	Unsatisfactory

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.
In terms of distribution safety, some issues remain in the categories of response to emergency situations as well as inspection and monitoring.
In the category of social dialogue, there are still many issues with objectives, plans, education and training, in addition to inspection and monitoring.

6 Responsible Care Verification

Companies Undergoing a Responsible Care Verification



Companies Undergoing a Responsible Care (RC) Verification

In FY2018, 11 companies underwent an RC verification (all 11 for verification of reports and none for verification of actions). The total number of companies that have undergone an RC verification is 218 (173 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, Nihon Nohyaku Co., Ltd., 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.

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

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October 23 is
Chemistry Day

Nikka-chan:
JCIA's official character