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.
Environmental Protection
(Prevention of Global Warming)

CO₂ 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, CO₂ emissions have dropped by 8.1 million metric tons (12.0%).

Reduction of Emissions of CO₂ and Four Alternatives to Freon

When the reduction of CO₂ emissions and the reduction of emissions in the manufacture of four alternatives to Freon (HFCs, PFCs, SF₆, NF₃) are combined, emissions in 2016 were down 29% from the base years (= 100%).

* Base years: The base year for CO₂ emissions is FY1990; the base year for estimated emissions associated with manufacturing of HFCs, etc. is 1995 (calendar year).
## 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 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

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.

### Importance of Industrial Waste Reduction

<table>
<thead>
<tr>
<th>Environmental Protection</th>
<th>(Industrial Waste Reduction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Target Status</th>
<th>FY 2017</th>
<th>FY 2018</th>
<th>Uncertain</th>
<th>Not Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieved</td>
<td>65%</td>
<td>3%</td>
<td>24%</td>
<td>91%</td>
</tr>
</tbody>
</table>

### Industrial Waste Volume and Effective Resource Utilization Ratio

Data are reviewed annually. (92 survey responding companies)

### Final Landfill Disposal Volume

Data are reviewed annually. (92 survey responding companies)

<table>
<thead>
<tr>
<th>Result of FY 2017</th>
<th>Relative to FY 2000</th>
<th>Relative to FY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial waste volume</td>
<td>Reduced by 35%</td>
<td>Slight increase</td>
</tr>
<tr>
<td>Effective resource utilization ratio</td>
<td>Improved by 23 points</td>
<td>Slight reduction</td>
</tr>
<tr>
<td>Final disposal by JCIA members</td>
<td>30%</td>
<td>3% reduction</td>
</tr>
</tbody>
</table>
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.
**Environmental Protection (Reduction of Chemical Emissions)**

**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**

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**

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, xylene, and ethyl acetate.

**Environmental Protection (Environmental Investment)**

**Investment in Environmental Measures**

In FY 2017, investment for the installation and maintenance of environment-friendly equipment, such as energy-saving and CO₂-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 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.
Process Safety and Disaster Prevention
(Efforts to Prevent Plant Accidents)

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

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.

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.

Investment in Safety, Security, and Disaster-Prevention Measures

Ordinary safety and disaster-prevention investment amount (% of sales)

Industrial Health and Safety

Occurrence of Occupational Accidents

Lost Time Injury Rate (LTIR) 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.

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

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.

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

Number of Fatalities from Occupational Accidents

The amount of fatalities for members and their partnering companies increased in 2017 from 2016.
Social (Regional) Dialogue

Implementation of Regional Dialogue Meetings

Areas where implemented in FY 2017
Oita, Western Yamaguchi, Iwakuni & Otake, Sakai & Semboku, Toyama & Takaoka, Kawasaki

Areas where implemented in FY 2016
Eastern Yamaguchi, Okayama, Hyogo, Osaka, Yokkaichi, Aichi, Chiba, Kashima

Members’ Self-Assessment

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

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

Abbreviation
- MS: Management system
- EP: Environmental protection
- PS: Process safety and disaster prevention
- OSH: Occupational health and safety
- 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
- Under 3.5 points Somewhat unsatisfactory
- Under 2.5 points Unsatisfactory

Responsible Care Verification

Companies Undergoing a Responsible Care 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., Daisel 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

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October 23 is Chemistry Day

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