

**Integrated Report****2019****Supplementary Information  
(Environment and Safety)**

---

Outline of Environment and Safety Activities	1
Process Safety and Disaster Prevention	3
Occupational Safety and Health	4
Measures to Mitigate Global Warming	5
Environmental Preservation: Environmental Accounting and Environmental Impact Data by Facility	6
Environmental Preservation: PRTR and Treatment of Industrial Waste and PCB Waste	7
Environmental Preservation: Emissions to the Air and Bodies of Water, Water Resource Usage and the Fluorocarbon Emission Restriction	8
Quality Assurance and Product Safety	9
Third-Party Verification and Scope of This Report	10

---

# Outline of Environment and Safety Activities

## The UBE Group's Medium-Term Environmental & Safety Policy (Fiscal 2016 – 2018): Continually improving the quality of Responsible Care (RC)\*1.

In order to advance its medium-term environment and safety policy, the UBE Group strives to improve its environment and safety activities through the use of the PDCA cycle.

Fiscal 2018 evaluation: Plans were mostly achieved.

★★★: Achieved   ★★: Mostly achieved   ★: Not achieved

Responsible Care Code	FY2018 Action Plans	FY2018 Results	Self-Evaluation
<b>Process Safety and Disaster Prevention</b>	<b>Reinforcing process safety frameworks</b>		
	1. Reduce facilities accident risks	1. Reduced facilities accident risks 1-1. Continued to assess risks and deploy risk responses for irregular HAZOP*2 and other facilities 1-2. The Accident Information Liaison Group shared accident data from inside and outside the Company	★★
	2. Enhance safety of high-pressure gas accredited business sites	2. Enhanced safety of high-pressure gas accredited business sites 2-1. Reviewed and reinforced framework for headquarters requests for opinions on business plans of accredited sites 2-2. Headquarters issued uniform security management criteria at accredited sites	
	<b>Earthquake and tsunami readiness</b>		
	1. Earthquake and tsunami readiness	1. Implemented Earthquake and Tsunami Countermeasure Plans at each department and location in light of revisions to earthquake resistance standards and government notices	★★
<b>Occupational Safety and Health</b>	<b>Health management</b>		
	1. Curb days lost to non-occupational injuries and illnesses	1. Implemented mental health initiatives, effectively used external EAPs*3, and leveraged stress check system results	
	2. Respond to regular health check results	2. Harnessed results of regular health checkups to identify and address health risks and roll out lifestyle disease, overwork, and diet improvement initiatives. Tried efforts to ensure that employees exercise habitually Addressing occupational health risks by evaluating results of special medical checkups	★★
	3. Smoking policy (to eliminate passive smoking at business sites)	3. Reviewed smoking environments at business sites. Collaborated with Ube Industries Health Insurance Association in holding a smoking reduction contest.	
	<b>Occupational safety</b>		
	1. Cultivate a culture of safety 1-1. Selection and concentration through evaluations of activity effectiveness	1. Cultivated a culture of safety 1-1. Continued to quantitatively evaluate eight elements of culture of safety through environmental safety audits, with business site heads sharing and improving on strengths and weaknesses 1-2. Unified evaluation criteria and published on the intranet	★★
2. Eliminate major disasters 2-1. Support improvements for sites that experience frequent disasters 2-2. Improve capabilities of site managers (revise management techniques so they are less instinctive)	2. Eliminated major disasters 2-1. Registered worksites at which multiple occupational accidents had occurred over past few years and continued to provide support Formulated and employed rules on company safety designations*4 2-2. Investigated operational circumstances leading to major disasters and shared issues and recommendations for improvements		
<b>Process Safety and Disaster Prevention</b>	<b>Global warming countermeasures</b>		
	Greenhouse gas reduction targets for fiscal 2021 1. Consider and implement initiatives aimed at meeting targets at each company, division and facility 1-1. Greenhouse gas (GHG) emissions: Down 15% compared with the fiscal 2005 level (including major overseas facilities)	1. Greenhouse gas reductions 1-1. Greenhouse gas (GHG) emissions: Down 15% compared with the fiscal 2005 level	
	2. Expand scope of application to businesses that contribute to the environment 2-1. Aim for environment-friendly products and technologies to account for 30% of total net sales	2. Expanded scope of application to businesses that contribute to the environment 2-1. Environment-friendly products and technologies accounted for 27% of total net sales	★★
	3. Promote understanding and knowledge of global warming (including information related to medium- and long-term plans and adaptive measures inside and outside Japan)	3. Promote understanding and knowledge of global warming (including information related to medium and long-term plans and adaptive measures inside and outside Japan) 3-1. Provided information on responding to global warming and related topics at meetings of each business division's energy saving promotion committee and elsewhere	
	<b>Reduce emissions of environmentally hazardous substances</b>		
	1. Address environmental regulations and lower risks	1. Steadily implemented response to the Fluorocarbon Emission Restriction Law and other environmental regulations	
2. Implement chemical substance emissions reduction plans	2. Emissions of 20 voluntarily selected chemical substances*5: Reduced 32% compared with fiscal 2010	★★	
3. Implement industrial waste implementation plans	3. External final disposal: Reduced 85% compared with fiscal 2000		

★★★: Achieved ★★: Mostly achieved ★: Not achieved

Responsible Care Code	FY2018 Action Plans	FY2018 Results	Self-Evaluation
<b>Chemicals and Product Safety (Transportation Safety)</b>	<b>Chemical and product safety</b>		
	1. By fiscal year-end, all business units, Group companies, and overseas subsidiaries fully complying with chemical regulations	1. By fiscal year-end, all business units, Group companies, and overseas subsidiaries fully complied with chemical regulations 1-1. Provided correctional guidance regarding weak elements in quality and product safety audits of key business divisions, including Group companies and overseas subsidiaries 1-2. Conducted on-site audits and handed oversight to product safety departments in each business unit and division 1-3. Educated about the Industrial Safety and Health Act and Chemical Substances Control Law, explaining registration tasks and completing task transfers	
	2. Improve capabilities of business division heads and provide advanced human resources development education to support leaders and improve information	2. Improved capabilities of business division heads and provided advanced human resources development education to support leaders and improved information 2-1. Provided daily product safety guidance, audits, and education for each business division head. Through rotation system between headquarters and business units and divisions, took on people from divisions and provided advanced on-the-job training 2-2. Functionally augmented internally developed chemical substance management systems and made it possible to compare reported and actual quantities from next fiscal year	★★
3. Bolster collaboration between overseas subsidiaries and domestic business divisions and ensure subsidiary compliance with laws and ordinances	3. Bolstered collaboration between overseas subsidiaries and domestic business divisions and ensured subsidiary compliance with laws and ordinances 3-1. Provided instructions on improving business, notably through document management and extensive sharing of information with domestic business divisions through audits of overseas subsidiaries 3-2. Collaborated with overseas subsidiaries and used the intranet to strengthen deployment of information on foreign laws at domestic business divisions		
	<b>Transportation safety</b>		
	1. Ensure compliance with internal operating rules and transportation safety management guidelines and continually reinforce the operating system	1. Pursued logistics safety and security through SDS, label, and Yellow Card guidance and audit	★★
<b>Dialogue with Communities</b>	1. Promote dialogue with communities	1. Promote dialogue with communities 1-1. Held 12th RC Local Dialogue Meeting*6 in the Chiba region 1-2. Held 15th RC Dialogue Forum*6 in the Ube district 1-3. Published local newsletter Tsubasa (released semiannually)	★★★
	2. Ensure information disclosure and transparency	2. Issued the 2018 Integrated Report and its Supplementary Information (Environment and Safety), had a third-party RC review, and published a third-party opinion	
<b>Management Systems</b>	1. Implement environment and safety audits and inspections	1. Implemented environment and safety audits and inspections 1-1. Headquarters and divisions implemented environmental and safety audits at 7 parent sites and 10 Group companies 1-2. Implemented environmental safety inspections at 10 parent sites and 4 Group companies	★★★
	2. Implement quality and product safety audits	2. Headquarters implemented quality and product safety audits at 15 sites and Group companies	

Glossary

\*1 Responsible Care (RC): Under RC, corporations that handle chemical substances voluntarily preserve the environment, safety, and health throughout product lifecycles, from the development of chemicals through their manufacture, distribution, use, and final consumption to disposal and/or recycling, and communicate and engage with society by disclosing activity outcomes.

\*2 Irregular HAZOP: Short for irregular hazard and operability study. A method for identifying hidden process risks in operations at times of irregular operation, such as plant startup or shutdown.

\*3 External EAP (Employee Assistance Program): Programs through external institutions to support employees' mental health. These programs help provide more specialized mental health care from experts, including industrial counselors and clinical psychologists.

\*4 Company safety designations: Short for Special Safety Management Guidance Office; designates sites at which safety management (including in terms of compliance and accident occurrences) has deteriorated, investigating causes, deciding ways to prevent recurrences, and improving safety management

\*5 UBE's 20 voluntarily selected chemical substances: Methyl alcohol, butyl alcohol, toluene, Epsilon-caprolactam, cyclohexane, ammonia, vinyl acetate, xylene, N,N-dimethylacetamide, 2-hexanone, ethylbenzene, n-hexane, benzene, water-soluble zinc compounds, 1,3-butadiene, cis-2-butene, boron compounds, cyclohexanone, hexadecyltrimethylammonium chloride and dichloromethane

\*6 RC Local Dialogue Meeting and RC Dialogue Forum: Please see page 52 of the 2019 Integrated Report.

# Process Safety and Disaster Prevention

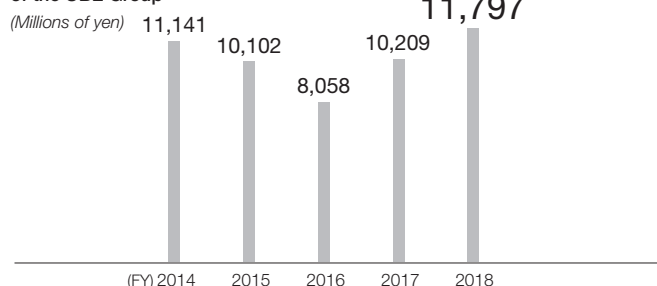
## Initiatives for Process Safety and Disaster Prevention

### UBE Group Facility-Related Accidents

(FY)	(Number of accidents)				
	2014	2015	2016	2017	2018
UBE	4	7	2	3	4
Group companies	1	2	0	1	0

In fiscal 2018, the UBE Group recorded four accidents, investigated their causes and implemented recurrence prevention measures.

### Occupational Safety, Health and Disaster Prevention Expenditure of the UBE Group



## Plant Safety Assessment

Plant safety assessments of new, additional or modified offices and facilities are carried out following the methods stipulated in the plant safety assessment standards. In fiscal 2018, the UBE Group carried out 94 such safety assessments.

### Response to the Japan Petrochemical Industry Association's Industrial Process Safety Action

	Initiatives that Member Companies Should Take	UBE's Initiatives
1. Commitment of corporate management to industrial process safety	(1) Commitment to basic principles and policies related to process safety and other aspects of safety	Establishing and maintaining the UBE Group Environmental and Safety Principles and UBE Action Guidelines Messaging from top management to employees and partner companies about industrial process safety On-site roundtable meetings with top management held at facilities, facilitating direct communication between the president and employees
	(2) Commitment to policy on resource allocation for industrial process safety	Building an educational structure and using educational and training facilities to develop human resources Providing explanations to facilities regarding budgets and staffing for production plans, maintenance plans and capital investment plans prepared by process safety divisions
2. Setting goals for industrial process safety	(1) Set numerical targets for process safety	Numerical target: Zero major facility accidents
3. Formulating action plans to implement industrial process safety measures	(1) Risk assessment	Conducting risk assessments with the participation of several departments from comprehensive and diverse perspectives for normal and unstable circumstances and when deploying new facilities and processes
	(2) Education and training to develop human resources	Participating in classes, on the job training, and RA and educating about operational principles and knowhow through experiential education
	(3) Utilize information about accidents	Horizontally sharing information on accidents inside and outside the Company and their countermeasures through the Accident Information Liaison Group
	(4) Organizational operations	Implementing change management with operational management, facility management, process safety management and design divisions when facilities are newly established or renovated and when procedures change
	(5) Facility maintenance and deterioration countermeasures	Update based on results of assessments of remaining service lives and formulate repair plans Harness the IoT, including for deploying advanced nondestructive inspection techniques and smart valve
	(6) Maintain and enhance earthquake resistance of high-pressure gas facilities and conduct voluntary seismic assessments of existing piping	Implementing Earthquake and Tsunami Countermeasure as Companywide initiatives Assessing compliance with seismic resistance standards for high-pressure gas facilities, undertaking measures, and conducting seismic diagnoses of existing piping systems
	(7) Incorporate new methods and technologies to enhance safety	Incorporating operational data to analyze operational patterns, introducing fluctuation prediction systems and utilizing driving training simulators and smart devices
	(8) Safety management that encompasses partner companies	Group companies and related partner companies hold joint safety management meetings Staff in charge of operational management, facility management and staff from partner companies meet before construction begins to confirm safety
4. Surveying and evaluating achievement of goals and implementation of measures	(1) Structure and operations relating to attainment surveys and assessments	Progress is checked and evaluated through annual audits Strategic Management Meeting considers the results of the year's activities when discussing measures for the next year
	(2) Respond to results of above survey and assessments	Based on assessment results, act on key priorities, which are to undertake overall risk steps to prevent accidents from aging facilities, improve the safety of high-pressure gas-certified business sites, and undertake measures to tackle natural disaster.
5. Initiatives to advance each company's own process safety activities (cultivating a culture of safety)	(1) Approaches to developing a culture of safety	Institute safety awards within the Group and at business sites Have the Process Safety Enhancement Center conduct safety assessments, and use findings in improvement initiatives
6. Leveraging external knowledge	(1) Harnessing third-party institutions	Have the Process Safety Enhancement Center assess business site safety
	(2) Disseminating information externally	IoT and big data usage methods included in case studies for smart future of the Ministry of Economy, Trade and Industry's website Provide safety and security information to local industry associations
7. Communicating about risks with communities	(1) Risk communications tools and frequency	Holding regular dialog with local residents Hold events for local citizens
8. Efforts to prevent industrial accidents from earthquakes, tsunamis, and other natural disasters	(1) Evacuating employees in event of major earthquakes and tsunamis and approaches to facility setups	Formulating responses for earthquakes and tsunamis and conducting evacuation training and assessing and reinforcing seismic resistance of facilities and piping Creating and implementing earthquake and tsunami countermeasure plans and formulating business continuity plans

# Occupational Safety and Health

## Prevention of Occupational Accidents

### Measures to Prevent Occupational Accidents

	Goals	Activities	Status and history of initiatives
1. Setting occupational accident-related goals	Prevent occupational accidents	Establish numerical goals	Fiscal 2018 goal: 6 incidents with lost work time and 19 without, for a total of 25 Fiscal 2018 result: 11 incidents with lost work time and 15 without, for a total of 26
2. Use of occupational accident information	Prevent similar accidents	Create occupational accident information database	We are using information on occupational accident at each business site as important data sources for facilities and operational risk assessments.
3. Audits and inspections	Drive ongoing improvements at business sites <ul style="list-style-type: none"> <li>• Improve weak areas</li> <li>• Enhance safety levels</li> </ul>	(1) Audits <ul style="list-style-type: none"> <li>• Audits conducted by the head office and business site environmental safety personnel</li> <li>• Quantitative evaluation of offices in line with checklists and feedback</li> <li>• Chemical substance management audits</li> </ul> Audit three management areas (work, work environments, and health) as covered by the Occupational Safety and Health Act  (2) Inspections <ul style="list-style-type: none"> <li>• Members of the president-chaired Strategic Management Meeting visit business sites</li> <li>• Confirming results of audit and activity achievements and conveying reviews</li> </ul>	History of improvement activities inspired by audits and inspections <ul style="list-style-type: none"> <li>• Fiscal 2013: Summarize outstanding activities and internally publish in Best Practices and Safety and Health Guidelines</li> <li>• Fiscal 2016: Begin assessments according to eight culture of safety components, which are organizational governance, positive involvement, resource management, work management, motivation, learning and knowledge transmission, risk perception and mutual understanding</li> <li>• Fiscal 2017: Start disclosing evaluation criteria and verifying gaps between these and self-evaluations</li> <li>• Fiscal 2018: Publish evaluation criteria on intranet and integrate UBE Group evaluation criteria in a culture of safety</li> <li>• Fiscal 2018: Audit all Chemicals business sites</li> </ul> Establish Companywide criteria in three management areas, build database for substances handled in-house and related regulations, and formulate quantitative risk assessment techniques for chemical substances  • Fiscal 2017: Launch small safety team reports and group discussions
4. Safety and health rallies	Share information Encourage activities	Annual UBE Group health and safety rallies Participants: Around 400 people (Group executives and employees) participating	Zero accident efforts and resolutions to enhance workplace environments <ul style="list-style-type: none"> <li>• Recognition by the president (to entities and individuals for outstanding contributions to health and safety)</li> <li>• Small safety team presentations on experiences</li> <li>• Special lectures from outside instructors on safety and health management</li> <li>• Executives and all employees reciting safety goals after rallies</li> </ul>

### Occupational Safety and Health Council

This is a forum in which representatives of the Companywide union and Ube's Human Resources and Environmental and Safety Department gather to review annual occupational safety and health results and plans for the new fiscal year and discuss requests from both sides.

### Labor-Management Councils

Following Occupational Health and Safety Council discussions with Companywide union representatives, regional business sites convene gatherings to discuss local union and management requests.

### Measures against Asbestos

UBE provides asbestos-related health examinations for current and retired employees who have handled asbestos products. The Group cooperates in the submission of industrial accident reports by individuals whose examination results warrant medical attention. The Group also appropriately treats problems at locations where a high rate of asbestos diffusion has been found. In addition, the Group is promoting systematic measures for the disposal and replacement of asbestos materials. Insulation and gasket packing are replaced regularly with substitute materials when piping and reactors are opened.

# Measures to Mitigate Global Warming

## GHG Emissions

(FY)	(kt-CO <sub>2</sub> e/y)			
	2016	2017	2018	
Scope 1	11,320	11,330	11,250	Direct GHG emissions from a reporting entity, due to fuel use, etc.
Scope 2	790	780	750	Indirect GHG emissions from electricity and heat purchased from other entities
Scope 3	15,380	15,770	15,550	Indirect GHG emissions throughout the supply chain, such as those that occur during material procurement, transport and product processing, use and disposal


### Scope 3 Emissions by Category

Category	GHG Emissions (kt-CO <sub>2</sub> e)	Note
1 Purchased goods and services	680	
4 Upstream transportation and distribution	810	
9 Downstream transportation and distribution	500	
11 Use of sold products	11,070	Sold coal, machinery, etc.
12 End-of-life treatment of sold products	1,830	
— Other categories	660	
<b>Total</b>	<b>15,550</b>	

### Results of third-party scope 1 and 2 verifications

**GREENHOUSE GAS EMISSIONS VERIFICATION STATEMENT**

To: Ube Industries, Ltd.

  
 Bureau Veritas Japan Co., Ltd.  
 System Certification Services Headquarters  
 YOKOHAMA  
 March 5, 2018

Bureau Veritas Japan Co., Ltd. (Bureau Veritas) was engaged by Ube Industries, Ltd. (Ube Industries) to conduct independent verification of the greenhouse gas (GHG) emissions for FY2016.

**1. Scope of Verification**  
 Ube Industries requested Bureau Veritas to verify, to a limited level of assurance, the accuracy of the following GHG information:

Scope 1 and Scope 2 emissions:

- CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O(\*1) emissions from business operations of UBE Group's 20 sites within Japan for the period of April 1, 2016 through March 31, 2017
- HFCs, PFCs, SF<sub>6</sub> and NF<sub>3</sub> emissions from business operations of UBE Group's 20 sites within Japan for the period of January 1, 2016 through December 31, 2016
- CO<sub>2</sub> and N<sub>2</sub>O(\*2) emissions from business operations of UBE Group's two sites outside Japan for the period of April 1, 2016 through March 31, 2017

(\*1) N<sub>2</sub>O emissions from the production process of caprolactam are included.  
 (\*2) limited to N<sub>2</sub>O emissions from the production process of caprolactam.

**2. Methodology**  
 Bureau Veritas conducted the verification in accordance with the requirements of the international standard 'ISO 14064-3(2006): Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions'.

As part of Bureau Veritas' assurance, the following activities were undertaken:

- Interviews with relevant personnel of Ube Industries responsible for the identification and calculation of GHG emissions;
- Review of Ube Industries' information systems and methodology for collection, aggregation, analysis and review of information used to determine GHG emissions; and
- Audit of a sample of source data to check accuracy of quantified GHG emissions.

**3. Conclusion**  
 Based on the verification work and processes followed, there is no evidence to suggest that the GHG emissions assertions shown below:

- are not materially correct and are not a fair representation of the GHG emissions, as per the scope of work;
- are not prepared in accordance with the methodology for calculating GHG emissions established and implemented by Ube Industries.

Verified greenhouse gas emissions	
Scope 1	Scope 2
11,317,900 t-CO <sub>2</sub> e	790,994 t-CO <sub>2</sub> e

**[Statement of independence, impartiality and competence]**  
 Bureau Veritas is an independent professional services company that specializes in Quality, Health, Safety, Social and Environmental management with over 150 years history in providing independent assurance services. No member of the verification team has a business relationship with Ube Industries, its Directors or Managers beyond that required of this assignment. We conducted this verification independently and to our knowledge there has been no conflict of interest. Bureau Veritas has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities. The verification team has extensive experience in conducting assurance over environmental, social, ethical and health and safety information, systems and processes.

# Environmental Preservation: Environmental Accounting and Environmental Impact Data by Facility

## Environmental Accounting

### Environmental Preservation Costs

			(¥100 million)					
Category	Main Activity	(FY)	Capital Investment			Costs		
			2017	2018	Difference	2017	2018	Difference
Cost by business area	Pollution prevention	Investing in and maintaining energy-saving facilities	17.3	9.3	(8.0)	48.1	49.3	1.2
	Investing in and maintaining air and water pollution prevention facilities	Resource recycling	31.1	20.0	(11.1)	9.9	10.1	0.2
	Global environment preservation	Recycling and reducing industrial waste	8.2	21.3	13.1	29.8	33.7	3.9
Upstream/downstream costs	Container/packaging recycling, green purchasing		0.0	0.0	0.0	6.0	6.1	0.1
Costs of management activities	Acquiring, running and maintaining environmental management systems		0.4	0.1	(0.3)	5.2	5.1	(0.1)
Research and development costs	R&D of environment-friendly products and technologies		0.0	0.0	0.0	5.3	2.8	(2.5)
Costs of social activities	Greening and beautifying offices/facilities and their surroundings		0.1	0.1	0.0	2.0	2.0	0.0
Costs of cleaning up environment damage	Payment of environment-related levy		0.0	0.0	0.0	2.5	1.4	(1.1)
<b>Total</b>			<b>57.1</b>	<b>50.8</b>	<b>(6.3)</b>	<b>108.8</b>	<b>110.5</b>	<b>1.7</b>

### Economic Effect

			(¥100 million)		
Category	Main Activity	(FY)	2017	2018	Difference
Income effect	Proceeds from sales of marketable waste products		19.7	19.9	0.2
Savings effect	Savings achieved through resource recycling and energy conservation		62.7	58.5	(4.2)

## Environmental Impact Data by Facility

### Fiscal 2016 and 2017 Environmental Impact Data by Facility

	(tons/year)											
	Emissions into the Atmosphere						Emissions into Water					
	SOx*1 Emissions		NOx*2 Emissions		Dust Emissions		COD*3 Emissions		Total Phosphorus Emissions		Total Nitrogen Emissions	
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
<b>In Japan</b>												
Chiba Petrochemical Factory	1.2	1.1	36	34	0.4	0.2	13	14	0.1	0.1	3.4	4.3
Sakai Factory / Osaka Research and Development Center	0.0	0.0	1.6	1.3	0.0	0.1	1.5	1.6	0.1	0.1	1.2	1.6
Ube Chemical Factory	1,648	1,840	3,615	3,695	87	92	455	390	5.6	5.0	451	398
UBE-Fujimagari Factory	628	482	333	314	3.0	0.8	258	220	5.0	3.8	58	59
Ube Cement Factory	27	40	1,589	1,931	44	46	8.1	7.7	—	—	—	—
Isa Cement Factory	355	314	6,554	6,432	171	180	0.0	0.0	—	—	—	—
Kanda Cement Factory	4.3	3.3	1,777	2,553	17	18	2.6	3.2	0.1	0.1	1.7	1.3
Technical Development Center	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Okinoyama Coal Center	—	—	—	—	—	—	—	—	—	—	—	—
Strategic Core Technology Research Laboratory / Pharmaceuticals Research Laboratory	—	—	—	—	—	—	0.2	0.1	0.1	0.1	0.3	0.2
Frontier Technology Research Laboratory	—	—	—	—	—	—	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal (UBE)	2,664	2,680	13,906	14,960	322	337	738	637	11	9.2	516	464
UBE Film, Ltd.	—	—	—	—	—	—	—	—	—	—	—	—
Meiwa Plastic Industries, Ltd.	—	—	—	—	—	—	0.0	0.0	0.0	0.0	0.0	0.0
Ems-Ube, Ltd.	0.0	0.0	1.9	1.8	0.0	0.0	5.8	0.7	0.0	0.0	1.3	0.4
UBE-MC Hydrogen Peroxide Limited	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0
UBE EXSYMO CO., LTD.	0.0	0.0	0.4	0.6	0.2	0.2	0.4	1.7	—	—	—	—
UBE Material Industries, Ltd.	161	178	926	1,073	11	11	0.7	0.6	0.0	0.0	1.2	1.5
UBE Machinery Corporation, Ltd.	0.1	0.1	—	—	—	—	0.9	1.2	0.2	0.2	1.3	1.7
UBE Steel Co., Ltd.	14	14	114	113	7.5	7.2	0.7	0.6	—	—	—	—
Fukushima, Ltd.	0.4	0.3	26	25	0.1	0.1	—	—	—	—	—	—
Subtotal (Group companies)	176	192	1,068	1,213	19	19	8.7	5.0	0.2	0.2	3.8	3.6
<b>Total (UBE Group)</b>	<b>2,839</b>	<b>2,873</b>	<b>14,974</b>	<b>16,174</b>	<b>341</b>	<b>356</b>	<b>747</b>	<b>642</b>	<b>11</b>	<b>9.4</b>	<b>519</b>	<b>468</b>
<b>Overseas</b>												
Thailand	9.3	8.3	30	45	11	7.7	103	111	1.5	1.4	32	8.4
Spain	93	77	752	791	5.8	6.9	107	164	1.3	1.0	82	101

#### Glossary

\*1 Sulfur oxides (SOx) originate in the sulfur (S) component of fuels. Boilers are our main source of these oxides.

\*2 Nitrogen oxides (NOx) stem from fuel combustion, primarily from Group boilers and cement kilns.

\*3 Chemical Oxygen Demand (COD): This is an indicator of water pollution by organic substances and represents the amount of oxygen consumed in the chemical oxidation of organic matter.



# Environmental Preservation: PRTR and Treatment of Industrial Waste and PCB Waste

## Emission/Transfer of PRTR\*1 Substances

Total Volume of PRTR Substances Emitted/Transferred in Fiscal 2018	Handling Volume (t)	Emissions Volume (tons)				Increase/Decrease Rate Compared with Fiscal 2017 (Total Emissions)	Transfer Volume (tons)	Number of PRTR Substances
		Atmosphere	Public Water	Soil	Total			
UBE	314,171	134.6	86.6	0.0	221.2	(4.7)%	1,913.9	54
Other Group companies	32,435	117.4	10.7	0.0	128.1	15.0 %	1,079.6	26
Total (UBE Group)	346,606	252.0	97.3	0.0	349.3	1.7 %	2,993.5	68

## Volumes of Individual PRTR Substances Emitted/Transferred in Fiscal 2018 (Top 10 by UBE's Emission Volumes and Dioxins)

Ordinance Designation No.	Chemical Substance	CAS No.*2	Handling Volume (tons)	Total Emissions Volume (tons)				Increase/Decrease Rate Compared with Fiscal 2017 (Total Emissions)	Transfer Volume (tons)
				Atmosphere	Public Water	Soil	Total		
300	Toluene	108-88-3	1,064	79.4	14.6	0.0	94.0	(15.1)%	279.6
76	Epsilon-caprolactam	105-60-2	128,220	0.0	77.5	0.0	77.5	(12.6)%	389.4
240	Styrene	100-42-5	203	58.9	0.0	0.0	58.9	177.8 %	0.1
134	Vinyl acetate	108-05-4	5,904	22.8	0.0	0.0	22.8	(1.7)%	0.0
80	Xylene	—	164	18.4	0.0	0.0	18.4	9.5 %	19.8
392	n-Hexane	110-54-3	185	15.9	0.0	0.0	15.9	0.6 %	34.0
53	Ethylbenzene	100-41-4	46	13.8	0.0	0.0	13.8	0.0 %	18.0
128	Chloromethane	74-87-3	12	12.3	0.0	0.0	12.3	0.8 %	0.0
400	Benzene	71-43-2	82	11.5	0.1	0.0	11.6	45.0 %	11.6
213	N,N-dimethylacetamide	127-19-5	543	7.1	0.0	0.0	7.1	14.5 %	200.1
243	Dioxins (Note) mg-TEQ/year	—	—	200.2	1.1	0.0	201.3	25.9 %	0.0

Note: Contains various compounds

The UBE Group has voluntarily selected 20 substances\*4 that it emits in relatively large amounts and particularly strives to reduce its emissions of these substances. The 20 substances comprise substances subject to the Japanese PRTR Law as well as a number of volatile organic compounds (VOCs) \*3.

## Treatment of Industrial Waste

### Overall Flow of Industrial Waste in Fiscal 2018



When contracting waste treatment or disposal outside the Group, the UBE Group utilizes industrial waste management forms (a waste manifest system) in compliance with waste treatment and clean-up laws (namely the Wastes Disposal and Public Cleansing Act) and carefully manages the entire process.

## Polychlorinated Biphenyl (PCB) Waste Disposal

We thoroughly audit stabilizers and other equipment using PCBs. In addition, we are endeavoring to complete PCB waste disposals by the deadline set under the amended Act on Special Measures for Promotion of Proper Treatment of Polychlorinated Biphenyl. We comply with storage and disposal laws and ordinances processing, and utilize Japan Environmental Storage & Safety Corporation (JESCO) and certified detoxification contractors to systematically dispose of PCB waste.

### Glossary

\*1 PRTR (Pollutant Release and Transfer Register) Law: This legislation requires companies to identify business site chemical substance emissions and transfer volumes and report to the government. The Ministry of the Environment discloses the submitted information on its website. Such disclosure is designed to encourage voluntary efforts to improve chemical substance management.

\*2 CAS No.: Chemical Abstract Service registry number

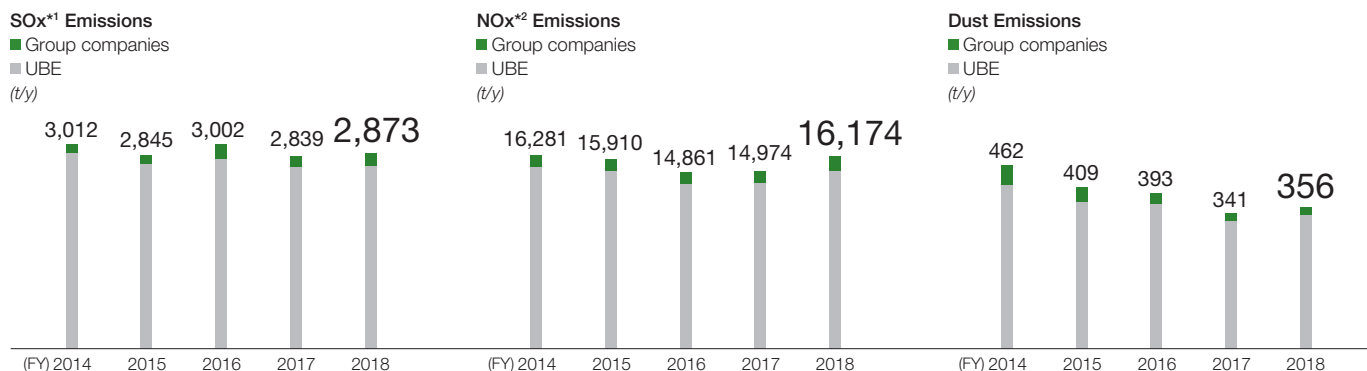
\*3 Volatile organic compounds (VOCs): These organic chemicals evaporate or sublime easily, entering the atmosphere as gases. They are factors in the forming of suspended particulate matter (PM) and photochemical oxidant pollution.

\*4 UBE's 20 voluntary selected chemical substances: Please see the Glossary on page 2.

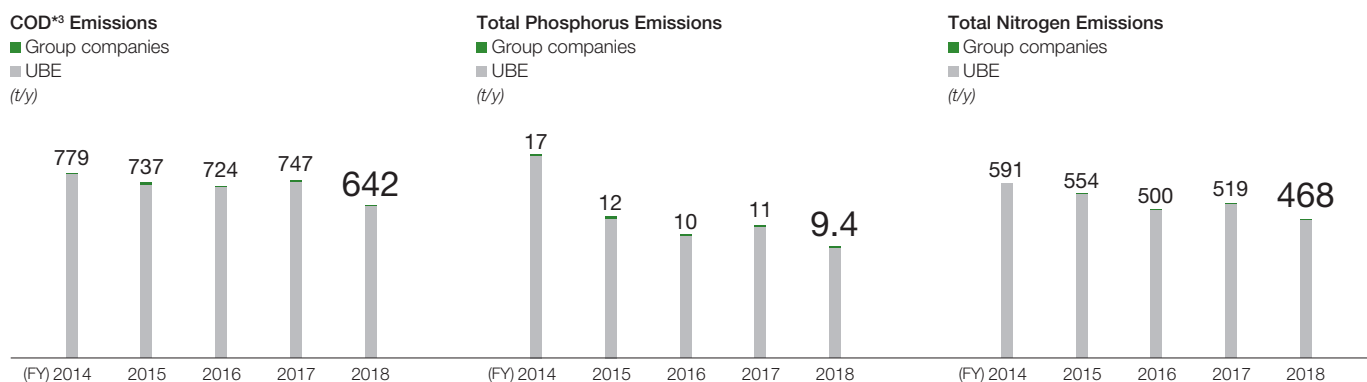


# Environmental Preservation: Emissions to the Air and Bodies of Water, Water Resource Usage and the Fluorocarbon Emission Restriction

## Emissions to the Air



## Emissions to Bodies of Water



Reference: Please refer to page 6 for environmental impact data by facility.

## Measures to Prevent Odors

The UBE Group has installed deodorization and other facilities and constructed its own odor monitoring systems in the Ube area. The Group is also cooperating with government bodies to further control odors.

## Water Resource Usage

UBE Group water resource usage (Fiscal 2014 through 2018)		(FY)2014	2015	2016	2017	2018
Water resource inputs (Millions of cubic meters)	Tap water	0.5	0.6	0.5	0.6	0.6
	Groundwater	1.9	2.0	1.9	2.0	2.0
	Industrial water	91	94	94	91	89
	Seawater	116	115	108	115	106
	Total	209	212	204	209	198
Water discharges (Millions of cubic meters)		172	164	156	162	147

We installed pollutant monitoring facilities to manage the quality of water discharges into bodies of water. We maintain facilities to treat plant wastewater that could cause significant pollution. We also manage water usage and discharges to use water resources effectively.

## Response to the Fluorocarbon Emission Restriction Law

Promulgated in April 2015, the Fluorocarbon Emission Restriction Law is aimed reducing leaks of fluorocarbon refrigerants to help prevent global warming and the further destruction of the ozone layer. We comply strictly with laws and regulations relating to commercial refrigeration and air conditioning equipment inspections. We endeavor to prevent fluorocarbon leaks by improving their recovery and filling methods and strengthening equipment operations management.


### Glossary

Please see the glossary on page 6 for \*1, \*2, and \*3.

# Quality Assurance and Product Safety

## Quality Assurance

The diverse operations of the UBE Group encompass such fields as chemicals, pharmaceuticals, construction materials, and machinery. Our in-house companies and divisions undertake quality assurance initiatives that match the specific markets of their businesses and have formulated their own quality policies to cater to customer needs by maintaining stable supplies of safe products.

UBE Group Quality Guidelines 2019.04.01. 

In order to earn the trust of stakeholders, we will continually focus on safety and security in developing and providing products and services that meet customer expectations for quality.

1. We will always obtain the latest information on regulations and public standards that relate to quality, and we will adhere to them.
2. We will adhere to the agreements with customers.
3. We will build close relations with customers and provide the quality sought by customers.
4. We will continually improve our quality assurance systems.
5. We will develop products and services that can be safely and securely handled throughout the product life cycle, ensuring that we suitably provide necessary information.

UBE Group Quality Guidelines

 **Chemicals Company Quality policy**

Chemicals Company in UBE surely assures the quality of products and services to our global customer to supply customer satisfaction and win customer confidence.

1. We comply with related laws, internal rules, contracts and social norms.
2. We fulfill our responsibility of quality assurance from the customer's point of view.
3. We, all employees concerned shall conduct quality management activities together for providing the value unique to UBE.
4. We renovate "Morozukuri" technology and hand down to the next generation for ensuring stable quality.
5. We improve the QMS (Quality Management System) it should be, without being bound by the existing framework.

Masato Izumihara  
President of Chemicals Company,  
UBE Industries, Ltd.

Established July 2018

Chemicals Company Quality Policy

**Pharmaceutical Quality Policy** 

The following five items are pharmaceutical quality policies set up for the purpose of contributing to the maintenance and enhancement of people's health by serving the supply of high-quality pharmaceuticals which can win the trust in medical practice.

- (1) Implement social responsibilities and comply with domestic and overseas laws and regulations as a company related to pharmaceuticals, based on corporate activities giving top priority to ethics and compliance.
- (2) Always seek technological innovations, and arrange/strengthen the pharmaceutical quality system to secure the quality and stable supply of products which can win the trust of customers.
- (3) Maintain the pharmaceutical quality system intended to comprehensively evaluate and warrant all operations related to quality securement from the development to supply of products.
- (4) Promote continuous optimization of the pharmaceutical quality system by performing evaluations (reviews) and audits of operations related to quality securement of pharmaceuticals.
- (5) Strive to improve capabilities of members by planning and continuously implement systematic educations/training.

Established: April 01, 2010 Revised : April 01, 2019  
Yoichi Funayama, Executive Officer ,  
General Manager of Pharmaceutical Division , UBE Industries, Ltd

Pharmaceutical Quality Policy

 **Construction Materials Company Quality Policy**

We aim to enhance the satisfaction of customers by identifying their quality requirements and prioritizing consistent quality in manufacturing. We seek to contribute to society by continuing to supply safe and secure products.

1. We will keep our promises to customers in all processes. We will also endeavor to maintain strong communications across processes and deliver quality that satisfies customers.
2. We will ensure that we always comply with regulations relating to quality assurance and product safety while remaining up to date with official standards.
3. We will assess the effectiveness of quality assurance and product safety initiatives through the Company Council while continuing to improve our quality assurance systems.
4. We will educate and inform all Company employees and keep focusing on quality.

September 5, 2019  
Makoto Koyama  
President, Construction Materials Company  
UBE Industries, Ltd.

Construction Materials Company Quality Policy

**Machinery Company Quality Policy** 

We will continue to provide high quality products and service to bring satisfaction and confidence to our customers.

- 1. Focus on Quality**  
We will always make following the industry rules and customer requests our first priority, focusing on quality.
- 2. Customer Priority**  
We will understand the various needs and background of the customer in order to provide safe products and service with satisfactory qualities.
- 3. Continuously Improving the Quality Assurance System**  
Under UMC's quality assurance system, we will continue to improve our quality as a group, and challenge ourselves to achieve higher quality goals.

Enacted: 4/1/2019

Tokuhisa Okada  
Senior Managing Executive Officer  
President of Machinery Company  
UBE INDUSTRIES, LTD.

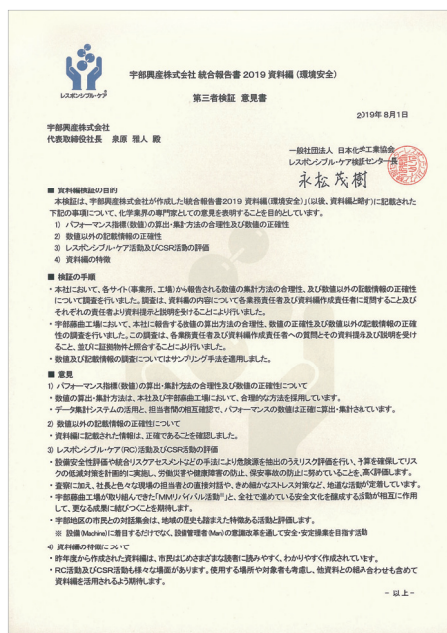
Machinery Company Quality Policy

## Advance Safety Assessments of Chemical Substances

We conduct advance safety assessments of newly developed chemical substances and chemical substances that we will be handling in factories for the first time. In fiscal 2018, the UBE Group performed 108 advance safety assessments of chemical substances.

# Third-Party Verification and Scope of This Report

## Third-Party Verification



### ● Objectives of Supplementary Information Verification

The Responsible Care Verification Center has verified the Supplementary Information (Environment and Safety) of the 2019 Integrated Report (hereinafter, “Supplementary Information”), created by Ube Industries, Ltd., in order to provide its opinion regarding the following items in its capacity as an expert in the chemical industry:

- 1) Rationality of the methods used to calculate and tabulate the performance indicators (numerical data) and accuracy of numerical data
- 2) Accuracy of the information other than numerical data provided in the Supplementary Information
- 3) Evaluation of Responsible Care (RC) and CSR activities
- 4) Characteristics of the Supplementary Information

### ● Verification Procedures

- The Center staff visited the head office of Ube Industries, Ltd., and asked questions to verify the rationale of the methods the Company used to compile numerical data reported by each of its sites (offices and plants) and to check the accuracy of information provided in the Supplementary Information. Employees in charge of relevant business operations and those in charge of creating the Supplementary Information answered the questions of the Center staff, presented documentation, and gave explanations.

- The Center staff also visited the UBE-Fujimagari Factory and asked questions to verify the rationale of the methods the factory employed to calculate the numerical data reported to the head office and the accuracy of the numerical data and other information provided in the Supplementary Information. Factory employees in charge of relevant business operations and those in charge of creating the Supplementary Information answered the questions of the Center staff, presenting documentation and providing explanations. The Center staff also checked the consistency of the items used with the material evidence submitted.
- The Center used sampling methods to verify the numerical data and other information contained in the Supplementary Information.

### ● Opinions

- 1) Rationality of the methods used to calculate and tabulate the performance indicators and accuracy of the numerical data
    - Both the head office and the UBE-Fujimagari Factory calculated and tabulated the performance indicators in a rational manner.
    - Performance-related numerical data was accurately calculated and tabulated using the data collection system and confirmed by officers in charge.
  - 2) Accuracy of the information other than numerical data provided in the Supplementary Information
    - The information published in the Supplementary Information was accurate.
  - 3) Evaluation of Responsible Care (RC) and CSR activities
    - They were rated very highly for using facilities safety evaluations, comprehensive risk assessments, and other techniques to identify sources of dangers and evaluate risks, secure budgets to undertake systematic measures to lower risks, prevent occupational accidents and maintain worker health, and prevent security incidents.
    - As well as undertaking audits, efforts were taken, such as direct dialogue between the president and officers at various sites, and scrupulously formulated stress measures.
    - Capitalize on progress through synergies with the MM Revival initiative\* of the UBE-Fujimagari Factory and Companywide initiatives to foster a corporate culture of safety.
    - Dialogue with residents of the Ube district has been well received for its unique approach that reflects local history.
- \* Activities that focus on not just machines but also enhancing awareness among operators to ensure operational safety and stability
- 4) Characteristics of the Supplementary Information
    - Supplementary Information produced since last fiscal year is comprehensible for the community members and other readers.
    - There are diverse aspects to the Company’s RC and CSR activities. We look forward to harnessing Supplementary Information and combining it with other materials to tailor information to the needs of audiences.

## Scope of This Report

Period Covered	Fiscal 2018 (from April 1, 2018 to March 31, 2019)	
Companies Covered	Ube Industries, Ltd. (13 operational sites)	Four chemical factories (Chiba, Sakai, Ube, and Ube-Fujimagari) Three cement factories (Ube, Isa, and Kanda) and Technical Development Center Okinoyama Coal Center Strategic Core Technology Research Laboratory, Frontier Technology Research Laboratory, Pharmaceuticals Research Laboratory, Osaka Research and Development Center
Other Group companies (9)		UBE Film, Ltd., Meiwa Plastic Industries, Ltd., Ems-Ube, Ltd., UBE-MC Hydrogen Peroxide Limited, UBE EXSYMO CO., LTD., UBE Material Industries, Ltd., UBE Machinery Corporation, Ltd., UBE Steel Co., Ltd., Fukushima, Ltd.
Areas Covered	Japan	
Definitions	UBE: Refers to Ube Industries, Ltd. (unconsolidated) The UBE Group: Refers to the UBE Group companies, including Ube Industries, Ltd.	