UBE INDUSTRIES,LTD.

Integrated Report 2020

Supplementary Information (Environment and Safety)

Outline of Environment and Safety Activities

In order to advance its medium-term environment and safety plan, the UBE Group strives to improve its environment and safety activities through the use of the PDCA cycle.
Fiscal 2019 evaluation: Plans were mostly achieved.

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

Responsible Care* Code		FY2019 Action Plans	FY2019 Results	Self-Evaluation
Process Safety and Disaster Prevention	**Reinforcing process safety frameworks**	1. Comprehensive risk countermeasures for accidents that involve aging facilities 1-1. Review inspection plans	1. Implemented comprehensive risk countermeasures for accidents involving aging equipment 1-1. Chose facilities for inspection at each company, formulated plans, and implemented improvements	★★
		2. Enhance safety of high-pressure gas accredited business sites 2-1. Evaluate security and formulate improvement plans	2. Enhanced safety of high-pressure gas accredited business sites 2-1. Each certified office employed Guidelines for Using Security Evaluation Results, a framework for planned improvements	
	Earthquake and tsunami readiness	1. Undertake natural disaster countermeasures 1-1. Evaluate response capabilities and formulate improvement plans	1. Promoted natural disaster countermeasures 1-1. Each company conducts self-assessments in line with the Self-Evaluation Standards for Natural Disaster Countermeasures that headquarters established, selected improvement items from results, and systematically implemented improvements	★★
	Cultivate a culture of safety	1. Cultivate a culture of safety Create a system that enables companies to constantly improve eight safety culture components	1. Cultivated a culture of safety Formulate and implement development plan based on headquarters assessment results (to improve weaknesses)	★★
Occupational Safety and Health	**Occupational safety**	1. Elite Major Disasters 1-1. Implement effective risk reduction plans	1. Animated Major Disasters 1-1. In keeping with Company guidance, businesses produced and implemented risk reduction plans to eliminate major disasters	★★
		2. Improve work environments 2-1. Implement three management improvement plans [??] under Industrial Safety and Health Act	2. Improved work environments 2-1. Implemented audits and improvement plans for work environment management, work management, and health management improvement plans under Industrial Safety and Health Act with respect to chemical substances	
	Health management	1. Curb days lost to non-occupational injuries and illnesses	1. Stepped up mental health initiatives (used external EAPs*2 and used results generated from group stress check analysis)	★★
		2. Respond to regular health check results	2. Used results of regular medical examinations to address health risks, recommend secondary examinations, and take measures to combat lifestyle diseases. "Measures against overwork" and "food environment improvement activities" are carried out, and initiatives to "continue exercise habits" are actively implemented Undertook measures to address risks of occupational diseases by leveraging work and work environment management in response to results of special medical checkups	
		3. Smoking policy (to eliminate passive smoking at business sites)	3. Surveyed tobacco awareness and reviewed smoking environment by assessing smoking situations at business sites. Reduced smoking rates through cessation contests	
		4. Promotion of health and productivity management	4. Certified under 2020 Certified Health and Productivity Management Organization Recognition Program 2020 of Ministry of Economy, Trade and Industry	
Process Safety and Disaster Prevention	**Global warming countermeasures**	1. Undertake ongoing initiatives to cut GHG emissions and reach fiscal 2021 goals 1-1. Keep striving to reduce GHG emissions to reach fiscal 2021 goals	1. Kept striving to reduce GHG emissions to achieve fiscal 2021 goals • GHG emissions: Down 15% compared with the fiscal 2005 level • Sales ratio of environmentally friendly products and technologies: 29%	★★
		2. Increase employee awareness about global warming 2-1. Understand and disseminate information about medium- and long-term trends relating to climate change, using that knowledge to strengthen initiatives and create new businesses 2-2. Convey UBE's initiatives to internal and external stakeholders	2. Enhanced employee awareness of global warming 2-1. Provided information on global warming issues, etc. by the Energy Conservation Promotion Committee of each division 2-2. Information on external websites and response to CDP, etc.	
	Environmental conservation	1. Lower environmental risks 1-1. Identify environmental risks and deploy mitigation measures	1. Reduced environmental risk 1-1. Identified environmental risks across the Company and promoted reduction planning and implementation	★★
		2. Keep reducing environmental impact	2. Continuously reduced environmental impact 2-1. Emissions of 20 voluntarily selected chemical substances*3: Reduced 29% compared with fiscal 2010 2-2. External final disposal of industrial waste: Reduced 80% compared with fiscal 2000 2-3. Promoted of chlorofluorocarbon loss suppression	

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

Responsible Care Code		FY2019 Action Plans	FY2019 Results	Self-Evaluation
Chemicals and Product Safety (Transportation Safety)	**Chemicals and product safety**	1. Maintain independent activities in line with chemical regulations of each company	1. After transferring tasks relating to chemical regulations for each company, these companies conducted product safety audits for businesses and Group company and provided guidance Quality Management Department audited product safety departments of each company and highlighted weaknesses to help them undertake independent activities	
		2. Conduct advanced human resources development and use ICT to maintain information	2. Conducted advanced human resources development and used ICT to maintain information 2-1. Developed advanced human resources for product safety by leveraging rotation systems of at headquarters and each company 2-2. Used intranet to keep amassing information about chemical regulations 2-3. Used in-house-developed chemical substances management system to make it easy to compare registered and actual quantities, thereby reduced man-hours	★★
	Transportation safety	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*4, label, and Yellow Card guidance and audit	★★
Dialogue with Communities		1. Promote dialogue with communities	1. Promote dialogue with communities 1-1. Held 12th RC Local Dialog Meeting*5 in Western Yamaguchi region 1-2. Held 12th RC Local Dialog Meeting in Sakai/Senboku region 1-3. Published local newsletter Tsubasa (released semiannually)	★★★
		2. Ensure information disclosure and transparency	2. Issued the 2019 Integrated Report and its Supplementary Information (Environment and Safety), had a third-party RC review, and published a third-party opinion	
Management Systems		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 4 parent sites and 9 Group companies 1-2. Implemented environmental safety inspections at 9 parent sites and 5 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 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.*

**3 20 chemicals selected independently: methyl alcohol, butyl alcohol, toluene, epsilon-caprolactam, styrene, ammonia, cyclohexane, cyclohexan, cyclohexan, oxalic acid, vinyl acetate, xylene, n-hexane, ethylbenzene, chloromethane, benzene, dimethyl phthalate, N, N-dimethylacedamide, boric acid compound, phenol, methylbutylketone*

**4 Safety Data Sheet (SDS): Documentation presenting information on chemical substance hazards when manufacturers provide chemicals and products containing these substances*

**5 Responsible Care (RC) Regional Dialogue Meetings: Local members of the RC Committee of the Japan Chemical Industry Association are encouraged to engage with residents, civic groups, government officials, and other local stakeholders and convene meetins to RC implementation items (environmental conservation, safety and disaster prevention, etc.). A dialogue meeting held in each district once every two years to deepen mutual understanding of initiatives.*

Process Safety and Disaster Prevention

Initiatives for Process Safety and Disaster Prevention

UBE Group Facility-Related Accidents

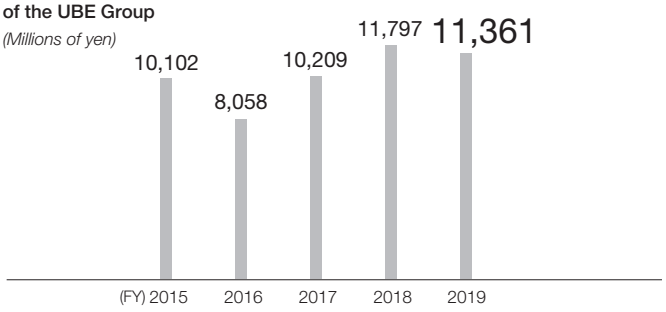
(Number of accidents)

(FY)	2015	2016	2017	2018	2019
UBE	7	2	3	4	4
Group companies	2	0	1	0	3

In fiscal 2019, the UBE Group recorded seven accidents, investigated their causes and implemented recurrence prevention measures.

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

(Millions of yen)



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 UBE Corporate Philosophy, UBE Management Principles and the UBE Group Environmental and Safety Principles 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 and providing plant simulator 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	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 Each business site formulated goals and plans to improve the safety culture and undertook improvement initiatives
6. Leveraging external knowledge	(1) Harnessing third-party institutions	Have the Process Safety Enhancement Center assess business site safety Set improvement goals based on assessment results and acted
	(2) Disseminating information externally	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

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 2019 goal: 4 incidents with lost work time and 19 without, for a total of 23 Fiscal 2019 result: 11 incidents with lost work time and 28 without, for a total of 39
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 • Improve weak areas • Enhance safety levels	(1) Audits • Audits conducted by the head office and business site environmental safety personnel • Quantitative evaluation of offices in line with checklists and feedback • Chemical substance management audits Audit three management areas (work, work environments, and health) as covered by the Occupational Safety and Health Act (2) Inspections • Members of the president-chaired Strategic Management Meeting visit business sites • Confirming results of audit and activity achievements and conveying reviews	History of improvement activities inspired by audits and inspections • Fiscal 2013: Summarize outstanding activities and internally publish in Best Practices and Safety and Health Guidelines • 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 • Fiscal 2017: Start disclosing evaluation criteria and verifying gaps between these and self-evaluations • Fiscal 2018: Publish evaluation criteria on intranet and integrate UBE Group evaluation criteria in a culture of safety • Fiscal 2018: Audit all Chemicals business sites • Fiscal 2019: Audit Research and Development Department • Fiscal 2019: Establish Companywide criteria in three management areas, build database for substances handled in-house and related regulations, formulate quantitative risk assessment techniques for chemical substances, and sequentially and continuously improve • 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 • Recognition by the president (to entities and individuals for outstanding contributions to health and safety) • Small safety team presentations on experiences • Special lectures from outside instructors on safety and health management • Executives and all employees reciting safety goals after rallies

Occupational Safety and Health Council

This is a forum in which representatives of the Companywide union and Ube's occupational safety and health officers gather to review annual occupational safety and health results and plans for the new fiscal year and discuss requests from both sides. Participants share prevailing issues and discuss ways to address them. We reflect forum results in the following year's plans. Several workplace accidents involving the employees of subcontractors have occurred in recent years. Labor representatives and management recognize the importance of coordinating better with subcontractors. Our annual plans accordingly include measures to foster safety activities with subcontractors.

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.

GHG Emissions

(FY)	2017	2018	2019	
	(kt-CO_2e/y)			
Scope 1	11,330	11,250	11,400	Direct GHG emissions from a reporting entity, due to fuel use, etc.
Scope 2	780	750	700	Indirect GHG emissions from electricity and heat purchased from other entities
Scope 3	15,770	15,550	16,010	Indirect GHG emissions throughout the supply chain, such as those that occur during material procurement, transport and product processing, use and disposal

GHG Emissions by Company in 2019

Business Sites		Scope 1	Scope 2	Total
		(kt-CO_2e/y)		
Chemicals Company		3,380	580	3,960
	Domestic	2,580	210	2,790
	Thailand	400	350	750
	Spain	400	20	420
Construction Materials Company		7,830	110	7,940
Machinery Company		200	10	210
Total		11,400	700	12,110

Scope 3 Emissions by Category

Category		GHG Emissions *(kt-CO_2e)*	Note
1	Purchased goods and services	690	
4	Upstream transportation and distribution	850	
9	Downstream transportation and distribution	480	
11	Use of sold products	11,520	Sold coal, machinery, etc.
12	End-of-life treatment of sold products	1,830	
—	Other categories	640	
	Total	16,010	

Emissions Data by GHG Category

GHG Categories	2018	2019
	(kt-CO_2e/y)	
CO_2	11,100	11,230
CH_4	10	10
N_2O	900	870
HFC*2	0	0
PFC	0	0
SF_6*2	0	0
NF_3	0	0
Total	12,010	12,110

**1 CO_2 emissions at three Construction Materials Company cement factories (Ube, Kanda, and Isa) were 5.58 million t-CO_2/year (excluding waste) Periodical report of production value under Energy Conservation Law (fiscal 2019)*

**2 less than 10,000tCO_2e*

GHG Emission Intensity (GHG emissions per unit of production)

	2018	2019
	(tCO_2e/t)	
GHG emission intensity	3.283	3.282*

**Construction Materials Company: GHG emission intensity (excluding waste) for Ube, Kanda, and Isa cement factories*
692kg-CO2e/t Intensity for periodical reports of production value under Energy Conservation Law (fiscal 2019)

Energy Type Consumption Data

Energy Type	2018	2019
	(MWh/year)	
Thermal coal	17,400,000	17,400,000
Kerosene and light oil	450,000	400,000
Liquefied natural gas	600,000	590,000
Liquefied petroleum gas	120,000	150,000
Petroleum coke	560,000	550,000
Heavy oil	430,000	320,000
Gas and oil by-products	240,000	230,000
Purchased electricity	950,000	920,000
Purchased steam	1,220,000	1,080,000
Renewable energy*	—	500,000
Total	21,970,000	22,140,000

** Biomass and solar energy*

Environmental Preservation:
Environmental Accounting and Environmental Impact Data by Facility

Environmental Accounting

(¥100 million)

Environmental Preservation Costs

Category		Main Activity	(FY)	Capital Investment 2018	Capital Investment 2019	Capital Investment Difference	Costs 2018	Costs 2019	Costs Difference
Cost by business area	Pollution prevention	Investing in and maintaining energy-saving facilities		9.3	7.9	(1.4)	49.3	41.0	(8.3)
	Investing in and maintaining air and water pollution prevention facilities	Resource recycling		20.0	87.5	67.5	10.1	21.5	11.4
	Global environment preservation	Recycling and reducing industrial waste		21.3	4.3	(17.0)	33.7	36.5	2.8
Upstream/downstream costs		Container/packaging recycling, green purchasing		0.0	0.2	0.2	6.1	4.5	(1.6)
Costs of management activities		Acquiring, running and maintaining environmental management systems		0.1	0.4	0.3	5.1	5.7	0.6
Research and development costs		R&D of environment-friendly products and technologies		0.0	0.0	0.0	2.8	2.7	(0.1)
Costs of social activities		Greening and beautifying offices/facilities and their surroundings		0.1	0.3	0.2	2.0	2.1	0.1
Costs of cleaning up environment damage		Payment of environment-related levy		0.0	0.0	0.0	1.4	1.5	0.1
Total				50.8	100.6	49.8	110.5	115.5	5.0

Economic Effect

(¥100 million)

Category	Main Activity	(FY)	2018	2019	Difference
Income effect	Proceeds from sales of marketable waste products		19.9	28.8	8.9
Savings effect	Savings achieved through resource recycling and energy conservation		58.5	63.1	4.6

Environmental Impact Data by Facility

Encompassing domestic factories and laboratories and key domestic and overseas consolidated subsidiaries with factories. Details are on page 10.

(tons/year)

Fiscal 2018 and 2019 Environmental Impact Data by Facility

	Emissions into the Atmosphere						Emissions into Water					
	SOx*1 Emissions		NOx*2 Emissions		Dust Emissions		COD*3 Emissions		Total Phosphorus Emissions		Total Nitrogen Emissions	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
In Japan												
Chiba Petrochemical Factory	1.1	0.5	34	32	0.2	0.2	14	13	0.1	0.1	4.3	3.6
Sakai Factory / Osaka Research and Development Center	0.0	0.0	1.3	1.3	0.1	0.1	1.6	1.0	0.1	0.0	1.6	0.7
Ube Chemical Factory	1,840	1,523	3,695	3,546	92	101	390	422	5.0	5.6	398	392
UBE-Fujimagari Factory	482	541	314	395	1	3	220	247	3.8	4.9	59	63
Strategic Core Technology Research Laboratory / Pharmaceuticals Research Laboratory	—	—	—	—	—	—	0	0	0.1	0.1	0	0
Frontier Technology Research Laboratory	—	—	—	—	—	—	0	0	0.0	0.0	0	0
Ube Cement Factory	40	57	1,931	1,448	46	54	8	8	—	—	—	—
Isa Cement Factory	314	370	6,432	7,149	180	169	0	0	—	—	—	—
Kanda Cement Factory	3.3	3.3	2,553	2,498	18	23	3	3	0.1	0.1	1	1
Technical Development Center	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Okinoyama Coal Center	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal (UBE)	2,680	2,495	14,960	15,069	337	350	637	694	9.2	11	464	461
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	1.8	1.9	0.0	0.0	0.7	5.9	0.0	0.0	0.4	1.8
UBE-MC Hydrogen Peroxide Limited	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.4
UBE EXSYMO CO., LTD.	0.0	0.0	0.6	0.4	0.2	0.1	1.7	1.2	—	—	—	—
UBE Material Industries, Ltd.	178	144	1,073	929	11	13	0.6	0.9	0.0	0.0	1.5	1.3
UBE Construction Materials Sales Co., Ltd.	—	—	—	—	—	—	—	—	—	—	—	—
UBE Machinery Corporation, Ltd.	0.1	0.1	—	—	—	—	1.2	1.1	0.2	0.2	1.7	1.7
UBE Steel Co., Ltd.	14	13	113	71	7.2	7.9	0.6	1.9	—	—	—	—
Fukushima, Ltd.	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal (Group companies)	192	157	1,188	1,002	18	21	5.0	11	0.2	0.2	3.6	5.2
Total (UBE Group)	2,873	2,652	16,149	16,071	356	371	642	705	9.4	11	468	466
Overseas												
UBE Corporation Europe, S.A Unipersonal (Spain)	77	79	791	859	6.9	12	164	129	1.0	0.7	101	62
UBE Chemical (Asia) Public Company Limited (Thailand)	8.3	8.3	40	39	7.3	4.4	86	64	1.4	0.6	8.4	8.1
THAI SYNTHETIC RUBBERS COMPANY LIMITED (Thailand)	0.0	0.0	0.0	0.0	0.1	0.7	25	26	0.0	0.0	0.0	0.0
UBE Fine Chemicals (Asia) Co., Ltd. (Thailand)	0.0	0.0	5.5	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	85	87	837	898	15	17	275	219	2.4	1.3	109	70

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.

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

Data covers 13 domestic factories and laboratories and 10 key domestic consolidated subsidiaries with factories.

Total Volume of PRTR Substances Emitted/Transferred in Fiscal 2019

	Handling Volume *(t)*	Emissions Volume (tons)				Increase/Decrease Rate Compared with Fiscal 2018 (Total Emissions)	Transfer Volume *(tons)*	Number of PRTR Substances
		Atmosphere	Public Water	Soil	Total			
UBE	336,400	113.0	101.8	0.0	214.8	(2.9)%	1,236.3	50
Other Group companies	31,012	103.3	9.9	0.0	113.2	(4.1)%	1,144.9	25
Total (UBE Group)	367,412	216.3	111.7	0.0	328.0	(3.3)%	2,381.2	61

Volumes of Individual PRTR Substances Emitted/Transferred in Fiscal 2019 (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 2018 (Total Emissions)	Transfer Volume (tons)
				Atmosphere	Public Water	Soil	Total		
76	Epsilon-caprolactam	105-60-2	140,234	0.0	92.1	0.0	92.1	19.0 %	570.7
300	Toluene	108-88-3	1,133	71.5	12.5	0.0	84.0	(10.7)%	283.9
240	Styrene	100-42-5	211	39.8	0.0	0.0	39.8	(18.5)%	0.5
134	Vinyl acetate	108-05-4	4,823	20.2	0.0	0.0	20.2	(11.6)%	0.0
80	Xylene	—	173	18.4	0.0	0.0	18.4	0.0 %	21.2
392	n-Hexane	110-54-3	191	16.4	0.0	0.0	16.4	3.7 %	31.3
53	Ethylbenzene	100-41-4	40	12.7	0.0	0.0	12.7	(8.1)%	19.0
128	Chloromethane	74-87-3	11	10.9	0.0	0.0	10.9	(11.3)%	0.0
400	Benzene	71-43-2	104	8.5	0.1	0.0	8.6	(26.0)%	11.3
213	N,N-dimethylacetamide	127-19-5	671	8.4	0.0	0.0	8.4	19.1 %	240.5
243	Dioxins (Note) mg-TEQ/year	—	—	311.2	1.8	0.0	313.0	55.5 %	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

Data covers 13 domestic factories and laboratories and 10 key domestic consolidated subsidiaries with factories.

Overall Flow of Industrial Waste in Fiscal 2019

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 sublimate 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: Water Resource Usage, Fluorocarbon Emission Restriction and Preliminary Chemical Safety Assessments

Water Resource Usage

Data covers 13 domestic factories and laboratories and 10 key domestic consolidated subsidiaries with factories.

UBE Group water resource usage (Fiscal 2015 through 2019)

			(FY)2015	2016	2017	2018	2019
Water resource inputs [Note] (Millions of cubic meters)	UBE	Tap water	0.4	0.4	0.4	0.4	0.4
		Groundwater	0.0	0.0	0.0	0.0	0.0
		Industrial water	75	74	73	69	73
		Seawater	115	108	115	106	115
		Sub total	190	182	188	175	188
	Group companies	Tap water	0.2	0.2	0.2	0.2	0.3
		Groundwater	2.0	1.9	2.0	2.0	2.1
		Industrial water	20	20	18	20	22
		Seawater	0.0	0.0	0.0	0.0	0.0
		Sub total	22	22	21	22	24
	Total (UBE Group)		212	204	209	198	212
Water discharges (Millions of cubic meters)	UBE	Sewers	0.0	0.0	0.0	0.0	0.0
		Rivers and lakes	0.0	0.0	0.0	0.0	0.0
		Ocean areas	160	152	158	143	159
		Sub total	160	152	158	143	159
	Group companies	Sewers	0.1	0.0	0.0	0.0	0.1
		Rivers and lakes	2.0	2.0	2.1	2.1	2.1
		Ocean areas	2.2	2.1	2.2	2.1	2.0
		Sub total	4.3	4.1	4.3	4.2	4.2
	Total (UBE Group)		164	156	162	147	163

Note: Water resource inputs are in keeping with the Ministry of the Environment's Environmental Reporting Guidelines 2018. These inputs are withdrawal from external sources to business sites.

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.

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.

Preliminary assessment of chemical safety

When we develop and handle new chemical substances, we conduct preliminary assessments of them. The UBE Group conducted 100 such assessments in fiscal 2019.

Management System Acquisitions (for occupational safety and health and environment)

(As of January 2020)

UBE management system acquisitions for occupational safety and health and the environment were as shown in the table below.

Occupational Safety and Health Management System Acquisitions (Acquisition rate*: 100%)

Business Sites	OSHMS	Year and Month of Acquisition	Registration Agencies
Ube Chemical Factory	OHSAS18001	February 2006	Lloyd's Register Quality Assurance Limited (LRQA)
Chiba Petrochemical Factory	OHSAS18001	April 2006	Japan Chemical Quality Assurance (JCQA)
Sakai Factory	ISO45001	December 2019	Lloyd's Register Quality Assurance Limited (LRQA)
UBE-Fujimagari Factory	ISO45001	December 2019	Lloyd's Register Quality Assurance Limited (LRQA)
Strategic Core Technology Research Laboratory	OHSAS18001	February 2007	GCC Japan
Frontier Technology Research Laboratory	OHSAS18001	February 2007	GCC Japan
Ube Cement Factory	JISHA OSHMS Standards Certification	March 2005	Japan Industrial Safety and Health Association
Kanda Cement Factory	JISHA OSHMS Standards Certification	September 2005	Japan Industrial Safety and Health Association
Isa Cement Factory	JISHA OSHMS Standards Certification	September 2005	Japan Industrial Safety and Health Association
Technical Development Center	JISHA OSHMS Standards Certification	June 2007	Japan Industrial Safety and Health Association
Energy Division	OHSAS18001	March 2007	JIC Quality Assurance Ltd.
Electric Power Department	OHSAS18001	September 2006	Japan Quality Assurance Organization (JQA)

Environmental Management System Acquisitions (Acquisition rate*: 92%)

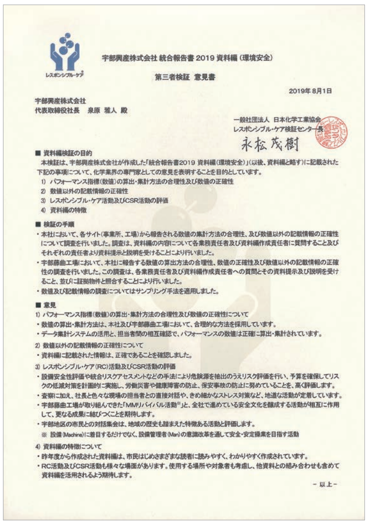
Business Sites	EMS	Year and Month of Acquisition	Registration Agencies
Ube Chemical Factory	ISO14001	March 2000	Lloyd's Register Quality Assurance Limited (LRQA)
Chiba Petrochemical Factory	ISO14001	July 1999	Japan Chemical Quality Assurance (JCQA)
Sakai Factory	ISO14001	February 2000	Lloyd's Register Quality Assurance Limited (LRQA)
UBE-Fujimagari Factory	ISO14001	March 2001	Lloyd's Register Quality Assurance Limited (LRQA)
Strategic Core Technology Research Laboratory	ISO14001	December 1999	GCC Japan
Frontier Technology Research Laboratory	ISO14001	December 1999	GCC Japan
Ube Cement Factory	ISO14001	August 1999	Japan Industrial Safety and Health Association
Kanda Cement Factory	ISO14001	August 1999	Japan Industrial Safety and Health Association
Isa Cement Factory	ISO14001	January 1999	Japan Industrial Safety and Health Association
Energy Division	ISO14001	March 2000	Japan Industrial Safety and Health Association
Electric Power Department	ISO14001	January 2014	Japan Quality Assurance Organization (JQA)

Glossary

** Acquisition rate: Proportion of sites*

Third-Party Verification and Scope of This Report

Third-Party Verification



宇部興産株式会社 統合報告書 2019 資料編（環境安全）

第三者検証 意見書

2019年 8月1日

宇部興産株式会社
代表取締役社長　泉原 雅人 殿

一般社団法人 日本化学工業協会
レスポンシブル・ケア検証センター長
永松茂樹

■ 資料編検証の目的
本検証は、宇部興産株式会社が作成した「統合報告書2019 資料編（環境安全）」（以後、資料編と略す）に記載された下記の事項について、化学業界の専門家としての意見を表明することを目的としています。
1) パフォーマンス指標（数値）の算出・集計方法の合理性及び数値の正確性
2) 数値以外の記載情報の正確性
3) レスポンシブル・ケア活動及びCSR活動の評価
4) 資料編の特徴

■ 検証の手順
・本社において、各サイト（事業所、工場）から報告される数値の集計方法の合理性、及び数値以外の記載情報の正確性について調査を行いました。調査は、資料編の内容について各業務責任者及び資料編作成責任者に質問すること及びそれぞれの責任者より資料提示と説明を受けることにより行いました。
・宇部藤曲工場において、本社に報告する数値の算出方法の合理性、数値の正確性及び数値以外の記載情報の正確性の調査を行いました。この調査は、各業務責任者及び資料編作成責任者への質問とその資料提示及び説明を受けること、並びに証拠物件と照合することにより行いました。
・数値及び記載情報の調査についてはサンプリング手法を適用しました。

■ 意見
1) パフォーマンス指標（数値）の算出・集計方法の合理性及び数値の正確性について
・数値の算出・集計方法は、本社及び宇部藤曲工場において、合理的な方法を採用しています。
・データ集計システムの活用と、担当者間の相互確認で、パフォーマンスの数値は正確に算出・集計されています。
2) 数値以外の記載情報の正確性について
・資料編に記載された情報は、正確であることを確認しました。
3) レスポンシブル・ケア（RC）活動及びCSR活動の評価
・設備安全性評価や統合リスクアセスメントなどの手法により危険源を抽出のうえリスク評価を行い、予算を確保してリスクの低減対策を計画的に実施し、労働災害や健康障害の防止、保安事故の防止に努めていることを、高く評価します。
・査察に加え、社長と色々な現場の担当者との直接対話や、きめ細かなストレス対策など、地道な活動が定着しています。
・宇部藤曲工場が取り組んできた「MMリバイバル活動※」と、全社で進めている安全文化を醸成する活動が相互に作用して、更なる成果に結びつくことを期待します。
・宇部地区の市民との対話集会は、地域の歴史も踏まえた特徴ある活動と評価します。
※ 設備（Machine）に着目するだけでなく、設備管理者（Man）の意識改革を通して安全・安定操業を目指す活動
4) 資料編の特徴について
・昨年度から作成された資料編は、市民はじめさまざまな読者に読みやすく、わかりやすく作成されています。
・RC活動及びCSR活動も様々な場面があります。使用する場所や対象者も考慮し、他資料との組み合わせも含めて資料編を活用されるよう期待します。

－以上－

Objectives of Supplementary Information Verification

The Responsible Care Verification Center has verified the Supplementary Information (Environment and Safety) of the 2020 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 Chiba Petrochemical 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 Chiba Petrochemical 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
   - We highly evaluate the Company’s efforts to help reach SDGs by selecting and acting on themes from business activities.
     Effectively using waste as raw material for cement → SDG 12. Responsible Consumption and Production
     Providing customers with battery materials used in electric and hybrid electric vehicles → SDG 13. Climate Action
   - We hope that each business site keeps endeavoring to foster a culture of safety and assess initiatives that not only seek to learn why disasters have occurred but also identify underlying factors to prevent further facilities accidents and occupational accidents.
   - For efforts to tackle the COVID-19 pandemic, we highly rate efforts to collect information, prevent infections, and review business continuity plans.
   - At the Chiba Petrochemical Factory, we highly rate efforts to digitize near miss reports, visualize processes, and shorten circulation periods.
4) Characteristics of the Supplementary Information

UBE devised and endeavored to disclose information to citizens and other readers.

- Environmental impact data: Disclosing emissions information for UBE business sites and domestic and overseas Group companies (Page 6)
- Water resource usage: Disclosing information on water consumption by water source and emissions by discharge destination (Page 8)

Scope of This Report

Period Covered	Fiscal 2019 (from April 1, 2019 to March 31, 2020)	
Companies Covered (Note 1)	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
	Domestic Group companies (10)	UBE Film, Ltd., Meiwa Plastic Industries, Ltd., Ems-Ube, Ltd., UBE-MC Hydrogen Peroxide Limited, UBE EXSYMO CO., LTD., UBE Material Industries, Ltd., UBE Construction Materials Sales Co., Ltd., UBE Machinery Corporation, Ltd., UBE Steel Co., Ltd., Fukushima, Ltd.
	Overseas Group companies (4) (Note 2)	UBE Corporation Europe, S.A. Unipersonal (Spain), UBE Chemical (Asia) Public Company Limited (Thailand), THAI SYNTHETIC RUBBERS COMPANY LIMITED (Thailand), UBE Fine Chemicals (Asia) Co., Ltd. (Thailand)
	Notes: 1. Including domestic factories and laboratories and major consolidated subsidiaries with factories. 2. Factory Environmental Impact Data presented on page 6 for four overseas Group companies.	
Definitions	UBE: Refers to Ube Industries, Ltd. (unconsolidated)	
	The UBE Group: Refers to the UBE Group companies, including Ube Industries, Ltd.	