UBE INDUSTRIES,LTD.

Integrated Report 2021

Supplementary Information (Environment and Safety)

Outline of Environment and Safety Activities

In order to advance its medium-term environment and safety policies, the UBE Group strives to improve its environment and safety activities through the use of the PDCA cycle.
Fiscal 2020 evaluation: Plans were mostly achieved.

		FY2020 Action Plans	FY2020 Results
Common to All	**Cultivate a culture of safety**	1. Cultivate a culture of safety 1-1. Systematically undertake activities based on headquarters assessment results 1-2. Ensure that everyone makes safety the top priority	1. Cultivated a culture of safety 1-1. Each business site completed and implemented plans to cultivate a culture of safety 1-2. Undertook initiatives to enhance safety awareness (stepped up basic operational rule implementation and conducted safety calls)
Occupational Safety and Health	**Occupational safety**	1. Eliminate major disasters 1-1. Continue to implement (improve effectiveness of) measures to reduce serious risks 1-2. Undertake safety initiatives in cooperation with contractors	1. Eliminated major disasters 1-1. Identified risks of grave occupational accidents at each business site and formulated and are implementing inherent safety plans to reduce those risks 1-2. Included joint patrols with contractors and subcontractors, participation in safety meetings, stronger audits, and other efforts in environmental and safety management plans at each business site to foster integrated safety activities
	Enhance workplace environments	1. Enhance workplace environments 1-1. Prevent implementation of three management improvement plans under Industrial Safety and Health Act from becoming dead letter	1. Enhanced workplace environments 1-1. Ensured workers wear and recorded usage of protective equipment and considered soundproofing measures
Process Safety and Disaster Prevention	**Strengthen safety management structure**	1. Comprehensive measures to minimize accident risks with aging equipment 1-1. Review and improve inspection and testing plans 1-2. Roll out measures to prevent electrical equipment accidents	1. Comprehensive measures to minimize accident risks with aging equipment 1-1. Each business chose equipment for inspection and testing, formulated plans, and implemented improvements 1-2. Each business rolled out measures to prevent electrical equipment accidents from recurring
		2. Enhance safety of high-pressure gas accredited business sites 2-1. Use self-assessment results to drive improvements	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, and implemented improvements
	Earthquake and tsunami readiness	1. Undertake natural disaster countermeasures 1-1. Implement natural disaster countermeasure action plans	1. Undertook natural disaster countermeasures 1-1 Each business conducted self-assessments in line with Self-Evaluation Standards for Natural Disaster Countermeasures that headquarters established, selected improvement items from results, and systematically implemented improvements
Environmental Conservation	**Reduce environmental risks**	1. Reduce environmental risks 1-1. Push ahead with improvement plans of Environmental Accident Measures Council	1. Reduced environmental risks 1-1. Each site installed additional environmental meters and set up temporary storage tanks for possible leakages
	Keep reducing environmental impact	1. Deploy environmental impact reduction plans 1-1. Reduce emissions of 20 voluntarily selected chemical substances*2 Push ahead with improvement plans to reach fiscal 2021 target 1-2. Reduce volume of industrial waste for external final disposal Push ahead with improvement plans to reach fiscal 2021 target	1. Deployed environmental impact reduction plans 1-1. Reduced emissions of 20 voluntarily selected chemical substances by 29% from fiscal 2010 level 1-2. Reduced volume of industrial waste for external final disposal by 81% from fiscal 2000 level
Environmental Issues	**Low-carbon economy contributions and responses**	1. Explore specific measures to reach targets for fiscal 2022 and beyond	1. Explored specific measures to reach targets for fiscal 2022 and beyond 1-1. Collaborate with NEDO and other external organizations in R&D and conserve energy 1-2. Greenhouse gas (GHG) emissions in fiscal 2020 totaled 11.27 million metric tons 1-3. Environmentally friendly products accounted for 30% of net sales in fiscal 2020 1-4. Defined measures to address global warming, marine plastic waste, biodiversity, and water resources as environmental issues and set targets
		2. Increase employee awareness of global warming 2-1. Identify and disseminate information about medium- and long-term climate change trends and link information to efforts to strengthen initiatives and create new businesses 2-2. Properly inform internal and external stakeholders about UBE's initiatives	2. Increased employee awareness of global warming 2-1. Informed and educated at Energy Management Committee and other entities (with support from parent Environment & Safety Department) 2-2. Informed external parties through Carbon Disclosure Project (D→B evaluation), FTSE4Good, and other vehicles, integrated report, and company questionnaires 2-3. Engaged in ESG discussions and collected information from institutional investors (in collaboration with Finance & Investor Relations Department) 2-4. Scrutinized disclosure contents to improve assessments (in collaboration with headquarters departments) 2-5. Announced support for recommendations of Task Force on Climate-related Financial Disclosures (TCFD) 2-6. Had third-party verify Scope 1 and Scope 2 energy-derived CO_2 emissions and reviewed Scope 3 calculations
Environment and Safety Audits and Inspections		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 Group companies 1-2. Implemented environmental safety inspections at 10 parent sites and 3 Group companies
Dialogue with Communities		1. Promote dialogue with communities	1. Held RC Regional Dialogue Meetings*3 with community stakeholders 1-1. Held on paper 13th RC Regional Dialogue Meeting in Chiba region: Featured messages for the publication of 13th RC Regional Dialogue Meeting in Chiba Region District Regional Dialogue (mayors of Sodegaura and Ichihara), Chiba Petrochemical Complex Disaster Prevention Plan (Chiba Prefecture Disaster Prevention and Crisis Management Division) and corporate initiatives 1-2. Held 16th RC Dialogue Forum online in Ube district: Featured a Japan Chemical Industry Association lecture on Responsible Care activities and related communications, an Ube Environmental Community explanation about PRTR, and presentations on corporate initiatives and theme discussions

(Continued on page 2)

Self-Evaluation
★★★: Achieved ★★: Mostly achieved ★: Not achieved

Self-Evaluation	FY2021 Action Plans	SDGs	RC*1 Code
★★	1. Cultivate a culture of safety •Systematically undertake activities based on headquarters assessment results 2. Strengthen UBE Group environmental safety governance structure •Apportion functions between headquarters and business units and implement	–	–
★★	1. Eliminate major disasters 1-1. Continue implementing measures (and ensuring implementation) to address significant risks 1-2. Undertake safety activities (and enhance their effectiveness) with contractors 1-3. Educate and train personnel to enhance safety awareness		**Occupational Safety and Health**
★★	1. Enhance workplace environments 1-1. Reduce workplace noise and implement three management improvement plans under Industrial Safety and Health Act		
★★	1. Comprehensive measures to minimize accident risks with aging equipment 1-1. Review, add, and improve priorities for inspection and testing and confirm results 1-2. Prevent recurrences of similar incidents 2. Enhance safety of high-pressure gas accredited business sites 2-1. Establish usage (framework) for results of security evaluations and confirm effectiveness		**Process Safety and Disaster Prevention**
★★	1. Undertake natural disaster countermeasures 1-1. Establish and confirm effectiveness of natural disaster countermeasure action plans		
★★	1. Reduce environmental risks 1-1. Implement and confirm effectiveness of measures to reduce environmental risks 1-2. Roll out at other business sites		
★★	1. Deploy environmental impact reduction plans 1-1. Reduce emissions of 20 voluntarily selected chemical substances by 37% compared with fiscal 2010 1-2. Reduce volume of industrial waste for external final disposal by 83% from fiscal 2000 level		
★★★	1. Explore specific measures to reach environmental issues targets 2. Streamline data collection 3. Increase employee awareness of environmental issues and distribute information		**Environmental Conservation**
★★★	1. Implement environment and safety audits and inspections	–	**Management System**
★★★	1. Promote dialogue with communities		**Dialogue with Communities**

Glossary

**1 Responsible Care (RC): Under RC, corporations that handle chemical substances voluntarily preserve the environment, safety, and health throughout product life cycles, 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 20 chemicals selected independently: methyl alcohol, butyl alcohol, toluene, epsilon-caprolactam, styrene, ammonia, cyclohexane, cyclohexanone, oxalic acid, vinyl acetate, xylene, n-hexane, ethylbenzene, chloromethane, benzene, dimethyl phthalate, N, N-dimethylacetamide, boric acid compound, phenol, 2-hexanone*

**3 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 meetings regarding RC implementation items (environmental conservation, safety and disaster prevention, etc.). A dialogue meeting is held in each district to deepen mutual understanding of initiatives.*

Prevention of Occupational Accidents

Measures to Prevent Occupational Accidents

	Goals	Activities	Status and History of Initiatives
1. Setting occupational accident-related benchmarks	Prevent occupational accidents	Establish numerical goals	Fiscal 2020 goal: 4 incidents with lost work time and 19 without, for a total of 23 Fiscal 2020 result: 11 incidents with lost work time and 29 without, for a total of 40
2. Use of occupational accident information	Prevent similar accidents	Create occupational accident information database and publish it on intranet	We are using information on occupational accidents 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 Group 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 in Best Practices and Safety and Health Guidelines and publish these on intranet • 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: Approximately 250 people (Group executives and employees, including online) 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

** Terminated program owing to COVID-19 pandemic*

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.

Process Safety and Disaster Prevention

Initiatives for Process Safety and Disaster Prevention

UBE Group Facility-Related Accidents

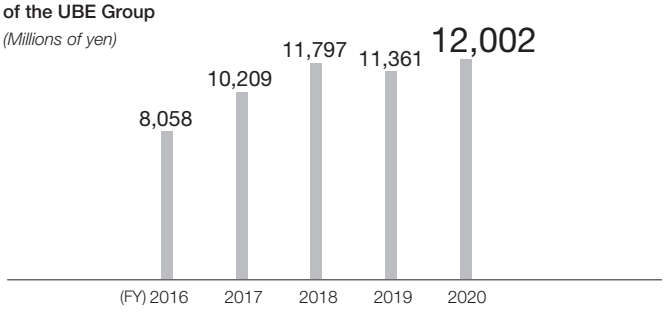
(Number of accidents)

(FY)	2016	2017	2018	2019	2020
UBE	2	3	4	4	13
Group companies	0	1	0	3	2

In fiscal 2020, the UBE Group recorded 15 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 2020, the UBE Group carried out 90 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 Corporate Philosophy, UBE Management Principles, and UBE Group Environmental and Safety 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 know-how 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 tablets
	(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 Group 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 dialogue 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

Environmental Preservation:
Environmental Accounting and Environmental Impact Data by Facility

Environmental Accounting

Environmental Preservation Costs

(¥100 million)

Category		Main Activity	(FY)	Capital Investment 2019	Capital Investment 2020	Capital Investment Difference	Costs 2019	Costs 2020	Costs Difference
Cost by business area	Pollution prevention	Investing in and maintaining energy-saving facilities		7.9	12.2	4.3	41.0	43.8	2.8
	Investing in and maintaining air and water pollution prevention facilities	Resource recycling		87.5	11.7	(75.8)	21.5	39.4	17.9
	Global environment preservation	Recycling and reducing industrial waste		4.3	3.4	(0.9)	36.5	34.6	(1.9)
Upstream/downstream costs		Container/packaging recycling, green purchasing		0.2	0.0	(0.2)	4.5	4.8	0.3
Costs of management activities		Acquiring, running, and maintaining environmental management systems		0.4	0.1	(0.3)	5.7	5.8	0.1
Research and development costs		R&D of environmentally friendly products and technologies		0.0	0.0	0.0	2.7	2.9	0.2
Costs of social activities		Greening and beautifying offices/facilities and their surroundings		0.3	0.0	(0.3)	2.1	2.4	0.3
Costs of cleaning up environment damage		Payment of environment-related levy		0.0	0.0	0.0	1.5	1.4	(0.1)
Total				100.6	27.4	(73.2)	115.5	135.1	19.6

Economic Effect

(¥100 million)

Category	Main Activity	(FY)	2019	2020	Difference
Income effect	Proceeds from sales of marketable waste products		28.8	45.0	16.2
Savings effect	Savings achieved through resource recycling and energy conservation		63.1	58.2	(4.9)

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 2019 and 2020 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	
	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
In Japan												
Chiba Petrochemical Factory	0.5	0.6	32	30	0.2	0.2	13	12	0.1	0.1	3.6	3.6
Sakai Factory / Osaka Research & Development Center	0.0	0.0	1.3	1.4	0.1	0.1	1.0	1.0	0.0	0.1	0.7	0.8
Ube Chemical Factory	1,523	1,572	3,546	3,331	101	118	422	415	5.6	5.1	392	359
Ube-Fujimagari Factory	541	451	395	295	2.7	1.3	247	205	4.9	4.3	63	51
Strategic Core Technology Research Laboratory / Pharmaceuticals Research Laboratory	—	—	—	—	—	—	0.1	0.2	0.1	0.1	0.2	0.2
Frontier Technology Research Laboratory	—	—	—	—	—	—	0.0	0.0	0.0	0.0	0.0	0.0
Ube Cement Factory	57	41	1,448	1,246	54	40	8.2	7.9	—	—	—	—
Isa Cement Factory	370	355	7,149	7,080	169	171	0.0	0.1	—	—	—	—
Kanda Cement Factory	3.3	5.0	2,498	2,437	23	46	2.9	2.4	0.1	0.1	1.0	0.4
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)	2,495	2,425	15,069	14,420	350	377	694	644	11	10	461	415
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	2.5	0.0	0.0	5.9	5.6	0.0	0.0	1.8	1.3
UBE-MC Hydrogen Peroxide Limited	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.4	0.3
UBE EXSYMO CO., LTD.	0.0	0.0	0.4	0.5	0.1	0.1	1.2	3.5	—	—	—	—
UBE Material Industries, Ltd.	144	152	929	781	13	8.4	0.9	0.6	0.0	0.0	1.3	1.0
UBE Construction Materials Sales Co., Ltd.	—	—	—	—	—	—	—	—	—	—	—	—
UBE Machinery Corporation, Ltd.	0.1	0.1	—	—	—	—	1.1	1.4	0.2	0.3	1.7	2.1
UBE Steel Co., Ltd.	13	12	71	70	7.9	6.9	1.9	2.3	—	—	—	—
Fukushima, Ltd.	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal (Group companies)	157	164	1,002	854	21	15	11	14	0.2	0.3	5.2	4.7
Total (UBE Group)	2,652	2,589	16,071	15,274	371	392	705	658	11	10	466	420
Overseas												
UBE Corporation Europe, S.A. Unipersonal (Spain)	79	80	859	497	12	9.0	129	277	0.7	1.4	62	170
UBE Chemicals (Asia) Public Company Limited (Thailand)	8.3	4.8	40	40	4.4	5.1	64	42	0.6	1.3	8.1	8.6
THAI SYNTHETIC RUBBERS COMPANY LIMITED (Thailand)	0.0	0.0	0.0	0.0	0.7	0.6	26	19	0.0	0.0	0.0	0.0
UBE Fine Chemicals (Asia) Co., Ltd. (Thailand)	0.0	0.0	0.0	4.6	0.0	0.1	—	—	—	—	—	—
Total	87	85	899	542	17	15	219	338	1.3	2.7	70	179

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. Details are on page 10.

Total Volume of PRTR Substances Emitted/Transferred in Fiscal 2020

	Handling Volume *(Tons)*	Emissions Volume (Tons)				Increase/Decrease Rate Compared with Fiscal 2019 (Total Emissions)	Transfer Volume *(Tons)*	Number of PRTR Substances
		Atmosphere	Public Water	Soil	Total			
UBE	274,401	78.9	71.7	0.0	150.6	(15.4)%	2,142.4	56
Other Group companies	30,038	110.6	10.5	0.0	121.1	7.0%	1,218.4	25
Total (UBE Group)	304,439	189.5	82.2	0.0	271.7	(6.7)%	3,360.8	66

Volumes of Individual PRTR Substances Emitted/Transferred in Fiscal 2020 (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 2019 (Total Emissions)	Transfer Volume (Tons)
				Atmosphere	Public Water	Soil	Total		
300	Toluene	108-88-3	868	65.1	11.1	0.0	76.2	(9.3)%	361.5
76	Epsilon-caprolactam	105-60-2	116,231	0.0	64.1	0.0	64.1	(30.4)%	783.4
240	Styrene	100-42-5	253	42.8	0.0	0.0	42.8	7.5%	0.5
80	Xylene	—	155	18.3	0.0	0.0	18.3	1.1%	9.0
53	Ethylbenzene	100-41-4	23	14.3	0.0	0.0	14.3	15.3%	7.9
104	Chlorodifluoromethane	75-45-6	13	12.3	0.0	0.0	12.3	288.0%	1.1
400	Benzene	71-43-2	92	9.4	0.2	0.0	9.6	11.6%	3.3
213	N,N-dimethylacetamide	127-19-5	677	9.3	0.0	0.0	9.3	10.7%	287.7
128	Chloromethane	74-87-3	9	8.9	0.0	0.0	8.9	(18.3)%	0.0
405	Boron compound	—	44	0.1	3.9	0.0	4.0	(5.4)%	6.0
243	Dioxins (Note) mg-TEQ/year	—	—	182.2	3.4	0.0	185.6	(40.7)%	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.
Details are on page 10.

Overall Flow of Industrial Waste in Fiscal 2020

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 Waste Management 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 Issues: Tackling Global Warming

GHG Emissions

(FY)	kt-CO_2e 2018	2019	2020	
Scope 1	11,250	11,400*	10,690	Direct GHG emissions from a reporting entity, due to fuel use, etc.
Scope 2	750	700*	580	Indirect GHG emissions from electricity and heat purchased from other entities
Scope 3	15,550	15,100	13,470	Indirect GHG emissions throughout the supply chain, such as those that occur during material procurement, transport and product processing, use and disposal

** The Greenhouse Gas Emissions Verification Statement on page 8 covers the above fiscal 2019 Scope 1 and 2 energy-derived CO_2 for UBE Group's domestic operations.*

Scope 3 Emissions by Category

	Category	GHG Emissions (kt-CO_2e) 2019	2020	Note
1	Purchased goods and services	2,180	2,040	
4	Upstream transportation and distribution	850	700	
9	Downstream transportation and distribution	480	540	Increased overseas freight traffic
10	Processing of sold products	200	180	
11	Use of sold products	8,960	7,650	Sold coal, machinery, etc.
12	End-of-life treatment of sold products	1,840	1,760	
—	Other categories	590	600	
	Total	15,100	13,470	

GHG Emission Intensity (GHG emissions per unit of production)

	t-CO_2e/t-Lc*1 2019	2020
GHG emission intensity	3.282	3.263*2

**1 Lactam equivalent production volume*
**2 Construction Materials Company: CO_2 emission intensity (excluding waste) for Ube, Kanda, and Isa cement factories totaled 710kg-CO_2e/t-cement Intensity for periodical reports of production value under Energy Conservation Law (fiscal 2020)*

Energy Type Consumption Data

Energy Type	MWh/year 2019	2020
Thermal coal	17,400,000	16,170,000
Kerosene and light oil	400,000	370,000
Liquefied natural gas	590,000	650,000
Liquefied petroleum gas	150,000	130,000
Petroleum coke	550,000	520,000
Heavy oil	320,000	270,000
Gas and oil by-products	230,000	250,000
Biomass	500,000	670,000
Total	20,140,000	19,030,000

GHG Emissions by Company in 2020

Business Sites		kt-CO_2e Scope 1	Scope 2	Total
Chemicals Company		2,970	510	3,480
	Domestic	2,150	200	2,350
	Thailand	410	290	700
	Spain	410	20	430
Construction Materials Company		7,530	70	7,600
Machinery Company		190	10	200
Total		10,690	580	11,270

Emissions Data by GHG Category

GHG Categories	kt-CO_2e 2019	2020
CO_2	11,230	10,410*1
CH_4	10	10
N_2O	870	850
HFC*2	0	0
PFC	0	0
SF_6*2	0	0
NF_3	0	0
Total	12,110	11,270

**1 CO_2 emissions at three Construction Materials Company cement factories (Ube, Kanda, and Isa) were 5.54 million t-CO_2e/year (excluding waste) Periodical report of production value under Energy Conservation Law (fiscal 2020)*
**2 less than 10,000t-CO_2e*

Energy Consumption Data

	MWh/year 2019 Total	2019 Derived from Renewable Energy	2020 Total	2020 Derived from Renewable Energy	Notes
Fuel consumption	20,140,000	500,000	19,030,000	670,000	Biomass
Purchased electricity consumption	920,000	0	840,000	60,000	Power from renewable energy
Purchased steam consumption	1,080,000	0	1,050,000	0	
Private power generation (renewable energy)	1,000	1,000	2,000	2,000	Solar power
Total	22,140,000	500,000	20,920,000	730,000	

Totals may not add up because numbers are rounded off.

GREENHOUSE GAS EMISSIONS VERIFICATION STATEMENT

To: Ube Industries, Ltd.

February 26, 2021

Bureau Veritas Japan Co., Ltd.
System Certification Services Headquarters

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 FY2019.

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_2 emissions from energy use through the business operations of UBE Group's 20 sites within Japan for the period of April 1, 2019 through March 31, 2020

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 4,540,733 t-CO_2	Scope 2 325,653 t-CO_2

【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 190 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 Issues:
Water Resource Usage and Fluorocarbon Emission Restriction

Water Resource Usage

Data covers 13 domestic factories and laboratories and 10 key domestic consolidated subsidiaries with factories. Details are on page 10.

UBE Group Water Resource Usage (Fiscal 2016 through 2020)

			(FY)2016	2017	2018	2019	2020
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	74	73	69	73	71
		Seawater	108	115	106	115	108
		Subtotal	182	188	175	188	179
	Group companies	Tap water	0.2	0.2	0.2	0.3	0.3
		Groundwater	1.9	2.0	2.0	2.1	2.1
		Industrial water	20	18	20	22	21
		Seawater	0.0	0.0	0.0	0.0	0.0
		Subtotal	22	21	22	24	23
	Total (UBE Group)		204	209	198	212	202
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	152	158	143	159	148
		Subtotal	152	158	143	159	148
	Group companies	Sewers	0.0	0.0	0.0	0.1	0.1
		Rivers and lakes	2.0	2.1	2.1	2.1	2.1
		Ocean areas	2.1	2.2	2.1	2.0	1.9
		Subtotal	4.1	4.3	4.2	4.2	4.1
	Total (UBE Group)		156	162	147	163	152

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 Act on Rational Use and Appropriate Management of Fluorocarbons is aimed at 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 or handle new chemical substances, we conduct preliminary assessments of them. The UBE Group conducted 83 such assessments in fiscal 2020.

Management System Acquisitions (for occupational safety and health and environment), and Scope of This Report

(As of April 2021)

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 (OSHMS) Acquisitions (Acquisition rate*: 100%)

Business Sites	OSHMS	Year and Month of Acquisition	Registration Agencies
Chiba Petrochemical Factory	ISO 45001	July 2020	Japan Chemical Quality Assurance Ltd. (JCQA)
Sakai Factory	ISO 45001	December 2019	Lloyd's Register Quality Assurance Limited (LRQA)
Ube Chemical Factory	ISO 45001	February 2021	Lloyd's Register Quality Assurance Limited (LRQA)
Ube-Fujimagari Factory	ISO 45001	December 2019	Lloyd's Register Quality Assurance Limited (LRQA)
Strategic Core Technology Research Laboratory	ISO 45001	October 2020	GCC Japan
Frontier Technology Research Laboratory	ISO 45001	October 2020	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	ISO 45001	March 2021	JIC Quality Assurance Ltd.
Electric Power Department	ISO 45001	January 2021	Japan Quality Assurance Organization (JQA)

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

Business Sites	EMS	Year and Month of Acquisition	Registration Agencies
Chiba Petrochemical Factory	ISO 14001	July 1999	Japan Chemical Quality Assurance Ltd. (JCQA)
Sakai Factory	ISO 14001	February 2000	Lloyd's Register Quality Assurance Limited (LRQA)
Ube Chemical Factory	ISO 14001	March 2000	Lloyd's Register Quality Assurance Limited (LRQA)
Ube-Fujimagari Factory	ISO 14001	March 2001	Lloyd's Register Quality Assurance Limited (LRQA)
Strategic Core Technology Research Laboratory	ISO 14001	December 1999	GCC Japan
Frontier Technology Research Laboratory	ISO 14001	December 1999	GCC Japan
Ube Cement Factory	ISO 14001	August 1999	JIC Quality Assurance Ltd.
Kanda Cement Factory	ISO 14001	August 1999	JIC Quality Assurance Ltd.
Isa Cement Factory	ISO 14001	January 1999	JIC Quality Assurance Ltd.
Energy Division	ISO 14001	March 2000	JIC Quality Assurance Ltd.
Electric Power Department	ISO 14001	January 2014	Japan Quality Assurance Organization (JQA)

Glossary
** Acquisition rate: Proportion of sites*

Scope of This Report

Period Covered	Fiscal 2020 (from April 1, 2020 to March 31, 2021)	
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 & 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 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 Chemicals (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. Environmental Impact Data by Facility presented on page 5 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.	