

\* The scope of reporting on Global Environmental Conservation (pages 96–105) is on Tokyo Ohka Kogyo Co., Ltd., and consolidated subsidiaries in Japan. In other cases, the scope of coverage is listed on each page.



under the PRTR Law) \* January 2020 to December 2020 \* January 2020 to December 2020 (Chemical substances: April 2020 to March 2021)

\*1 SOx: Abbreviation for Sulfur Oxides. Produced from the combustion of fossil fuels containing sulfur and are considered the substances that cause acid rain.

\*2 BOD: Abbreviation for Biochemical Oxygen Demand. Refers to the volume of oxygen required when pollutants in the water (organic substances) are turned into inorganic substances or gases through the action of microorganisms. BOD is a major indicator used when evaluating the degree of contamination of rivers and other bodies of water A higher value for BOD means that the water is more contaminated

Please follow the URL below for more detailed information on the environmental impact by site.

Information on environmental impact by site https://www.tok.co.jp/eng/csr/env-activity/s\_management.html#e-data

industrial waste



#### **Emissions of Greenhouse Gases**

Because climate change has become more serious in recent years, companies are expected to measure greenhouse gas emissions from their own properties and across the entire value chain. The TOK Group measures and calculates greenhouse gas emissions based on the Ministry of the Environment's Basic Guidelines on Accounting for Greenhouse Gas Emissions throughout the supply chain within the context of emissions from business activities (Scope 1 and Scope 2) and indirect emissions from nonbusiness activities (Scope 3). TOK will advance the initiatives for the realization of a sustainable society by identifying issues throughout the value chain where corporate activities can have an impact.

Scope 1	10,313 t-CO <sub>2</sub>	Scope 2	20,627 t-CO <sub>2</sub>

#### Scope 3 Emissions by Category

1 7 8 7			
Purchased goods and services	31,297 t-CO2	Upstream leased assets	—
Capital goods	Not applicable	Downstream transportation and distribution	Domestic: 2,582 t-CO <sub>2</sub> Overseas: 3,812 t-CO <sub>2</sub>
Fuel-and energy-related activities not included in Scope 1 or 2	—	Processing of sold products	Not applicable
Upstream transportation and distribution	Not applicable	Use of sold products	Not applicable
Waste generated in operations	9,018 t-CO <sub>2</sub>	End-of-life treatment of sold products	Not applicable
Business travel	397 t-CO2	Downstream leased assets	—
Employee commuting	602 t-CO <sub>2</sub>	Franchises	_
		Investments	Not applicable

\* January 2020 to December 2020 (Waste generated in operations: April 2020 to March 2021) \* Excludes people seconded to other companies



**Environmental Conservation Cost** Investments refer to the accounting for equipment associated with environmental conservation and improvement. Expenses are the sum of depreciation, personnel, and other operating expenses associated with environmental conservation. Computation of personnel expenses are based on the basic unit

TOK has been using environmental accounting since 2000.

Global environmental conservation cost

Category of the cost

Pollution prevention cost

Resource circulation cost

In 2020, environmental conservation expenses totaled ¥1,025

million, mainly for the prevention of pollution and the recycling

cost.

of resources.

Business

area cost

R&D cost

Tota

Upstream/Downstream cost

Environmental remediation cost

\* January 2020 to December 2020

Administration cost

Social activity cost

sportation Cust	omer End Users	
sportation volume	21.67 million ton-kilometers	
gy consumed	972 kL crude oil equivalent	
emissions (Janan)	2,582 t-CO <sub>2</sub>	

\* Environmental accounting: A system for understanding environmental conservation related investments made by and expenses incurred by businesses and other organizations, as well as the effects of such investments in quantitative terms (currency or physical quantity) and communicating such information to stakeholders.

		(Millions of yen)
Key initiatives	Investment	Cost
Air, water, and other pollution prevention equipment and the renewal, operation, maintenance, and management of equipment Installation of flood control facilities	69	74
Energy conservation activities	467	11
Installation of melting equipment	0	173
Green purchasing, collection of used products	0	9
Approach to environmental management system	104	64
Research and development related to environmental conservation (costs for chemical substance screening)	0	51
Cleanup activities around the production plants	0	0
Treatment of soil pollution by the construction of a new building	3	0
	643	382

#### Economic Benefits Associated with Environmental **Conservation Measures**

Figures are calculated on the basis of internally realized benefits from the sale of materials with value and from the reduction of costs.

		(Millions of yen)
	Effects	Amount
Revenue	Gain on the sale of recycled products	22
Cost savings	Reduction in disposal costs through a reduction in the volume of waste	103
Total		125

\* January 2020 to December 2020

\*1 Scope of environmental accounting covers production facilities in Japan and distribution centers, excluding the headquarters and marketing offices. The reference used is the Environmental Accounting Guidelines 2005 published by the Ministry of the Environment

\*2 Amounts of less than one million yen have been rounded off

# **Address Climate Change Issues toward Decarbonization**



### **Basic Concept**

The TOK Group quantitatively measures the environmental impact throughout the value chain and works to reduce the environmental load with a full understanding of the impact our production activities have on the environment. We aim to achieve sustainable development alongside society through the development of products that conserve resources and energy.

# Improve Energy Consumption per Base Unit and CO<sub>2</sub> Emissions

When equipment is introduced or replaced, we endeavor to select models with higher energy efficiency in order to improve the system of each site and optimize the system as a whole.

Energy consumption in 2020 increased by 5% year-overyear because the new R&D Building, which was completed at the Sagami Operation Center in 2019, and one more new building, started full-scale operation, while a variety of improvement measures were implemented, including the replacement of air-conditioning equipment and the shift to LED lighting at certain sites, review of air-conditioning temperature settings, and the survey of illuminance and lighting followed by adjustment to optimal illuminance.

Energy consumption per base unit decreased by 9 points year-over-year, reflecting more efficient production at the Koriyama plant, Gotemba plant, and several other plants. Energy-related CO<sub>2</sub> emissions per base unit decreased by 11 points year-over-year owing to increased net sales, coupled with the shift of the total amount of electricity used at the headquarters to renewable energy starting January 2020. The Company set a new 10-year target in 2020 to reduce energy consumption per base unit and emissions per base unit by 15 points compared with 2019 by 2030, and the Company has been striving to reach this target.





# Improve Energy Consumption per Base Unit in Distribution

For the quality and safety management of products, the Company ensures rigorous temperature control during product storage and transportation. The product storage warehouse is single-storied and requires refrigeration and freezing equipment. Product transportation also requires freezer trucks.

TOK endorses the aim of the White Logistics Promotion Movement and is taking steps to realize sustainable logistics, while working with partner logistics companies to improve energy consumption. In 2020, we introduced new vehicles to improve fuel efficiency. We reviewed the efficiency of transportation routes (such as closure of the Ibaraki SP\* among the product storage sites in Japan and distribution starting from neighborhood plants) and kept CO<sub>2</sub> emissions at the same level as last year. At present, we are preparing for logistics optimization ranging from the purchase of raw materials to the distribution of products based on the monitoring of warehouse occupancy at each site.

\* Stands for constant-temperature constant-humidity stock point



# Future Issues and Initiatives

Over the past several years, climate change has been evident in large typhoons and torrential rainfall causing major damage to society. Climate change is thought to be caused by fluctuations in the oceans and changes in solar activity, as well as global warming caused by the build-up of greenhouse gases and the warming of the oceans due to hot water discharged from electric power stations and other factors. The Group will address these issues by steadily carrying out initiatives to reduce its environmental impact in order to achieve the new medium- to long-term targets related to energy consumption, which started in 2020.

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#### Measures to Prevent Global Warming at Overseas Manufacturing Sites

The overseas ratio of energy consumption temporarily decreased in 2019 but started to increase again in 2020. The probable causes are the increased production equipment and extended cleanrooms at production sites in the United States and South Korea combined with an increase in production volume. Going forward, TOK will continue its production activities with a focus on energy conservation through a PDCA cycle for environmental management systems.



\* Errors in Integrated Report 2019 regarding the overseas ratio in 2016 and the overseas total in 2017 and 2018 have been corrected.

#### TOK Human Resources

### Kunio Kido

Section Manager, Facilities Section, Facilities and Construction Div.

#### Proactively proceeding with more advanced measures and the attainment of targets

Saving energy and reducing CO<sub>2</sub> emissions are always key themes in the industry, and TOK has implemented proactive measures. In 2020, we introduced equipment that focused on energy efficiency (e.g. super-high efficiency transformers and LEDs) when a new business building was established. Other diverse activities included the energy-saving initiative and other continuous efforts toward the same goal. Climate change has become a major social issue and call for more advanced countermeasures and target setting. Under these circumstances, the TOK Group will gear up related activities and implement proactive measures to attain the set targets.

#### Worldwide Water Risk (0-100%) Projections for 2030

In a business-as-usual (BAU) scenario, the map shows water use as a percentage of the water supply in each region, assuming both economic growth and higher CO2 emissions.

The higher the percentage, the more severe the competition for water as more people fight over fewer water resources

- Low risk (under 10%)
- Low to medium risk (10% to 20%)
- Medium to high risk (20% to 40%)
- High risk (40% to 80%)
- Extremely high risk (over 80%) ■ Water shortage



#### Aqueduct Water Risk Atlas

Aqueduct is an interactive website tool for mapping water risk provided free of charge by the World Resources Institute (WRI), a think tank in the United States that researches water and other natural resource problems. Aqueduct provides interactive data on water risk at the production sites of companies. The website also offers detailed information about natural resource problems in different regions of the world.

### Future Issues and Initiatives

# There are concerns about the impact of

water stress caused by climate change on water resources. Difficulties may increase in the environment surrounding product manufacturing due to water intake restrictions and discharge limitations imposed by more stringent regulations. To protect equipment from floods, flood control work is in progress at the Sagami Operation Center as our R&D hub, and standards of conduct in the event of a flood are being formulated at each site. We continue working to minimize water stress and water risk by reducing water use, reducing pollution risks, and examining the impact of natural disasters.



Amid increasing public attention to the social issue of water resources, the Group's products and manufacturing processes use water as an essential resource. Therefore, we strive to minimize the volume of water consumed in production activities and to maintain and improve the quality of wastewater. We aim to contribute more through business activities that consider the global water risks.

Water usage

(all domestic plants)

**370,000** m<sup>3</sup>

#### Changes in Water Use Volume

Water use volume changes when manufacturing processes and output change. TOK works to reduce its use by constantly monitoring the state of industrial water and city water use and reviewing related equipment.

In 2020, water use volume in Japan increased slightly from the previous year to 370,000 m<sup>3</sup>. Overseas, water use volume at our sites increased by 11,000 m<sup>3</sup> from the previous year to 354,000 m<sup>3</sup> due to the increased production volume.



\* Starting with the target of FY 2021, the base year was shifted from 2017 to 2019 for new activities

#### Water Risk Management

**Promotion of Resource Recycling: Initiatives to Address Water Risk** 

🗼 🔔 🎓 🕈 🎿 Key initiatives/Results in 2020 👗 🔔 🎓 🕈 🎿

Water risks and other natural resource risks are widely recognized as serious worldwide risks that are ranked among the five greatest risks in the Global Risks Report 2021 published by the World Economic Forum. To better understand water use volume at all sites around the world, the TOK Group has clarified the respective risks in the stages of water supply, raw materials supply, manufacturing processes, and wastewater emissions from plants. TOK then examined the measures to implement for water risks in the supply chain, including water intake restriction and flooding risks due to natural disasters, and the risk of business interruption resulting from water contamination.

**Risk reduction measures** 

in Japan

Implemented at sites

#### Set a Medium- to Long-Term Target

The Company implemented proactive measures to reduce water risk in 2018 and has worked toward company-wide targets since 2019. In 2020, we examined reduction measures for the risk of contamination of piping and equipment at each site, water use operation, and measures to reduce natural disaster risks, and performed the relevant activities based on the plans. We will continue to implement risk reduction measures to attain the medium- to long-term target of reducing water use by 15% from the 2019 level by 2030.



Installed water bars at the entrances to buildings to reduce flooding risks (Sanami Oneration Center)

for stakeholders

Serious climate change risks have become apparent in catastrophic natural disasters. Extreme torrential rainfall and drought referred to as once in several tens of years now occur almost annually. The Sagami Operation Center is the R&D hub of the TOK Group and is the place where critical equipment and devices are installed. Because the Center adjoins a river, we consider the reduction of flood risks as a key requirement; consequently, we have implemented flood control measures since 2020, including the water cutoff/ control work around and inside the buildings. Our water use will continue to increase for air conditioning, manufacturing equipment, devices, and other purposes as the miniaturization and lamination of semiconductors advance and our business scale expands. We will implement measures to effectively use and reuse limited water resources and reduce flooding risks in order to achieve a stable product supply and peace of mind for stakeholders.

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#### **Overall Water Risk**

The current degree of exposure to water risk at TOK's production sites based on a comprehensive evaluation of Physical Risk Quantity, Physical Risk Quality, and

Regulatory and Reputational Risk

Low risk (0-1) Low to medium risk (1–2) Medium to high risk (2–3) High risk (3–4) ■ Extremely high risk (4–5)

#### The business as usual (BAU) scenario (RCP8.5).

One of the four scenarios for representative concentration pathways outlined in the Fifth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC). This scenario assumes no further efforts being made to suppress emissions after already introduced or currently planned reduction measures. This scenario assumes the largest emission volume among the projected greenhouse gas emissions as of 2100.

#### **TOK Human Resources**

Kazuyuki Nitta Div. Manager. Production Functionality Characterization Div.

## **Risk reduction to achieve stable** product supply and peace of mind



# **Promotion of Resource Recycling: Reducing Industrial Waste Emissions and Landfill Disposal**



### **Basic Concept**

We conduct 3R activities (reduce, reuse, and recycle) for the effective use of limited natural resources. By restricting the volume of generated waste, thoroughly sorting all waste by type, and increasing the volume that is recycled, we are working to make more effective use of resources. We strive to maintain zero emissions\* by reducing the landfill disposal volume by processing waste products through combustion or crushing, which is called intermediate treatment, and through stabilization and volume reduction initiatives.

\* Zero emissions: Landfill disposal volume (direct or after intermediate treatment) of less than 1% of industrial waste discharged by production activities

#### **Reduce Industrial Waste Emissions**

In 2016, TOK set a new medium-term target to reduce industrial waste (per base unit) by 5 points by 2020 compared with 2015 (reduction of 1 point annually). With this target in mind, TOK has been working to reduce industrial waste by refining and reusing process effluents, internal effluent processing, internal recovery, and converting waste into items of value.

In 2020, as the final target year, our efforts to proactively reuse process effluents and convert waste into items of value succeeded in attaining the target by reducing our waste generation by 11 points compared with 2015 as the base year of the Medium-Term Management Plan, though the value was an increase by 15 points from the previous year due to the increased production volume. In 2021, TOK will set new targets indexed to 2019 and further continue reduction efforts.

#### Achieved Zero Emissions

In 2020, industrial waste for landfill disposal after intermediate treatment stood at less than 1% of total waste, so we have achieved zero emissions for seven consecutive years since 2014.

Volume of Industrial Waste\*1, \*2



\*1 The base unit index is calculated after adding general industrial waste and specially controlled industrial waste

\*2 We are committed to reducing the volume of generated industrial waste, and our goal is to reduce this amount by 5 points (1 point per year) by 2020, taking the index for 2015 as the base unit

#### Techniques for Recycling Organic Solvent Effluents

TOK strives to effectively use the waste generated by its plants. Waste oil is sorted by type of recyclable solvent, and ratings of impurities and purity are introduced with strengthened control applied. In this way, it is possible to reuse waste oil that was previously disposed of as industrial waste. It is now also possible to use waste oil with a mixture of organic solvents as combustion improvers by blending with other waste oil of differing calories and water content. In addition, at the Gotemba plant, we recycle waste oil by distilling it at an external partner company and reuse it in the production process (the circular economy to reuse generated waste through the purification process). TOK will continue its efforts to reduce industrial waste generation by effectively using resources.



processes.

manufacture of LCD panels.

Reduce: This refers to reducing the volume of waste material generated. Beduction involves minimizing the volume of materials in products in order to minimize the volume of materials that is eventually discarded Reuse: This refers to the repeated use of manufactured goods, containers, and other products in order to reduce the volume of waste materials generated and to conserve resources Recycle: This refers to the use of waste materials as resources rather than incinerating these materials or sending them to a landfill, thereby conserving resources and preventing pollution

### TOK Human Resources

Hiroshi Sugawara Plant Administration Section, Gotemba Plant



#### **Advancing environmental** conservation activities through cooperation with stakeholders

The industrial waste generated at the Gotemba plant accounts for nearly one-half of all waste generated by TOK. In particular, flammable waste oil, designated as specially controlled industrial waste, has a major impact, and it is an important requirement to reduce this effluent.

Through reduction efforts in cooperation with a partner company, it is now possible to recycle one-half the specified waste oil generated since 2017. We are happy with this accomplishment, which was attained by overcoming many difficulties, including repeated consultations with the administration. The Gotemba plant continued to consult with the partner for further reductions and achieved additional reductions in 2020.

We will continue striving to further reduce waste by asking for cooperation from stakeholders and related entities.

Our Foundation

#### **TOK Stakeho**

Mr. Kensaku Horie Tokyo Sales Department Nippon Refine Co., Ltd.

#### To realize a circular econom



Since its foundation, the business of our company has been based on refining and recycling toward a society that enables the sustainable development of humankind.

We have done business with Tokyo Ohka (TOK) for many years. At present, we collect used solvent from TOK's Gotemba plant, other plants in Japan, and the Taiwan sites, and refine it for delivery to TOK. The refining of used solvent by our company affects the quality of TOK products. Therefore, we have repeated inspections and consultations with the persons in charge from TOK whenever there is a change in the collection volume and process. Recently, we have started triangular recycling, where we refine the used solvent from TOK's customers for reuse by TOK in their product manufacturing. We plan to expand this initiative in cooperation with the persons in charge from the EHS Division, which leads environmental activities at TOK, and establish a system for achieving a circular economy.

# **Air, Water and Soil/Biodiversity**



### **Basic Concept**

The Group takes steps to lighten its environmental impact by reducing the emissions of greenhouse gases\* and chemical substances and by upgrading equipment, switching fuels, and reviewing the manufacturing processes to preserve the air, water, and soil environments upon which our livelihoods depend.

\* Greenhouse gas: Gas in the atmosphere that allows sunlight to pass through but absorbs infrared rays emitted from the ground and seas These gases are believed to cause global warming

#### Prevent Air, Water, and Soil Pollution

#### · Reducing the emissions of air-polluting substances

TOK has shifted to boilers that use natural gas to reduce the emissions of sulfur oxide (SOx) and nitrogen oxide (NOx), which are major contributors to air pollution. Boilers at all plants now use low-emission natural gas as fuel with the exception of plants without access to city gas supplies. In 2020, SOx emissions related to production activities decreased by 0.1 tons year-over-year. NOx emissions decreased by 3.3 tons yearover-year, mainly because of the review of the operating program and other improvements in the method of operation of the electric power generator at the Koriyama plant.

#### · Monitoring soil pollution

The TOK Group manages the risk of soil and underground water pollution by recognizing the concerns that such pollution could threaten the safety and health of local residents and employees. In the event surveys discover soil or underground water pollution, the Company rapidly discloses information and takes remedial action to ensure the health and safety of local residents.

In addition, the Sagami Operation Center of TOK is a member of the Koza River Purification Association, which comprises the plants, offices, and municipalities located along the rivers in the Koza District of Kanagawa Prefecture. As such, the Center endeavors to conserve water guality and maintain and improve the environment of the rivers in the neighborhood.

#### · Reducing emissions of water-polluting substances

TOK set its own management standards for treating the wastewater from its sites. The standards are stricter than the regulations, laws, and local ordinances for purifying wastewater, such as activated sludge processing, at its process wastewater treatment facilities. Only water that satisfies the standards for cleanliness is released into the public water system.

The Company also periodically evaluates water quality for compliance with its own standards and public laws and regulations. TOK will continue to reduce emissions by maintaining and managing its process wastewater treatment facilities so that water can be released after satisfying all applicable standards.

BOD emissions in the water discharged into public waters in 2020 were approximately 0.2 tons, while COD emissions were 0.4 tons.



#### Countermeasures against Ozone-Depleting **Substances**

The TOK Group uses the ozone-depleting chlorofluorocarbons CFC-11 and CFC-12 as coolants in refrigerators and freezers. The entire Group is working to reduce the equipment that uses these substances and to switch to alternative substances and green coolants (non-CFC). The revised Act on the Rational Use and Proper Management of Fluorocarbons mandates regular inspections and reporting of any leakage volume, and TOK is updating its environmental system for the proper management, filling, and disposal of CFCs. As a result of implementing the appropriate measures, TOK's estimated leakage of CFCs in 2020 was approximately 156 t-CO<sub>2</sub> based on the Act. TOK will continue to conduct group-wide inspections and periodically replace fire extinguishers that use ozone-depleting substances with the aim of further strengthening management to prevent any CFC leakage.

\* Data collection period: April 2020 to March 2021

#### Comply with PRTR Law

Under the Japanese Pollutant Release and Transfer Register (PRTR) Law, companies must manage and report to the government the production, release, and transfer of designated chemical substances. To accurately calculate and report these figures, TOK relies on its chemicals and PRTR management system

Of the Class I Designated Chemical Substances, a list of 462 substances defined by the PRTR Law, TOK handled 44 substances (a total of 1,113 tons) in 2020, including an estimated 2 tons released into the atmosphere and public water systems. TOK measures the emissions of VOCs and harmful air-polluting substances through PRTR surveys with the Japan Chemical Industry Association, of which it is a member.

\* Data collection period: April 2020 to March 2021

### Future Issues and Initiatives

The TOK Group has implemented a variety of activities and measures to prevent global warming and the pollution of the air, soil, and water and has worked to maintain biodiversity. In all these categories, we will continue to appropriately maintain and manage our facilities and equipment to ensure continuous normal operation, thereby fulfilling our social responsibility as a company handling chemical substances.

**Resolving environmental issues** by accumulating basic analysis and endeavor Regarding activated sludge processing at the wastewater treatment facilities at the Koriyama plant, the high COD value had been a problem for many years. We analyzed the wastewater from each building in an effort to explore measures for improvement and found out that the trace resin content mixed into the wastewater from a specific building could not be adequately treated with activated sludge. We shifted the treatment of this wastewater from activated sludge processing to industrial waste processing, which led to a substantial improvement in the value. At present, we reuse this wastewater to further reduce its environmental impact. We will continue to resolve environmental issues by accumulating basic analyses and endeavors.

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#### Preserve Biodiversity

The TOK Biodiversity Protection Declaration guides the TOK Group's activities to preserve biodiversity. In 2020, 185 employees participated in biodiversity training, and six employees were dispatched to help with afforestation projects in cooperation with local residents through the Kanagawa Trust Midori Foundation. We will continue to preserve biodiversity with the intention of starting a ripple effect inside and outside the Company and spreading them throughout society.

#### TOK Biodiversity Protection Declaration

https://www.tok.co.jp/eng/csr/env-activity/s\_management.html#biodiversity



#### Regarding Groundwater Pollution at the Sagami **Operation Center**

In December 2020, voluntary inspections of groundwater pollution detected arsenic and arsenic compounds exceeding standard values at the Sagami Operation Center. We took careful action to prevent the spread into the surrounding areas and have adequately responded to all administrative instructions, including the prompt conduct of a flow survey. As of May 2021, no pollution has been detected by these substances. We will continue to conduct periodic monitoring.

#### **TOK Human Resources**

Shinji Okada Facilities Section, Koriyama Plant

