# Sustainability Management

We aim to create social value through innovative gas solutions that increase industrial productivity, enhance human well-being and contribute to a more sustainable future.



#### Sustainability Management

We will contribute to the realization of a sustainable society throughout the entire value chain.

#### ESG and Materiality

A list of the Company's ESG Materiality themes and the process used for identifying them.

**Four Key Themes** 



Theme: Management Issues

Enhancement of Governance Initiatives to Ensure Safe and Stable Supplies



Theme: Society

Development of Products and Services That Contribute to Resolving Environmental and Social Issues Product and Service Reliability Contribution to Medical Care Intellectual Property and R&D



Theme: The Earth

Promotion of Environmental Management Initiatives for Protecting the Global Environment



Theme: People (Company and Organization)

Respect for Human Rights

Human Resource Development and Training Health and Productivity Management Occupational Health and Safety Communication with Shareholders and Investors Social Contribution Activities

#### **Dialogue with Stakeholders**



# **Sustainability Management**

#### Environmental and Social Contribution across the Value Chain

We work to ensure a solid grasp of our environmental and social impact on stakeholders through all of our business processes—from development and production through to supply, sale, and use, that is, across our entire value chain—and implement a variety of initiatives designed to avoid or mitigate related risks. Looking ahead, we will also strive to contribute to a sustainable society by reinforcing collaboration not only with Group companies but with all stakeholders.

			• E	nvironmental initiatives 🔹 🔸	Social contribution initiatives
and			Stakeh	olders	
prod	Gas production facilities	Employees	Suppliers	Shareholders/investors	Local communities/society
unent Supply	Gas filling Pipelines Pipelines Tanker trucks	<ul> <li>Promotion of chemical substance management</li> <li>Education and training configuration</li> <li>Fair and impartial hiring</li> <li>Creation of a positive work environment conducive to diversity and work-life balance</li> <li>Promotion of physical and mental healthcare</li> <li>Internal communications</li> <li>Guarantee of occupational health and safety</li> </ul>	<ul> <li>Prevention of global warming</li> <li>Development/sale of products that reduce environmental impact</li> <li>Fair and impartial supplier selection</li> <li>Support for dealers through official dealer system</li> </ul>	<ul> <li>Disclosure</li> <li>Distribution of retained earnings</li> </ul>	<ul> <li>Prevention of global warming</li> <li>Promotion of chemical substance management</li> <li>Reduction/recycling of resources</li> <li>Assistance with community disaster prevention and environmental protection initiatives</li> <li>Disclosure</li> <li>Support for education</li> </ul>
Sales	Sales offices	Employee welfare system			of future generations <ul> <li>Security/management</li> </ul>
	•				
	Customers <ul> <li>Steel</li> </ul>	Custo	mers		
Use	<ul> <li>Chemicals</li> <li>Electronics</li> <li>Transport equipment and machinery</li> <li>Food</li> <li>Life sciences/medical</li> <li>Energy</li> <li>Others</li> </ul>	<ul> <li>Reduction/recycling of resources</li> <li>Development/sale of products that reduce environmental impact</li> </ul>	Process safety management Product safety Product quality control/ quality assurance Information management		



#### ESG Management System

Nippon Sanso Holdings holds a meeting of the Global Strategy Review Committee, chaired by the president and CEO, once a year. The committee decides on the policy for key initiatives in technological risk management (including safety, quality and product safety, environmental, and intellectual property risks), based on the President's Basic Policy on Technological Risk Management.



#### Nippon Sanso Holdings Auditing and Risk Management Structure

Coordination

#### Nippon Sanso Holdings Group Risk Management Structure



#### The Presidential Policy Directive on Technology Risk Management

The President CEO of Nippon Sanso Holdings requests all the Group members to comply thoroughly with the applicable laws, regulations, and rules as "The Gas Professionals," and herewith has established the following policy on the risk management of public safety and security, quality, product safety, environmental sustainability, and intellectual property, that are essential to running our business.

All the Group members are expected to: • thoroughly comprehend this policy and put it into practice, • minimize the risk of loss by planning, doing and continuously improving the corporate risk management system and business continuity plan (BCP) to cope with disasters, e.g., large-scale earthquakes, • make sincere efforts to raise customers' satisfaction over our business activities, • obtain and maintain social credibility by achieving public safety and security, and contribution to environmental sustainability of the earth, and • pursue a sound prosperity of our business and an enhancement of our corporate value.

Public safety and security : We, Nippon Sanso Holdings, implement voluntary activities for safety

assurance based on our motto of "Selling gas is selling safety."

**Quality**: We, Nippon Sanso Holdings, accurately identify the sophisticated and diversifying needs of customers and society,and offer the services and products of the best suited quality in response. **Product safety**: We, Nippon Sanso Holdings, offer safer and more reliable products by minimizing dangers inherent over the life of the products.

**Environmental sustainability** : We, Nippon Sanso Holdings, drive action to reduce the impact on the global environment and prevent pollution.

**Intellectual property**: We, Nippon Sanso Holdings, by obtaining the exclusive right of intellectual properties and exploiting them, protect our business from patent litigation that might be imposed by other parties.

#### Contribution to the SDGs

The Group's mainstay products are industrial gases. They are made using the natural resource of air. We therefore consider the global environment to be an irreplaceable resource and view its preservation in a sustainable condition for the future to be our natural mission. The Group has formulated its ESG Materiality themes and will contribute to the SDGs through its industrial gases business.



#### Participation in Initiatives

The Group participates in a range of initiatives that include Japanese and overseas companies. Nippon Sanso Holdings announced its agreement with the TCFD recommendations in 2019. For the new medium-term management plan that starts from FYE2021, we will work to disclose information in line with the recommendations, covering governance, strategy, risk management, indicators, and targets. We will also work to contribute to the realization of the 17 goals and 169 targets presented in the SDGs, promoted by the United Nations.

#### NIPPON SANSO HOLDINGS

# **ESG Materiality**

With the aim of contributing to the realization of a sustainable society, Nippon Sanso Holdings works to ensure a solid grasp of its impact on the global environment, society, and people (the Company and its organizational structure) through all of its business processes, that is, across the entire value chain. To this end, we have defined the roles we are expected to play in addressing issues we have identified as being of material importance, which are grouped under four themes, including management issues.

Low-carbon	society (	Climate change	Technological innova	ation	
Falling birth	rate and aging	population	International situation		
Theme	Materiality	Role of the	e Nippon Sanso Holdings	Principal Initiatives	Relevant
Management issues	•Compliance •Corporate governance •Process safet	<ul> <li>S) Group</li> <li>In adhere standards corporate impartial, promoting complian regulation and intern</li> <li>Reinforce by improving transpare as by inc agility thr managem and acce</li> <li>Strengthe for ensur with our b commens</li> <li>Realize s gases, th to provide customer needed.</li> </ul>	ence to high ethical s, strive to conduct e activities in a fair, and sincere manner by g and maintaining ce with relevant laws, ns, international norms, nal rules. e corporate governance ving management ency and fairness, as well reasing management ough efforts to enhance nent oversight functions lerate decision-making. en independent systems ing process safety in line pelief that selling gases is surate with selling safety. table supply of industrial ereby ensuring our ability e the gases our rs need when they are	<ul> <li>Reinforcement of systems based on Japan's Corporate Governance Code</li> <li>Initiatives to ensure safe and stable supplies</li> <li>Continuous implementation of compliance training</li> </ul>	SDGS 8 DECENT WORK AND ECCNOMIC GROWTH WILL OR OWTH WILL OR OWTH WILL OR OWTH WILL OR OWTH WILL OR OWTH WILL OR OWTH WILL OR OWTH
Global environment	<ul> <li>Efficient use of resources and energy</li> <li>Climate chang</li> <li>Securing of cle water resource</li> <li>Preservation o biodiversity</li> </ul>	<ul> <li>Introduce reduce ela and CO2</li> <li>Lower fue trucks to r emissions</li> <li>Fortify fran climate ch reduction emissions</li> <li>Promote t greenhou creation c mitigate/a and expan the sale o bottles an</li> </ul>	effective ASUs that help ectric power consumption emissions. I consumption by tanker reduce related CO2 s. mework for mitigating hange through the of greenhouse gas s and other efforts. he reduction of se gas emissions and the of opportunities to idapt to climate change nsion of business through of vacuum-insulated ad cookware	<ul> <li>Promotion of environmental management</li> <li>Initiatives to protect the global environment</li> </ul>	7 ATORIABLE AND CLEAR BRENZY CONSUMPTION NO PRODUCTION COOST 13 CLIMATE ACTION



Society	<ul> <li>Contribution to maintenance of physical health</li> <li>Contribution to medical care</li> <li>Response to food- and agriculture- related issues</li> <li>Increase in consumer satisfaction</li> <li>Contribution to upgrading and expanding social infrastructure</li> <li>Response to smart societies</li> </ul>	<ul> <li>Contribute to health and medical care through the provision of products for the medical field.</li> <li>Provide industrial gases and related equipment that contribute to the resolution of key issues by helping protect food resources and improve agricultural productivity.</li> <li>Leverage the advantages of LP gas, including its low carbon footprint and disaster-resistant nature of its distribution system, to create business opportunities and expand business.</li> <li>Contribute to the realization of comfortable and environment-friendly lifestyles through the sale of Thermos brand products.</li> <li>Ensure that customers can use products and services with peace of mind by strengthening systems to ensure quality and safety across the entire product life cycle.</li> </ul>	<ul> <li>Development of products that contribute to solutions for environmental and social issues</li> <li>Reinforcement of quality assurance and management systems</li> </ul>	3 GOOD HEALTH AND WELL-BEING AND NEALSTRY, INNOVATION AND NEALSTRY, INNOVATION AND NEALSTRY, INNOVATION
People (the Company and its organizational structure)	<ul> <li>Respect for human rights</li> <li>Occupational health and safety</li> <li>Human resources development and training</li> <li>Diversity and inclusion</li> <li>Product and service reliability</li> <li>Promotion of measures to improve information security and privacy</li> <li>Stakeholder engagement</li> <li>Contribution to communities</li> <li>Promotion of sophisticated ICT use</li> <li>Participation in initiatives and demonstration of leadership</li> <li>Promotion of sustainability in the supply chain</li> </ul>	<ul> <li>Respect human rights in corporate activities and require that business partners do not violate human rights or engage in any form of discriminatory behavior (through such measures as the promotion of anti-harassment initiatives and the establishment of hotlines).</li> <li>Promote health management in accordance with relevant national and regional laws and regulations, create a safe work environment, while at the same time maintaining and advancing the physical and mental health of employees.</li> <li>Offer equal opportunities in hiring, placement, advancement, and skill development as well as seek to foster and develop human resources from a medium- and long-term perspective.</li> <li>Actively seek to secure diverse human resources with diverse values without regard to considerations such as nationality, age, or religion and promote diversity and inclusion in corporate activities (e.g., promotion of active roles for women, hiring of non-Japanese, employment of people with disabilities, etc.).</li> <li>Recognize the importance of and responsibilities associated with protecting information assets in corporate activities and ensure appropriate information</li> </ul>	<ul> <li>Thorough internal promotion of the "Policy on the Prevention and Eradication of Harassment in the Workplace"</li> <li>Employee education and training</li> <li>Maintenance and improvement of information security systems</li> <li>Promotion of sophisticated ICT use</li> <li>Dialogue with shareholders and investment analysts</li> <li>Initiatives to ensure safe and stable supply</li> <li>Creation of environments to promote innovation and diversity</li> <li>Social contribution activities</li> <li>Health management initiatives</li> <li>Enhancement of information disclosure</li> </ul>	3 GOD HEATH AND WELL-BENG AND WELL-BENG AND WELL-BENG AND WELL-BENG AND WELL-BENG AND WELL-BENG AND WELL-BENG AND



	confidential information pertaining to customers, business partners.	
	Nippon Sanso Holdings, and	
	•Step up efforts to contribute to society through business activities	
	and deepen understanding of communities while at the same	
	time working continuously to respond to communities' requests and expectations	
	•Earn stakeholders' trust through respect and close dialogue and	
	by reflecting their views in corporate activities, and work with	
	stakeholders to realize a better society.	

#### ESG Materiality Identification Process

Based on the materiality matrix set out by the parent company, Mitsubishi Chemical Holdings Corporation, we have formulated the Nippon Sanso Holdings Group's version, deciding on the importance of management issues based on their materiality. In the identification process, the suitability of the themes was discussed by the KAITEKI Promotion Committee,\* which is an ancillary body of the Management Committee that promotes Mitsubishi Chemical Holdings' vision, "Realizing KAITEKI." Moreover, in accordance with the identification process detailed below, we are examining the revision of ESG materiality and KPIs for the next medium-term management plan.

\* The discussion will be conducted within the sustainability strategy of the Global Strategy Review Committee,

which was newly established on October 1, 2020 as part of a reorganization that was conducted on the same day in conjunction with the transition to a holding company structure. The following identification process is presented based on the results of initiatives taken under the corporate structure prior to September 2020.

As the KAITEKI Promotion Committee secretariat, the KAITEKI promotion project prepares materials related to ESG materiality.

Examination, discussion, and decision by the KAITEKI Promotion Committee

Report to the Management Committee (in effect, decisions made by execution function)



### Matrix of Key Initiatives



• Key issues related to the global environment • Key issues related to social systems • Key issues related to the Company and its organizational structure

## Theme: Management Issues

#### Enhancement of Governance >

In March 2015, the Financial Services Agency and the Tokyo Stock Exchange announced Japan's Corporate Governance Code (the "Code"). The Company has taken the principles of the Code seriously and worked to strengthen its structure in line with the Code's main themes. Looking ahead, we will continue working to improve compliance and realize a sustainable society.

#### Corporate Governance Framework

We have established corporate governance principles to serve as guidelines for corporate governance across the Nippon Sanso Holdings Group. With the aim of ensuring sustainable growth and increasing corporate value over the long term, and taking into account the positions of stakeholders, we strive to guarantee the transparency and fairness of decision-making. This reflects our belief that the key to effective corporate governance is to bolster the strength of management by ensuring the effective use of available management resources and making swift, resolute decisions.



#### Auditing Structure and Risk Management Structure

Coordination

#### NIPPON SANSO HOLDINGS

#### Initiatives to Improve Corporate Governance

Date	Area	Initiative
June 2015	Composition of the Board of Directors	Revised Articles of Incorporation to reduce the maximum number of directors on the Board of Directors from 20 to 15, reduced the actual number of directors on the Board of Directors from 16 to 11 and appointed two independent outside directors
June 2015 July 2015	Compliance	Established the position of Chief Compliance Officer (CCO) with the aim of ensuring the effectiveness of compliance Established the Internal Control Office to assist the efforts of the CCO
October 2015	Other	Formulated Principles of Corporate Governance Formulated disclosure policy
June 2016	Committees	Established the Advisory Committee on Appointments and Remuneration, consisting of the chairperson of the Board of Directors, the president (CEO), and independent outside directors, to improve the transparency and objectivity of procedures for appointing and determining remuneration for directors
June 2016	Remuneration for directors	Introduced performance-linked bonuses tied to degree of achievement of medium-term management plan targets as an incentive with the goal of driving medium-term growth
July 2017	Committees	Established the Information Management Committee to create an appropriate framework for the joint management of information among pertinent departments
February 2018	Compliance	Appointed a Group CCO and six regional CCOs (North America, East Asia, Taiwan, Southeast Asia, India, and Australia) to create an effective Groupwide compliance framework and formulated global compliance management regulations Established the Global Compliance Committee, which comprises the regional CCOs and is chaired by the Group COO, to facilitate the sharing of information on the status of compliance within the Group, the progress of legal proceedings, and various related issues
June 2018	Risk management	Established the TNSC Technical Academy with the purpose of providing safety training and ensuring technical skills are passed on, crucial considerations from the perspective of technological risk management
March 2019	Compliance	Appointed a regional CCO for Europe

Initiatives to Ensure Safe and Stable Supplies >

The Group has been working to ensure the safety of facilities and equipment, provide safe and secure operations, and raise awareness of safety. Looking forward, we will continue to steadily reinforce safe and stable supply systems through all industrial gases processes, from production to supply and product use.

As "The Gas Professionals," we work to provide safe and stable supplies of industrial gases to customers in a wide range of industries.

To ensure safe and stable supplies of industrial gases, we are stepping up efforts at all Nippon Sanso Holdings Group production and supply facilities, as well as at the facilities of our sales partners and at our customers' premises, to strengthen our capabilities at the production, supply, and use stages.

In line with our belief that "Selling gas is selling safety," we rigorously implement safety management, having built a safety management system headed by the president and CEO under the president's approach of steadily implementing independent safety measures. Specifically, the Global Strategy Review Committee, chaired by the president and CEO, meets every year, and the decisions made by the committee on matters including safety-related technology risk management are incorporated into the activity plans of each region around the world to ensure they are rigorously implemented.

#### Safety Management System in Nippon Sanso Holdings

The Group has established the NSHD Group Standards related to safety, quality, and the environment, and aims to further advance safe and stable supplies of industrial gases while integrating its standards in each region. Furthermore, at the TNSC Technical Academy, we conduct experience-based training to increase risk tolerance among other measures to implement training for Group employees in regions outside of Japan.

In addition to the above, the Group conducts the following kinds of safety activities in each region.

The Taiyo Nippon Sanso Group has bolstered its efforts to prevent accidents, such as presenting safety commendations to recognize the results of independent safety activities in its Production Division. In addition, to ensure the safe use of industrial gases by customers, we offer safety seminars regarding the properties of industrial gases, their dangers, and safe handling. We have also designated 55 emergency response depots nationwide to provide rapid responses to gas leaks occurring during transport of specialty gases or during use by customers, and we also conduct training and drills for emergency response personnel.

To conduct these initiatives systematically, the Taiyo Nippon Sanso Group has established the following safety management organization.

#### Taiyo Nippon Sanso Group Safety Management Organization



#### Safety and Quality and Product Safety Management Framework

\* Specified sites are mixed-purpose sites—primarily production and research facilities—that are under direct divisional supervision and for which integrated safety management is necessary.

On the other hand, overseas, the Matheson Tri-Gas, Inc. Group aims to realize accident prevention through education based on e-learning and practical drills for the production and transport divisions. The Group conducts regular drills for containing leaking cylinders so that it can response rapidly to emergency situations such as leaks of specialty gases. The Nippon Gases Euro-Holding S.L.U. Group holds multiple accident prevention campaigns with full participation by all employees at its production facilities, constantly promoting and improving safety awareness and skills. At production sites in the Asia and Oceania region, we actively conduct safety patrols to promote improvements, and the regional safety officers come together at safety conferences to pursue best practices, aiming to supply industrial gases more safely and stably.

#### Audits

We conduct safety and environmental audits at our own sites, as well as at sites operated by affiliated companies to manage technological risks related to, among others, safety and the environment. Safety and environmental audits, the main goals of which include reinforcing compliance and preventing accidents, are conducted by the Technical Audit Dept., in principle every five years, at all Group companies in Japan and overseas. In FYE2020, safety and environmental audits were conducted at 26 sites belonging to 21 companies in Japan and four sites belonging to two companies in two countries overseas (Asia). Internal audits also were conducted in the United States and Europe and information was shared with the Technical Audit Dept..

Furthermore, in Japan we conducted management inspections, in which the general manager of the pertinent Taiyo Nippon Sanso Corporation division or branch assesses the status of safety and environmental activities from a management perspective.

## Theme: The Earth

#### Promotion of Environmental Management

Nippon Sanso Holdings holds a meeting of the Global Strategy Review Committee, chaired by the president and CEO, every year. The committee decides on the policy for key initiatives for the environment for each year.

We have established a framework for promoting a broad range of initiatives with the aim of contributing to environmental protection.

#### **Environmental Management Framework**

Nippon Sanso Holdings has established an environmental management framework for promoting policies decided by the Global Strategy Review Committee at its Group companies.



In line with the Group's Rules for Environmental Management, our Environmental Management Committee from Taiyo Nippon Sanso Group, which is chaired by the individual responsible for environmental management, meets once annually. We have established an Environmental Contribution Investigation Working Group as a subsection of the Environmental Management Committee to guide our efforts to address particularly important challenges. The Environmental Management Committee's annual meeting formulates decisive initiatives to address issues determined by the Technological Risk Management Conference and deliberates annual activity reports and activity plans for the Company as a whole, corporate headquarters, branches, specified sites, and working groups.

#### **Environmental Management Framework**



\* Specified sites are mixed-purpose sites—primarily production and research facilities—that are under direct divisional supervision and for which integrated process safety management is necessary.

#### **Environmental Training**

Taiyo Nippon Sanso provides a wide range of environmental training to all employees with the aim of raising employee awareness of environmental initiatives. Our environmental training program encompasses components focusing on environmental targets, environmental laws and regulations and emergency responses, as well as training for internal auditors.

New recruits are given basic Group training for new employees to promote the understanding of basic environmental issues and encourage familiarity with the Group's environmental initiatives and achievements.

#### Certification under ISO 14001

A total of 12 Nippon Sanso Holdings Group companies in Japan and 29 Group companies overseas have obtained certification under ISO 14001, the International Organization for Standardization (ISO)'s standard for environmental management systems.

Japan	Overseas	
Taiyo Nippon Sanso Corporation Thermos K.K. Shizuoka Sanso Inc. Japan Fine Products Co., Ltd. Sogo Kariya Sanso Corporation Taiyo Nippon Sanso Engineering Corporation Taiyo Nippon Sanso Gas and Welding Corporation Taiyo Nippon Sanso Higashikanto Corporation Daiichikaimei Co., Ltd. Nippon Ekitan Corporation Nissan Tanaka Corporation Funtaigiken Co., Ltd	Matheson Tri-Gas, Inc. Nippon Sanso (Thailand) Co., Ltd. Ingasco, Incorporated Ayutthaya Industrial Gases Co., Ltd. Vietnam Japan Gas Joint Stock Company Leeden National Oxygen Ltd. Taiyo Nippon Sanso Clark, Inc. Taiyo Nippon Sanso Clark, Inc. Taiyo Nippon Sanso Philippines, Inc. Nippon Gases Scandinavia Holding AS Nippon Gases Offshore Asia Pacific Pte Ltd. Nippon Gases Offshore Tanks Ltd. Nippon Gases Offshore Tanks Ltd. Nippon Gases Offshore Ltd. Nippon Gases Spana S.L.U. Nippon Gases Norge AS Nippon Gases Deutschland Holding GmbH Nippon Gases Deutschland GmbH Nippon Gases Denmark A/S Nippon Gases Sverige AB Rivoira Gas S.r.I. Rivoira Operations S.r.I. Rivoira Pharma S.r.I. Rivoira Refrigerant Gases S.r.I.	Taiyo Nippon Sanso Engineering Taiwan, Inc. Taiyo Nippon Sanso Taiwan, Inc. Dalian Chanxhing Island Taiyo Nippon Sanso Gas Co., Ltd. Matheson Specialty Gas ( Xi'an) Co., Ltd. Shanghai Taiyo Nippon Sanso Gas Co., Ltd.

#### Acquisition of Green Management Certification

Green Management is an environmental certification system for companies engaged in transportation, including those operating truck, bus, and taxi fleets, administered by the Foundation for Promoting Personal Mobility and Ecological Transportation. Efforts to reduce the environmental impact of their operations are screened based on the foundation's Green Management Promotion Manual, with companies judged to be implementing particularly key initiatives earning Green Management certification and registered. As of October 2020, a total of 11 of the 19 Taiyo Nippon Sanso Group and subcontracted logistics companies\* we use, including Nissan Unyu K.K., have earned Green Management certification.

\* For more information, please refer to the Sustainability Data Book.

#### Initiatives for Protecting the Global Environment

We promote a broad range of initiatives to prevent global warming. Of particular note, we are taking steps to reduce energy consumed per unit of production at gas production facilities, promoting energy-saving measures at various sites, and striving to increase the efficiency of transport by tanker truck.

We promote a broad range of initiatives to combat climate change with the aim of helping mitigate global warming, the central theme of our environmental protection efforts. Of particular note, we are taking steps to reduce energy consumed per unit of production at gas production facilities, promoting energy-saving measures at various sites, and striving to increase the efficiency of transport by tanker truck.

We also promote the development of products that reduce our impact on the environment and propose solutions that contribute to global environmental protection.

#### Environmental Impact of Oxygen, Nitrogen, and Argon Production

The production of the Nippon Sanso Holdings Group's core air separated gases (oxygen, nitrogen, and argon) requires a considerable amount of electric power.

Air separation units produce oxygen, nitrogen, and argon simultaneously by separating atmospheric air into its constituent gases. Air is first compressed, a process that is highly energy intensive and thus uses a significant amount of electric power. Compressed air is cooled almost to the point where the gases liquefy. After this, it is ready for the distillation column, where it is separated into its gas and liquid components using a thermal distillation process. Nitrogen, which has a low boiling point, concentrates in the gas and is withdrawn from the top of the column, while oxygen, which has a higher boiling point, concentrates in the liquid and is withdrawn from the bottom of the column. Argon, which has an intermediate boiling point, is withdrawn from the middle of the column.



#### Air Separation Unit: Simplified Process Flow

#### Preventing Global Warming

Our efforts to contribute to the prevention of global warming center on reducing energy consumption at gas production facilities. We have established an Environmental Contribution Investigation Working Group as a subsection of our Environmental Management Committee to improve energy consumption per unit of production. In FYE2020, consumption of energy per unit of production by such facilities was down 2.9% from FYE2006, the base year used for this measurement, reflecting the installation of energy-saving type air separation units and other measures.

Moreover, these facilities' consumption of electric power per unit of production was down 29.5% from FYE1991. Efforts by gas production facilities to reduce energy consumption included developing and installing energy-efficient air separation units, replacing air separation unit components with new high-efficiency versions and optimizing facility operations to better reflect demand.

These facilities also promote initiatives in line with the Commitment to a Low-Carbon Society plan formulated by the Keidanren (Japan Business Federation) and the Japan Chemical Industry Association (JCIA)'s action plan for realizing a low-carbon society.



#### Electricity Consumption at Gas Production Facilities \* in Japan / Energy per Unit of Production Index



 Electricity consumption (Left axis) 

 Electricity per unit of production index (Right axis)
 Gas production facilities of Taiyo Nippon Sanso Corporation and its consolidated subsidiaries, and of certain affiliated companies

#### Other Initiatives

Challenges and targets	Principal initiatives	Progress as of FYE2020	Relevant companies/ departments/sites *1
1. Promote energy-saving measures at various sites to reduce electric power consumption (Target: Average annual reduction of 1.0% over the medium to long term)	<ul> <li>Cut unnecessary electric power consumption by office and lighting equipment</li> <li>Replace air conditioning, office equipment, lighting, shared, and other equipment with energy- efficient new models</li> <li>Implement no overtime days and Cool Biz (liberal summer dress code to reduce use of air conditioning)</li> </ul>	Down 4.9% (from FYE2019)	All Taiyo Nippon Sanso sites (excluding gas production facilities)
2. Increase the efficiency of transport by tanker truck to reduce fuel used in the transport of products	<ul> <li>Optimize shipping routes</li> <li>Rethink delivery intervals</li> <li>Promote the weighing of cargo in the presence of the customer</li> <li>Introduce new-model tanker trucks</li> <li>Reinforce green driving training</li> </ul>	Down 28.0% (from FYE1991)	Group and subcontracted logistics companies * 1
training         training         Take steps to bolster sales of hydrogen refueling         S. Contribute to environmental protection through our products by increasing sales of environment-friendly products       stations, SCOPE – JET®, MG Shield®,SF6 recovery service, Thermos products, nitrogen supply systems for laser processing, and combustion-type gas abatement systems		Contribution to overall reduction: 2,373,000 tonnes of CO2 <sup>*2</sup>	Nippon Sanso Holdings and its consolidated subsidiaries in Japan

- \*1 For information on relevant companies/departments/sites, please see the Sustainability Data Book.
- \*2 Contributions to the reduction of greenhouse gas (GHG) emissions were calculated in accordance with

Japan's Ministry of Economy, Trade and Industry's Guideline for Quantifying GHG Emission Reduction Contribution (formulated in March 2018).

#### Material Balance



Environmental Inputs and Outputs of the Nippon Sanso Holdings Group's Operating Activities

Note: Reporting boundary for environmental inputs and outputs

Development and production:

Taiyo Nippon Sanso, directly owned consolidated subsidiaries in Japan and principal consolidated subsidiaries overseas Supply, Sales:

Taiyo Nippon Sanso and directly owned consolidated subsidiaries in Japan (For information on principal overseas subsidiaries, see the Sustainability Data Book (FYE2020).)

## Theme: Society

#### Development of Products and Services That Contribute to Resolving Environmental and Social Issues

# We capitalize on gas control technologies cultivated over many years to promote the development and supply of a range of products that contribute to global environmental preservation by reducing environmental impact and help resolve social issues.

Nippon Sanso Holdings aims to realize a sustainable society and global environment through the industrial gases business. The Nippon Sanso Holdings Group considers air to be a precious natural resource, and the global environment to be irreplaceable. We naturally consider it our mission to maintain the global environment in a sustainable condition for the future. The Group will develop a variety of products that contribute not only to the global environment but also to efficiency gains in work-style reforms at customers' plants and propose them to the market.

#### IGSS—A New Gas Supply System That Meets Customer Needs for Converting to Smart Factories and Realizes Labor Saving and Digitalization of the Gas Industry

Energy saving Operating efficiency gains Work-style reforms

The stable supply of gas and monitoring of equipment along with daily container exchange operations play an important role in ensuring the production, quality, and safety of customers' products. IGSS is digital innovation technology using the IoT and RPA as an initiative for the fourth industrial revolution. It was developed as a next-generation gas supply system that incorporates the Company's gas handling expertise accumulated over many years. By realizing a society in which humans and robots work together cooperatively, and providing new additional service, we will contribute to operating efficiency gains and labor saving for our customers.

#### **IGSS System**

- · C-drive : Automated container conveyor system
- LUM-system: Container management database system
- · C-eyes: Constant inspection support
- · U-NACS II tab: Tablet operating Gas Cabinets
- · C-recorder: Operation recorder
- TELEOS-i: High-performance monitoring system Reference: News release (in Japanese only)



C-drive—A robotic system for automated conveyance of gas containers

Oxygen Combustion Technology Contributed to Energy Saving and CO2 Emissions Reduction

Energy saving

Reduction of air pollution

Taiyo Nippon Sanso promotes the development of oxygen combustion technologies for a broad range of applications, contributing to energy saving and emissions of substances harmful to the environment. For example, we have developed a combustion technology whereby high-purity oxygen is added to atmospheric air, increasing the oxygen concentration to 21% or higher, which boosts combustion efficiency. This facilitates a higher burner flame temperature while at the same time lowering the concentration of NOx, thereby reducing NOx in emissions and thermal losses. This technology is used in a variety of applications, where it contributes to both energy saving and CO2 emissions reduction, including high-temperature



The Innova-Jet<sup>®</sup> swing burner directs flames efficiently and evenly over a wide area via self-induced oscillation.

heating furnaces and melting furnaces.

This achievement has its origins in an oxygen burner technology introduced from U.S. firm Air Reduction Company in 1970, in which fuel (mainly heavy oil) and oxygen were injected into a nozzle tip, diffused, and combusted. Attaching a nozzle and oxygen burner to a smelting or sintering furnace thus made it possible to improve productivity. In the United States, the technology was commonly used in aluminum smelting, but in Japan it first became popular as a way to reduce energy consumed by electric furnaces, after which use expanded to include other industrial furnaces, including aluminum melting furnaces, refractory cement melting furnaces, and aluminum oxide kilns. Taiyo Nippon Sanso has responded by developing a lineup of products suited to diverse needs, including the SCOPE-Jet<sup>®</sup> swing burner, which substantially reduces power consumption, and Innova-Jet<sup>®</sup>, which achieves a significant reduction in NOx generation during oxygen-enriched combustion.

#### SF6 Gas Recovery Service Realized Using Proprietary Technologies

Prevention of global warming

SF6 gas is a type of greenhouse gas known as sulfur hexafluoride. Used in voltage transformers and highvoltage electrical equipment, it has a global warming potential (GWP) around 20,000 times that of CO2. In addition, on sites where SF6 gas is used, the purity decreases after recovery, making it unsuitable for reuse. Taiyo Nippon Sanso Group company Taiyo Nippon Sanso Higashikanto Corporation has addressed this issue using proprietary technologies developed in-house to provide a comprehensive service for recovering SF6 gas, processing it for reuse, and detoxifying and recycling it. We aim to achieve zero emissions to contribute to preservation of the global environment and realize a recycling society.



We supply all equipment and services related to SF6 recovery.

# NeoKelvin <sup>®</sup>-Turbo 10 kW Large-Capacity Turbo-Brayton Refrigerator for Superconducting Power Cables

#### Energy saving

In the area of superconducting power cables, practical development is expected to yield benefits in the form of a stable power grid and reduced costs. Of particular note, efforts to achieve commercialization are progressing overseas, fueled by growing demand for electric power. In response to rising needs, in May 2013 Taiyo Nippon Sanso launched the NeoKelvin®-Turbo 2 kW, a Turbo-Bravton refrigerator developed specifically for this application that uses neon gas as a refrigerant. In July 2016, we commenced sales of NeoKelvin®-Turbo 10 kW, a large-capacity Turbo-Brayton refrigerator. While NeoKelvin®-Turbo 2 kW is only capable of cooling testscale superconducting power cables several hundred meters long, NeoKelvin®-Turbo 10 kW facilitates the cooling of cables upwards of 1.0 km. A prototype of the NeoKelvin®-Turbo 10 kW is currently being used to cool cables in a superconducting power cable verification test being conducted jointly by Korea Electric Power Corporation and LS Cable & System Ltd. on the Korean island of Cheju. In July 2019, actual transmission of electric power through these cables began, marking the first time a Turbo-Brayton refrigerator has been used commercially for cooling superconducting power cables.



NeoKelvin<sup>®</sup>-Turbo 10 kW large-capacity Turbo-Brayton refrigerator

### Energy-Saving Ultra-Large-Scale Air Separation Unit

#### Energy saving

Air separation units take in atmospheric air and produce gases, notably oxygen and nitrogen, through liquefaction and separation.

Taiyo Nippon Sanso's ultra-large-scale air separation unit offers distinct advantages over its predecessors in terms of energy efficiency, reducing energy consumption per unit of gas produced by approximately 15%. This accomplishment reflects three key improvements:

- 1. Increased operating efficiency, achieved by boosting the size of the unit as a whole and of the air compressor;
- 2. Reduced air compressor power requirements, attributable to the use of a low pressure-loss packed column; and
- 3. Reduced air compressor energy consumption, a result of the use of a downflow condenser reboiler 減



Ultra-large-scale air separation unit

#### Nitrocube ® RE-LT Series of High-Performance PSA Nitrogen Generators

#### Energy saving

Pressure-swing adsorption (PSA) nitrogen generators capitalize on differences in the properties of the adsorbent used to continuously extract nitrogen while alternately pressurizing and depressurizing compressed air. In addition to achieving performance improvements by modifying its in-house adsorbent technologies and by combining a newly developed proprietary gas separation process with a control technology that optimizes the action of the compressor in accordance with the amount of nitrogen generated, Taiyo Nippon Sanso succeeded in reducing energy consumption. Thanks to these energysaving technologies, Nitrocube® RE-LT series' PSA nitrogen generators are eligible for a tax scheme in Japan designed to help strengthen small and medium-sized enterprises.



LT-F nitrogen supply system for laser cutting machines

#### JN Series and MG Series of Nitrogen Generators

Energy saving

Reduction of air pollution

Reduction of noise and vibration

We install nitrogen generators at the sites of customers that consume a large volume of nitrogen. We use an environment-friendly production process that unlike conventional processes does not require the use of chlorofluorocarbon (CFC) refrigerators. The JN series of nitrogen generators are standardized units with advanced noise reduction features. Thanks to process modification, the MG series delivers increased nitrogen yield, achieving a reduction in energy consumption per unit of gas produced of approximately 20%. Taiyo Nippon Sanso also



Nitrogen generator

NIPPON SANSO HOLDINGS



#### Thermos Vacuum-Insulated Products

#### Energy saving

The Thermos business of subsidiary Thermos K.K. capitalized on its vacuum insulation technologies cultivated in the industrial gases business to develop the world's first vacuum-insulated stainless steel bottle in 1978. The Thermos lineup also includes portable vacuum-insulated mugs for hot and cold beverages and sports-use vacuuminsulated beverage bottles, as well as the Shuttle Chef series of vacuum-insulated thermal cooking pots, which continue to cook food with residual heat after being heated for only a short time. All of these products have earned certification under Japan's Eco Mark program.

In line with its goal of providing solutions that enhance lifestyles and are environment-friendly. Thermos continues to promote the development of a variety of products that reduce resource use and contribute to environmental protection.



**[Cold Retention:** 

Vacuum-Insulated Container vs. PET Bottle]



**[Heat Retention:** Shuttle Chef vs. Standard Pot]



Shuttle Chef

#### Package-Type Hydrogen Refueling Station Hydro Shuttle

Prevention of global warming

Reduction of air pollution

The Hydro Shuttle ® package-type hydrogen refueling station integrates the four major components of a hydrogen refueling station—dispenser, pre-cooler, hydrogen compressor, and storage—into a single unit. These compact (9 m × 2 m × 2.6 m) units can be used not only as permanent stations but also as truck-mounted mobile stations. The package format significantly reduces the cost of installation, while the simplification of components means the cost of fabrication is only half that of conventional permanent stations. Because it can be used as a mobile station, a single Hydro Shuttle® offers promise for multiple applications, including on-site stations equipped with hydrogen



production facilities, off-site stations that supply hydrogen produced at facilities elsewhere, and traveling stations that transport hydrogen from one location to another.

In 2017, Taiyo Nippon Sanso started operation of Nimohys Hydrogen Station Minami-Rokugo and Nimohys Hydrogen Station Setagaya, operated by Nippon Mobile Hydrogen Station Services, LLC (nicknamed "Nimohys"). Looking ahead, we will continue working to realize an energy-conscious society.



Mobile hydrogen station Hydro Shuttle®

#### **Biogas Refining Units**

#### Prevention of global warming

Our biogas refining units, which employ ordinary-pressure regenerative PSA, are capable of increasing the purity of methane gas to 98% or higher. We recently developed a low-cost compact unit suitable for the small- and mediumscale decentralized biogas plants used by dairy farmers and food processing factories.

Because high-purity methane gas separated and refined from biogas can be used with city gas appliances, it offers promise as carbon-neutral energy that can be produced locally for local consumption, contributing to environmental preservation.



#### **Biogas refining unit**

#### Sun Cutter<sup>®</sup> HL-1 Gas Cutting Fuel Gas

Prevention of global warming

Operating efficiency gains

Work-style reforms

Gas cutting is a process that uses fuel gases and oxygen to cut steel. Taiyo Nippon Sanso has developed and launched Sun Cutter<sup>®</sup> HL-1, a flammable gas for this application, the principal component of which is hydrogen. Because it emits almost no CO2, Sun Cutter<sup>®</sup> HL-1's environmental impact is minimal. It also enhances work environments by suppressing radiant heat. It also delivers an excellent cutting performance thanks to a cutting speed 1.4 times faster than existing products, lower thermal distortion, and improved cut surface quality.



Index of CO2 Emissions (LPG=100)







Sun Cutter<sup>®</sup> HL-1

Cutting steel with Sun Cutter<sup>®</sup>HL-1

### New Compact Combustion-Type Exhaust Gas Abatement System

Prevention of global warming Reduction of air pollution

Gas abatement systems contribute to the prevention of global warming and reduced environmental impact by efficiently decomposing perfluorocarbon (PFC) gases used in electronics manufacturing, which have a long atmospheric lifetime.

Leveraging related combustion technologies, Taiyo Nippon Sanso developed a new burner that can be installed near the dry pump outlet downstream in the chemical vapor deposition (CVD) system that isolates chambers, reducing the need for previously essential nitrogen and exhaust piping for exhaust gas dilution. By reducing necessary utilities, this unit achieves a reduction in CO2 emissions attributable to exhaust gas abatement systems of 50 to 60% compared with existing models.

V-600

⊗ (LS)

₩-700 「「水出口

0745

# New compact combustion-type exhaust gas abatement system: Overall drawing

NACS HEAT<sup>®</sup> Liquefied Gas Cylinder Heating System

Prevention of global warming

Pump

Reduction of air pollution

V-701A V-702A

We recently added NACS HEAT<sup>®</sup>, a liquefied gas cylinder heating system for use with our U-NACS II automated cylinder cabinet. This energy-efficient system achieves significantly higher energy conversion efficiency than conventional systems using heating blankets or jacket heaters. In addition, an interlock function that links the system to the cabinet itself ensures a safe and stable supply.

Comparison with conventional systems

- Electric power consumption: -50%
- Facility costs: -50%
- Supply capacity: 2–3 times
- Space required: -30%



New compact combustion-type exhaust gas abatement system: Flames in burner



# NACS HEAT® used with a 1,860-liter cylinder

Installing NACS HEAT® on a 47-liter cylinder

Pesticide system for spider mites using carbon dioxide gas to increase agricultural production

Operating efficiency gains Food safety

Nippon Ekitan Corporation sells a system for exterminating spider mites, a pest that affects strawberry cultivation, using pesticide carbon dioxide gas.

Conventional damage is controlled using chemical pesticides and predator mites. However, spider mites have become increasingly tolerant of pesticides, and natural predator mites have sometime been unsuccessful at removing spider mites from strawberries.

Nippon Ekitan has combined its carbon dioxide gas fumigation technology with the spider mite removal technologies of Utsunomiya University to develop a pesticide carbon dioxide gas system to eliminate strawberry spider mites. Carbon dioxide gas is non-toxic, non-flammable, less reactive with other chemicals, and does not adhere to or remain on processed strawberry seedlings. "Ekika Tansan Gas - Agurikun ®" is a product registered and approved based on the Agricultural Chemicals Control Law as carbon dioxide gas used for spider mite extermination.

The highly gas-tight "Sukusuku ® bag" kills adults and eggs of spider mites that inhabit strawberry seedlings by enclosing the pesticide " Ekika Tansan Gas - Agurikun ®" after putting seedlings in the bag.

#### Product and Service Reliability

# To ensure safe and stable supplies of industrial gases, we have established systems for process safety management, as well as for quality management and assurance, and strive to appropriately manage information.

Nippon Sanso Holdings strives to maintain and improve quality in accordance with the Presidential Policy Directive on Technology Risk Management to ensure that customers can use its products and services safely and securely. The Global Strategy Review Committee, chaired by the president and CEO, meets every year to determine the policy for important management initiatives for technology risk (quality and so forth). The operating companies formulate plans based on this policy each fiscal year and carry them out.









#### Nippon Sanso Holdings Quality and Product Safety Management Framework



#### (Reference) Taiyo Nippon Sanso Group Quality and Product Safety Management Framework



\* Specified sites are mixed-purpose sites—primarily production and research facilities—that are under direct divisional supervision and for which integrated safety management is necessary.

#### Product Quality Control / Quality Assurance

In line with the President's Policy Directive on Technology Risk Management, the Nippon Sanso Holdings Group strives to grasp increasingly sophisticated and diverse customer needs and social imperatives and to respond by providing optimum product quality. To this end, we promote extensive quality control and quality assurance initiatives aimed at ensuring a high level of quality for our products and services.

In light of recent increases in expectations regarding both quality control and quality assurance, we sought to reconfirm the effectiveness of initiatives implemented to date, as well as to ensure effective compliance, by once again inspecting related systems at Group companies in Japan and subsequently expanding this effort to include Group companies overseas.

#### **Quality Management System**

We have established a quality management system based on ISO 9001, the International Organization for Standardization (ISO)'s standard for quality management systems, which we continue to leverage with the aim of steadily increasing customer satisfaction. Group companies involved in production—including those involved in the production of industrial gases (oxygen, nitrogen, and argon) and the air separation units and supply equipment used in their production and storage, the production and installation of semiconductor fabrication equipment, the production of medical gases and medical gas supply systems, and all areas of our helium and hydrogen businesses—have acquired ISO 9001 certification.

Moreover, Taiyo Nippon Sanso has also earned ISO 9001 certification for its sales and logistics for liquid oxygen, liquid nitrogen, liquid argon, and specialty gases, reflecting our goal of creating a system that ensures not only the quality of our products but also the provision of stable supplies and effective support.

As of March 2020, a total of 81 Group companies are currently certified under ISO 9001. Going forward, we will continue effectively using our quality management system with the goal of achieving improvements in customer satisfaction and continuous improvement in our operations.

#### Site Analytical Management Certification System

Reliable analytical management is seen as critical to the quality of industrial gases. To ensure its ability to provide optimum product quality, the Taiyo Nippon Sanso Group has established a system for certifying production facility analytical management performance and continue to take steps aimed at bolstering the analytical management capabilities of gas production sites.

#### Product Safety

As outlined in the President's Policy Directive on Technology Risk Management, the Nippon Sanso Holdings Group has built a product safety management framework to offer safer and more reliable products by minimizing safety risks over the entire life cycle of our products, thereby ensuring customers can use our products with peace of mind.

For many products, the Nippon Sanso Holdings Group explores ways to reduce risks from the design stage and consider safety not only during use but at all stages of a product's life cycle, including production, transport, maintenance, and scrapping. Product safety assessments are subsequently conducted by individuals who have earned internal qualifications, after which a declaration of conformity with product safety standards is made by representatives of the pertinent division or affiliated company, thereby ensuring the safety of the products we provide.

#### Information Management

With corporate information leaks an increasingly critical issue, companies face an ever-greater responsibility to manage and protect confidential customer information they accumulate through their business activities. To create a framework for systematic management, the Nippon Sanso Holdings Group's Information Management Committee, established in FYE2018, set forth Rules for Information Security Management to guide our handling of our own and our customers' information. To maintain this system, we continue to promote initiatives across the Nippon Sanso Holdings Group to strengthen management practices, including holding periodic seminars to enhance management-level employees' awareness of changes to pertinent laws and regulations and providing guidance to affiliated companies.

#### Approach to Information Management

- 1. In line with the Rules for Information Security Management, the individual responsible for information security oversees information security Groupwide and appoints information security officers and promotional staff for each division and information security managers for each department.
- 2. Department information security managers are charged with identifying confidential information and classifying such information as either "highly confidential" or "proprietary."
- 3. Appropriate measures are taken to limit access to confidential information.
- 4. Confidential information disclosed by customers will be managed at a level equivalent to or higher than our own confidential information.

#### Information Security Management Framework



#### Contribution to Medical Care

# We provide stable supplies of high-quality medical gases such as oxygen, nitrogen, helium, and nitrous oxide to medical facilities and research institutions.

Nippon Sanso Holdings aims to contribute to health maintenance and medical care through the provision of products in the medical field. We supply high-quality medical gases and medical equipment for applications ranging from large hospitals to home health care, primarily though our nationwide network of logistics and services bases. We are also developing a wide range of equipment for home healthcare. We develop, sell, and rent home healthcare and respiratory therapy-related equipment, particularly home oxygen therapy (HOT). Through our nationwide network of our distributors, we provide 24-hour equipment installation, return, and maintenance inspection services. By providing products and services that are designed for safety and ease of use in every aspect, we contribute to better quality of life (QOL) for patients.

#### Contribution to Home Oxygen Therapy

Japan's coming super-aged society is driving demand for a better system of home healthcare. As such, we are taking steps to enhance our home healthcare services, which center on HOT. HOT is a medical treatment involving the provision of high concentration oxygen using oxygen concentrators, cylinders, and other devices in non-hospital settings Used primarily in the management of chronic obstructive pulmonary disease (COPD), a cause of chronic respiratory insufficiency, HOT is also used in the treatment of a variety of other conditions, including interstitial pneumonia and advanced lung cancer. The use of HOT has expanded significantly since it was first approved for coverage under Japan's national health insurance (NHI) program in 1985, with an estimated 160,000 patients currently receiving this therapy. In addition to enabling patients to better balance the demands of everyday life with treatment, there is also strong evidence of additional medical benefits, including prolonged survival, improved mobility, and a reduction in the frequency of hospitalization. In addition to systems for use when patients are at home or out, there is a need for systems that can be used in a variety of everyday situations, including at school and work, as well as when traveling. Moreover, because they are operated by patients or family members, HOT systems must be easy to use to ensure safety and peace of mind.

We promote product development with the aim of addressing diverse needs, with an emphasis on user-friendliness. For example, when HOT patients leave the house, they can transport oxygen cylinders easily using a dedicated cart, but this is shunned by more than a few patients for a variety of reasons, including the weight of portable cylinders and the attention they attract. In response to concerns such as these, we upended conventional ideas of oxygen cylinders with an ultra-compact portable model that can be carried with only a shoulder strap. thus leaving both hands free in an entirely inconspicuous fashion. Other feedback included comments that the oxygen cylinders were complex and difficult to use, and that patients wanted them to last longer. In response, we integrated the cylinder valve with a built-in oxygen regulator that allows oxygen to be delivered efficiently when breathed in, thereby making cylinders last longer. In addition, we extended the continuous usage time and reduced the weight of the unit by combining it with a lightweight conserver. With an increasing number of patients now able to choose home healthcare, we will also continue to promote the development of easy-to-use devices that can be used free of worry and to enhance our supply configuration.

#### HOT-Related Products

#### Oxygen concentrators

Oxygen concentrators create high concentration oxygen by absorbing oxygen from the air. Since they are powered by electricity, a common concern among patients is that oxygen supplies can be lost if the power goes out. To relieve such concerns, we developed a concentrator that automatically switches to supply from an oxygen cylinder in the event of a power outage or malfunction, as well as a model that includes a backup battery as a standard feature.



Ultra-compact portable oxygen cylinder



These devices gasify liquid oxygen and supply it to patients as highly concentrated oxygen. Because there is no external power source, operation is not affected by power outages. Their portable units can used to refill from a bulk storage reservoir.

# Accessories for portable cylinders

When inhaling oxygen from an oxygen cylinder, if the inhalation volume is small, it may be difficult to tell whether the oxygen gas is flowing through the tube. We developed a visual flow checker to make it easier to see whether the oxygen gas is being supplied.

#### OXYMED Medical Gas Supply System

Drawing on its many years of business experience in the medical gases field, we analyzed near-miss events in hospitals to develop the OXYMED medical gas supply system, which has been pursued for safety and easy to use. Our wide-ranging product lineup and detailed service system enables us to provide a high-quality gas supply system.

### Water-<sup>18</sup>O, a Pharmaceutical Ingredient for Reagents Used in PET Diagnostics

We are the first in the world to successfully manufacture Water-<sup>18</sup>O, a pharmaceutical ingredient for reagents used in positron emission tomography (PET) diagnostics, through distillation of oxygen based on technologies cultivated in our air separation operations. PET scans are widely used for early detection and diagnosis of cancer. An essential pharmaceutical ingredient for the diagnostic reagent used in PET is water marked with the rare oxygen isotope <sup>18</sup>O, known as "Water-<sup>18</sup>O."

We currently have three oxygen isotope separation plants in Japan, providing the world's largest annual production capacity at 600 kg. The final product is manufactured under a quality management system compliant with good manufacturing practice (GMP) at our SI Innovation Center, to supply high-quality Water-<sup>18</sup>O to approximately 35 countries including Japan.

### Contribution to Bioresearch and Development

Induced pluripotent stem (iPS) cells were discovered in 2008, and R&D in the field of regenerative medicine using human cells has been accelerating. The practical implementation of regenerative medicine requires the establishment of technology for reliable management of high-quality cultured cells and the cryopreservation of large quantities of living cells, vaccines, and blood. As Japan's sole manufacturer of liquid nitrogen cryopreservation vessels, we are conducting technology development in areas such as regenerative therapy and biomedicine to create a diverse product lineup.

In the area of cryopreservation of biological samples using liquid nitrogen, we have a market share of roughly 50% in the Japanese market for cryopreservation vessels based on cumulative sales. Using our strengths as Japan's sole manufacturer of these vessels, we have developed a fully automatic cryopreservation system called CryoLibrary<sup>®</sup> ADVANCE to meet diverse cryopreservation needs.

**High-pressure** 

gas manifold

Oxygen flow checker



Hotaru











Liquid nitrogen cryopreservation system



**Biological sample** 

transport container



CryoLibrary<sup>®</sup> ADVANCE

#### Intellectual Property and R&D

# We strive to make use of intellectual property, recognizing it as essential to supporting the competitiveness of our businesses.

Nippon Sanso Holdings recognizes that intellectual property is an important asset, and actively promotes the strategic acquisition, maintenance, and application of intellectual property with the aim of ensuring a competitive advantage, contributing to profitability, and enabling global growth. At the same time, we are working actively to utilize intellectual property in our businesses. In addition to respecting the intellectual property rights of third parties, in line with our philosophy of legal and regulatory compliance, we take appropriate measures against infringements of our intellectual property rights.

Furthermore, we are engaged in research on applied technologies in various fields, including in advanced fields based on our proprietary gas technologies accumulated over more than 100 years since our founding. Looking ahead, we will continue our initiatives to promote the creation and use of intellectual property, and support the growth of the Group as a global company.

#### System for Promoting Intellectual Property Management

Nippon Sanso Holdings will work to encourage coordination with each operating company to ensure the appropriate acquisition, management, and use of intellectual property with a view of strengthening the comprehensive capabilities of the Group and achieving sustainable growth globally. The Global Strategy Review Committee, chaired by the president and CEO, meets once a year to determine the direction for important initiatives in management of technological risks (risks related to safety, quality and product safety, the environment, and intellectual property). Each operating company formulates and executes plans for each fiscal year in accordance with the determined policy.



Number of Publication of Patent Applications

in Japan Held by Taiyo Nippon Sanso Corporation

Number of Patents Held Worldwide by Taiyo Nippon Sanso Corporation



Japan Overseas
%For FYE2016 to 2019, the number of patents held as of I

\*\*For FYE2016 to 2019, the number of patents held as of December 31; For FYE2020, the number held as of March 31





#### Breakdown of Patent Portfolio of Taiyo Nippon Sanso Corporation in Japan by Business

#### R&D

By continuing our rigorous pursuit of the possibilities of gas and uncompromising R&D, we will create new demand for gas. To propose total solutions for our customers' needs, we will continue to make unstinting efforts at the Yamanashi Laboratory, Tsukuba Laboratory, and SI Innovation Center, backed by a wealth of expertise and experience.

#### Yamanashi Laboratory

The Yamanashi Laboratory is one of our global R&D hubs, responsible for development of the Taiyo Nippon Sanso Group's core technologies. These include gas-related safety technologies, oxygen combustion, welding and cutting, heat treatment, low-temperature applications, adsorption, and nanomaterials. Furthermore, the plant also focuses on the development and commercialization of cutting-edge technologies, such as additive manufacturing, which is at the heart of the manufacturing digital revolution, as well as cryopreservation systems for biological samples in the life science field.



Yamanashi Laboratory



Oxygen combustion SCOPE-Jet ® serie



Food-freezing Bistranza series



Additive manufacturing



Carbon nanotubes and copper nanoparticles

At the Tsukuba Laboratory, we are engaged in R&D in the fields of cryoseparation, stable isotope separation, cryogenic technologies, application technologies for gas and stable isotopes, and ultra-high-sensitivity gas analysis. In the electronics field, we are engaged in the development of new materials and processes, as well as cutting-edge research into semiconductor manufacturing technologies such as metal organic chemical vapor deposition (MOCVD).





separation unit

Liquid material container



**MOCVD** equipment for semiconductor manufacturing



NIPPON SANSO HOLDINGS

**Tsukuba Laboratory** 



Separation-type dilution refrigerator e-Diluton®

#### SI Innovation Center

The SI Innovation Center concentrates on R&D of stable isotopes. The center develops and produces stable isotope-related products, such as cell-free protein expression kits and stable isotope labeling tag reagents, and other applications. Based on our proprietary technologies, the center focuses on further technological innovations, for example, participating in national research programs in cooperation with universities and research institutions.



SI Innovation Center



Musaibokun cell-free kit

# Theme: People (Company and Organization)

#### Respect for Human Rights

# As stipulated in the "Respect for human rights" and "Prohibition of discrimination" sections of the Taiyo Nippon Sanso Group Code of Conduct, we are committed to promoting diversity and inclusion and prohibiting discriminatory treatment based on factors such as nationality, race, gender, or other factors.

Nippon Sanso Holdings understands that the Company has the potential to impact human rights in its business activities. As stipulated in our Code of Conduct, we support and respect the protection of internationally proclaimed human rights. In addition, the Group has identified human rights issues related to its business activities and has promoted the formulation of a common human rights policy for the Group that sets out the key elements to be observed in terms of responsibility for human rights. The policy is to be disclosed in February 2021.

#### Nippon Sanso Holdings Group Code of Conduct (Excerpts)

#### (1) Respect for human rights

We will support and respect internationally proclaimed human rights and will not be complicit in human rights abuses.

#### (2) Prohibition of discrimination

We will not engage in any discriminatory treatment in employment or other working conditions by reason of the nationality, race, gender, religion, creed, personal preference, or social status of employees.

#### (3) Prohibition of child labor and forced labor

We will support and implement effective elimination of child labor and abolition of forced labor in any form in accordance with internationally recognized rules.

#### (4) Harassment

We will not allow any sexual harassment as well as any act which may be construed as sexual harassment or any other conduct which may impair the dignity of other employees in the workplace.

#### (5) Protection of privacy

We will ensure that any personal information capable of identifying an individual or private information that may be known to us in the course of business activities will be kept under strict control to prevent leaks.

#### Preventing Harassment

The Nippon Sanso Holdings Code of Conduct forbids any act that may be construed as harassment. Our Rules of Employment clearly stipulate the prohibition of harassment and the establishment of hotlines for employees to seek consultation or report complaints. In addition to providing training to raise awareness of the importance of eliminating harassment, in January 2017 we formulated the President's Policy on the Prevention and Eradication of Harassment in the Workplace, calling on employees to help create positive workplaces by, among others, disseminating information on the policy.

#### Establishment of a Helpline

We have established a helpline to facilitate the swift discovery/correction and prevent the recurrence of compliance violations while also protecting the privacy of whistleblowers. Use of the helpline is governed by guidelines for use, which also outline robust protections that prohibit anything unfavorable to whistleblowers.

#### Promoting the Employment of Individuals with Disabilities

We provide information on opportunities for individuals with disabilities with the goal of further opening the door to employment at our offices across Japan. Such efforts have led to the hiring of individuals to fill positions in a wide range of areas, including general affairs, administration, accounting, sales, distribution, technological management, production control, R&D, and engineering. As of March 31, 2020, the percentage of our labor force accounted for by individuals with disabilities was 2.5%, exceeding the legally mandated minimum of 2.2%. We will continue



working to create workplaces where employees understand and respect one another, so that each employee can work with a positive attitude.

#### Percentage of Labor Force Accounted for by Individuals with Disabilities

	FYE2017	FYE2018	FYE2019	FYE2020
Percentage	2.0%	2.0%	2.2%	2.3%

#### Providing a Working Environment That Encourages Innovation and Diversity

In the Innovation Division, which is located at our Shiba Office, we strive to facilitate global business expansion and value creation by providing a working environment conducive to the development of original ideas and new value and to job satisfaction for a wide range of human resources. As part of this effort, we have established an open area on the eighth floor of the office based on the concept of "a work/lounge/office where employees can choose how and where they work." The space is suitable for a wide range of uses, including meetings, as a workspace, and for presentations using large displays. The Innovation Division brings together diverse human resources, including a number of foreign nationals. In addition to facilitating in-house communication, the open area has also proven useful in encouraging innovation and diversity.



#### Eighth floor open area equipped with tables, counters, meeting spaces, and large displays

#### Human Resource Development and Training

# We work continuously to enhance our highly practical training programs with the aim of fostering the next generation of "The Gas Professionals."

The proper development of human resources is essential for the sustainable growth of a company. It is individual employees who support our social mission of stably supplying industrial gases. Having changed its structure on October 1, 2020, Nippon Sanso Holdings is now expanding its fields of activity even further on a global scale. Right now, nearly 70% of the Group's consolidated employees are non-Japanese, and we are continuing to become a multinational organization. We will strive to create a structure were employees can actively play their roles as "The Gas Professionals" while respecting the values and cultures of different regions.

#### Basic Themes of Human Resources Development

Nippon Sanso Holdings is ranked No. 1 in Japan and No. 4 in the world in the industrial gases market. In Japan, we have already established a solid position as the market leader, and now our aim is to become a global player. Developing human resources who are capable of conducting business globally is an important pillar of the Group's strategy. Looking forward, we aim to implement our "Basic Themes of Human Resources Development" and "Key Employee Qualities and Conduct," which underpin our human resources development, for our employees not only in Japan but globally.

Human resources development that accommodates further globalization

Human resources development that trains "The Gas Professionals" Human resources training that addresses customers' and society's needs Human resources training that emphasizes strengthening integrity

Health	Integrity	Resourcefulness
1. Understands the Importance of	1. Earns Customer Trust	1. Knows the customer
Occupational Health and Safety	Exhibits a dedication to stable supply	Responds to Customers' expectations
Looks after their own health and	and quality assurance and responds	and interests
helps create positive working	with sincerity	
environments		2. Knows Himself/Herself
	2. Exhibits a Well-Formed Character	Works to realize personal goals and
2. Displays a Positive Attitude	Maintains an agreeable temperament	acquire knowledge and skills crucial
Has a positive attitude and see things	and promotes mutual trust and	to a professional and strives to act
through	respect	independently
3. Demonstrates Organizational	3. Endeavors to Fulfill Responsibility	3. Knows Society
Capabilities	to Society	Strives to be open, grasp changes,
Uses communication to overcome	Works to comply with safety, security,	and looks to the future
limited personnel levels and maximize	and environmental standards, as well	
teamwork	as with social norms	

#### Development of Global Human Resources

The Company has always placed emphasis on initiatives to develop professional human resources that are able to work with a global perspective, whether in Japan or overseas. Following this transition, it is now necessary for us to focus even more on these efforts. Currently, we have stationed or assigned overseas a wide range of employees of all ages, ranks, and job types, mainly in Southeast Asia, China, and North America. However, for a company seeking to increase the ratio of overseas sales, the number of our people overseas is still small. We therefore need to have each employee come to see their workplace as being not only Japan but the whole world. To help cultivate this awareness, the Company has implemented training for global human resources and the Overseas Trainee Program.

#### Training for Global Human Resources

We introduced this program in 2007 to enable employees who are capable of functioning in a global business environment to learn the necessary skills for playing an active role both in Japan and overseas. The training is conducted entirely in English by instructors who are foreign nationals and encompasses seven sessions, including final presentations, held over approximately six months. It covers such topics as mindset, logical presentation skills, business model generation, case studies, negotiating proficiency, and leadership skills. In addition to improving language capabilities, the training seeks to cultivate the confidence and presentation skills necessary to express one's own opinions clearly and effectively whenever and wherever necessary.



#### **Overseas Trainee Program**

This program was introduced in 2016 with the goal of developing human resources that are able to quickly produce results when posted overseas. Selected young employees between their fifth and tenth year in the Company are given extensive on-the-job training at one of the Company's overseas subsidiaries. Participants need to apply for the program, and those who wish to are given an opportunity to work overseas. One of the characteristics of Taiyo Nippon Sanso Corporation is that an encouraging environment is provided for those who are motivated to acquire experience.



#### Human Resources Development in Cooperation with Local Operating Companies

Taiyo Nippon Sanso has continued to grow steadily, backed by a stable business model. However, it would be a mistake to assume that this business model is permanent. We must constantly think about the next business model to suit the changes in the times. The same principle applies with human resources development. The industrial gases sector is undergoing rapid globalization, and I believe that we need to develop human resources in connection with regions and operating companies all over the world, not only in Japan. The Company has always emphasized training, but now our vision is to widen the selection pool to a global scale and expand opportunities for personnel exchange training with operating companies and exchange meetings between different industries.

#### Education and Training for Developing "The Gas Professionals"

I believe that what a company can do to develop human resources is provide a place to accumulate experience, conduct education and training covering the required knowledge and skills, and establish a chain of experience. With this in mind, we have been building an education system since FYE2008 and introduced a wide range of focused training programs, including hierarchical, selective, optional, theme-specific, and division-specific education.

In training for new recruits, participants experience a wide range of operations from production to sales, regardless of the job for which they were hired, in order to build a foundation for acquiring the knowledge and skills required by the Company. In our hierarchical training, we provide a program for acquiring the knowledge and skills required to be a working professional, which is arranged so that people can complete the course by their fifth year. Also, even after the five years of basic training after joining the Company, there are training programs for supervisors, managers, and executive officers.

In 2017, we established training for line managers, aimed at strengthening line management and developing team members. Furthermore, we encourage employees to actively participate in external training and selective training run by the Mitsubishi Chemical Holdings Group. For employees who aim to acquire national qualifications, we provide support such as a qualification acquisition incentive scheme and correspondence education course materials. By providing an environment and systems that allow individual employees to grow, we will continue to develop "The Gas Professionals," that are equipped with health, integrity, and resourcefulness.

### Taiyo Nippon Sanso Employee Training Framework

	Hierarchical	Selective	Opti	onal	Ther	ne-spe	cific	
Senior middle management	Training for new corporate officers Training for new middle management	Training for line managers 교요그 오	(full fee	9		Life plannii	(organ	
Middle management	Training for new middle management	verseas Trair aining fo obal human sources	Seminars cor s for the sem	Corres 50% of fees a	Mento	ng seminars	TNSC T lized by the T	Divisio
Fifth year of employment	Strategy and marketing training	nee Pro	nducted	pondeno are paid	rship tra		echnica	nal tra
Fourth year of employment	Finance training	gram	l by thin re paid l	by the	aining		Il Semin gical Ec	ning
Third year of employment	Training in logical thinking		d partie by the c	ses			ars ducatior	
Second year of employment	Followership training		ompany	IV)			ı Team)	
New recruit	Training for new recruits		3					







# Cultivating a Sense of Mission as a Provider of Social Infrastructure over a Five-Year Training System

The Company has a distinctive training system that provides basic training to young employees over a five-year period after recruitment. The basic training starts with a three-month training for new recruits, followed by annual group training with other employees from the same recruitment intake once a year until the fifth year. The program is for all employees, regardless of their type of work, whether it is in business administration or engineering. By building up cross-organizational basic training outside of technical aspects, we aim to have all employees develop a full awareness and deep understanding of the characteristics of the industrial gases business and the importance of our mission of maintaining supply at all costs. Through the five years of basic training, all employees will become more conscious of their roles as "The Gas Professionals" as they work in various fields.

#### Hierarchical Training (First Year to Fifth Year in the Company) Basic Training

Basic training increases employees' skills and raises their perspective incrementally and continuously over five years. In their feedback, employees that have participated in the training indicate that they can observe its benefits and effects. Young employees are assigned to various departments after joining the Company, and enjoy being reunited with others from the same recruitment year where they share their trials and observations. The growth of their same-year colleagues stimulates and motivates them to grow themselves. By conducting the training over five years, the young employees advance through friendly competition and grow, developing a spirit of cooperation that builds better teamwork.



NIPPON SANSO HOLDINGS



First year of employment – Training for new recruits



Third year of employment – Training in logical thinking



First year of employment – Training for new recruits



Fifth year of employment training – Strategy and marketing

#### Fair and Impartial Hiring Practices

The Nippon Sanso Holdings Group seeks to secure diverse human resources and have eliminated such potentially discriminatory factors as gender and age from our hiring practices. Our personnel system is based on three key concepts: Put the right person in the right position, ensure impartial evaluations and training, and provide results-based compensation.

For employees of Taiyo Nippon Sanso Corporation, we have developed job/role-specific criteria for evaluating the performance of and determining compensation for employees. Prioritizing a fixed cycle of actions (fulfill

expectations/exercise capabilities  $\rightarrow$  evaluate performance/determine compensation  $\rightarrow$  provide feedback  $\rightarrow$ 

foster human resources) and repeating this cycle both ensures fairness and impartiality and enhances job satisfaction.

In 2015, Taiyo Nippon Sanso Corporation eliminated the vocational qualification system, an essential component of which is seniority, in favor of a system that focuses on performance so that the personnel system for managementlevel employees assigns the right person to the right position in a timely manner. Additionally, to enhance profit sharing, we raised the percentage of annual remuneration accounted for by bonuses, thereby creating a system of compensation that is more closely tied to the achievement of medium-term management plan targets.

#### Health and Productivity Management

We strive to create work environments that support and motivate employees. To this end, we are promoting measures in three areas: Healthy people, healthy workplaces, and healthy families and communities.

Nippon Sanso Holdings believes that consideration for employees' work styles and health is part of a management strategy for enhancing individual capabilities, increasing productivity, and raising corporate value. We have therefore been promoting health and productivity management, which realizes mental and physical health with a view to being a company where employees can work with enthusiasm. We are actively promoting initiatives to maximize the activity of employees, one of our most important assets from a perspective of health and productivity.



#### Taiyo Nippon Sanso's Health Management Declaration

#### -Create a working environment that supports and motivates employees-

We look for three key qualities in our employees, namely, health, integrity, and resourcefulness. With the aim of giving form to the first of these and recognizing that employee health is the driving force behind everything we do, we hereby declare our commitment to promoting sound corporate management and helping realize a spiritually affluent society through the creation of a health-first corporate culture.

Recognizing the health and wellness of all of our employees as a crucial corporate asset, we will also strive to realize secure and pleasant workplaces.

We also understand that the health and wellness of each individual employee and of their family is a critical motivating factor for employees in both their professional and private lives. Accordingly, we encourage employees to be proactive in maintaining their own health and ask for their active participation in the creation of a health-first corporate culture.

April 1, 2017 Yujiro Ichihara Representative Director, President CEO Taiyo Nippon Sanso Corporation (At the time)

#### Health and Productivity Framework



#### Promoting Employee Health

The Company aims to foster a culture that puts health first, following the idea that the health of its employees is the driving force behind everything it does. To promote employee health, we conduct health examinations for all employees as a matter of course. We also subsidize the use of health facilities and participation in health promotion programs, and provide consultations with a physician to workers who are working long hours. Furthermore, all employees who are assigned to postings away from their families are obliged to receive an annual physical and mental health check.

In addition, we are cooperating with industrial physicians and the health insurance societies to assign industrial physicians to each branch office. This will enable us to respond to health issues related to extreme overwork and expedite support for employees who have taken leave for the treatment of mental health issues returning to work. We have also revised items covered in annual health checks to facilitate the early detection of cancer, and introduced subsidies for employees obtaining influenza vaccinations and treatment to guit smoking.



Participants engage in stretching at FYE2019 Seminar for Healthy Working Women

In a new initiative, in FYE2019 we held the first Improving the Health of Working Women seminar at our corporate headquarters in Tokyo. Three female speakers—a nutritionist, public nurse, and trainer—were invited from Pasona Inc., a personnel placement firm noted for promoting career advancement for women, to speak at the seminar, which focused on three central themes (female hormone-related issues, exercise, and diet). Going forward, we will continue working to create healthy working environments that enable female employees to pursue successful careers.

We also conduct yearly health checks for former employees who in the past worked with asbestos and have expressed a desire to receive such checks. For those who receive asbestos health management guides or designation as a person affected by industrial accident as a result of the checks, we have set up a compensation system.

#### Wearable Devices for Visualizing Health

In FYE2018, we began distributing wristband-type wearable devices that increase the visibility of individual health-related data. These devices are designed to make employees more health conscious by enabling them to understand their own health status from day to day, providing such information as step count, heart rate, sleep time, and calorie burn. As of March 31, 2020, approximately 1,300 employees are wearing these devices. From July 2018, we introduced a walking point system where users can convert their daily step count into points redeemable for various services, or donatable to the Japanese Red Cross Society and others. We will continue to devise creative ways to further increase health management in an enjoyable way, and plan to expand the walking point system to include affiliated companies and employees' dependents going forward.

#### Caring for Mental Health

We have introduced an employee assistance program (EAP) provided by a third-party specialist and set up an external counseling service. At the same time, we have continued to take steps to support mental health care, including establishing a support program for employees who have taken leave for the treatment of mental health issues returning to work.

	Management-level participants	Executive-level participants
FYE2015	25	38
FYE2016	37	38
FYE2017	32	24
FYE2018	32	28
FYE2019	35	29
FYE2020	37	32

#### Participants in Mental Health Care Training

#### **Employee Welfare Program**

We have created a welfare program that provides extensive support for employees. In addition to Company housing or dormitory accommodations for individuals on temporary transfers, the program provides rent subsidies for married employees, subsidies for employees who are homeowners, and a mortgage system for employees purchasing homes that includes a Company guarantee, a preferential interest rate, and an interest subsidy. The program also makes it possible for current employees and family members, as well as retired employees, to use three Company-owned recreational facilities.







**Nippon Sanso Wearable** 

device

### Comment from the Health Insurance Society Executive Director

The Taiyo Nippon Sanso Health Insurance Society conducts activities that contribute to promoting and maintaining the health of employees and their families through health operations based on data. In 2018, we concluded a memorandum for promoting collaborative health with the Company, and are now making a full-scale collaborative effort with the Company on activities to promote and maintain employee health.

Meanwhile, from the Health Insurance Society side, we face challenges from the perspective of encouraging employees. The Company's Health Insurance Society does not have specialist positions such as consulting physicians or public health nurses. For example, we would like to actively encourage employees to seek further consultation based on their health examination results, but this is difficult under the current system from a perspective of privacy protection. Therefore, we think it would be better to create a structure that enables direct access to collaboration with medical professionals. As a Health Insurance Society, I think an important task going forward will be to find ways to encourage individual employees while cooperating with the Company.

#### Occupational Health and Safety

#### We have positioned safety and health in the workplace as a key priority in the Taiyo Nippon Sanso Group Code of Conduct and have formulated the Rules for Occupational Health and Safety, in line with which we are promoting a variety of initiatives.

Nippon Sanso Holdings aims to provide safe, comfortable working environments in the belief that this will support the growth of individual employees, raising their productivity and leading to increased corporate value. Furthermore, since the Company's business activities mainly involve the supply of industrial gases, which can be dangerous if not handled correctly, it is essential to educate employees about safety and raise their awareness. To create an environment where all of our diverse employees can work safely and with peace of mind, we will promote improvements in our standards of occupational health and safety.

### Occupational Health and Safety

In line with our Rules for Occupational Health and Safety, we promote a variety of efforts in Japan to ensure health and safety in the workplace. Based on these rules, we have created an occupational health and safety team and an occupational health and safety committee at each site. In addition, we continue to promote efforts to eliminate workplace accidents. These include providing safety training and holding morning assemblies, offering Kiken Yochi Training (KYT) ("hazard prediction training") and introducing "5S" (a workplace organization methodology based on five words (Seiri (Sort), Seiton (Set in Order), Seiso (Shine), Seiketsu (Standardize), and Shitsuke (Sustain)). We also distribute Health and Safety News, an electronic newsletter that includes materials published by the Japan Industrial Safety & Health Association (JISHA), among others, to raise employee awareness.



Akira Sakai Executive Director Taiyo Nippon Sanso Health Insurance Society



#### Site Occupational Health and Safety Management Framework



#### Working with the Taiyo Nippon Sanso Employees' Labor Union

The Taiyo Nippon Sanso Employees' Labor Union was established in May 2005, and a union shop agreement was concluded in October of the same year. Our policy is to disclose information to the Taiyo Nippon Sanso Employees' Labor Union as much as possible and to consult and negotiate in good faith. Labor–management relations are healthy, and both parties are committed to working and growing together.

#### Labor-Management Negotiations

	Matters discussed	Schedule
Collective bargaining	This is a forum for consultation regarding wages, bonuses, and various working conditions based on union demands and for discussions between labor and management on a wide range of topics, including important Company initiatives and business conditions.	Regularly held in early March (requested submission date) and April (specified response date)
Central Labor Council	This is a forum for discussing various matters affecting union members in general. In response to proposals from the Company, the union's central executive committee and the executive general manager of the HR Division hold discussions, and financial reports and information on important Company initiatives are presented. Principal matters discussed include amendments to working conditions for union members, permanent reassignments, early retirements, and proposed temporary transfers.	Unscheduled (20–30 times/year)
Branch Labor Council	This is a forum for discussing matters related to union members at regional sites. Discussions are held between branch executive committees and local labor managers, i.e., branch general managers, department general managers, and department managers. Matters discussed include provisions regarding working hours in Japan's Labor Standards Act and the relocation of sites.	Unscheduled (Frequency varies from one region to another.)

#### Work-Style Reforms Designed to Create Positive Work Environments for All Employees

With the aim of creating positive work environments for all of our employees, we have developed a variety of leave systems to accommodate individual needs.

Eligibility for reduced working hours following childcare leave has been set at children up to the third year of elementary school, higher than the legal standard of three years of age. Furthermore, in FYE2018 the possible reduction in working hours, previously set at 2.0 hours, was lowered to 1.0 hour, making the system easier to use.

We have also made it possible for employees to use their expired annual vacation days to take special childcare

leave to nurse children of elementary school age or younger in the event of illness, assist with childcare, or attend school functions, or to provide nursing care for family members. There is also a system that enables them to take nursing care leave of up to 365 days in total.

Other moves designed to realize more flexible work styles include the adoption in FYE2018 of a leave system that allows employees to accompany spouses on overseas assignments and a rehiring scheme for employees that have resigned because of pregnancy, childcare, or nursing care. From FYE2019, we introduced a system that allows employees to take annual leave in hourly units, and from October 2019 a flextime system was launched on a restricted basis at certain business sites, aiming to promote measures to enable flexible working hours and realize work-style reforms.

As of October 1, 2020, to prevent the spread of COVID-19 we have been promoting staggered starting times using the flextime system to reduce the risk of infection on crowded public transport during peak commuter times. Flextime is ordinarily only available at certain workplaces, but for the time being it has been allowed for all employees.

#### Measures Such as Reduced Working Hours within the Childcare Leave System

	Reduced working hours	Flextime
Eligibility	Employees with children up to the third year of elementary school	Employees with children up to three years of age
Duration	Up to the end of the child's third year of elementary school	Up until the month the child turns three years of age (i.e., until the day before the child's birthday)
Terms	Start and/or end of working day can be adjusted in either direction in 30-minute intervals (maximum permitted reduction per day: 1 hour or 2 hours)	Flextime (Core time: 10:30–15:00)

#### Number of Employees Making Use of Childcare Leave Systems

		FYE2017	FYE2018	FYE2019	FYE2020
Special maternity leave before/after birth		6	2	4	4
Childcare leave		7	7 (Female employees:7)	7 (Female employees:5)	7 (Female employees:7)
Reduced working hours		9	11 (Female employees:11)	11 (Female employees:11)	13 (Female employees:13)
Flextime		0	0	1 (Female employees:1)	2 * (Female employees:1)
Special childcare leave	Cumulative number of individuals	42	39 (Female employees:25, male employees:14)	75 (Female employees:46, male employees:29)	119 (Female employees:70, male employees:49)
	Cumulative number of days	37.0	52.0 (Female employees:34.0, male employees:18.0)	52.5 (Female employees:33.0, male employees:19.5)	100 (Female employees:59.5, male employees:40.5)

\* Flextime indicates the number of users of childcare flextime. Separately, there was 1 person (male) who used nursing care flextime (not included in the above count). Furthermore, from October 2019, flextime has been introduced at each business site, such as the Head Office, and due to the nature of the system the numbers of people using it have not been included.

#### Communication with Shareholders and Investors

# We strive to ensure the timely disclosure of corporate and financial information and to ensure fair returns to shareholders. At the same time, we aim to increase the transparency of management through dialogue.

Nippon Sanso Holdings actively engages in dialogue with its stakeholders in order to grasp social changes and needs, then uses this knowledge in its management and business activities. In addition to the annual general meeting of shareholders, we also hold financial results presentations for institutional investors and securities analysts, and host observation tours of our business sites in an effort to facilitate constructive communication.

#### Financial Results Presentations

At our financial results presentations, we use visual aids to give a deeper understanding of the Company's businesses, financial results, and forecasts.

#### **Business Site Observation Tours**

Observation tours of the Company's plants and research laboratories are held regularly to give people an even deeper understanding of the Company's business. In November 2019, we conducted a plant observation tour at Shanghai Taiyo Nippon Sanso Gas Co., Ltd. in China to introduce the Group's gas business.

#### Publications

We have also released a number of regular publications for shareholders and investors, including full-term and interim business reports and a single integrated report that provides both financial information, such as that related to business strategies and operations, and non-financial information, including that related to environmental protection, social contribution, and corporate governance, with the aim of giving readers an accurate overall picture of the Nippon Sanso Holdings Group.

#### Ensuring Fair Returns to Shareholders

Having positioned the provision of fair returns to shareholders as a key management responsibility, we strive to maintain stable dividends, while at the same time ensuring our dividend payout ratio fairly reflects our business performance. Guided by the strategic policy set forth in our medium-term management plan, we will continue working to enhance our performance.











Number of shares authorized: 1,600,000,000 Number of shares issued: 433,092,837 Number of shareholders: 15,216 (As of March 31, 2021)



#### Social Contribution Activities

# As a provider of industrial gases, we recognize that we have a mission to communicate the technologies and potential of industrial gases, as well as to work actively with local communities.

The industrial gases business is basically established at the site of consumption, and it is necessary to contribute to local economic activity in a way that is rooted in the local community. We consider this to be the true social purpose for the existence of Nippon Sanso Holdings as an industrial gases manufacturer, and we undertake social contribution activities in the areas where we conduct business. We believe these activities play an important role and function in the development of local economies, and we strive to leverage strengths of our core operations in them.

#### Nippon Sanso Ingasco Received "Best Supplier Award"

The Nippon Sanso Ingasco Group of the Philippines received the 2019 "Best Supplier Award" from IBIDEN Philippines, Inc.

This award was held for the first time by IBIDEN and given to the Nippon Sanso Ingasco Group in recognition of IBIDEN's high evaluation of the quality, supply stability, productivity, and cost superiority of an on-site plant established in 2017 for the supply of nitrogen. Looking ahead, the Nippon Sanso Ingasco Group will work as one to ensure stable operation of the gas production plant and maintain quality and safety management systems. We will make even greater efforts to be highly evaluated by IBIDEN and all of our customers.



Received 2019 "Best Supplier Award"

#### Shanghai Taiyo Nippon Sanso Gas Received Award for "Company Practicing Excellent Safety Management"

Shanghai Taiyo Nippon Sanso Gas Co., Ltd. received the "Award for Companies Promoting Safe Production" in recognition of its record of beneficial activities from the Shanghai Industrial Park Safety Production Committee. One of the company's employees also received an honorary award as a "Driver with Excellent Manners" for being a model driver.

The Company also received an award from the committee for its excellence in sincerely providing safe services.

This award has been received continuously since FYE2017, and our continued receipt amid increasingly tough regulation and management of liquid bulk product transportation is a testament to our daily efforts to ensure safety, conducted with the support of our investing companies and head office.

We will continue working to make even further improvements to ensure safe and stable transportation.



Award for "Company Practicing Excellent Safety Management"

#### Letter of Appreciation Received Regarding Surgical Masks

Taiyo Nippon Sanso donated surgical masks to medical institutions and others in response to a severe shortage of masks in medical institutions following the spread of COVID-19 and received a letter of appreciation from the Tokyo Fire Department.

#### Welcoming Visits by High School Students

In response to a request from the non- profit organization (NPO) School Support Center, we actively encourage visits to our facilities by junior and senior high school students. In June 2018, we invited seven year-two students from Okayama Prefectural Saidaiji Senior High School to visit our corporate headquarters in Tokyo to learn about our operations and technologies. In addition to asking business-related questions, the students queried employees about a variety of other topics, including job satisfaction and career choice. Going forward, we will continue activities such as these to assist in career education by providing opportunities for students to learn about the industrial gases field as part of our social activities.





Using familiar examples of using industrial gases to introduce the Group's businesses

#### Thermos Collaborates with Volunteer Environmental Initiative and Participates in Team ECO Work! 224 Event

In September 2018, 48 Thermos employees and family members took part in Team ECO Work! 224 Thermos Zero Waste Action at Teradomari Central Beach Resort, a post-season beach cleanup initiative sponsored by UX Niigata Television Network 21, Inc., on the prefecture's Teradomari coast. Thermos collaborates actively with the UX Niigata Television Network 21's Team ECO: Nature Support Declaration project and has now participated in this particular volunteer initiative three times. The Team ECO: Nature Support Declaration project is a volunteer initiative led by local residents and companies in Niigata Prefecture. In addition to beautifying the environment, the initiative aims to deepen people's love of nature and thus is a good fit with Thermos' own environmental activities. The event also provides a valuable opportunity for Thermos to communicate with local residents.



Team ECO Work! 224 event participants

#### Lab Lessons Using Liquid Nitrogen

Our Taiyo Nippon Sanso Kids' Science Class lab lessons seek to encourage children to take an interest in science by giving them the chance to participate in hands-on experiments using liquid nitrogen. These lab lessons enable children to actually experience the use of liquid nitrogen by, for example, freezing roses.

They continue to earn positive feedback not only from participating children but also from their teachers and parents, as well as from local residents. In 2018, we conducted a lab lesson featuring an explanation and demonstration of industrial gases followed by a variety of experiments, including testing roller coaster superconductivity and freezing inflated balloons for 16 fifth year students as part of nearby Shinagawa Municipal Ushiroji Elementary School's open house, in which we participate every year.

Looking ahead, we will continue aiming to expand opportunities to offer lab lessons to broaden understanding of the Nippon Sanso Holdings Group.



Experiment in freezing roses



An experiment that generates white mist in the same way that clouds are formed in the sky



#### Sergio Soccer Clinic

Established as an event to commemorate the 80th anniversary of the founding of Nippon Sanso Holdings' predecessor, Nippon Sanso Corporation, the Sergio Soccer Clinic was first held in 1990 with the cooperation of the Chiba-shi Football Association. The objectives of the first clinic were to create an event that would be enjoyed by the local community and to contribute through sports to better health for children. Since 2005, we have also sponsored a clinic in Osaka in collaboration with the Osaka Football Association. These clinics, which are attended by elementary school student teams affiliated with local football associations, include coaching by Brazilian-born Sergio Echigo, a well-known soccer commentator and former professional player, as well as a number of other former professional players. Features include friendly matches against a team made up of clinic instructors and elementary school student teams, as well as a round-robin tournament for participating teams and a penalty kick competition that is also open to families and coaches. Since it started, the Sergio Soccer Clinic has welcomed more than 19,000 children, and some of those who attended the clinic have gone on to become professional soccer players.

It is our hope that the clinic will continue to contribute to the development of talented young players.





A total of 455 children from 48 teams affiliated with the Chiba-shi Football Association took part in the 2018 Sergio Soccer Clinic in Chiba, which featured five coaches, including Sergio Echigo.





Sergio Echigo and six other coaches welcomed 316 children from 36 teams affiliated with the Osaka Football Association to the 2018 Sergio Soccer Clinic in Osaka.

## **Dialogue with Stakeholders**

#### Dialogue (1) The Unlimited Potential of Industrial Gases

Takeo Kikkawa, an expert in the industrial gases business, and Company director Kenji Nagata engage in a dialogue to review the social purpose of the industrial gases business to elucidate its future potential.



Takeo Kikkawa Professor of the Graduate School of International Management, International University of Japan

Kenji Nagata Member of the Board, Nippon Sanso Holdings Corporation Representative Director and President, Taiyo Nippon Sanso Corporation

Industrial gases make a huge contribution to the development of industry around the world. In this section, Professor Takeo Kikkawa, who has a deep knowledge of the industrial gases business, talks with director Kenji Nagata of the Group about how to draw out the latent potential of the industrial gases business going forward.

#### The Essential Role of Industrial Gases in Economic Development

Kikkawa: I have authored company histories for roughly 30 companies in my capacity as an expert on the history of entrepreneurship. From 2013 to 2019, I served as an outside director for Mitsubishi Chemical Holdings Corporation. Industrial gases is something of an invisible industry—not only because the products are invisible, but because there are only a very limited number of companies that sell industrial gases themselves, despite their being indispensable to chemical and steel companies. Nevertheless, these companies play an essential role. This is just one of the things I find interesting about industrial gases, and I believe that the adoption of gases among industries throughout the world will be an important theme going forward.

Nagata: Industrial gases will always be needed for the development of industries. They are basically produced at the site of consumption. For example, steel and automobiles can be manufactured in advanced countries and then shipped, but transportation of large volumes of industrial gases requires them to be liquefied, which creates difficulties in terms of control and long-distance transportation. The industrial gases business needs to contribute to the economic activity of a region by developing strong roots there, which I think is where industrial gases manufacturers find their social purpose. I feel they have an extremely important role and function not only for business but for economic development at the national level.

Kikkawa: I think this is one of the background reasons why the industrial gases business is particularly stable from a business perspective.

Nagata: In connection with this, I think that originality has been extremely important in the successful industrialization of oxygen. For example, even if an automaker manufactures mass-market vehicles, the mass production or design may be changed afterward; but industrial gases themselves do not change, which is one of their strengths, and the industry has grown and expanded by changing the application to suit the needs of the age. This is the potential of industrial gases, and I think it also relates to the stability that you mentioned. There are differences in products according to the industry structure of each country, but whether we are talking about Japan, Singapore, or Thailand, the global supply format is more or less the same. While there are differences in language and business customs, the industry is surprisingly suited to globalization.

Kikkawa: I hear that a team from your Group company Matheson Tri-Gas, Inc. in the United States played a role in the acquisition of Praxair Inc.'s European business in 2018. While the industry may be suited for globalization, I think that it is because of the success of your progressive expansion into the United States since the 1980s, and that you were chosen to make the acquisition because you have the ability to compete with global super majors.

#### The HyCO Business as a Powerful Tool for Achieving Goal 13 of the SDGs

Kikkawa: I think the way that gases can be used to combat global warming will be an important point, and I suspect the industrial gases industry will garner more attention going forward. I have the highest hopes for the HyCO business\*. Goal 13 of the SDGs is a goal for specific countermeasures against climate change. One of the powerful tools in this effort that has been touted by the Ministry of Economy, Trade and Industry (METI) is carbon dioxide capture, utilization, and storage (CCUS), which involves the separation, storage, and use of CO2 emitted from power stations and chemical plants. In the HyCO business, carbon is recovered in the form of hydrogen and carbon monoxide, which means that like CCUS it converts carbon into a resource. The HyCO business, which recovers carbon in the form of hydrogen and carbon monoxide rather than CO2, has great potential to be a technology that can help save the human race.

Nagata: That's right. HyCO changes hydrocarbon resources, separating them into hydrogen and carbon monoxide, which can then be used. Hydrogen is used for converting heavy oil into light oil, removing impurities, and other purposes. By adding hydrogen when these petroleum products are consumed, the sulfur content can be reduced to zero or heavily reduced. This reduces the environmental impact when the products are consumed as fuel. Therefore, in the HyCO business, in the process of separating natural gas and so forth into hydrogen and carbon monoxide, some CO2 is emitted, but then by adding the product created by the HyCO business, the environmental impact at the consumption stage is reduced. Furthermore, among the process options for HvCO, there are some that enable the recovery of high-pressure CO2 for separation or CCUS. This makes it possible to generate electricity with reduced CO2 emissions, as you have pointed out. Setting HyCO aside. I think that we can talk about reducing environmental impact in relation to all products, such as oxygen and nitrogen. I mean, by applying oxygen to combustion technology we can reduce energy consumption by improving combustion efficiency. In the case of nitrogen, we can improve quality and productivity by preventing its oxidization. So, we can talk about the connection to reducing waste products and improving energy efficiency. We do not sell oxygen and nitrogen, but rather the effects and functions of oxygen and nitrogen. To sell these functions we are also promoting technology developments, such as gas hybrid technology and devices that use it. This is what I consider to be the industrial gases business.

Kikkawa: Looking further ahead, it seems likely that hydrogen will need to be used for electricity generation if we are to achieve a hydrogen society. If demand for hydrogen-powered electricity generation is established, the HyCO business will have even further potential for development. I think it is very possible that this could be realized by 2050.

Nagata: While we are not yet ready to start operating hydrogen stations, we are now working on the development and installation of stationary and mobile equipment. We would like to focus on hydrogen in terms of using it as a carrier in combustion technologies for ammonia and the like.

Kikkawa: Japanese power companies have chosen to use ammonia rather than hydrogen-based electricity generation, but this process requires nitrogen, which should offer opportunities for Nippon Sanso Holdings. After all, your strength is in your ability to meet all needs related to gases.

Nagata: Given the extremely matured state of the Japanese economy, I don't expect to see much growth in demand for oxygen, hydrogen, argon, and so forth. For this reason, I think it is most important to promote businesses that are focused on the SDGs and sustainability, which are key trends in the world today.

\* "HyCO" stands for hydrogen (H2) and carbon monoxide (CO), which are separated from natural and other gases through a technology called Steam Methane Reforming (SMR). The HyCO business provides large-scale supply of H2 and CO to oil refining and petrochemical industries by way of a pipeline.

#### Industrial Gases Have Potential in Numerous Scenarios

Nagata: Members of the public may not feel that they have any points of contact with industrial gases. However, atmosphere control, which is a gas control technology, is playing an extremely important role in the field of 3D printing, which is capturing the public eye in numerous applications. We do not make 3D printers but we aim to contribute to widespread uptake of 3D printers in Japan through atmosphere control, working in partnership with 3D printer manufacturers. Moreover, recently industrial gases are being used in a growing range of applications in fields related to aquaculture. By dissolving high-pressure oxygen in water, rather than air, we expect to improve the cultivation environment. We supply a considerable volume of oxygen to the Norwegian salmon farming industry and the Japanese eel farming industry. Another application that has been prominent lately in the area of food and water issues is modified atmosphere packaging (MAP). By injecting a mixed gas of nitrogen and CO2, this technology slows down the oxidization of food and helps to prolong the expiry dates of ready-made salads and similar products sold at convenience stores.



Kikkawa: This is a safe way to extend the expiry date rather than using a hypochlorite additive, isn't it?

Nagata: It's safe because it is nitrogen and carbon gases that are present in the air. By extending the expiry date, we aim to reduce food loss as much as possible. What's more, as the weather was particularly bad this year, driving up the price of leafy vegetables, there were a growing number of cases where vegetables were frozen at the production site to preserve them before shipping. Since the Group has a long track record in refrigeration technology, we were able to use our technologies to reduce food loss at production areas as well. Going forward, I think that industrial gases will be able to contribute even more in the area of food.

#### Kikkawa: How about the medical field?

Nagata: In the medical business, we are focusing on Water-18O, a stable isotope used as a diagnostic reagent for cancer. It can now be used to diagnose Alzheimer's disease as well. In our medical business, we also use a lot of CO2. For example, in endoscopic surgery, CO2 gas is injected to expand the intestine. Medical CO2 makes laparoscopic surgery much easier to perform. So various kinds of gases are used in the medical field—not only the oxygen used for ventilators that people would generally think of. In the case of a disaster, for example, we continue to supply these gases stably without stopping. In this way, we also aim to contribute to the medical field.

Kikkawa: So, the trend toward adopting gases has reached the agriculture, aquaculture, and medical fields. That's very interesting. I expect that the industrial gases industry will surprise us with even more unexpected ways for using gases going forward. It truly is an invisible industry, or rather, it has a lot of invisible latent potential. I think that Japan is extremely fortunate to have a global gas major such as Nippon Sanso Holdings.

Nagata: If we can fully realize the potential of the industrial gases business and continue contributing to the development of industries and the solution of social issues, then we are sure to achieve sustainable growth. I want to apply the power of industrial gases across a wider range going forward, including social issues and new fields following the development of industries. Pursuing this goal is our direction as an industrial gases manufacturer.

#### Takeo Kikkawa

Born in 1951 in Hajikamimura (now Arita City) in Wakayama Prefecture. Graduated from the Faculty of Economics, The University of Tokyo, and obtained a PhD in Economics from the Graduate School of Economics, The University of Tokyo. Served on an expert panel for METI discussing the composition of electric power sources for 2030. Professor, Graduate School of International Management, International University of Japan. Professor Emeritus, The University of Tokyo. Professor Emeritus, Hitotsubashi University.

#### Dialogue (2) Welcome NGE! Promoting Global Sustainability

Yurite Inaki, the Operations & Safety Director for Nippon Sanso Holdings Group company Nippon Gases Euro-Holding S.L.U., talks with Takeshi Miki, Executive Officer, Executive General Manager of the Technology and Environment Office, and CSO of Nippon Sanso Holdings, about the sustainability issues that the Group should cooperate on going forward.



#### Takeshi (Ken) Miki Executive Officer, ( Group Technological Affairs & Environment Office, and Chief Sustainability Officer (CSO), Nippon Sanso Holdings Corporation (Additionally appointed as Executive Officer, Executive General Manager, Technological Affairs Division, Taiyo Nippon Sanso Corporation)

Inaki Uriarte Operations & Safety Director Nippon Gases Euro-Holding S.L.U.

Nippon Gases Euro-Holding S.L.U. ("NGE") joined the Group in December 2018. NGE's Operations & Safety Director, Inaki Uriarte, recently had a discussion with executive officer and Chief Sustainability Officer (CSO) of Nippon Sanso Holdings, Takeshi (Ken) Miki, regarding the sustainability issues that should be addressed in a coordinated effort by the newly launched Nippon Sanso Holdings Group going forward.

#### **Pursuing Global Synergies**

Miki: The Group has been holding an annual Safety Meeting since 2015. The idea is that persons in charge of health and safety from each of the overseas companies gather together in one room to exchange information and opinions about safety measures. Inaki, you attended the meeting for the first time last year; what was your impression?

Uriarte: My colleagues and I were quite inspired by the meeting. People from Japan, Matheson Tri-Gas, Inc. ("MTG") in the United States, and Group companies in Asia really did have a lively exchange of opinions. I think it is tremendous that the entire Group has such a shared interest in learning from each other's experiences.

Miki: The meeting was held in Japan last year, so you were also able to observe the Technical Academy at the Kawasaki-Mizue site. How was that?

Uriarte: I had heard a lot about the Technical Academy from both the NGE President and the CFO who visited the Academy before, and was myself deeply impressed by the experiments and demonstrations involving the knowledge of so many professionals that I saw there. A particularly memorable item was the hazard experience with experiments that envisages various accidents or faults that can occur on a site such as using high-pressure gas, over and sub oxygen atmosphere hazards, the electric shocks live experiment, and the combustion caused by adiabatic compression. All the devices produced an excellent simulation of risks that we could have on a site with the support of using virtual reality (VR). I would really like to create this kind of experience and learning space at NGE as well.

Miki: As a company that handles industrial gases, our first priority is ensuring safety. Also, there are many aspects of the operation not limited to safety that are handled differently between Japan and Europe, so we have a lot to learn. It is important that we share each other's best practices to create better systems for one another. I would also like to receive active advice from you, Inaki.

Uriarte: We also have a lot to learn from Japan. The first area is in insight about the handling of specialty gases, which is an area where we have received thorough support from Japan. The second is insight about HyCO, which is an area where MTG has brought synergies. Meanwhile, the area where NGE can contribute to the Group is by providing knowledge of various standards. As our knowledge of aspects such as operations, security, health and



safety, and quality grows deeper, I would like to coordinate with Nippon Sanso Holdings to standardize them. Knowledge is a universal asset that can be applied in any situation. Therefore, it would be good to accumulate knowledge about specialty gases in Japan, and about HyCO in the United States, and then bring them together and share the knowledge. Conversely, if we were to attempt to build up all of the knowledge and functions independently in each area, it would be extremely inefficient.

Miki: Thank you for that valuable proposal. NGE's participation in the Group is a huge benefit not only to Japan but also to MTG in the United States and our companies in Asia. I would like us to continue to pursue synergies through integration as we go forward.

#### Vision for Sustainability Disclosure

Miki: In response to changes in social awareness, companies now face the important task of enhancing their nonfinancial disclosures and initiatives, such as responding to ESG and the SDGs. In Europe there is a considerably high level of interest in sustainability, and NGE has recently issued its sustainability report for FYE2020. Could you explain your initiatives in Europe?

Uriarte: The sustainability report is a mandatory disclosure for large corporations in Europe, just like a financial report. The minimum content for disclosure is set by the authorities. Our sustainability report is published on each of the company websites so that all stakeholders can access it. This is extremely important for gaining the understanding of our stakeholders regarding our activities. We have promoted the creation of a system that starts by first formulating a framework, then identifying where stakeholders' interests lie. Basically, we decided to use this report as a marketing tool. The main point for creating the framework was to establish an internal Sustainability Committee. The committee has 13 members, including the president, CFO, CCO\*1, CHRO\*2, and the directors in charge of procurement, quality, marketing, safety, and Group integration. The committee had weekly meetings over a 10-week period. Each member establishes their own team, which examines issues brought back from the meetings. Roughly 50 people were involved in operations lasting a total of about 70 days. We received over 150 questions from Audit & Supervisory Board members and consultants, and revised the draft for the report six times. However, having issued the sustainability report for the year, our task is not finished. This activity continues indefinitely, as we strive to make further improvements. NGE has committed itself to eight of the SDGs and has defined 17 targets within those. Seven of these SDGs are also shared with Nippon Sanso Holdings. I would like us to focus particularly on energy efficiency, community engagement, compliance, and safety, while constantly improving our business and communicating this to stakeholders.

Miki: I read the FYE2020 report, and found the content to be well-organized and thought out. I would really like to draw inspiration from your initiatives. We are still just developing our activities in this field, but with our recent conversion into a holding company, we will radically strengthen our initiatives. Last year, we expressed our support for the TCFD\*3 recommendations, and this year we also responded individually to the CDP\*4 survey. In this integrated report, we have already enhanced our reporting regarding sustainability. Our task now is threefold. First, we are enhancing our disclosure of non-financial data, which we have tried to do in this integrated report. Second, we will systematically organize and disclose our various policies. We also plan to review and add to our current materiality matrix. And third, we will set KPIs. It is important to set targets and work through a plan-do-check-act (PDCA) cycle. We are thinking to take specific action on these in our next medium-term management plan.

Uriarte: I think a good way to set KPIs is to start by first getting an overall image, and then narrowing down the areas that are to be evaluated. For example, NGE has 106 facilities in all, but over 95% of our energy consumption occurs at just 27 of these. I think it is important to get an accurate overall image like this, then properly discern which facilities and processes to pursue data on.

#### \*1 Chief Compliance Officer

\*2 Chief Human Resources Officer

\*3 Task Force on Climate-related Financial Disclosures. A task force established by the Financial Stability Board, the TCFD recommended that companies disclose the financial impacts (risks and opportunities) of climate change. \*4 A U.K.-based NPO (formerly called the Carbon Disclosure Project). The CDP cooperates with institutional investors and others to require companies and government agencies to disclose information about their countermeasures for environmental issues, and conducts surveys and analyses.

#### Industrial Gases as a Sustainable Business

Miki: The air separation process is important in the manufacture of industrial gases. This process separates air, the raw material, to produce oxygen, nitrogen, and argon. These products are finally returned to the natural environment, and the process generates almost no waste at all. Furthermore, the distillation process used for air separation is conducted at extremely low temperatures, and although it uses electricity it does not involve combustion of fossil fuels. Since air is the raw material, there is no supply chain risk. In addition to reducing the environmental impact of this kind of manufacturing process, another important point is the contribution of the



products themselves. Gas helps to reduce the environmental impacts of various industrial processes. In addition, the injection of gas to extend best-before and use-by dates for food helps to reduce food losses. This shows that industrial gases are actually a substantially environment-friendly business. In addition, Thermos brand products, which keep foods hot or cold, help to reduce energy losses. However, outside of the Thermos Business that I've just mentioned, our main business is in the B2B field, which makes it difficult for general investors to understand. I think we need to communicate more about it.

Uriarte: I feel exactly the same way. Through gas applications, we can make a significant contribution to helping customers reduce their environmental impacts. We can contribute to promoting sustainability not only by safely supplying gas but also through our customers using our gas and improve their processes.

Miki: I believe that under its new framework, the Group now needs to pursue "collective strengths" and "autonomous strengths." I want to respect the autonomy of Group companies, and while putting our so-called centrifugal force to work, simultaneously develop collective strengths that generate synergies within the Group. The field of sustainability should also present significant potential for creating such synergies.

Uriarte: By promoting the sharing of gas application technologies, we can both make further progress in developing environment-friendly businesses and products. We may also be able to cooperate in the manufacturing process to reduce CO2 emissions and water usage. I hope that we can further strengthen this kind of technology sharing between Japan and Europe.

#### A Member of the Nippon Sanso Holdings Group

Miki: We started working with Inaki at the preparation stage before the management integration. At that time, what kind of image did you have of the integration?

Uriarte: I had a positive impression of Taiyo Nippon Sanso, as it was named at the time, before it was decided that the Group would buy us. I thought that Taiyo Nippon Sanso had businesses in Asia, North America, and Europe that matched us perfectly, so I was rather delighted with this outcome.

Miki: Having NGE join our Group has been hugely stimulating for us in many ways other than earnings. In the integration, we respect NGE's autonomy as much as possible, and I think that NGE has joined our Group in a form that enables everyone to continue working as they had before.

Uriarte: We haven't experienced any particular difficulties with the transition. If I had to point to something, I would say that we did not know each other as individuals, but the Japan side often attends our meetings, and we have also visited Japan several times, so this issue resolved itself quickly. Now that we have become familiar faces to one another, the integration has really moved ahead.

Miki: The so-called PMI\*5 process has really gone smoothly, and we have built trust naturally through our visits with one another. The difficult part was really at the stage before the integration. At that time, we were both separate companies with confidentiality obligations, and most of our consultations were by telephone, so we didn't have a chance to properly meet. In this business dealing with high-pressure gas, the most important part is safety and security. From the date of the management integration, we would become an entity with a shared destiny, and we needed to finish smoothing out various wrinkles by then. I was looking forward to completing the integration and building relationships of trust as soon as possible.

Uriarte: I felt the same way. Ken, please do come and visit us again once the COVID-19 pandemic has passed. It will be an excellent opportunity to develop a deeper mutual understanding. And let's continue to cooperate closely going forward.

Miki: Thank you for your invitation. I have complete trust in you, Inaki, and in everyone at NGE. With workstyles and lifestyles now changing around the world due to COVID-19, we must make our business more sustainable and contribute to the realization of more sustainable societies. With our recent transition to a holding company, I aim to further develop our cooperation framework with a view to promoting global sustainability.

\*5 Post-Merger Integration. The integration process that occurs after an M&A.



#### Dialogue (3) Strengthening Governance through a Global Framework of Four Geographic Hubs

Outside directors Akio Yamada and Mitsuhiro Katsumaru have provided leadership in the Company's governance reforms. They engage in an open discussion on various issues, including a review of the five years since their appointments, the effectiveness of the Board of Directors, the significance of the transition to a holding company structure, challenges for the future, and response to the COVID-19 pandemic.



Akio Yamada Outside Director Nippon Sanso Holdings Corporation

Mitsuhiro Katsumaru Outside Director Nippon Sanso Holdings Corporation

Outside directors Akio Yamada and Mitsuhiro Katsumaru have provided leadership in the Company's governance reforms. Here, they have an open discussion on various issues, including a review of the five years since their appointments, the effectiveness of the Board of Directors, the significance of the transition to a holding company structure, challenges for the future, and response to the COVID-19 pandemic.

Looking Back on Five Years Since the Introduction of Japan's Corporate Governance Code

Katsumaru: Mr. Yamada and I were appointed as outside directors in 2015, the year that Japan's Corporate Governance Code (the "Code") was formulated. The management of Taiyo Nippon Sanso Corporation at the time took the philosophy of the Code seriously and it was a time when they started specific initiatives. One of the major themes of the Code was enhancing and strengthening the Board of Directors, and in fact the Group's Board of Directors has changed in several ways since that time.

First, discussions in the Board of Directors' meetings have become more active. Perhaps this was set in motion by our free questioning and expression of opinions from an outside viewpoint. Outside directors in general have also become more active in the contributions than before.

Second, the responsibility of the Board of Directors has been clarified. The Board makes decisions on important management issues centrally, and governance has now become transparent.

Third, I must mention the establishment of the Advisory Committee on Appointments and Remuneration. This was an excellent decision by President Ichihara as the committee ensures accountability on important internal personnel matters with plenty of discussion to decide on matters. Mr. Yamada plays an especially important role in leading the committee as its chairperson.

Yamada: The Advisory Committee on Appointments and Remuneration is composed of three members, including President Ichihara and ourselves. The committee met 11 times during FYE2020, so it is rather active. The most important theme for the committee recently has been selection of a future successor candidate for the President CEO. Referring to best practices at other companies and so forth, we interviewed multiple candidates in the selection process and proceeded to select personnel based on evaluation and screening criteria. Our next task is how to approach the development of future management executive candidates.

Katsumaru: I think this is a good point to mention the issue that arises when both parent and subsidiary are listed companies. The Company is a consolidated subsidiary of Mitsubishi Chemical Holdings Corporation, which is the parent company of the Nippon Sanso Holdings Group as it is the controlling shareholder. In this case, the protection of minority shareholders' interests is a focus, and there are two important points to be considered in this regard.

First, the Company's governance is systemically guaranteed to a certain extent by the independence of the outside directors. We are both in an independent position with no relationship to the parent company, and we both strive to speak out with a constant awareness of the issue of protecting minority shareholders' interests in the Board of Directors and other places.

Second, parent company Mitsubishi Chemical Holdings' stance is to place an extremely strong emphasis on the autonomy of the Company's governance. As such, we recognize that the risk of minority shareholders' interests



being harmed by the controlling shareholder will remain extremely low.

Yamada: Since 2018, the issue of protecting minority shareholders' interests in listed subsidiaries has been much discussed. As Mr. Katsumaru has pointed out, we have an important role to play as independent outside directors in this regard.

#### Diversity of the Board of Directors

Yamada: Another important theme is ensuring diversity in the composition of the Board of Directors; for example, appointing female directors. President Ichihara and ourselves have taken this issue very seriously; however, we have not yet managed to appoint a female director at this stage. We will continue making a sincere effort on this issue.

Next, at the General Meeting of Shareholders in 2019, Chairman and CEO Thomas Kallman of Matheson Tri-Gas, Inc. was appointed as a director along with Chairman and President Eduardo Gil Elejoste of Nippon Gases Euro-Holding S.L.U., which joined the Group at the end of 2018. Their inclusion has greatly changed the composition of the Board of Directors.

Katsumaru: The management team has been working proactively on this theme and intends to continue strengthening its initiatives. Furthermore, with the participation of the heads of our U.S. and European operating companies, just mentioned, and the selection of Vice President Hamada, who has experience on assignment at Matheson Tri-Gas, discussions in the Board of Directors' meetings have a more global perspective than ever before. In every theme that we discuss, including response to the COVID-19 pandemic, which will be mentioned later, we are now able to keep an eye on the status of the rest of the world, including Europe and the United States, at all time.

Furthermore, since October 2015, we have conducted evaluations of the effectiveness of the Board of Directors. This has been the most trying part of complying with the Code, but setting up a system for collecting the opinions of each director using the questionnaire, having a careful discussion based on the results, and implementing steps to solve issues has been an extremely important result.

Furthermore, a distinctive feature of the Company's governance is the presence of a powerful Audit & Supervisory Board. The Board also provides tremendous support for us as outside directors when we are giving our opinions. Diversity has been secured for both the Board of Directors and the Audit & Supervisory Board, and the two meeting bodies are both functioning properly.

Yamada: Three of the four full-time Audit & Supervisory Board members are outside members and all have affluent corporate management experience and accounting knowledge. They make insightful observations and actively share opinions in the Board of Directors' meetings. This is quite different from the scenario in other companies, I believe.

They say that all companies find it difficult to carry out an evaluation of the Board of Directors. The Company conducts a questionnaire survey and based on the results the execution site provides specific proposals, which are discussed again in turn by the Board of Directors. This approach has produced results such as narrowing down the matters for discussion, simplifying operating reports, and strengthening investment monitoring. In addition, the Audit & Supervisory Board is also active in presenting opinions and proposals.

Katsumaru: The organization is extremely good at self-transformation. There have been a large number of changes over these past five years compared with before the introduction of the Code. Many people are now interested in ESG and the SDGs as well.

Going forward, companies will be required to have diversity in management leadership and to have the power to transform themselves in step with the times. I believe that Nippon Sanso Holdings has the ability to meet these requirements.

#### Insights Achieved through Response to the COVID-19 Pandemic

Yamada: The Company rapidly implemented a series of responses to the COVID-19 pandemic. The Board of Directors has constantly had the latest situational reports since February, and in April a policy on preventing infection was formulated. Also, as Mr. Katsumaru just mentioned, Chairman and CEO Kallman and Chairman and President Elejoste have been appointed to the Board of Directors, providing direct access to wide-ranging information from outside of Japan as well, such as the overall status of infection in the United States and Europe, the economic impacts, and the impacts on the Group's businesses and customer relationships. Without a clear outlook on when the pandemic may subside, we will make a united effort in Japan, the United States, Europe, and Asia and Oceania to recover earnings within the fiscal year, based on various information such as trends in demand industries.

Another important point is a company's response to its social responsibilities. Amid concerns over the securing of adequate ventilators in medical institutions, the Company's wholly owned subsidiary IMI Co., Ltd. was right at the front of the supply line as a medical equipment sales company. Many Group companies also supply medical oxygen. The employees of each company face the risk of infection in the same way as medical professionals, and

continue to strive, putting their own health at risk.

Katsumaru: Everyone has performed admirably during the pandemic. I found two points particularly impressive. The first was the supply of masks in and outside the Company. In May, the Company donated a total of 1.5 million medical masks to medical institutions and others. The Company took this action right when the world was in an uproar due to an acute shortage of masks, and its effort was recognized with a letter of thanks from the Governor of Tokyo. The Company also distributed 100 masks to every employee and made efforts to prevent infection. Both of these actions were extremely proactive and effective.

The other point was the Company's supply of industrial gases amid the pandemic in Europe and other countries. The Board of Directors received an explanation from Chairman and President Elejoste of Nippon Gases Euro-Holding about its response to the pandemic in Italy. We were presented with the visual image of employees of Nippon Gases Euro-Holding risking infection to deliver oxygen to local hospitals, giving us a good understanding of the situation on the ground.

Through the recent series of situations, many companies have probably had to review the purpose of their existence and their role in society. The Nippon Sanso Holdings Group has performed its role tremendously, and I think it has reaffirmed its own purpose for existing.

Yamada: I feel that the Group philosophy of "Proactive. Innovative. Collaborative." has truly been put into practice.

#### Objectively Clear ESG Disclosure

Yamada: Recently, there has been a surge of public interest around corporate ESG initiatives. The capital markets have also been emphasizing ESG investment and socially responsible investment (SRI). In light of the situation, I think the Group needs to apply more innovative thinking about the status of its ESG disclosure. The Group provides many gas applications that contribute to increasing operational and combustion efficiency and to reducing the environmental impact of metal cutting and welding, and smelting in blast furnaces. It is important to provide more intuitive and clear explanations focused on these initiatives in order to gain stakeholders' understanding.

Katsumaru: It is somewhat difficult to achieve both objectivity and intuitiveness in ESG disclosures. However, the focus here should be on the extremely sustainable nature of the Group's business model itself. The industrial gases business takes in oxygen and nitrogen from the atmosphere and converts them into energy before releasing them back into the atmosphere. It is a wonderful circular process. This oxygen and nitrogen cycle supports various aspects of industry throughout the world. I think it is necessary to pursue a clearer explanation of how gas plays this social role and creates unique value.

Yamada: For example, just as the technology for the maglev train is supported by superconduction provided by liquid helium, the progress of humankind and the development of the economy rely on industrial gases. The impact of having the heads of our U.S. and European operating companies on the Board of Directors is apparent in the change of focus on ESG. For example, in 2019 the Group announced its support for the TCFD recommendations. In discussions about this in the Board of Directors' meetings, they drew out examples of other major companies that compete with the Group and stated their views that the Group should also promote its initiatives with greater urgency.

#### Acquisition of European Business and Creation of Synergies

Katsumaru: The acquisition of the European business (now Nippon Gases Euro-Holding) at the end of 2018 involved a major decision to invest acquisition funds comparable to the Company's annual sales. We actively expressed our encouragement for the acquisition up to the decision. The reason was that while the Japanese economy had continued to stagnate since the 1990s, the U.S. and European economies had grown steadily. Operating only in Japan limited the Group's aspirations for growth and transformation. Given the backdrop to this deal, as an outside director unfettered by any need to continue the previous trajectory or preserve continuity, my thinking was that we might not see such an opportunity again. There is still a lot of work to do, but thus far things have progressed nicely.

Yamada: Another important role that we have is to support appropriate decision-making by top management and to build a foundation for setting the Company on its course. President Ichihara made a huge decision, and I believe he has created a way forward for the Group's continuous growth.

Furthermore, Nippon Gases Euro-Holding's management executive team have been actively working to assist in the process of its integration. Moreover, the executive teams of Nippon Gases Euro-Holding and Matheson Tri-Gas have been involved in discussions about generating synergies after the integration. Chairman and President Elejoste made specific proposals such as deepening relationships with global customers in the electronic materials gases business, creating business opportunities through cooperation between engineering divisions, and mutual use of gas application technologies. These formed the basis for deeper discussion in the Global Operations Division (at the time) and subsequently in the Global committees.

In this way, the PMI is proceeding smoothly, and we have transitioned to a holding company structure to fully



maximize management efficiency for the global framework of our four geographic hubs and the Thermos business. With this, the Nippon Sanso Holdings Group made a fresh start under a new structure on October 1, 2020.

Katsumaru: The Group management philosophy and policies are created by the Company. However, each operating company has a considerable level of discretion and responsibility, and will promote its business autonomously. Generally, a holding company structure can be seen in various ways, but I believe it is one of the ultimate structures for promoting efficient, rational group management while utilizing the characteristics and strengths of each region of the world. Moreover, in our discussion on this issue, my contribution was regarding the change of company name. I thought it would be an appropriate time for a name that clearly reflected the new holding company structure. Moreover, Taiyo Nippon Sanso Corporation is a fine company name that carries the Company's history, so it has remained in use for the domestic operating company. In addition, in terms of having an executive function that specializes in business management, the appointment of Director Nagata as president of the Taiyo Nippon Sanso Corporation as the domestic operating company is appropriate for the holding company structure since he has a wealth of experience in the industrial gases business in Japan.

Yamada: Even in an ordinary operating company, if it has a lot of subsidiaries then strengthening governance as a group is a major challenge. In this regard, as a holding company, Nippon Sanso Holdings is truly an organization for Group governance, and will efficiently perform the functions of business strategy, management functions, risk management, and synergy creation for the entire Group.

Generally speaking, information sharing using IT and financial management are essential for creating Group synergies. In regard to this, CFO Draper, who is in charge of finance, accounting, and IT at Nippon Gases Euro-Holding, has been made executive officer of the Group Finance and Accounting Office and CFO of Nippon Sanso Holdings. I expect this will not only contribute to diversity and globalization within the execution structure but also generate wide-ranging ripple effects in all directions within the Company.

Katsumaru: I think this kind of diversity will create even more big changes in the newly launched Nippon Sanso Holdings Group. Nippon Gases Euro-Holding, which operates businesses in every country in Europe, has a great deal of knowledge regarding Group management. It is also well developed in terms of its relationships with employees and its stance on ESG. Having gained Nippon Gases Euro-Holding as a member on the heels of Matheson Tri-Gas, the Nippon Sanso Holdings Group can be expected to continue changing and growing going forward.

#### (Roundtable Discussion) Human Resources to Carry the Nippon Sanso Holdings Group into the Future

Having changed its company structure and name on October 1, 2020, Nippon Sanso Holdings has positioned itself for a new start. As the Company approaches this period of transformation, Satoshi Wataru, Executive Officer and Executive General Manager of the Human Resources Division, talks with two other frontline employees about the kind of human resources that the Group will need going forward.



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\* Assignment and position are as of July 16, 2020, when the interview was conducted.

On October 1, 2020, we made a fresh start as "Nippon Sanso Holdings," having changed our structure and our company name. At this turning point, Executive Officer Satoshi Wataru, Executive General Manager of the HR Division, and three employees working on the front lines had a discussion about the quality of human resources that the Nippon Sanso Holdings Group needs going forward.

#### Deciding Factors for Joining Nippon Sanso Holdings

Wataru: To begin, I would like to ask each of you to introduce yourselves and briefly tell us about your career up to now.

Fujita: I joined the Company in 2009, so this is now my 12th year. Originally, I joined because I wanted to be involved in building ASUs. However, before I could do that I felt I needed to learn more about ASUs, and so I wanted my first assignment to be at an ASU. My wish was granted, and I worked for three years at the Nagoya Sanso Center. The opportunity to see actual ASUs in operation was an extremely valuable experience. I currently work in the Process Design Section of the PEC Engineering Department in the Engineering Division. My current department is involved in ASU design, so there are few opportunities to visit on-site. My three years working at an ASU enables me to understand how a new ASU will operate after it has been installed. Being able to use that experience in the design process is a powerful tool for me in my present role, so I am glad that I agreed to do that when I joined the Company.

Ikeda: Although Taiyo Nippon Sanso Corporation is mainly an industrial gases company, I work in the SI\* Business Department of the Medical Division, which handles stable isotopes. I am responsible for developing applications for stable isotopes—in other words, finding out how customers can use them to their benefit. It may seem strange to say that I handle stable isotopes at an industrial gases company, but the principle of separating oxygen, nitrogen, and argon out from air can also be used to separate the stable isotopes of oxygen 16, 17, and 18. In fact, the core technologies are shared with industrial gases. The SI Business Department has a lot of customers with high levels of expertise, such as universities, hospitals, government agency research laboratories, and pharmaceutical companies. I value communication and dialogue with customers, based on accurately picking up their various



needs, getting a feel for them, and uncovering them. I am sometimes asked to present lectures at academic conferences and symposiums, and so forth, and I actively make an effort to maintain a lot of contact points with customers. At seminars and symposiums, where there are opportunities for direct dialogue in an open atmosphere, in many cases I have found that customers have hidden latent needs that they themselves are unaware of. When I talk with customers, I try to identify their fundamental issues, not just what they present on the surface, and then propose solutions, asking their opinion about a certain approach to solving it or suggesting alternatives. Sometimes the issue can be solved using an approach that does not use my goods or services, but even in these cases, the most important thing is that the customer trusted me and consulted with me.

#### \* Stable Isotope

Saida: I am the oldest in this group. Currently, I am working as the General Manager for our local subsidiary in China, Shanghai Taiyo Nippon Sanso Gas Co., Ltd. The company has a large plant for making gases, an ASU. The gas is transported by our Transport Division and sold by our Sales Division. For the equipment needed for gas supply installed on customers' sites, the Engineering Division handles everything from installation to after-sales service. The company is like a miniature version of Taiyo Nippon Sanso Corporation, undertaking everything from making gases to serving the customers who use them. I joined the Company in 1997, and this year is my 24th. At first, I worked in the Gas Sales Division of the Tokyo Branch, selling general gases such as oxygen, nitrogen, and argon. After that, in 2004 I started working on new sales channels for gases at the Head Office. At the time, we were seeing an increase in Japanese customers expanding their operations overseas in China, Thailand, and so forth. We thought we would like to supply these customers overseas in China, Thailand, and even India as well, so from 2004 onward we started providing support for them through our overseas subsidiaries. In 2011, I was assigned to Shanghai Taiyo Nippon Sanso Gas. I was initially responsible for sales as the vice president. Since 2015, I have been responsible for overall management as General Manager.

#### Wataru: What has been your most difficult experience?

Saida: In 2015, when I was appointed General Manager, the company recorded a loss. At the time, I wondered how to make the company profitable and generate a profit. As you might expect, our employees are Chinese, and while commonly accepted ideas for Japan are not completely strange to non-Japanese, they do have a really different way of thinking about things. On the other hand, since there are limits to what Japanese people can do at an overseas local subsidiary, we have to rely on the national staff to take care of all the detailed aspects of operations. I was certainly struggling at first to see how I could convey our passion to them and lift their motivation, and how we might work together to increase the company's earnings.

Wataru: Within the Group, most of the assignments as presidents of subsidiaries or affiliated companies are usually given to people who have a long history in the Company. Mr. Saida, you have become a company president at a young age. I think it is a tremendous example in terms of succession planning, and I would really like to see more people like yourself. While I don't think young people necessarily need to be at the very top, I do think it is a good idea for them to experience serving in a role at around the level of No. 2 so that they can get an overall view of the company.

#### Trust Relationships with Customers Are a Differentiation Factor

Wataru: Could you tell me what is important to you in carrying out your work?

Saida: When I was responsible for sales, I found the most important things to be an attitude of sincerity and seriousness. Since gas itself cannot be differentiated, our nitrogen cannot be differentiated from that of our competitors because it is colorless and odorless. To have customers choose our products, I felt it was of paramount importance for the sales personnel to provide something extra in terms of their passion, their earnestness, and so forth.

Ikeda: On the topic of something extra, our most important product in the SI Business Department is Water-18O, which is an essential material for PET diagnosis used for early detection of cancer. However, it can also be used for other applications. For example, we propose Water-18O as part of a package with the peripheral technologies we have developed so we can add value through something extra.

Saida: The same applies with gas sales. It is extremely important to start by getting an understanding of what is troubling the customer, or what the customer is seeking, and then propose a solution. This is a key approach for gaining customers' trust. Possibly because I am living overseas, in my work I am strongly conscious that I should avoid shutting myself inside my own shell and that I should always think about things from a higher perspective. China is developing rapidly, and we must change also if we want to keep up. Moreover, I think we must also change if we are to compete with major global industrial gases companies. Since my coworkers are not Japanese, I try to incorporate the good aspects of how Chinese people think and break down my preconceived ideas and attitudes. I have a strong intuition that hanging on to the notion that "Japanese people are like this" will not help me

#### perform well.

Fujita: I am also constantly aware of this. I am an engineer, but when customers tell me that they want to buy an ASU, I think together with the sales personnel about what kind of unit would be suitable. As an engineer, it is important simply to make something good, however, the definition of "something good" is different for each customer. When I make a proposal, I really try to incorporate the demands that the customer does not articulate. Another thing I do when making a proposal is to try and predict what kind of impact I want to have on the customer and relevant parties. In some cases, I may prepare a separate response, anticipating what one person is likely to do after that. In this way, I try to act with the idea of looking ahead at what will happen next.

Ikeda: As I listen to Mr. Fujita, I feel that our approach is broadly similar, although we have different jobs and handle different products and services. He and I joined the Company in the same year, so we both received the same training since our new recruit days, and I am impressed that 10 years later we have the arrived at the same kind of thinking. I pay attention to "ensuring the reliability of stable performance." Safety and reliability are extremely important factors for industrial gases and stable isotopic labeling reagents, and for Water-18O, which I mentioned before. In the SI Business Department, where I work, I often have contact with customers as the person responsible for engineering, and I try to give them a sense of peace of mind and confidence through a combination of not only my performance as the person in charge of engineering but also multifaceted proposals delivered with passion, and a strong grasp of data to back them up.

#### The Real Meaning of "The Gas Professionals"

Wataru: Even after becoming Nippon Sanso Holdings, the philosophies of "Market-driven collaborative innovation: Improving the future through gases" and "The Gas Professionals" have not changed. "The Gas Professionals" cannot be changed; or rather, I think it does not need to be changed. What do each of you think about this?

Saida: Personally, I interpret the "The Gas Professionals" as meaning "sincerity" and "honesty." If gas supplies are cut, then plants such as steel works have to stop operations. They would become unable to make steel. We provide gas to customers like this as part of their infrastructure, so I think that our responsibility as a supplier is extremely important. However, from the customer's point of view, it is taken for granted in the same way as water coming out when you turn on a tap—when they open the valve, nitrogen comes out. That's how if feels for them. Our mission as an infrastructure service, our job as a group of professionals, is one of sincerity and honesty, providing gas reliably and safely. Listening sincerely to customers' concerns and being ready to work with them to find solutions—this is what "The Gas Professionals" means in my opinion.

Fujita: Since we present ourselves as "The Gas Professionals," we are telling customers to trust us with their gasrelated issues. In the Engineering Division, where I work, I suppose we are telling people to trust us with engineering-related issues. While that would be fine if I were able to resolve everything myself, that tends not to be possible. Therefore, I aim to use the specialization of each member of the team, asking various people to help me and giving them help in return in order to create better proposals for the customer. Our ultimate goal is to propose the optimal solution for the customer. In our approach to this goal, various people cooperate with one another to achieve it. I think this is what "The Gas Professionals" as a team is all about. Recently, our European business is increasing and I too was involved in consultations with European engineers; however, since Praxair, Inc. itself is a large company, as one would expect, it has strong technological capabilities and there is much for us to learn from them. As we have brought them into our Group, we will absorb their technological knowledge as well as their management style and other aspects in order to further develop our own style. I believe this will increase the level of our professionalism even more.

Ikeda: The Company's internal resources are limited, so naturally there are limits to our ability to solve customers' issues or develop new products through our own efforts alone. I think it is necessary to grow our community, for example, by collaborating with customers to solve issues and develop new products. As we stand now, we have a network with external entities such as universities and research laboratories, and we are currently using this to create new value. I think the philosophy refers to using our external network to enhance our capabilities by taking a "market-driven" approach for grasping latent needs when conceptualizing new products, then "collaborating" to give concrete form to the products.

Fujita: I am not only given directions by a boss, but am also given quite a lot of freedom to follow my own ideas. I interact directly with our sales team and find that if I churn out proposals they are adopted surprisingly often. I have experienced this several times, and find it rather fulfilling. I think the entire Group has this way of allowing people to do things their own way if they actively ask to be allowed to, provided that they have been in the job long enough to have sufficient experience. That has been my actual experience.

Ikeda: In my department, we are also allowed to follow our own lead (laughs). When I express an interest in doing something, nobody ever tries to put me off or stop me. If we can bring together a reasonable amount of information



or supporting data to suggest that a project will work, the department will encourage us to go for it. This kind of atmosphere and culture is really good.

#### The Human Resources Needed for Nippon Sanso Holdings Group Going Forward

Wataru: Nippon Sanso Holdings will advance even further in becoming a global company going forward. When we have reached that stage, what kind of human resources would you like to be in charge of the Group's future?

Fujita: I joined the Company 10 years ago, and at the time I would never have imagined that the Company would grow to this size. The markets in the United States, Asia, and Europe have already become large, and I never thought that I would be going to Europe for a business trip, so I feel that the situation has been changing progressively. Therefore, I think the question to ask is how flexible these human resources can be in responding to the situation. As "The Gas Professionals," we take pride in holding steadfastly to our course, while also being flexible. I think that human resources who can find this balance will be extremely valuable, and I am also trying to develop this ability.

Saida: Reflecting on my current responsibility for Shanghai Taiyo Nippon Sanso Gas, I think the most important thing is the strong determination of the leader. It is essential first to have a strong determination to achieve goals, and to get everyone involved. The other factor is how well this determination can be shared by others in the company. There are various ways of achieving that I think, but I feel that it is important to be able to discuss issues together honestly from an equal position, and to find ways to deal with them. In particular, people overseas have different values, and I think that bringing in the opinions of diverse people enables the creation of something new. As Mr. Fujita said, we may hold tightly to our creed, but if we hold on too tightly and don't admit diversity, nothing new can be created. Going forward, I think that the Company needs flexible human resources who accept diversity and are willing to change themselves and create something new.

Ikeda: I think that's right. To overlap with what Mr. Saida just said, the SI Business Department where I work now has a very high number of mid-career hires, and we have new people joining such as researchers and people who have founded start-up companies. I think my department takes in more mid-career hires than others in the Company, but when I work with them I can feel they have a different perspective. If you are alone, your field of view tends to become narrower, but I have really noticed that the difference in the perspectives of people with different career backgrounds helps to stimulate opinions and leads to more flexible business planning. If specialists with various viewpoints join the Company, or not only specialists but also generalists and management personnel, as mid-career hires, I am excited to see what kind of synergies will be created.

Wataru: Actually, I think that employees have been held back a little in some ways by the values that we have had up to now. Our business model to date has been stable, and I think that we need to break up the parts that have become stultified with innovation driven by diversity. Ideally, we should have high-quality human resources in every area, including Japan, the United States, Europe, Asia and Oceania, and the Thermos Business, and I think this will be necessary. We need to enable further stimulation of employees' desire to grow, including by preparing systems, and increase their motivation. Having just heard all of your honest thoughts, I feel a great sense of promise. Let us share our philosophy not only in Japan but across the globe, as we pave the way for the future. Thank you again for giving your valuable time and sharing your opinions.