

Environmental Report 2023



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■ Coverage of this report

- Sumitomo Electric Device Innovations, Inc. (Yokohama HQ, Yamanashi Plant) (SEDI)
- Sumitomo Electric Photo-Electronics Components (Suzhou), Ltd. (SPEC)
- Sumiden Device Innovations Vietnam Co., Ltd. (SEDV)

Note: In this Report, the terms “we,” “our” and “us” refer to SEDI, and the term “our Group” refers to the SEDI Group (comprised of the three companies listed above).

Message

Message from the President

We believe that it is our important corporate responsibility to work on reducing the global environmental impact and widely disclose the results and challenges of our efforts. We are pleased to publish the Environmental Report, as we did last year, to fulfill part of this responsibility.

Our mission is to provide device products that achieve high-speed, large-capacity data transmission with minimal power consumption by taking full advantage of the features of compound semiconductors. To fulfill this mission, we have constantly striven to advance the compound semiconductor technology we have developed over many years.

For example, devices made from gallium arsenide (GaAs) were once the main products in our wireless communication device business. To meet the needs for high output, high efficiency, and low power consumption, however, we promptly began developing and producing devices made from gallium nitride (GaN), which has better suitability, and have steadily mass-produced these devices for about 20 years. Through accumulating such experience, we have continually improved production efficiency, thereby ensuring a stable supply of products to our customers and reducing the environmental impact of our manufacturing process. In recent years, investment in 5th generation mobile communication systems has gained momentum, leading to an even greater need for GaN devices. We are committed to continuously contributing to the creation of energy-efficient, large-capacity communication infrastructure by offering device products best suited to our customers' needs.

As a milestone toward the achievement of carbon neutrality, we have set a "50% reduction from fiscal 2020" as our fiscal 2030 target for the sum of Scope 1 and 2 greenhouse gas emissions. We will contribute to the fight against climate change, a common global issue, by investing the necessary management resources in such areas as innovations in production technology and the utilization of renewable energy.



Sumitomo Electric Device Innovations, Inc.
President **Yuichi HASEGAWA**

Environmental Activity Policy

Basic Philosophy

We think it is primarily important to establish a society that is sustainable and has less environmental impact. While making continuous and steady efforts to promote our global environmental preservation activities, we contribute to the people of the world and society by providing products and services related to compound semiconductors.

Activity Guidelines

- 1 Step up our efforts to combat causes of global warming
- 2 Proceed with resource conservation and recycling
- 3 Promote environmental pollution prevention and environmental protection
- 4 Expand the offering of eco-friendly products to meet customer demands more effectively

Acquisition of Certifications for Environmental Management Systems

Not only our Yokohama Headquarters and Yamanashi Plant but also our two manufacturing subsidiaries, SPEC (China) and SEDV (Vietnam), have established environmental management systems and have acquired ISO 14001 certifications.



SEDI (Yokohama)



SEDI (Yamanashi)



SPEC



SEDV

Efforts to Combat Causes of Global Warming

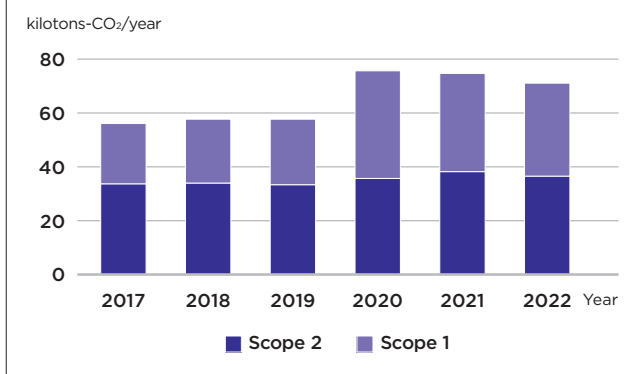


Scope 1 and 2 greenhouse gas emissions results and targets

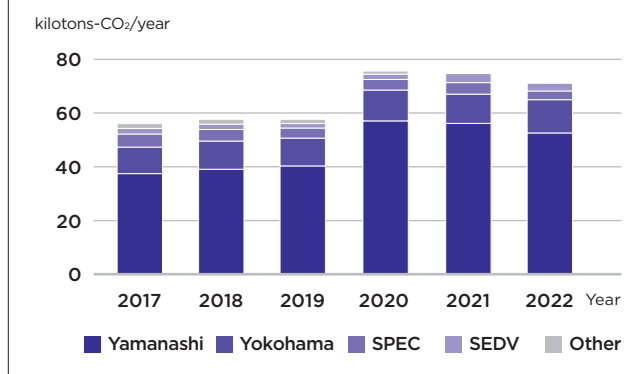
Fiscal 2020 results	Target for fiscal 2030
75.6 kilotons-CO ₂ /year	37.8 kilotons-CO ₂ /year (a 50% reduction from fiscal 2020)

As a measure to fight global warming, our Group strives to reduce greenhouse gas emissions. It has set the target on the sum of Scope 1 and 2 emissions for fiscal 2030 at 37,800 tons-CO₂/year, where Scope 1 emissions are direct emissions as a result of business activities of our Group and Scope 2 emissions are indirect emissions resulting from our Group's electricity consumption. This target is equivalent to a 50% reduction from the base year, fiscal 2020.

Trends in Greenhouse Gas Emissions by Scope

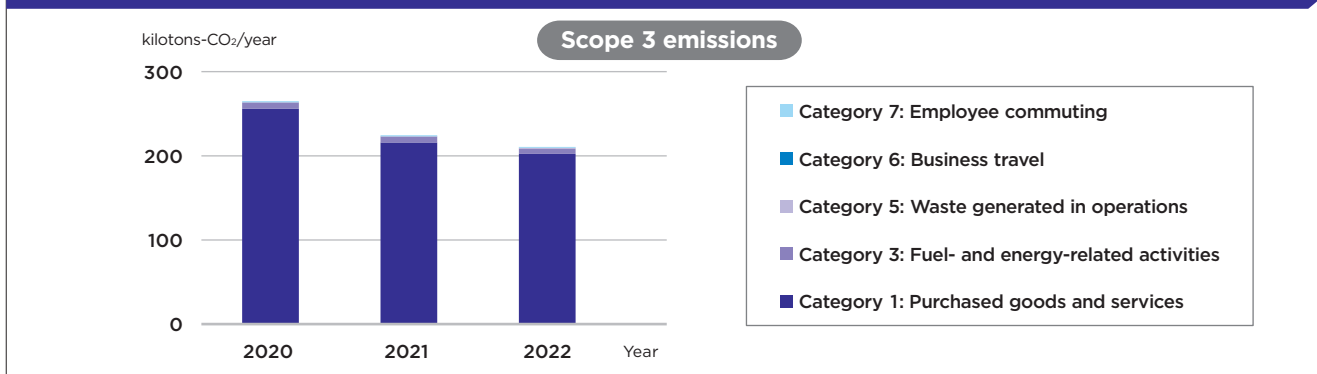


Trends in Greenhouse Gas Emissions by Base



Our Scope 1 and 2 emissions in fiscal 2022 were 71.1 kilotons-CO₂, a 4.8% reduction from the previous year. Emissions for Scope 1 and 2 were reduced by 5% and 4%, respectively, from the previous year. A solar power generation system, which began operation in fiscal 2021, at the Yamanashi Plant contributed to a reduction of 278 tons-CO₂ in fiscal 2022. We also started purchasing renewable energy in fiscal 2022, which resulted in a reduction of 153 tons-CO₂. Going forward, we plan to promote the reduction of greenhouse gas emissions by improving energy use efficiency through increased productivity, as well as by increasing the amount of renewable energy to be purchased.

Scope 3 greenhouse gas emissions results and target

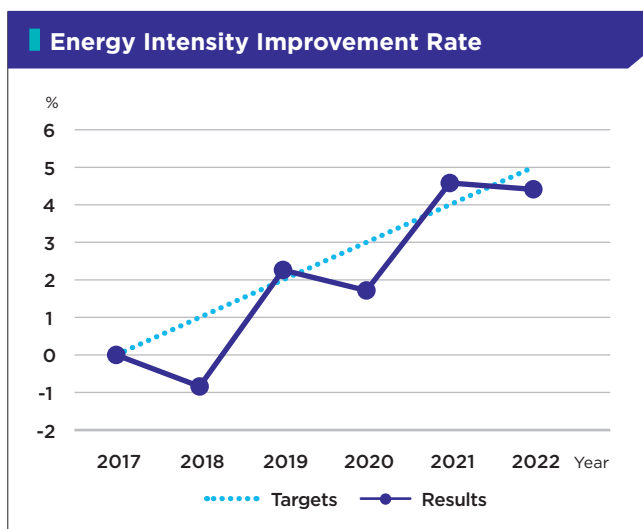
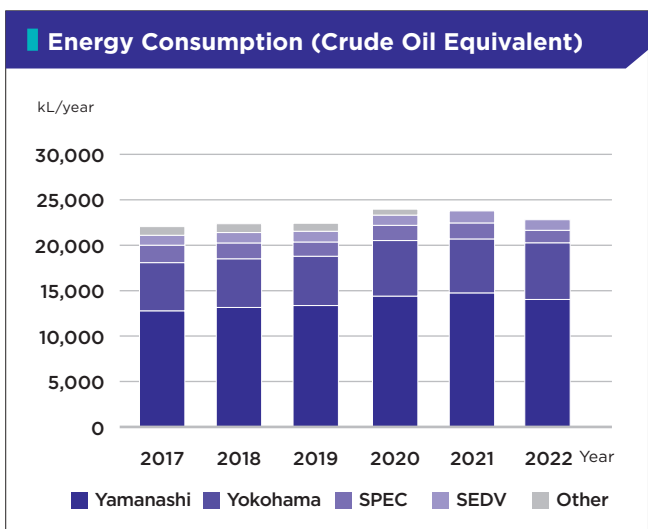


We have started calculating actual results for the five Scope 3 categories. For the calculation, we used the emission factors listed in the database published by the Ministry of the Environment, Japan. As shown in the figure, emissions in Category 1 (purchased goods and services) account for over 95% of the total emissions in the five categories, and thus we have set a reduction target for this category. We will strive to improve the calculation accuracy of and reduce Category 1 emissions while maintaining close communication with our business partners.

Scope 3, Category 1 emissions	Fiscal 2020 results	Target for fiscal 2030
	256.2 kilotons-CO ₂ /year	217.8 kilotons-CO ₂ /year (a 15% reduction from fiscal 2020)

As part of our initiatives to reduce greenhouse gas emissions, our Group has been working on improvement of energy intensity. Energy intensity is an indicator obtained by normalizing the sum of electricity and city gas consumption in crude oil equivalent by a production index. The production index is calculated based on the production volume and energy consumption for each product type and process.

The target for fiscal 2022 was a 5% improvement in energy intensity from the base year of fiscal 2017, but the actual improvement rate was 4.4%. Although we achieved a certain level of success by introducing energy-efficient equipment and improving productivity, we fell short of our target. This fiscal year, we have retrospectively reviewed how to calculate the production index. After the review, with the aim of evaluating energy use efficiency more appropriately than before, the results have improved from those shown in last year's report.



Example of energy conservation efforts



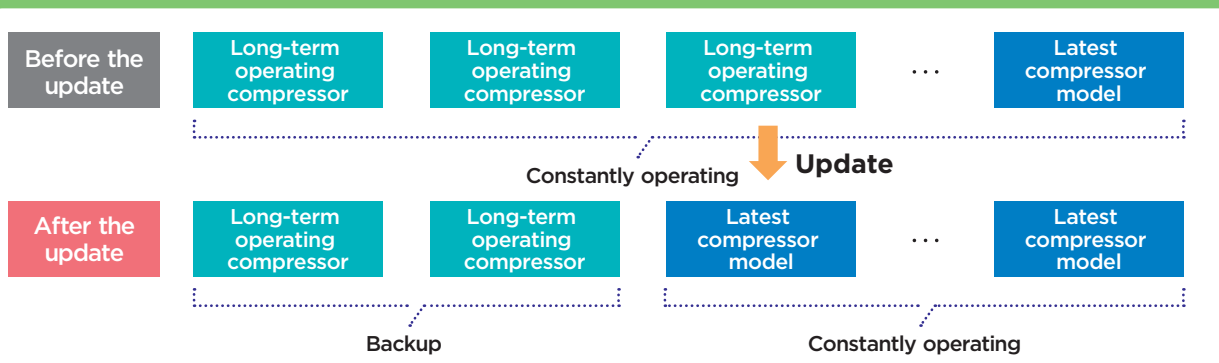
Establishment of a stable production system for clean dry air and improvement of energy efficiency at the Yamanashi Plant

Purpose

The Yamanashi Plant operates multiple compressors that produce clean dry air, which is essential for driving and cooling production equipment. Long-term operating equipment was upgraded to the latest model to ensure redundancy in clean dry air production and conserve energy.

Measures and Results

One long-term operating equipment unit was removed and the latest model with high manufacturing capacity and excellent energy efficiency was introduced. Consequently, the remaining long-term operating equipment was put on standby as backup equipment in case of abnormalities, and a system was created whereby clean dry air is secured during normal times using only the latest model. By ensuring redundancy, the foundation for stable production has been strengthened and it has become possible to effectively utilize equipment with excellent energy efficiency by controlling the number of units. This measure has resulted in an annual reduction of 122 kL (equivalent to 218 tons-CO₂) in energy consumption in crude oil equivalent.



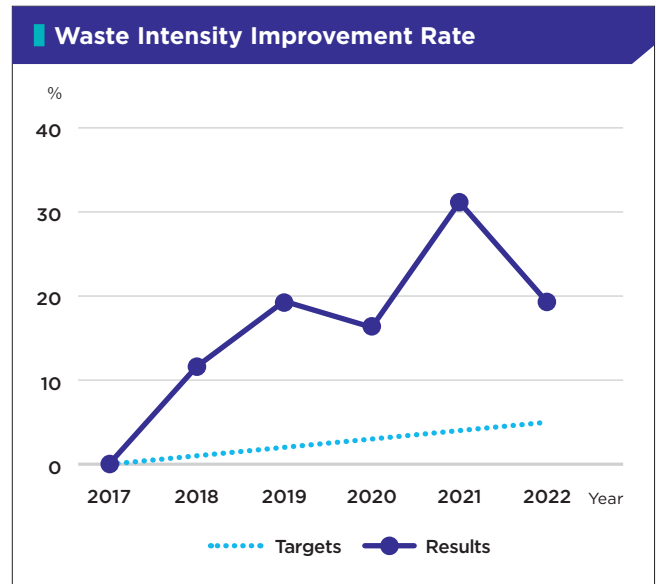
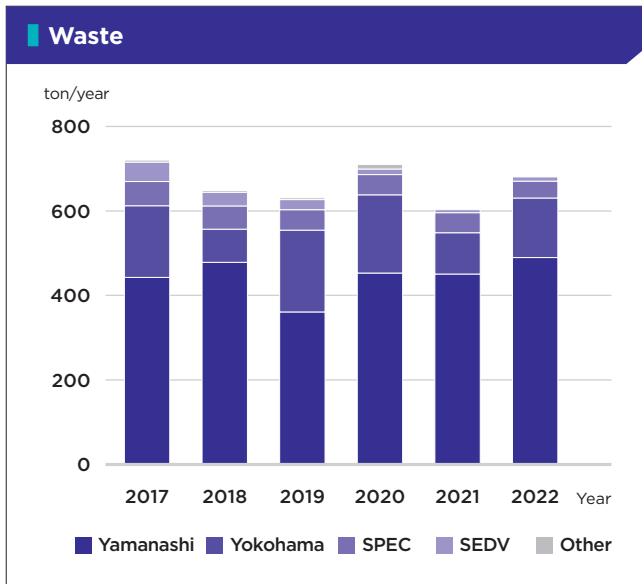
Commitment to Resource Conservation and Recycling



Our Group believes that effective use of resources and reduction of waste are also key issues to reduce the impact on the global environment.

Our Group implements its waste reduction activities using waste intensity, which is calculated by normalizing the amount of generated waste by a production index, as an indicator. The fiscal 2022 target was to improve waste intensity by at least 5% compared to the fiscal 2017 level, and we achieved a 19% improvement.

Our efforts to reduce sludge from wastewater treatment facilities greatly contributed to this improvement.

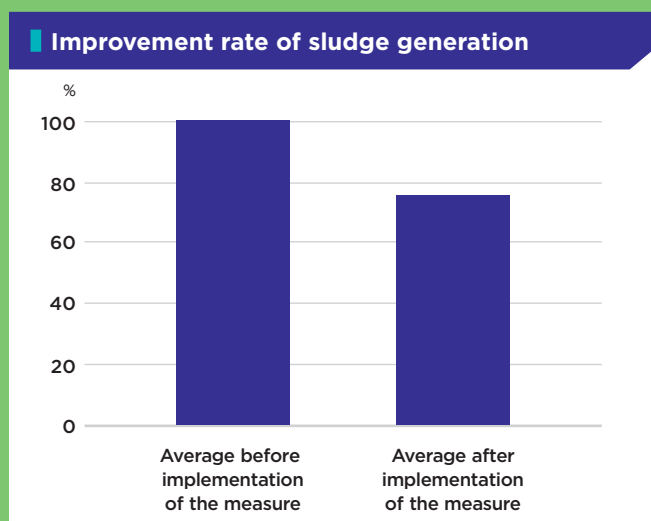


Example of waste reduction

Reduction of dehydrated sludge at the Headquarters

Purpose Wastewater containing acid and alkali chemicals used in the semiconductor manufacturing process is detoxified in an in-house wastewater treatment process before being discharged into sewers. In the treatment process, wastewater treatment chemicals suitable for the chemical substances contained in the wastewater are selected. Wastewater treatment chemicals were reviewed according to changes in the type and amount of chemical substances resulting from changes in the product types manufactured and production scale in an effort to reduce the amount of generated sludge.

Measures and Results In reviewing the chemicals, several candidates were selected. Then, by conducting a model experiment, the most suitable candidate for detoxification and sludge reduction was selected and applied to the actual treatment process. Through this measure, the amount of generated sludge was successfully reduced by 23%.



Measures to Reduce Environmental Pollution



As measures to reduce environmental pollution, our Group monitors exhaust and wastewater from plants, conducts emergency drills, and provides employees with education to raise their self-awareness of the importance of environmental conservation. The table below lists the results of these measures taken in fiscal 2022.

Results of exhaust and wastewater monitoring, and other measures (fiscal 2022)

	Yokohama	Yamanashi	SPEC	SEDV
Water quality	Kept within the reference value			
Air quality	Kept within the reference value			
Emergency drills	Conducted			
Self-awareness raising education on environmental conservation	Delivered to all employees			



Emergency drills at the Headquarters



Emergency drills at SEDV



SPEC environmental inspection report

VOICE

Initiatives by the Facility and Equipment Technologies Department for environmental conservation

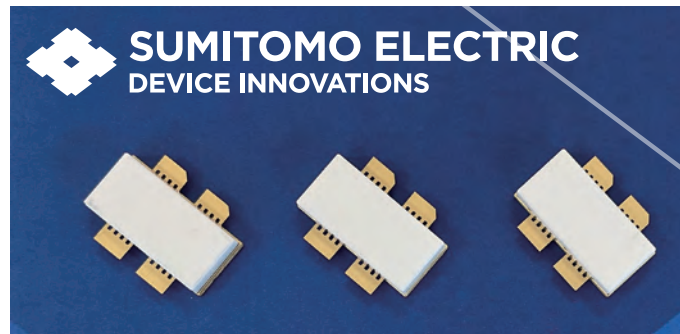
The Facility and Equipment Division maintains and manages power equipment and production equipment 24 hours a day to ensure that plant operations do not stop; it also carries out upgrading of aging equipment and other measures. Pure water and air used in semiconductor plants are produced using vast amounts of energy, including electricity and city gas. Therefore, to prevent wasteful energy consumption in pursuit of achieving carbon neutrality, we carefully adjust operating conditions according to daily changes to ensure energy-saving operations. For example, in the operation of air conditioning systems, we control the heat source by changing the combination of operating equipment according to changes in the outside temperature. When upgrading power equipment, we do not simply replace the equipment, but rather upgrade it by also reviewing the entire system, including related equipment, to achieve the best energy efficiency.

On the other hand, in addition to energy supply, we also carry out environmentally friendly maintenance and management of wastewater and exhaust air. For example, in wastewater management, we have established voluntary water quality control values that are stricter than the legal standards to enable us to detect signs of problems at an early stage. We also conduct analysis and other measures on a daily basis to confirm that the quality of wastewater is at normal levels and adjust the amount of chemicals added according to the quality of the wastewater. Furthermore, we have been conducting a number of drills simulating various scenarios in order to prevent environmental accidents. In drills simulating water leakage problems in the wastewater treatment process, participants learn how to operate emergency shutoff valves or prepare sandbags to prevent untreated wastewater from flowing into rivers or sewers. In addition, we provide training for construction contractors based on specific examples that can lead to environmental accidents in an effort to prevent environmental accidents during on-site construction work. We will continue to work on achieving stable plant operations and environmental conservation.



Facility and Equipment Division
General Manager **Atsushi GOTO**

Offering of Eco-friendly Products



Power amplifier device for base stations

Our Group contributes to the improvement of the energy efficiency of data centers and communication infrastructure by developing and providing device products that can achieve high-speed, large-capacity communications with low power consumption, leveraging the features of compound semiconductors.

For example, our GaN power amplifier devices are highly appreciated for their high speed and low power consumption and are widely used in base stations of the mobile phone infrastructure.

The devices we shipped in fiscal 2022 are estimated to reduce power consumption by 739 GWh/year compared to conventional silicon (Si)-based devices, which translates to 321 kilotons-CO₂/year of greenhouse gas equivalent. This includes a reduction of 273 GWh/year or 118 kilotons-CO₂/year (compared to fiscal 2020) achieved by the launch of new products with higher efficiency.

We will continue to take on the challenge of developing products with even higher efficiency, aiming to contribute to the creation of energy-efficient communication infrastructure.

Sumitomo Electric Device Innovations, Inc.