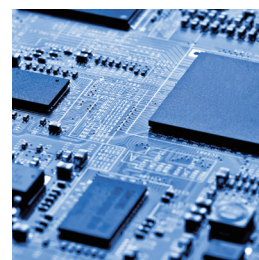


—Shimadzu Contributes to Solving Problems in a Diverse Range of Fields—

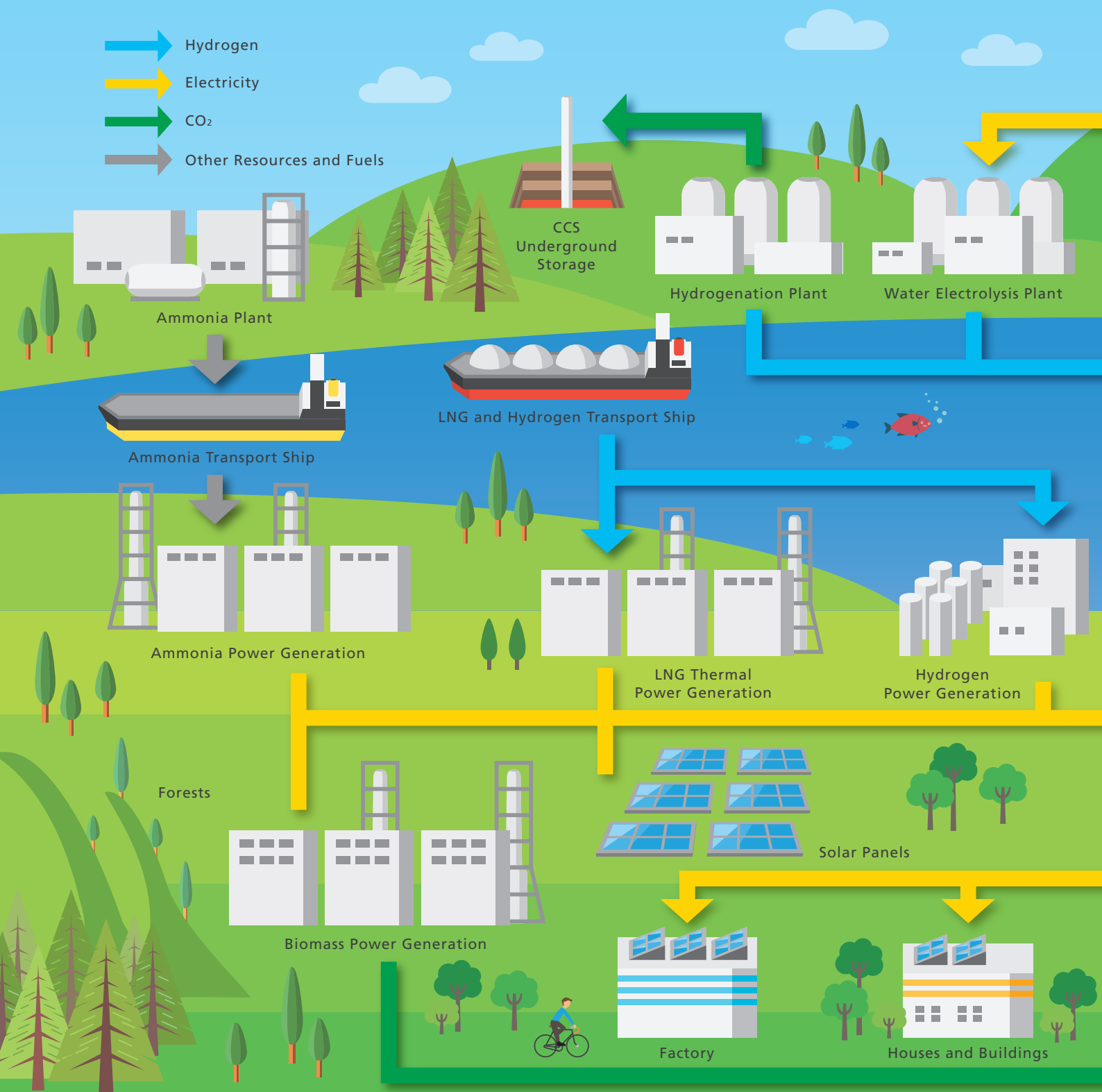
# Towards Carbon Neutrality



# Towards Carbon Neutrality

With our Products and Technologies, Shimadzu Contributes to Solving Problems in a Diverse Range of Fields.

We contribute to technological development and quality control in fields such as hydrogen fuels, biofuels, wind power generation, and other renewable energies, as well as automobiles and storage batteries, which are all indispensable for achieving carbon neutrality. In addition, we are actively adopting renewable energy in our business activities, aiming to reduce CO<sub>2</sub> emissions.



## Main Industries in which Shimadzu Contributes

Offshore wind power; ammonia fuel; hydrogen; automobiles and storage batteries; semiconductors and information & communications; food, agriculture, forestry, and fisheries; carbon recycling; and resource circulation-related industries





## Aiming for Carbon Neutrality

**We are Constantly Working to Reduce CO<sub>2</sub> Emissions in our Business Activities.**

- **Shimadzu Joins RE100 International Environmental Initiative**  
**We are Committed to Using Electric Power from 100 % Renewable Energy by 2050.**

**RE100**  
**CLIMATE GROUP**



Shimadzu has pledged to use electric power from 100 % renewable sources in the Shimadzu Group's business activities in Japan and abroad by 2050. Solar panels have been installed at the Head Office/Sanjo Works and Murasakino Works in Kyoto, as well as at Shimane Shimadzu and other Japanese Group companies, and in Malaysia, the Philippines, and other overseas Group companies. The power generated is then used in-house. Group companies in the UK and Germany have switched to contracts for power from 100 % renewable energy. Beginning in FY 2021, Shimadzu is gradually introducing 100 % renewable energy at Shimadzu Group plants, research centers, and other major facilities within Japan. Medium-term goals have been established, aiming to increase the percentage of renewable energy to 85 % by 2030, and 90 % by 2040.



Manufacturing Subsidiary in Malaysia Using Solar Power

- **Commitment to Global Society and Information Disclosure**

As part of our commitment to global society and information disclosure, Shimadzu has become a signatory to the United Nations Global Compact, which is a set of principles recommended by the United Nations for environmental conservation and endorsed the disclosure of information about the impact of businesses on climate change, as recommended by the Task Force on Climate-related Financial Disclosures (TCFD). We have also obtained certification from the Science Based Targets (SBT) initiative confirming that our target levels for reducing CO<sub>2</sub> emissions generated from business activities have a scientific basis.

**WE SUPPORT**



**TCFD** | TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES



**SCIENCE  
BASED  
TARGETS**

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



## ➤ Certified as Eco-First Company by Minister of Environment

On October 21, 2020, the Minister of the Environment designated Shimadzu as an 'Eco-First Company'. This is the first time in the precision equipment industry. Based on the "Eco First Program" the Ministry of the Environment certifies the companies that promise to engage in environmental conservation initiatives that are "innovative, unique and spillover effect" and that are carrying out industry-leading activities.

Shimadzu Corporation contributes to achieving harmony between the earth, society and people and realizing a sustainable society through initiatives for the conservation of biodiversity, based on our corporate philosophy "Contributing to Society through Science and Technology" and our management principle "Realizing Our Wishes for the Well-being of Mankind and the Earth."



Certification Ceremony (October 21, 2020)  
Former Minister of the Environment Shinjiro Koizumi (left) with  
President Ueda (right)

## ➤ Eco-First Commitment

1

### We will implement measures for addressing climate change.

- Medium/long-term target reduction in CO<sub>2</sub> emissions: 30 % by FY2030 (vs FY2017)
- Actively introduce solar panels and other renewable energy equipment.
- Strengthen energy efficiency measures, such as by installing smart meters to enable the visualization of electric power usage.
- Offer products with superior energy efficiency to reduce CO<sub>2</sub> emissions from product operation by customers. Also strive to reduce the environmental impact of the entire supply chain.

2

### We will implement measures for establishing a recycling-oriented society.

- Maintain a 99% or higher waste recycling rate at all production sites, research laboratories, and other facilities in Japan.
- Strengthen environmental monitoring capabilities at operations in Japan, such as monitoring effluent water.

3

### We will develop and supply products and services that promote global environmental conservation.

- Reduce Shimadzu's environmental impact by implementing life-cycle assessment (LCA) practices for all new products and achieve to spread of more environmentally-friendly products.
- Contribute to the environmental conservation of air, water, and soil by developing and supplying analytical and measuring instruments used to qualitatively and quantitatively analyze environmental pollutants.
- Provide support for a wide range of activities, from R&D activities for solving challenges in environmental and new energy fields to environmental conservation activities in local societies.

4

### We will engage in biodiversity conservation activities.

- Help conserve biodiversity by engaging in forest maintenance activities in cooperation with community organizations or other groups.
- Implement activities to teach environmental conservation by holding on-site classes at schools or other locations.

5

### We will actively engage in environmental conservation activities involving each employee.

- Actively engage in a variety of environmental activities within various business practices, with each employee engaged as a member of Shimadzu, an environmentally contributing company.
- Strive to increase environmental awareness by providing environmental education for all employees.



## Contributing to Achieving Carbon Neutrality through Shimadzu Analytical and Measuring Instruments and Industrial Machinery

\*Use the QR codes to view related information.

### Offshore Wind Power Industry

A Broad Offering of Inspection Technologies Ensures the Safety and Security of Equipment and a Reliable Supply of Energy

Manufacturing Equipment for Composite Materials and Highly Functional Transmission Components Ensure High Efficiency Energy Conversion

#### Applicable Products

- Parts inspections for wind power generation facilities: Tensile testing machines
- Strength of wind power generator blades: Glass fiber winders for glass fiber windings



AUTOGRAPH AGX-V Series  
Precision Universal Testing Machine



Glass fiber winder



### Ammonia Fuel Industry

Precision Gas Analysis Technologies Ensure Stable Energy Provision and a Clean Environment

# Hydrogen Industry

A Broad Offering of Inspection Technologies Ensures the Stable Provision of Energy

Inspection Systems for Composite Materials Help to Construct the Infrastructure for Safe and Secure Energy

## Applicable Products

- Measurement of catalysts on membranes: Energy dispersive X-ray fluorescence spectrometers (EDX)
- Evaluating the dispersion and stability of fuel cell catalysts: Particle size analyzers
- Evaluating the thermostability of fuel cell electrode agents: Thermogravimetric analyzers
- Fuel cell evaluations: Portable gas concentration analyzers
- Evaluation of solid oxide cells: Gas chromatographs (GC) and high-performance liquid chromatographs (HPLC)
- Leakage evaluations for raw material storage and transport tanks: Hydrogen leak detectors
- Sulfur component measurements in accordance with quality standards for FCV hydrogen fuels: Chemiluminescence sulfur detection systems



Nexis SCD-2030  
Chemiluminescence Sulfur  
Detection System



EDX Series  
Energy Dispersive  
X-Ray Fluorescence  
Spectrometer



Fuel cell  
related information



CGT-7100  
Portable Gas Analyzer



Leak Detector



Vacuum equipment  
and industrial machinery  
related information

## Applicable Products

- Analysis of impurities in ammonia gas: System GC
- Monitors for NOx in exhaust gas: Gas analyzers
- Control of urea water in NOx removal equipment: TOC/TN analyzers



NOA-7100  
Portable Gas Analyzer



System GC



## Contributing to Achieving Carbon Neutrality through Shimadzu Analytical and Measuring Instruments and Industrial Machinery

\*Use the QR codes to view related information.

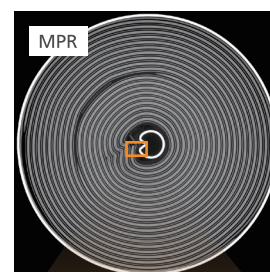
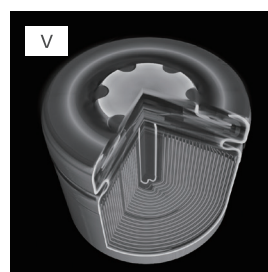


### Automotive and Storage Battery Industries

Precision Measurement Technologies for Achieving a Future Society with More Environmentally Friendly Mobility Applicable Products

#### Applicable Products

- Materials evaluation for solid state batteries: Laser diffraction particle size analyzers, dynamic particle imaging analysis systems, micro compression testing machines
- Development of lighter weight materials for EV: Various analytical instruments and testing machines
- Observing the deterioration of lithium ion batteries: X-ray CT systems
- Analyzing the electrodes of lithium ion rechargeable batteries: Electron probe microanalyzers



### Semiconductors and Information & Communications Industries

Creating More Energy Efficient Manufacturing Equipment to Meet the Increasing Demand for Digital Devices



## Manufacturing and Inspection Instruments Contributing to the Development of New Lightweight Materials for Achieving a Future Society with More Environmentally Friendly Mobility

### Applicable Products

- Achieving high accuracy balancing of high speed rotors: EV motor balancers
- Dewaxing of battery materials: Sintering furnaces
- High-speed, high-quality coating of 3D plastic products with metal films and protective films: Sputtering Systems



Sputtering System



Vacuum and Pressurized Sintering Furnace



Automotive  
related information



Dynamic  
Balancing Machine



SPM-Nanoa  
Scanning Probe  
Microscope



Vacuum equipment  
and industrial machinery  
related information



inspeXio SMX-225CT FPD HR Plus  
Microfocus X-ray CT System



EPMA-8050G  
Electron Probe Microanalyzer



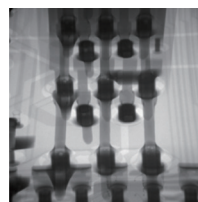
Lithium ion battery  
related information

### Applicable Products

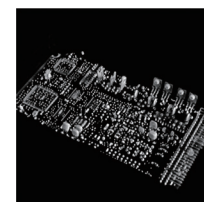
- Creating ultra high vacuum environment: Turbo Molecular Pumps
- Improving the efficiency of defect analysis, with detailed high accuracy penetration of devices and PCBs: X-ray CT systems



Turbo Molecular Pump



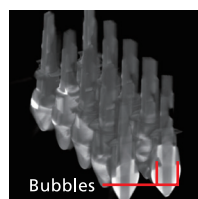
Fluoroscopic Image  
of Solder



CT Image of Solder  
on PCB



inspeXio SMX-225CT FPD HR Plus  
Microfocus X-ray CT System



CT Image of  
Inadequate Solder  
and Bubbles in Solder



Electronic and  
electrical equipment  
related information





## Contributing to Achieving Carbon Neutrality through Shimadzu Analytical and Measuring Instruments and Industrial Machinery

\*Use the QR codes to view related information.

### Carbon Recycling Industry

Contributing to the Development of Various Carbon Recycling Technologies and Industries with Measurement Technologies

#### Applicable Products

- Quality control of synthetic fuels based on carbon recycling: Pyrolysis GC-MS, System GC
- Concrete CO<sub>2</sub> absorption measurements: Total organic carbon (TOC) and solid sample measurement systems
- Investigation and standardization of conditions in the algae/biojet fuel production method: HPLC, GC, GC-MS, EDX, TOC, ICP emission spectrometers, differential scanning calorimeters, spectrophotometers (UV), Fourier transform infrared spectrophotometers (FTIR) etc.
- Development of biodegradable plastics: FTIR microscope, EDX, LC-MS
- Functional design and development of production technologies including innovative biomaterials and high functionality products: Smart cells
- Production of H<sub>2</sub> by photocatalysts, and catalyst research: Lightway photoreaction evaluation systems



GCMS-QP2020 NX  
Gas Chromatograph  
Mass Spectrometer



Lightway  
Photoreaction  
Evaluation System



UV-2600i  
Spectrophotometer



TOC-L Series  
Total Organic Carbon  
Analyzer



### Food, Agriculture, Forestry, and Fisheries Industries

Solving Social Problems through a Combination of Analytical and Measuring Technologies, Brain and Sensory Measurement Technologies, AI & IoT, and Robotics Technologies

# Resource Circulation-Related Industries

Contributing to Resource Circulation-Related Industries with Measurement Technologies

## Applicable Products

- Improving the combustion efficiency of wood biomass power generation: Electronic moisture meters
- Continuous analysis of mixed biogas and city gas: System GC
- Quality evaluations of biomaterials: Microfocus X-ray CT systems
- Evaluating the degradation of plastics in the ocean: Photoirradiation GC-MS



- Recycling of metals and resins by sorting waste: Resin identification technologies, laser induced breakdown spectroscopy (LIBS)
- Evaluating metal adsorption by plants, and recycling materials in combination with a water quality management system: ICP, EDX, and other elemental analysis systems



Microplastics  
related information



Waste  
related information



ICPE-9800  
ICP Emission Spectrophotometer



System GC



MOC63u  
Electronic Moisture Analyzer

## Applicable Products

- Analysis of amino acids, vitamins, and other functional components: HPLC, GC, GC-MS, and LC-MS
- Development of technologies for suppressing the production of greenhouse gases from agriculture and livestock industries
- Technologies for utilizing wood biomass energy
- Development of new materials from wood (Improved CO<sub>2</sub> storage capacity)
- Determining production regions and classifications



Post Column Amino Acid  
Analysis System (HPLC)



i-Series  
Integrated HPLC System



MultiNA  
Microchip Electrophoresis System  
for DNA/RNA Analysis



# Reducing the Environmental Load of Shimadzu Products

\*Use the QR codes to view related information.

## ➤ Eco-Products Plus, Certified Environmentally Friendly Products

Shimadzu is addressing concerns about the environment by reducing the size and power consumption of our products.

Shimadzu offers certified Eco-Products Plus products to customers that achieve especially high environmental performance. Eco-Products Plus products must satisfy one of the criteria at right compared to previous models. They reduce CO<sub>2</sub> emissions when used by the customer and thus contribute to the prevention of global warming.



1. At least 25 % lower energy consumption



2. At least 25 % smaller (either by weight, volume, or installation area)



3. 25 % reduction in the use of consumables such as gas and solvents

Electricity



44%↓



EDX Series  
Energy Dispersive  
X-ray Fluorescence Spectrometer

Electricity



25%↓



32%↓



Nexera Series  
Ultra Fast Liquid Chromatograph

Electricity



46%↓



AP Series  
Analytical Balance

Volume



80%↓



IRSpirit  
Fourier Transform Infrared  
Spectrophotometer

Consumables



33%↓



ICPMS-2030  
ICP Mass Spectrometer

Electricity



75%↓



NJ-SERVO  
Electric Motor Driven Actuator

Volume



72%↓



TMP-B300  
Turbo Molecular Pump



[ Related  
information ]

## ➤ Green Growth Strategies and Carbon Neutral Related Shimadzu Products

|                                            | Offshore Wind Power | Ammonia Fuel | Hydrogen | Automotive and Storage Batteries | Semiconductors and Information & Communications | Food, Agriculture, Forestry, and Fisheries | Carbon Recycling | Resource Circulation-Related |
|--------------------------------------------|---------------------|--------------|----------|----------------------------------|-------------------------------------------------|--------------------------------------------|------------------|------------------------------|
| LC                                         |                     |              | ●        |                                  |                                                 | ●                                          | ●                |                              |
| GC                                         |                     | ●            | ●        |                                  |                                                 | ●                                          | ●                | ●                            |
| GC-MS                                      |                     |              |          |                                  |                                                 | ●                                          | ●                | ●                            |
| UV                                         |                     |              |          |                                  |                                                 |                                            | ●                |                              |
| FTIR                                       |                     |              |          | ●                                |                                                 |                                            | ●                |                              |
| EDX                                        |                     |              | ●        |                                  |                                                 |                                            | ●                |                              |
| SPM/Microscope                             |                     |              |          | ●                                | ●                                               |                                            |                  | ●                            |
| X-Ray CT System                            |                     |              |          | ●                                | ●                                               |                                            |                  | ●                            |
| EPMA                                       |                     |              |          |                                  | ●                                               |                                            |                  |                              |
| ICP                                        |                     |              |          | ●                                |                                                 |                                            |                  | ●                            |
| TOC/TN                                     |                     | ●            |          |                                  |                                                 | ●                                          | ●                |                              |
| Gas Analyzer                               |                     | ●            | ●        |                                  |                                                 |                                            |                  |                              |
| Powder/Particle Size Distribution Analyzer |                     |              | ●        | ●                                |                                                 |                                            |                  |                              |
| Thermal Analyzer                           |                     |              | ●        |                                  |                                                 |                                            |                  |                              |
| Testing Machine                            | ●                   |              |          | ●                                |                                                 |                                            |                  |                              |
| High-Speed Video Camera                    |                     |              |          | ●                                |                                                 |                                            |                  |                              |
| Moisture Analyzer                          |                     |              |          |                                  |                                                 |                                            |                  | ●                            |
| Photoreaction Evaluation System            |                     |              |          |                                  |                                                 |                                            | ●                |                              |
| Turbo Molecular Pump                       |                     |              |          |                                  | ●                                               |                                            |                  |                              |
| Leak Detector                              |                     |              | ●        | ●                                |                                                 |                                            |                  |                              |
| Balancing Machine                          |                     |              |          | ●                                |                                                 |                                            |                  |                              |
| Sintering Furnace                          |                     |              |          | ●                                |                                                 |                                            |                  |                              |
| Sputtering System                          |                     |              |          | ●                                |                                                 |                                            |                  |                              |
| Glass fiber winder                         | ●                   |              |          |                                  |                                                 |                                            |                  |                              |

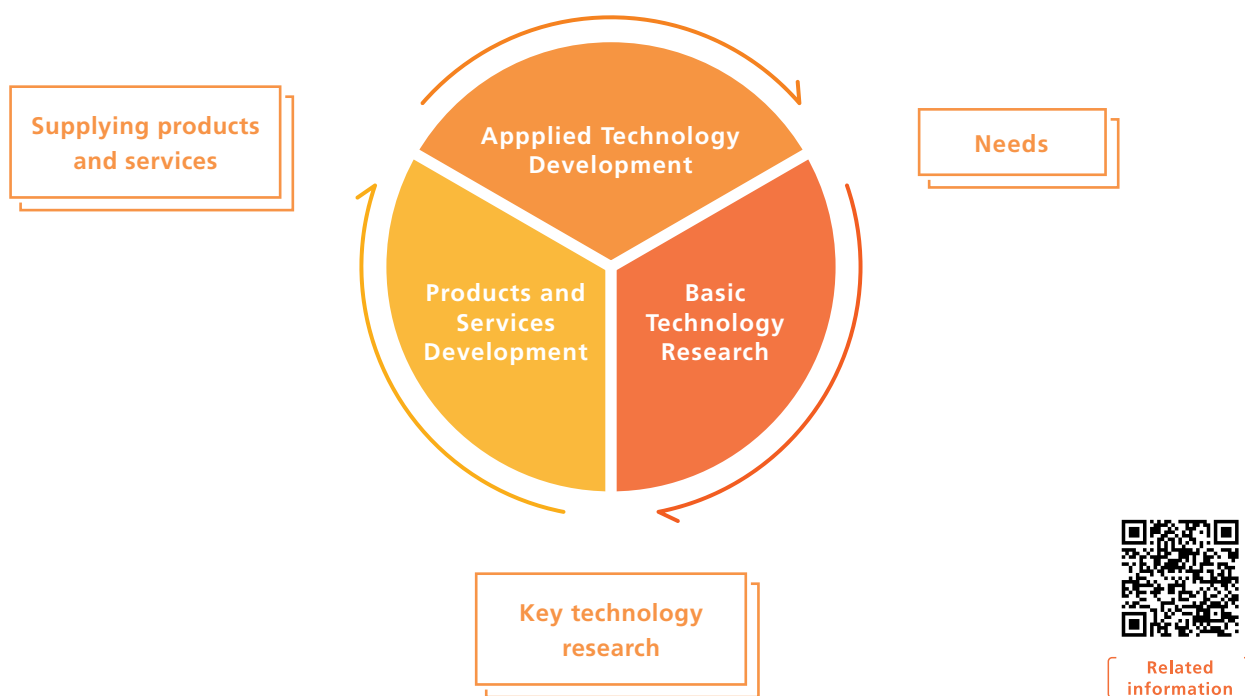


# Contributing Broadly to Solving the Challenges of Customers

\*Use the QR codes to view related information.

## Integrated Organization that Fosters Innovation

To provide support for our businesses, achieve additional growth, and promote the development of advanced technologies or the integration of different technologies through joint research and open innovation work with external entities, we are establishing integrated capabilities for activities ranging from research and development to product and application development.



### > Application and Technology Development

#### Innovation Centers

Innovation Centers have been established to conduct joint research and joint development with key customers, such as academic institutions, research institutions, and private companies that hold advanced technologies. Currently, there are four Innovation Centers located throughout the world, in Europe, the United States, China, and Singapore. Shimadzu is also strengthening ties between the Innovation Centers and the Global Application Development Center in Japan.



Innovation Center (U.S.)



Innovation Center (Germany)



Shimadzu China  
Mass Spectrometry Center



Innovation Centre (Singapore)



## > Technology Research Laboratory

With the emergence and evolution of new technology and rapid changes in the social environment, in order for Shimadzu to contribute to the realization of a prosperous society by science and technology, along with the strengthening and development of existing businesses, it is necessary to develop new businesses and products. In order to realize these, Technology Research Laboratory will pursue social tasks through active cooperation with research institutions, universities and companies, acquiring innovative technologies, deepening the technology and integration, promoting new businesses from a mid to long-term perspective, and we will create innovation.

### Technology Innovation

We acquire and deepen our core technologies from a mid to long-term perspective and investigate and earn the technologies that will be needed in the future society from a broad perspective.

### New Business Development

We investigate and forecast changes in society in the future, and through the integration and development of technologies and know-how, we provide new solutions for the next social issues.

### Open Innovation

We actively engage in collaboration with advanced research institutions, universities and companies, promote innovation by acquiring advanced technologies and creating new business models.

## SHIMADZU Future Collaboratory

A new research building, the SHIMADZU Future Collaboratory, will be established within the Technology Research Laboratory site, which is located in the Keihanna Science City (Seika-cho, Soraku-gun, Kyoto). The collaboratory is designed to facilitate research and development of advanced analytical technologies, the brain and the five senses, innovative biotechnology, and artificial intelligence (AI), for example, and for creating new value through open innovation and solving challenges of society.



## > Shimadzu Tokyo Innovation Plaza (Opening Scheduled in 2022)

An open innovation hub to create new business in the life sciences and environmental fields. Its role is to coordinate with the global innovation centers to develop analytical application technologies and provide solutions to customers through joint research.





Shimadzu Corporation



We introduce our SDGs initiatives on our website.

