Panasonic Connect Co., Ltd.
Process Automation Business Division
Environmental Report

April 1, 2024

Process Automation Business Division

Panasonic Connect Co., Ltd.

Introduction

The purpose of this report is to introduce environmental initiatives of the Process Automation Business Division, Panasonic Connect Co., Ltd. to our stakeholders. Regarding our other social and governance initiatives and basic policies, please refer to the Panasonic Connect Sustainability Report.

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April 2024 (Previous report: April 2023)

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Panasonic Connect Sustainability

By reforming frontline operational processes, we will reduce CO_2 emissions and make effective use of resources.

We propose optimal work styles for all workplaces and create a society where people can live with well-being.

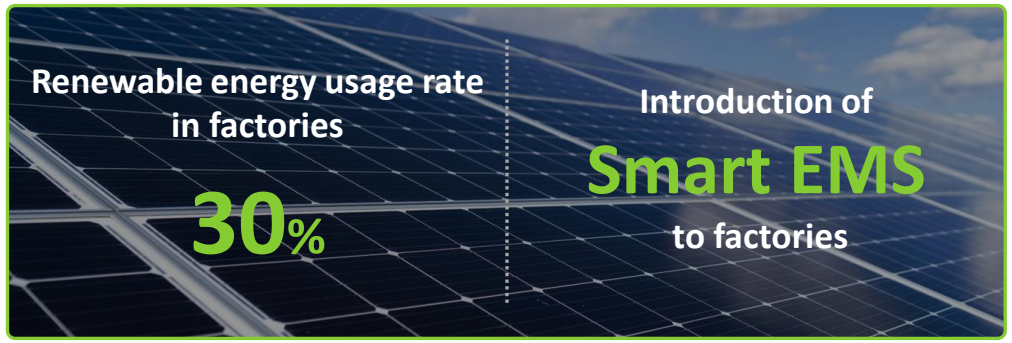
By connecting with customers and providing innovation in their operations, we will realize sustainability for the global environment and well-being for each individual.

Change Work,
Advance Society,
Connect to Tomorrow.

Fine Process Innovation Connecting to Tomorrow

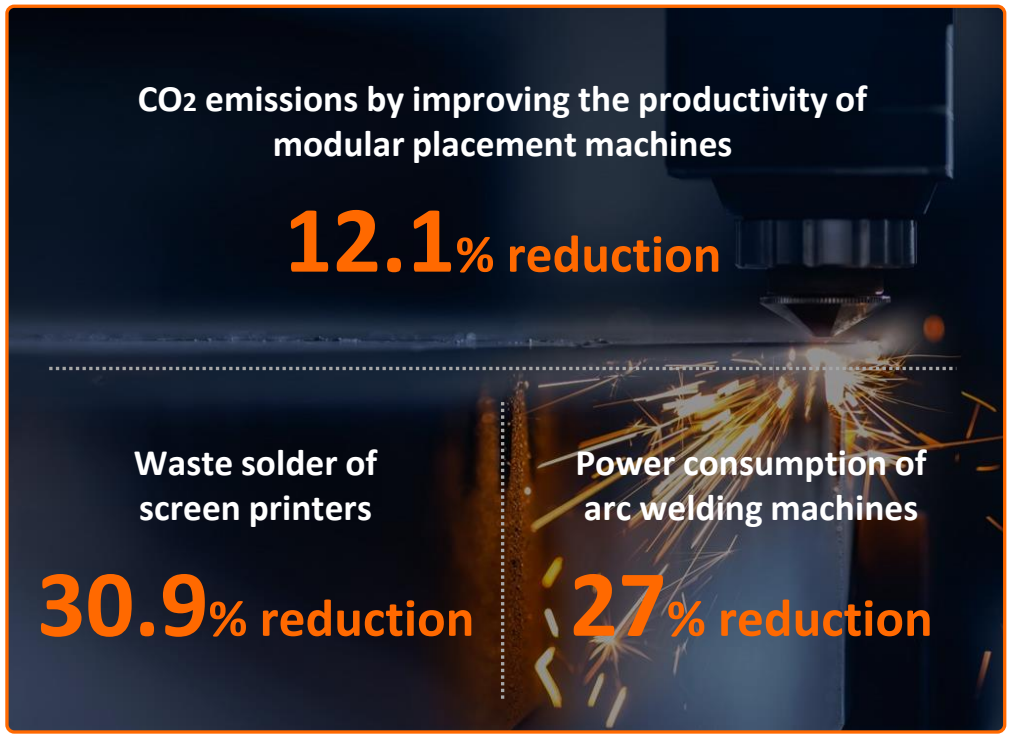
We will innovate the "Gemba" with our precise and accurate manufacturing technology and link it to a sustainable future

GREEN FACTORY Environmental activities in our workplaces



Panasonic ECO RELAY JAPAN Well-being in our workplaces

Optimization of manufacturing sites Sustainability through the provision of services to customers



GREEN FACTORY

To achieve a better life and a more sustainable global environment

The Panasonic Group is working to reduce the global environmental impact of manufacturing.

Key themes

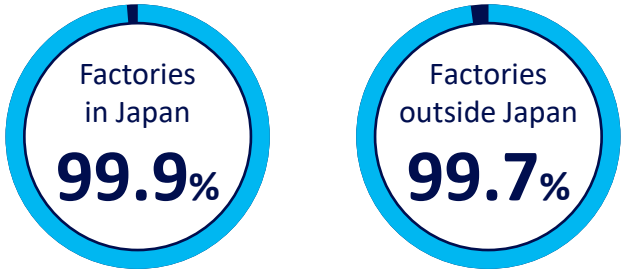
1. Energy conservation activities
2. Chemical substance management
3. Waste reduction
4. Environmental risk

Purpose of initiatives

1. Minimize CO2 emissions from factories
2. Minimize chemical substance emissions
3. Minimize waste generation
4. Prevent environmental risks

Each factory is working to minimize all inputs and emissions in the production process, reduce waste, and increase the recycling of valuable materials and resources, thereby achieving higher recycling rates.

Recycling rate of waste and valuable resources



There is a wide variety of chemicals, each with its own toxicity. The Panasonic Group assesses the hazard level of chemical substances, classifies them by rank, and establishes its own criteria for hazardousness factors. The HEI count (Human and Environment Impact) at each factory is calculated, managed, and reduced.

Chemical substance

	2018	2019	2020	2021	2022
Total global HEI count	723	746	733	769	523

HEI count = Hazardousness factor of chemical substance x Release and transfer amount

GREEN FACTORY

Consideration of introducing an on-site PPA to the Kofu Factory

We are considering the installation of solar panels at the Kofu Factory to introduce an on-site PPA in order to achieve net zero CO_2 emissions in FY2024.

Estimated effects of PPA introduction

CO_2 emission reduction

22,140

t/20 years

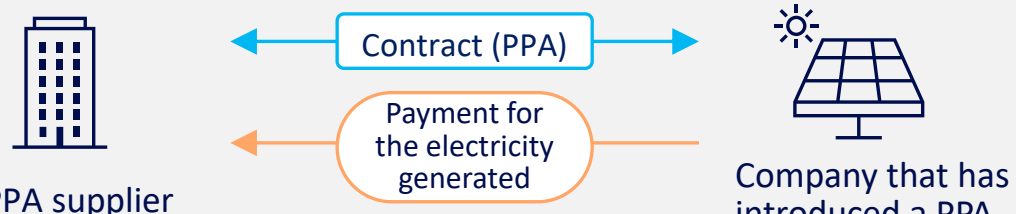
Renewable energy rate

30%

* Estimates as of September 26, 2023
* Panel installation area: 14,600 m2 (including the replacement of existing panels)

PPA [Power Purchase Agreement]

PPA is a contract concluded directly between electricity sellers and buyers.

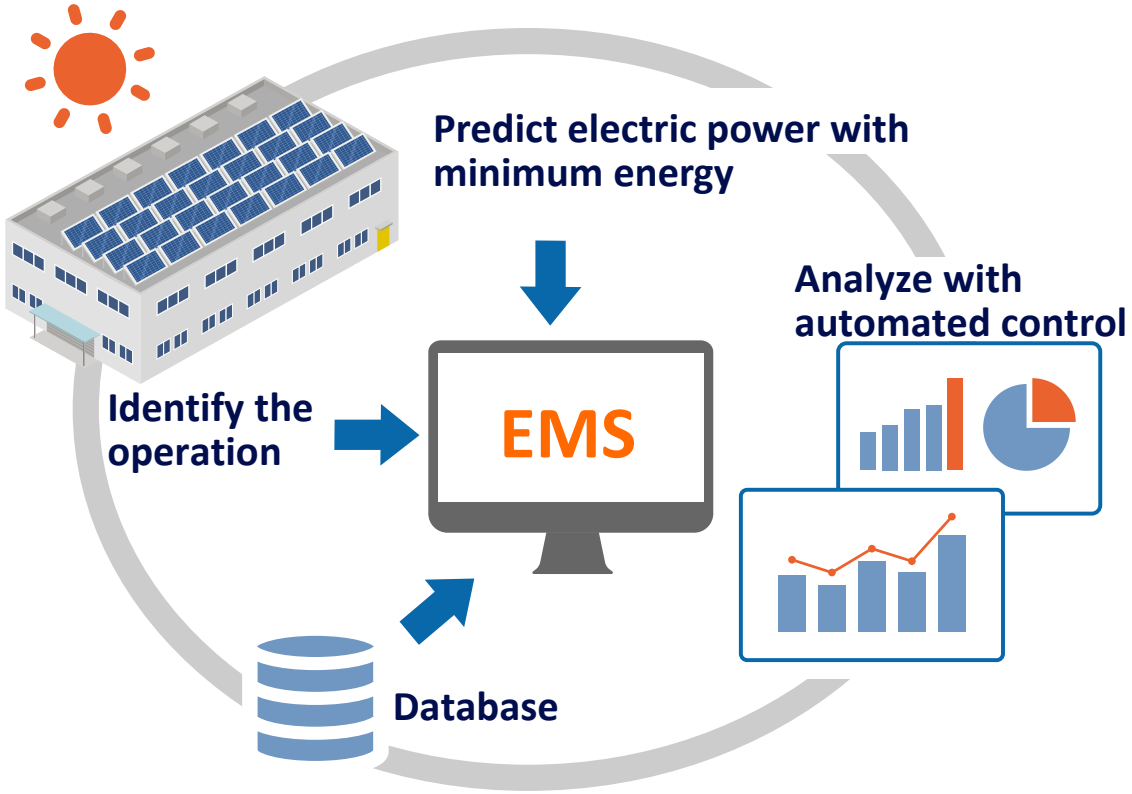


GREEN FACTORY

Smart EMS installation at Toyonaka Factory

Through the installation of smart EMS* in the cleanroom of the Toyonaka Factory, we have achieved energy-efficient manufacturing while maintaining quality.

*EMS: Environmental Management System



Panasonic to Achieve Net Zero CO_2 Emissions - Panasonic Japan

Optimization of Manufacturing Sites

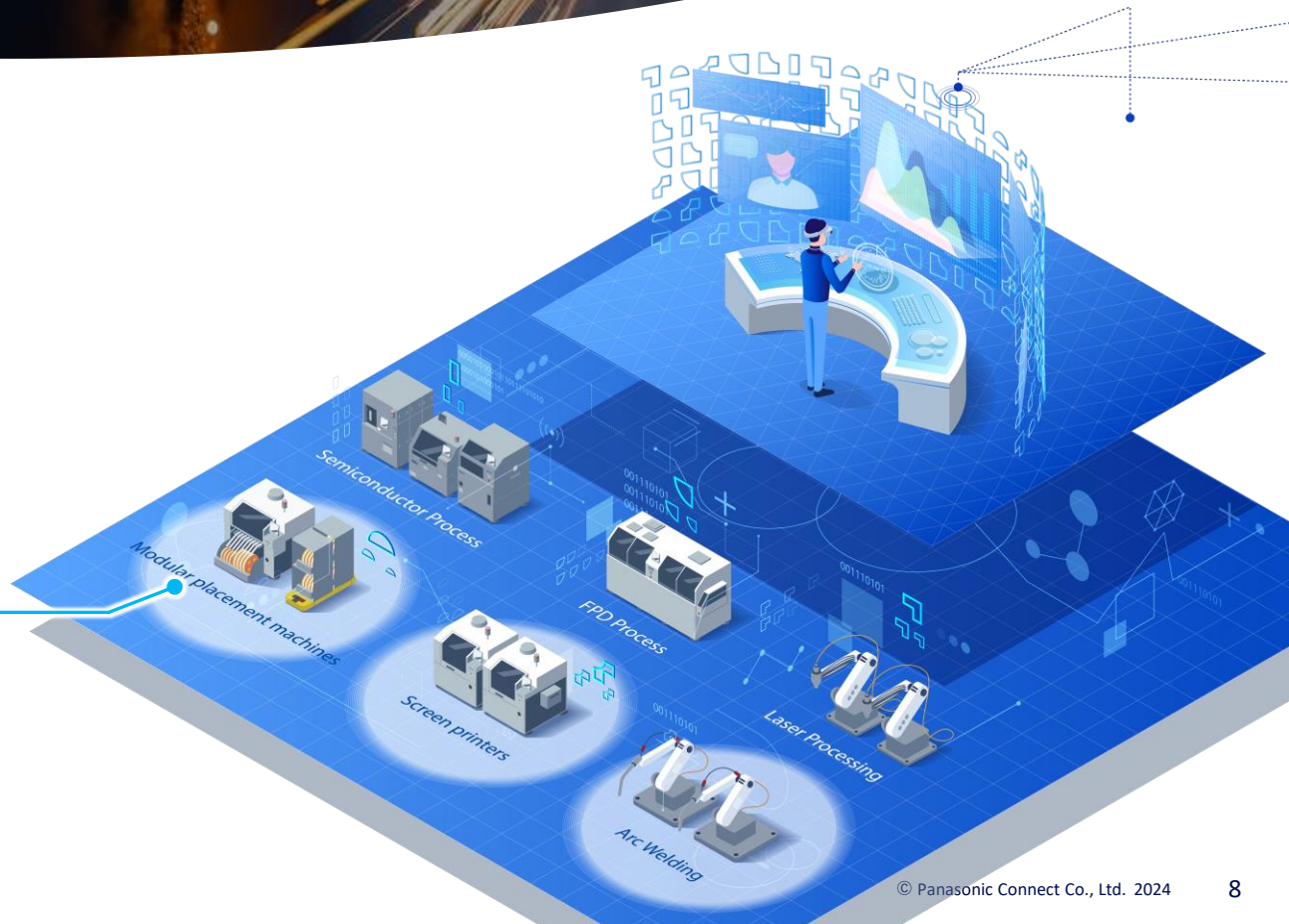
Autonomous Factory x Edge devices with environmentally friendly design

We propose the **Autonomous Factory** that autonomously controls the 5Ms*, which are variable factors at production sites, by combining expertise and technology to optimize production sites, enabling immediate response to customer demands and supply changes. By leveraging the 5M data effectively, we aim to develop optimal production plans to eliminate waste and achieve planned manufacturing.

*5M represents the elements that make up manufacturing: huMan, Machine, Material, Method, and Measurement

Aiming to achieve Autonomous Factories and specialize in edge devices

By promoting specialization in edge devices as the starting point for achieving the Autonomous Factory, PABD supports quality production through industry-leading precise and accurate machining processes.
In addition, by reducing CO_2 emissions through energy-saving measures during equipment operation and standby, including modular placement machines, screen printers, and arc welding machines, PABD contributes to enhancing energy efficiency and reducing environmental impact at customers' sites.



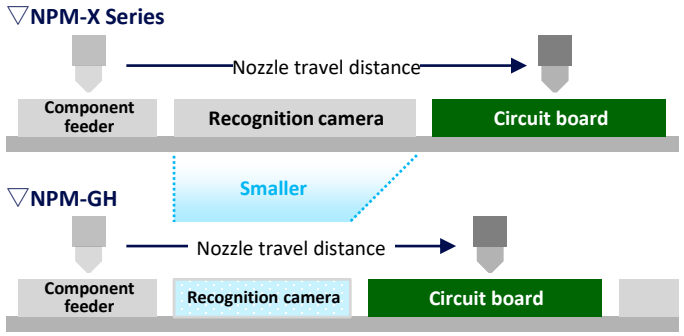
Optimization of Manufacturing Sites

Reducing CO_2 emissions by 12.1% by shortening production time through productivity improvement of modular placement machines

Improve productivity by reducing the travel distance in the Y direction

Component travel distance

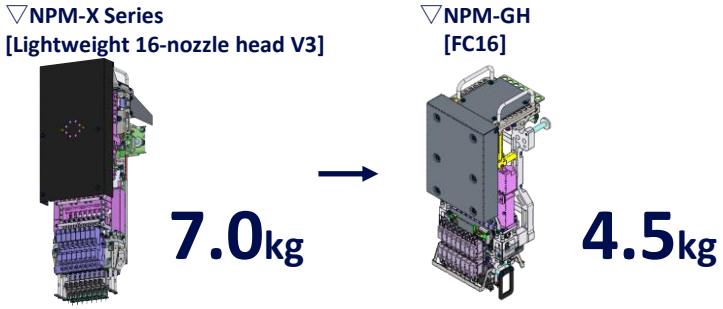
16% reduction



Improve productivity by using a lighter mounting head

Mounting head weight

36% reduction



Compared models
Model before replacement: NPM-DX
[Energy consumption: 2.31 kWh / Productivity: 70,000 cph] *1
Model after replacement: NPM-GH
[Energy consumption: 2.07 kWh / Productivity: 74,000 cph]
* Since one unit of the NPM-DX model is equivalent to two units of the NPM-GH model, its energy consumption and productivity are shown at half of the actual figures

Scope of quantification
The reduction in production time achieved through productivity improvement is calculated as an effect

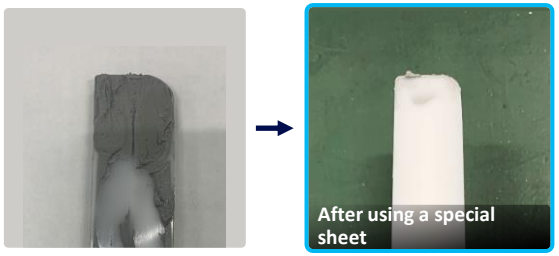
NPM-GH

Reducing waste solder by 30.9% using automatic functions of the screen printer

Reduce remaining solder through automatic functions

Solder remaining on the spatula when a special sheet is used

82% reduction



Solder remaining in the perforated pot when automatic solder supply is used

53% reduction

Solder leakage when the solder leak prevention block is used

50% reduction

Compared models
Before replacement: NPM-GP/L [standard spec]
After replacement: NPM-GP/L [equipped with optional functions]
a. Solder transfer function / b. Perforated pot type automatic solder supply / c. Solder leak prevention block

Scope of quantification
Reduced waste solder through automatic functions

NPM-GP/L

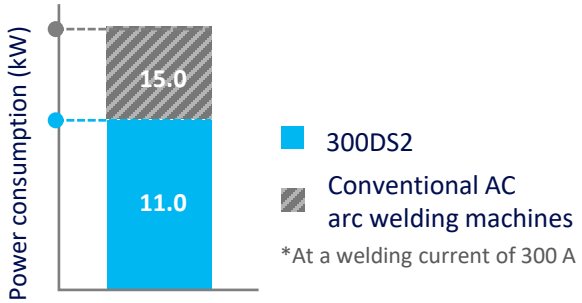
Reducing power consumption of arc welding machines by approx. 27%

Through the latest inverter control circuit, power consumption is significantly reduced compared to AC machines.
In addition, with the integrated start switch, energy consumption is reduced by providing standby voltage output when the switch is ON and automatically stopping when welding is completed.

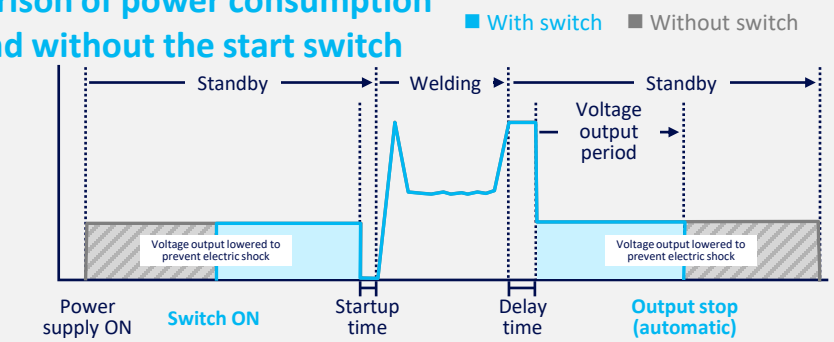
Reduce power consumption through inverter control circuit

Power consumption

Approx. 27% reduction



Comparison of power consumption with and without the start switch



Compared models
Comparison of our AC arc welding machines with equivalent functions and performance to the models before replacement (at 300 A output)
Models compared with 500DS2 [500FS7/500FH7/500FD7/500FL7/500DS1]
Models compared with 300DS2 [300AH4/300AG4/300AJ4/300AK4/300DS1]
Model compared with 250AD4 [250AD4]

300DS2/ 250AD4

Panasonic ECO RELAY JAPAN

Working with local communities to save the earth and raise awareness of global environmental conservation

We are working to raise awareness of the importance of preventing global warming and reexamining our lifestyles by engaging in a wide range of global environmental conservation activities. These activities include preserving local environments such as forests, green spaces, and bodies of water; efforts to conserve "satoyama" (undeveloped woodlands near populated areas); and nature education programs.
Additionally, by collaborating with local residents, we contribute to community revitalization efforts.

A total of 191 people participated in 12 events organized by the Process Automation Business Division

Activities in partnership with local governments

Number of participants

74 people

Arakawa River cleanup activity / Mount Fuji cleanup activity / Senri River cleanup activity / Kaga Coast cleanup activity / Minoshima cleanup campaign

Bamboo forest clearing activity in Kaga

Number of participants

18 people

Bamboo forest clearing activity on factory premises

Cleanup activities around factories

Number of participants

50 people

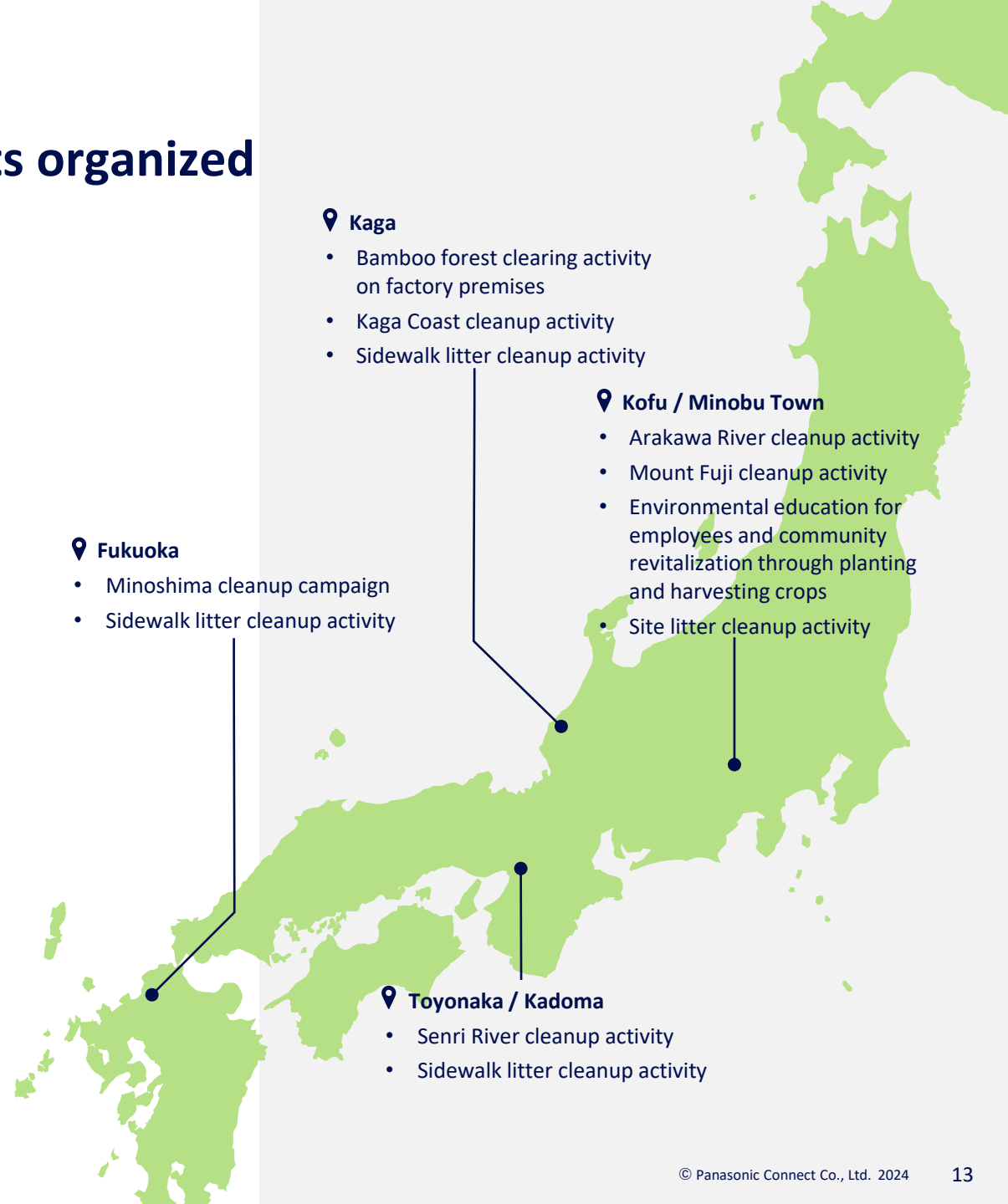
Sidewalk litter cleanup activity around each site

Activities in rural village zones

Number of participants

49 people

Environmental education for employees and community revitalization through planting and harvesting crops



Panasonic

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