Environmental Report

Environmental Management Basic Policy

<SDGs related to this section>

Today we face various environmental problems. Many environmental problems, from those unique to each region to those on a global scale, exist around the world. As they are complexly intertwined and continuing to deteriorate, achieving a sustainable society is a global common challenge. Companies are expected to play an increasingly larger role in tackling this challenge.

Since the time of its foundation, the Kubota Group has pursued a mission of solving social problems in developing its businesses. Toward the realization of "For Earth, For Life," the Kubota Group will contribute to the realization of a sustainable society through its environmental management initiatives.

Environmental Charter / Action Guidelines

The Kubota Group Environmental Charter

- The Kubota Group aspires to create a society where sustainable development is possible on a global scale.
- The Kubota Group contributes to the conservation of global and local environments through its environmentally friendly operations, products, technologies, services, and corporate activities.

The Kubota Group Environmental Action Guidelines

1. Environmental Conservation Efforts in All Business Activities
   (1) We promote environmental conservation measures in all stages of our corporate activities, including product development, production, sales, physical distribution, and service.
   (2) We also request that our suppliers understand the importance of environmental conservation efforts and cooperate in this regard.

2. Global Environmental Conservation
   (1) We promote global environmental conservation measures intended for dealing with climate change, creating a recycling-based society, conserving water resources, and controlling chemical substances.
   (2) We promote global environmental conservation by providing products, technologies, and services that contribute to solving environmental problems.
   (3) We strive to ensure our corporate activities are friendly to the natural environment and biodiversity.

3. Environmental Protection to Create a Symbiotic Relationship with Local Societies
   (1) We make efforts in the reduction of environmental risks and promote our business activities with proper consideration for the protection of local environments, including pollution prevention.
   (2) We actively participate in environmental beautification/education activities in local communities.

4. Our Voluntary and Organized Efforts in Environmental Conservation
   (1) By introducing the environmental management system and establishing voluntary targets and action plans, we work on our daily business operations.
   (2) We endeavor to enhance environmental awareness through active environmental education/enlightenment activities.
   (3) We actively provide stakeholders with environment-related information.
   (4) We collect stakeholders' opinions broadly through environmental communication, and reflect the findings in our environmental activities.

Environmental Management Approach

Concepts of Environmental Management

Having established the “For Earth, For Life” Brand Statement as its concept for environmental management, the Kubota Group balances its business growth and contribution to environmental conservation through its environment-friendly products, technologies, services and corporate activities and aims for ongoing synergistic development with society in order to continue supporting the prosperous life of humans while protecting the environment of this beautiful earth.

The Group has set five basic items for its environmental conservation, namely, “Tackling Climate Change,” “Working towards a Recycling-based Society,” “Conserving Water Resources,” “Controlling Chemical Substances,” and “Conserving Biodiversity.” Based on these items, the Group is committed to the development of society and the conservation of the global environment through the delivery of products, technologies and services that help solve the social problems in the fields of food, water, and the living environment and through the reduction of the environmental loads and environmental risks of its corporate activities.

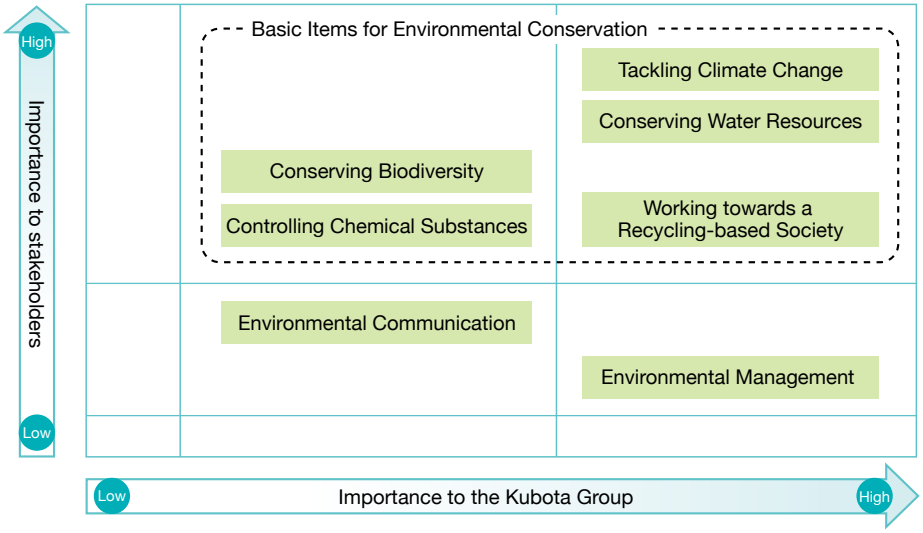
Materiality

The Kubota Group has identified material issues (priority issues) in its environmental conservation activities, taking into consideration their importance in business, requests and expectations from stakeholders, and social trends.

Process for Identifying Materiality

Step 1	**Gathering and analyzing information** We gathered and analyzed information on international frameworks and policy trends, key external evaluation indicators, global trends in the Kubota Group's business fields, etc.
Step 2	**Listing material issues** Through discussions at the Environmental Management Strategy Committee and interviews with relevant internal departments, and dialogues with ESG (environment, society, governance) investment institutions and external experts, we listed issues relating to environmental conservation.
Step 3	**Identifying materiality** We examined the identified issues from the perspectives of both the importance to stakeholders and the importance to the Kubota Group, and plotted the identified priority issues on a matrix.
Step 4	**Formulating and implementing key measures** After identifying the impacts (risks and opportunities) related to issues with a high degree of importance for both stakeholders and the Kubota Group, we formulate key measures and promote the steady implementation thereof.

Materiality Matrix



Materiality Awareness

Tackling Climate Change	Against a backdrop of more frequently occurring natural disasters caused by abnormal weather and other factors believed to be linked to climate change, tackling this challenge has become an issue of global proportions. As a corporate group that conducts business activities throughout the globe, the Kubota Group believes in the importance of working to reduce the emissions of greenhouse gases in the corporate value chain as well as undertaking adaptive measures designed to reduce the impact of climate change.
Conserving Water Resources	Access to safe drinking water is a critical part of life-supporting infrastructure. Despite this, there are many people throughout the world that cannot access safe drinking water. The Kubota Group has defined "Water" as one of its business areas, and believes in the importance of becoming more deeply committed to the supply of safe, secure water through the construction of water infrastructure, as well as conserving local water resources, which includes saving water, recycling wastewater, and applying water quality-related risk management at its business sites.
Working towards a Recycling-based Society	Mineral resources are used widely throughout modern society, but there is a limit to the amount existing on the planet. More recently, increasing amounts of waste and marine plastic pollution have become global issues. Likewise, the Kubota Group believes in the importance of providing waste processing services and related equipment, for example, as solutions for issues related to the garbage generated from human lifestyles and economic activities, as well as effectively utilizing resources and reducing waste in the business value chain.
Conserving Biodiversity	As part of agriculture, living things are the resource that is subject to harvest, where ecosystems denote the interrelation between the environments that produce living resources and other living things. Meanwhile, biodiversity is an essential factor for abundant, stable food production. The Kubota Group defines "Food" as one of its business areas, and in addition to addressing greater efficiency in agriculture and a diverse range of needs, we believe in the importance of delivering products and services that contribute to the conservation of biodiversity, as well as undertaking business activities that consider biodiversity and protecting the natural environment around its business sites.
Controlling Chemical Substances	Chemical substances have become an essential part of our lifestyles. On the other hand, chemical substances hold the potential to significantly impact humans and ecosystems, a fact that has led to stringent laws and regulations related to their appropriate use and control. The Kubota Group believes in the importance of appropriately controlling the chemical substances contained in its products and handled at its business sites in order to minimize the impact on customers, those who live and work near its business sites, employees, and ecosystems.

Risks and Opportunities

The Task Force on Climate-related Financial Disclosures (TCFD) set up by the Financial Stability Board (FSB) released its final report in June 2017 to provide companies with recommendations for assessing and disclosing the financial implications of climate change.

In light of the climate change-related risks (transitional risk, physical risk) and opportunities recommended for disclosure by the TCFD and other organizations, the Kubota Group endeavors to continuously assess the implications related to materiality (basic items for environmental conservation) considered to have a high degree of importance for stakeholders and the Kubota Group from the perspective of risks and opportunities. Moreover, we make efforts towards reducing risks and creating value from opportunities.

		Anticipated Risks and Opportunities
Tackling Climate Change	Risks	Higher costs coinciding with compliance to stricter energy saving-related regulations, etc.
		Higher manufacturing costs due to soaring energy prices
		Negative impacts on Kubota and supplier operations due to climate change-triggered natural disasters
		Changes in agricultural style due to more pests, lower crop yields, and relocation of suitable farming land, etc.
		Removal of low energy-saving products as a result of greater interest in climate change among the market and customers
	Opportunities	Contribution to greenhouse gas emissions control through the launch of products and services, etc., that enable energy savings and energy creation
		Improve energy efficiency through energy-saving measures, such as upgrading to high-efficiency equipment at business sites
		Expand climate change adaptation business based on the delivery of agricultural solutions that correspond to changes in agricultural styles
Working towards a Recycling-based Society	Risks	Higher costs coinciding with compliance to import and export regulations on discarded plastic and stricter waste-related regulations, etc.
		Higher manufacturing costs due to resource depletion and soaring resource prices
		Higher costs coinciding with the development and production of resource recycling-based products made from recycled materials, etc.
	Opportunities	Contribution to the effective use of resources through the launch of products that consider resource recycling, including the use of recycled materials, and through the deployment of environmental and waste-disposal services
		Improve resource efficiency through resource conservation measures at business sites
		Improve product sustainability through easier maintenance and the promotion of used product recycling
Conserving Water Resources	Risks	Fines and shutdowns due to non-compliance with wastewater standards, etc., and lower social credibility, higher costs coinciding with stricter water-related regulations, etc.
		Negative impacts on production activities due to higher manufacturing costs resulting from soaring water prices and water-use restrictions, etc.
		Negative impacts on Kubota and supplier operations due to flooding, droughts, and other disasters
		Lower crop yields due to shortage of water resource, changes in agricultural styles due to relocation of suitable farming land
		Higher costs coinciding with the design and development of products and services suited to the needs of regions with high water risk
	Opportunities	Contribution to social infrastructure through the delivery of water environment-related products that ensure access to safe and secure water, wastewater treatment and recycling treatment facilities that comply with stricter regulations, and solutions that help solve water-environment issues, etc.
		Improve water use efficiency through water conservation and wastewater reuse at business sites, etc.
		Expand climate change adaptation business based on the supply of water infrastructure that is highly resistant to flooding, droughts, and other disasters
Controlling Chemical Substances	Risks	Fines and shutdowns, etc., due to non-compliance with chemical substance-related environmental standards, etc., and lower social credibility, and higher costs coinciding with stricter chemical substance-related regulations, etc.
	Opportunities	Contribution to reduced environmental loads through the launch of products compliant with emissions gas regulation and toxic substance use regulation
		Reduce exposure risk through the decreased use of potentially toxic substances at business sites
		Improve painting efficiency through the reduced use of paints and improved yields, etc., at business sites
Conserving Biodiversity	Risks	Fines and litigation due to violation of biodiversity-related regulations
		Shortages and higher procurement costs of raw materials due to declining natural capital
		Litigation raised by local communities and lower social credibility due to inappropriate land use, pollutant emissions, and excessive resource consumption, etc.
	Opportunities	Contribution to the conservation of biodiversity through the launch of products that assist soil and water area conservation and products that control gas emissions, noise, and vibration, etc.
		Improve brand image through activities that consider biodiversity and environmental communication with local communities, etc.

Key Measures

In order to address the issues identified as materiality, the Kubota Group promotes the following key measures from the perspective of the value chain.

	Value chain of business (Expanding Environment-friendly Products and Services P57-70)		
	Design and development, procurement	Manufacturing and distribution	Use and disposal
Tackling Climate Change (P38-42)	• Optimal regional procurement	• Reduce waste and loss in the use of energy based on the Kubota Production System concept • Recover and reuse waste energy • Expand use of renewable energy • Improve distribution efficiency • Promote modal shift	• Lower fuel consumption • Improve efficiency and save labor for work and management • Conserve energy during construction
Working towards a Recycling-based Society (P43-46)	• Use recycled materials • Reduce the number of parts	• Conserve resources • Promote the 3Rs for waste and convert waste into functional materials • Reduce plastic • Reduce packing material • Ensure proper waste management	• Extend product life • Improve ease of maintenance • Promote product recycling • Ensure proper disposal
Conserving Water Resources (P47-49)	• Assess water risks	• Promote the 3Rs for water resources • Ensure proper wastewater management • Promote BCP measures	• Save water consumption • Promote purification or recycling of wastewater
Controlling Chemical Substances (P50-53)	• Reduce the use of substances of concern	• Reduce VOC emissions • Substitute for organic solvents • Ensure proper chemical substance management	• Make exhaust gas cleaner • Reduce environmental loads on soil and water areas
Conserving Biodiversity (P54-56)	• Assess the impact on natural capital	• Manage and reduce the environmental loads • Beautification and greening of business sites and neighborhoods	• Conserve soil and water areas • Reduce noise and vibration
Environmental Management (P71-75)	• Promote global environmental management led by the members at the management class level • Systematically reduce environmental loads toward achieving the Medium and Long-Term Environmental Conservation Targets • Reduce environmental risks through environmental risk assessment • Ensure environment-friendly design through product environmental assessment • Promote green procurement • Develop products that contribute to global environmental protection and solving social problems • Enforce compliance in accordance with globally systemized environmental conservation rules • Promote environmental training and environmental awareness-raising activities		
Environmental Communication (P76-80)	• Strengthen information dissemination through the environmental report and website • Promote environmental communication tailored to each target • Enhance two-way communication with stakeholders • Participate in regional environmental conservation activities		

Relationships Between Environmental Conservation Activities and the SDGs

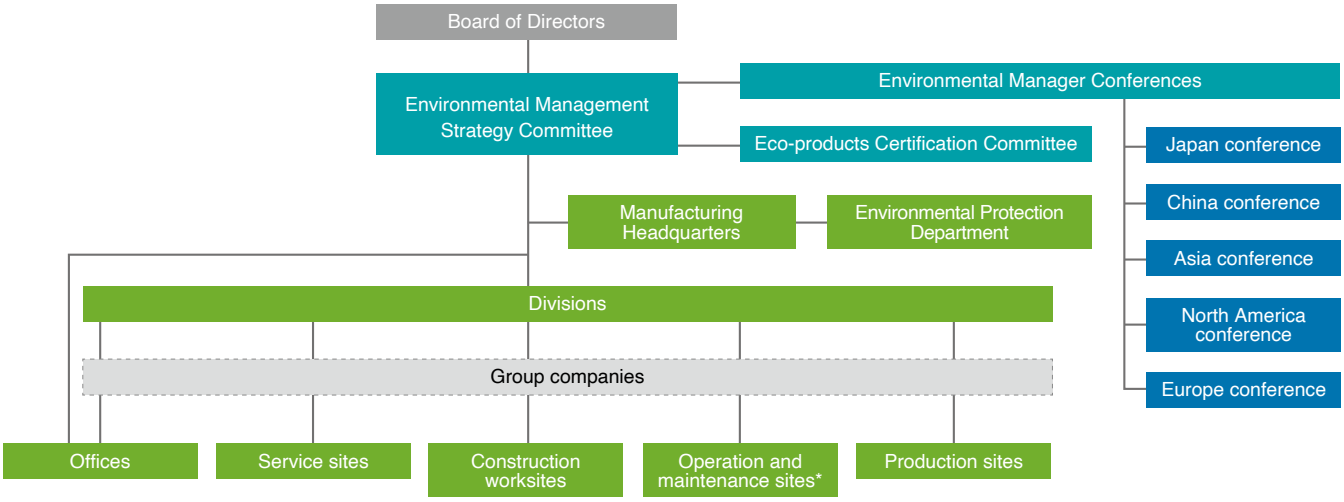
The Kubota Group environmental conservation activities are deeply related to the SDGs. In order to illustrate the relationship between our environmental conservation activities and the SDGs, we have organized their connections with the SDG targets.

View the list of related SDGs and targets
www.kubota.com/company/environment/sdgs/img/SDGs_target_list.pdf

Environmental Management Promotion System

Organization Structure

In 2014, the Environmental Management Strategy Committee was newly established to take a more strategic and innovative approach to environmental management by management-led promotion. In addition, Environmental Manager Conferences are held for each region—Japan, China, Asia, North America and Europe—to globally advance environmental management across the Kubota Group.



* Sites engaged in the business of operation or maintenance of environmental plants

Environmental Management Strategy Committee

The Environmental Management Strategy Committee is comprised of the President and all inside Directors, the General Manager of Planning and Control Headquarters, the General Manager of Manufacturing Headquarters, the General Manager of Research and Development Headquarters, the General Manager of Procurement Headquarters, and the General Manager of CSR Planning and Coordination Headquarters.* The Committee discusses the medium- and long-term direction of the Kubota Group's environmental management, such as medium- and long-term targets and key measures in light of global environmental issues such as climate change and the business environment. It determines priority items and plans that should be carried out in order to reduce environmental impacts and risks, and to enhance the lineup of environment-friendly products. In 2019, the Environmental Management Strategy Committee was held in May and November.

Environmental Management Strategy Committee

The results of the committee meetings are reported to the Board of Directors and the Executive Officers' Meeting, and are distributed throughout the Group. It also promotes management based on the plan-do-check-action (PDCA) cycle by assessing and analyzing the progress of the entire Group's environmental conservation activities and reflecting the results when formulating new plans and policies. We will continue to promote swift environmental management led by members at the management level.

* General managers are either directors or executive officers.

Environmental Manager Conferences

The Kubota Group holds Environmental Manager Conferences for each region aimed at strengthening the environment management system and reducing environmental loads and environmental risks on a global basis.

In 2019, conferences for North America, Asia, Europe and Japan were held. Environmental managers and staff members of six companies with business sites in the US and Canada gathered for the North America Conference, the same from seven companies with sites in Thailand, Indonesia, Vietnam and India gathered for the Asia Conference, and representatives from eight companies with sites in Germany, France, the Netherlands and Norway attended the Europe Conference. Environmental managers from relevant mother plants in Japan also attended the respective conferences. The Japan Conference brought together environmental managers and staff members from 24 sites across Japan, including Group companies.

The focus of the conferences was on communicating the Kubota Group's policies and initiatives, as well as sharing progress on the Medium-Term Environmental Conservation Targets. Participants also presented case studies on mainly energy-saving measures and identified areas where improvements should be made at plants.

As for conferences held overseas, since 2017 the Kubota Group has encouraged local business sites to host their own conferences in order to efficiently promote governance, strengthen collaboration, and raise the level of activities within their own region. A conference of five companies in Thailand was launched in December 2017, another with three companies in China's Jiangsu Province in December 2018, and another with six companies in North America in August 2019. Each of these conferences is addressing regional-specific topics by setting targets, regularly inspecting each other's plants, strengthening legal and regulatory compliance, and sharing good practices.

In Japan, two subcommittees have been established under the Environmental Manager Conference. In 2019, the Antipollution Subcommittee discussed and drafted measures regarding the Group's environmental risk assessment of wastewater treatment facilities, while the Waste Subcommittee did the same in order to further accelerate the Group's efforts on addressing the global issue of plastic waste.

The Group will continue to work diligently to further raise its level of environmental conservation activities across the entire Group by drawing on the contributions of the Environmental Manager Conferences and its subcommittees.

* Overseas, the conference is held as the Safety and Health / Environmental Manager Conference, and is also aimed at strengthening the safety and health aspects.

North America Conference
Kubota Manufacturing of America Corporation (US)

Europe Conference
Kubota Farm Machinery Europe S.A.S (France)

Asia Conference
SIAM KUBOTA Metal Technology Co., Ltd. (Thailand)

Japan Conference
Kubota Head Office

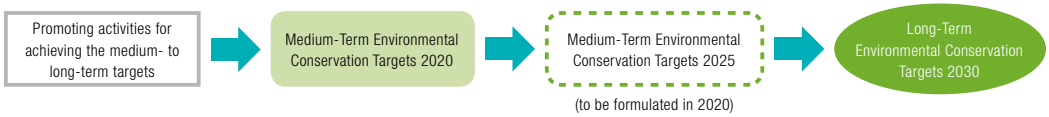
Medium- and Long-Term Environmental Conservation Targets and Results

As extreme weather events and other impacts of climate change continue to materialize, the global movement aimed at reducing greenhouse gases is growing increasingly active. Global environmental issues pose a significant threat to “ensuring food security,” as well as “ensuring a safe and secure water supply.”

In order to promote environmental management in light of various recent social developments, such as SDGs and the Paris Agreement, as a sustainable company, the Kubota Group has been promoting environmental activities by formulating its medium- and long-term targets for environmental conservation. In 2016, the Kubota Group formulated its Long-Term Environmental Conservation Targets 2030 and Medium-Term Environmental Conservation Targets 2020. Toward achieving these targets, the Kubota Group is advancing systematic initiatives in both the production and product development stages. Moreover, the Kubota Group checks its target items against the SDG goals and targets, thereby identifying the areas in which the Group can contribute to solving issues.

Long-Term Environmental Conservation Targets 2030

In order to achieve its Long-Term Environmental Conservation Targets 2030, the Kubota Group formulates its Medium-Term Environmental Conservation Targets every five years as an approach for deploying highly effective activities.

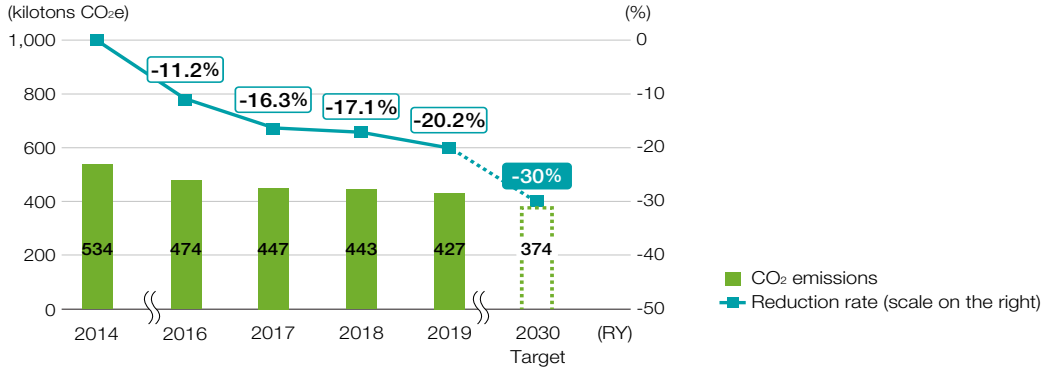


Tackling Climate Change

Goal	**Reduce** CO_2 emissions from the Kubota Group in Japan* by **30%** compared to the base year RY2014.
Result	In RY2019, CO_2 emissions of the Kubota Group in Japan* were **reduced** by **20.2%** compared to the base year RY2014.

* CO_2 emissions include greenhouse gases from non-energy sources.

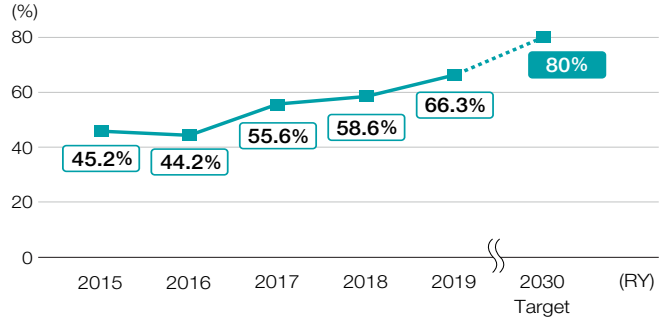
Trends in CO_2 Emissions of the Kubota Group in Japan



Efforts to Develop Environment-friendly Products

Goal	**Increase** the sales ratio of Eco-Products-certified products* to **80%** by 2030. Aim to put all new products which are certified as Eco-Products in the market in 2030 and later.
Result	The sales ratio of Eco-Products-certified products* was **66.3%** in RY2019.

Trends in Sales Ratio of Eco-Products-certified Products



* The sales ratio of products that have fulfilled the internal requirements in our own Eco-Products Certification System
Sales ratio of Eco-Products (%) = Sales of Eco-Products / Sales of products (excluding construction work, services, software, parts and accessories) × 100

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Medium-Term Environmental Conservation Targets 2020

Since 2016, the Kubota Group has been advancing initiatives toward achieving the Medium-Term Environmental Conservation Targets 2020. Each business site and division determined the measures to take, formulated an implementation plan, taking into consideration fluctuations in the volume and contents of business, and has been implementing the plan. The results for RY2019 are as shown in the table below. As in the previous year, global production sites achieved their RY2020 targets for all items earlier than planned, and have continued to promote initiatives towards improving the indicators per unit of production. For the product segment, 64 products were newly certified as Eco-Products, including 3 Super Eco-Products, increasing their sales ratio by 7.7 points from the previous year to 66.3%.

Targets for Global Production Sites

SDGs	Issue	Action item	Management indicator*3	Base RY	Target for RY2020*5	Result of RY2019*5	Achievement Status
13 CLIMATE ACTION 7 AFFORDABLE AND CLEAN ENERGY	Tackling Climate Change	Reduce CO_2*1	CO_2 emissions per unit of production	2014	▲14%	▲17.1%	We are promoting energy-saving for production equipment, lighting, air conditioning; fuel conversion; introduction of renewable energies; and measures for heat insulation of buildings, etc.
		Save energy	Energy consumption per unit of production	2014	▲10%	▲14.3%	
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Working towards a Recycling-based Society	Reduce waste	Waste discharge per unit of production	2014	▲10%	▲21.4%	We are promoting thorough sorting of wastes and converting waste into valuable materials.
			Recycling ratio*4 (Japan)	—	Maintain 99.5% or more	99.7%	We are maintaining the existing level through continuous efforts.
			Recycling ratio*4 (Overseas)	—	Maintain 90.0% or more	91.8%	We are promoting the reduction of the amount of waste sent to landfills by changing contractors.
6 CLEAN WATER AND SANITATION	Conserving Water Resources	Conserve water resources	Water consumption per unit of production	2014	▲10%	▲19.5%	We are promoting recycling of wastewater and saving of water use.
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Controlling Chemical Substances	Reduce VOCs*2	VOC emissions per unit of production	2014	▲10%	▲38.1%	We are promoting the elimination or reduction of VOC-contained paint and thinner.

Targets for Products

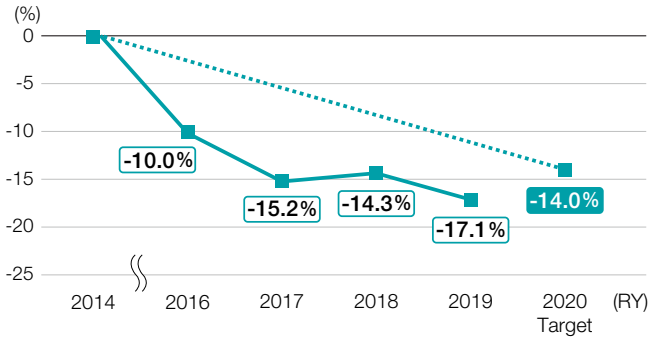
SDGs	Issue	Action item	Management indicator	Target for RY2020	Result of RY2019	Achievement Status
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Improving Product's Environmental Performance	Expand Eco-Products	Sales ratio of Eco-Products*6	60% or more	66.3%	In RY2019, 64 items were newly certified as Eco-Products.
		Promote recycling	Usage ratio of recycled materials*7	Maintain 70% or more	More than 70%	We are maintaining the usage ratio of recycled materials higher than the target.
		Develop vehicles compliant with exhaust gas regulations	Development of industrial diesel engines that comply with the latest emissions regulations, and launch onto the market of products with such engines*8		The following products*9 equipped with the engines that comply with the emissions regulations were launched onto the market. Tractor MR Series MR1007 Conforming to the Korean Agricultural Machinery Regulations Tier 4 (56 kW and above, lower than 130 kW) Combine harvester Agri Robo Combine Harvester DR6130A Conforming to the Japan Regulations on Emissions from Non-Road Special Motor Vehicles (56 kW and above, lower than 130 kW, Regulation 2014)	

*1 CO_2 emissions include greenhouse gases from non-energy sources. We use the emissions coefficient for electric power of the base year in our calculation of CO_2 emissions from energy sources.
*2 VOCs (volatile organic compounds) comprise the six substances that are most prevalent in emissions from the Kubota Group: xylene, toluene, ethylbenzene, styrene, 1, 2, 4-trimethylbenzene, and 1, 3, 5-trimethylbenzene.
*3 The figures per unit of production represent the intensity of the environmental load per unit of money amount of production. The exchange rate of the base year is used when translating the money amount of production of overseas sites into Japanese yen.
*4 Recycling ratio (%) = (Sales amount of valuable resources + External recycling amount) / (Sales amount of valuable resources + External recycling amount + Landfill disposal) × 100. Heat recovery is included in the external recycling amount.
*5 ▲ indicates a negative figure.
*6 The sales ratio of products that have fulfilled the internal requirements in our own Eco-Products Certification System
Sales ratio of Eco-Products (%) = Sales of Eco-Products / Sales of products (excluding construction work, services, software, parts and accessories) × 100
*7 Usage ratio of recycled materials (%) in the cast metal products and parts manufactured by the Kubota Group (ductile iron pipes, fittings, machine cast products (engine crankcase, etc.))
*8 Targeting tractors and combine harvesters (output range: 56 kW ≤ P < 560 kW) equipped with engines compliant with the European emissions regulations (Europe Stages IV and V) level, shipped to Europe, North America, Japan, and Korea
*9 Major products launched onto markets in 2019

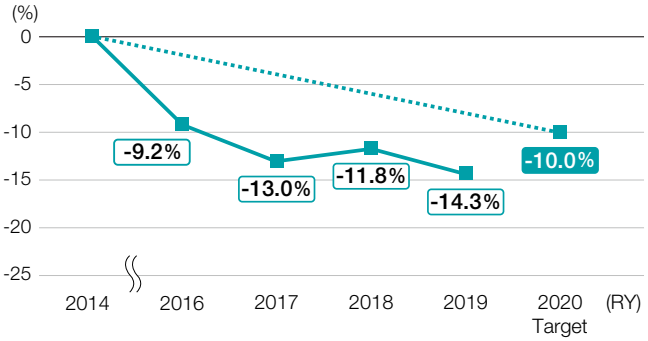
The environmental information provided in the KUBOTA REPORT 2020 <Full Version> has received the third-party assurance by KPMG AZSA Sustainability Co., Ltd. The indexes subject to assurance are marked with the "🔍" symbol.

The results for Medium-Term Environmental Conservation Targets 2020

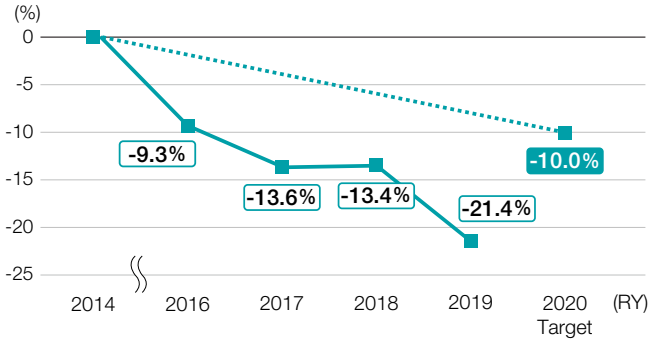
Trends in Reduction Ratio of CO_2 Emissions per Unit of Production



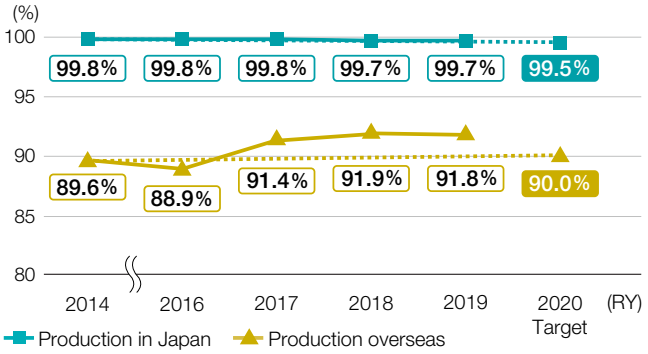
Trends in Reduction Ratio of Energy Use per Unit of Production



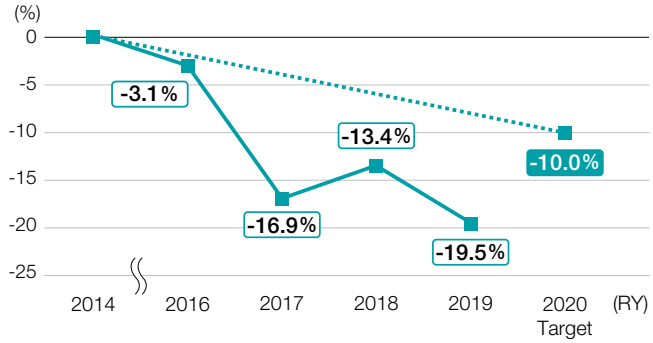
Trends in Reduction Ratio of Waste Discharge per Unit of Production



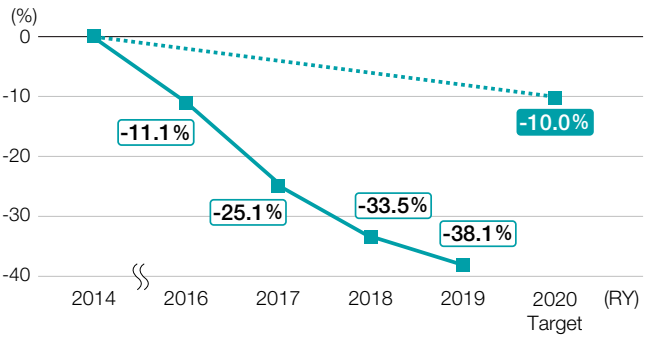
Trends in Waste Recycling Ratio



Trends in Reduction Ratio of Water Consumption per Unit of Production



Trends in Reduction Ratio of VOC Emissions per Unit of Production



Products with Engines Compliant with the Latest Exhaust Gas Regulations (Major Products Launched onto Markets in 2019)

Tractor MR Series MR1007 (Korea)

Combine harvester Farm Pilot Series Agri Robo Combine DR6130A

As an “Eco-First Company”

In May 2010, the Kubota Group was certified by the Japanese Minister of the Environment as an “Eco-First Company” due to its commitment to environmental conservation. According to the Medium- and Long-Term Environmental Conservation Targets, the Group has renewed its Eco-First Commitment and was recertified as an Eco-First Company in October 2017.

See here for details on Eco-First Company certification
www.kubota.com/company/environment/ecofirst/

Eco-First Mark

Tackling Climate Change

The Fifth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC), states that the "warming of the climate system is unequivocal," and that it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century. Moreover, a new phase of the Paris Agreement—an international framework for tackling climate change—will kick off in 2020, which indicates that the initiatives of individual companies to reduce greenhouse gases are growing increasingly important.

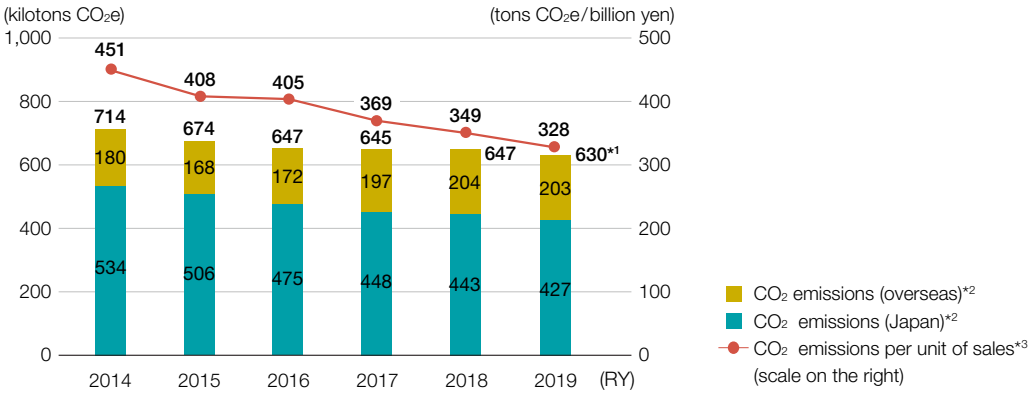
The Kubota Group sees tackling climate change as one item of materiality and has been advancing initiatives toward the "mitigation" of climate change by reducing greenhouse gas emissions mainly through energy-saving activities and the introduction of renewable energy sources and "adaptation" to be prepared for the impact of climate change.

Mitigation of Climate Change

CO_2 Emissions (Scope 1 and Scope 2)

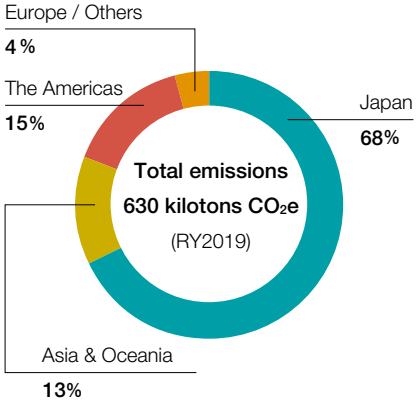
In RY2019, CO_2 emissions were 630 kilotons CO_2e, a decrease of 2.6% compared to the previous reporting year. Additionally, CO_2 emissions per unit of sales improved by 6.1% compared to the previous reporting year. In addition to the implementation of reduction measures, these are mainly due to the improvement of the emission coefficients for each electricity utility and a reduction in production volume at cast iron production sites in Japan.

Trends in CO_2 Emissions and Emissions per Unit of Sales

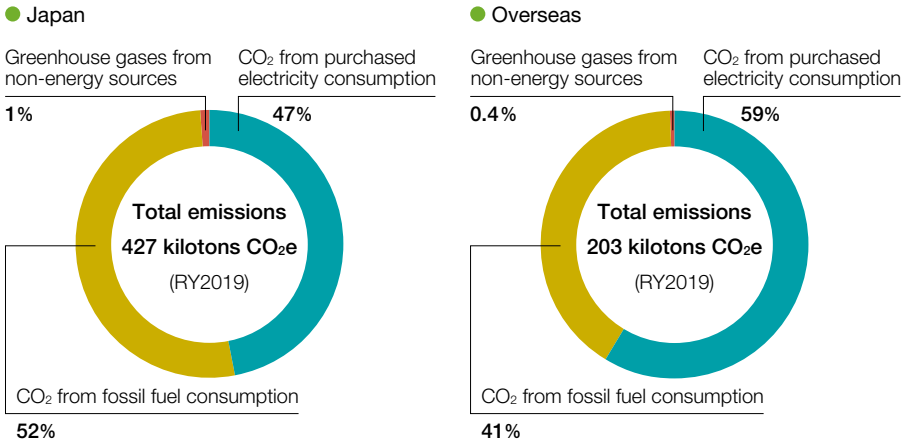


*1 CO_2 emissions (630 kilotons CO_2e) include portions of CO_2 that were not released into the atmosphere but absorbed as carbon into products such as iron pipe (19 kilotons CO_2e).
*2 CO_2 emissions include greenhouse gases from non-energy sources.
*3 CO_2 emissions per unit of consolidated net sales. The Kubota Group adopted International Financial Reporting Standards (IFRS) instead of accounting principles generally accepted in the United States of America from RY2018.
*4 CO_2 emissions for RY2016 and RY2017 and CO_2 emissions per unit of sales for RY2017 were corrected to improve accuracy.

CO_2 Emissions by Region

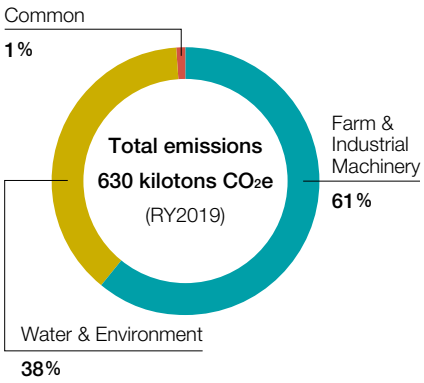


CO_2 Emissions by Emission Source

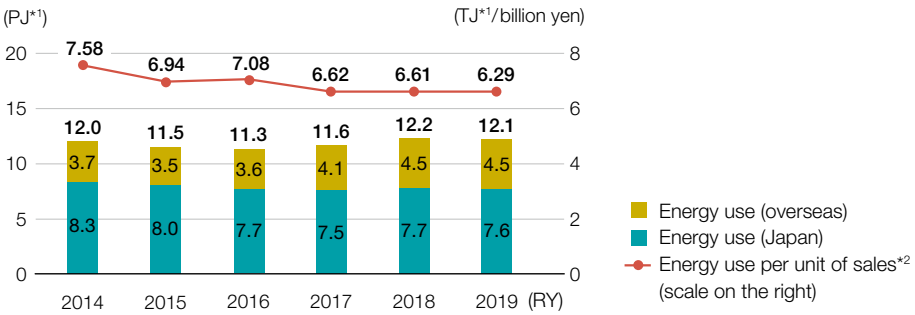


For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

CO_2 Emissions by Business



Trends in Energy Use at Business Sites and Energy Use per Unit of Sales



*1 PJ = 10^{15}J, TJ = 10^{12}J

*2 Energy use per unit of consolidated net sales. The Kubota Group adopted International Financial Reporting Standards (IFRS) instead of accounting principles generally accepted in the United States of America from RY2018.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Measures to Reduce CO_2 Emissions

The Kubota Group has established its Medium- and Long-Term Environmental Conservation Targets (p.35-36) and is devoting efforts to reducing CO_2 emissions and energy use associated with its business activities.

We have also established medium-term reduction measure implementation plans, which are reviewed every year by each production site. When the plans are reviewed, Internal Carbon Pricing* is introduced to calculate their effect on reducing CO_2 emissions and energy consumption, as well as the investment cost for the amount of CO_2 reduced, in the capital expenditure plans. The effectiveness and economical rationality of each project are identified from an environmental standpoint and used as resources for making investment decisions.

Some of the specific reduction measures that have been implemented include eliminating loss in energy consumption through a switch to equipment with higher energy efficiency and proper operation management, and promoting the visualization of power consumption in each process. At the same time, all global sites have been expanding their use of LED lighting. In RY2019, initiatives included a change in fuel for production equipment and heaters.

Installation of solar power generation system
Kubota Sakai Rinkai Plant

We are also accelerating the introduction of renewable energy. In RY2019, a new solar power generation system came online at the Kubota Sakai Rinkai Plant. This brought the renewable energy consumption of the entire Group to 2,604 MWh, an increase of 8.0% compared to RY2018.

As a result of the efforts toward achieving the Medium-Term Environmental Conservation Targets 2020 for CO_2 reduction, global production sites achieved a reduction of 38.8 kilotons CO_2e in RY2019 compared with the case where countermeasures were not implemented from the base year (RY2014). The economic effects of these measures reached 1.14 billion yen compared to RY2014. CO_2 emissions per unit of production in RY2019 improved by 17.1% compared to RY2014.

We will continue to implement measures to save energy on production equipment and air-conditioning/lighting, as well as promote measures to reduce waste and loss in the use of energy based on the concept of the Kubota Production System (KPS) and expand the use of renewable energy.

* Refers to the placing of an internal monetary value on carbon by an organization

VOICE

Installing Mega Solar Power Systems to Reduce CO_2 Emissions

Kubota Agricultural Machinery (Suzhou) Co., Ltd. (KAMS) (China) installed a solar panel with an output of 3.59MW on the roof of its plant.

We manufactures tractors, combine harvesters, and rice transplanters. Energy consumption at KAMS rose sharply, along with CO_2 emissions, when the company's second plant commenced operations in November 2017. In order to significantly reduce its CO_2 emissions, KAMS installed a mega solar power generation system in 2019 and started generating its own electricity in January 2020.

The mega solar power system is expected to generate around 3,220 MWh annually, which corresponds to a reduction of approximately 2,463 tons of CO_2 emissions if the total amount of electricity is consumed.

We will continue working to further reduce our CO_2 emission.

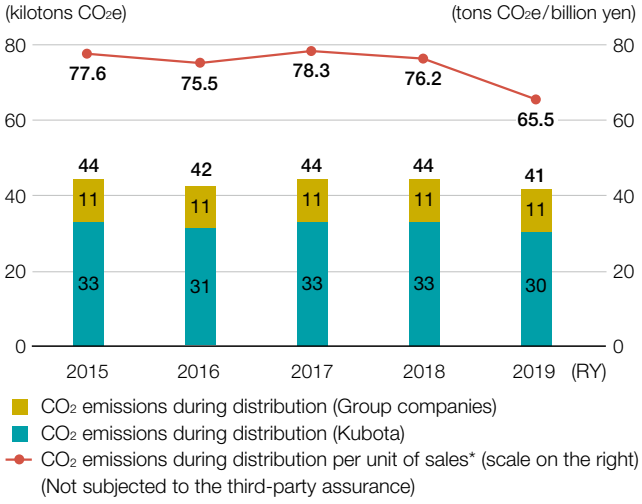
Kubota Agricultural Machinery (Suzhou) Co., Ltd.
Environmental Management Department
Yan Peisong

Solar panels installed

CO_2 Emissions during Distribution

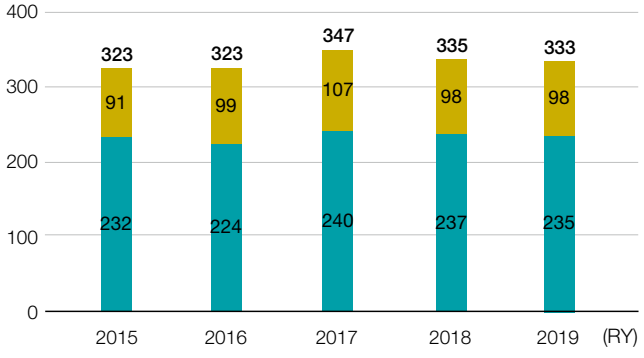
In RY2019, CO_2 emissions during distribution were 41 kilotons CO_2e, a decrease of 6.9% compared to the previous reporting year. Additionally, CO_2 emissions during distribution per unit of sales improved by 14.1% compared to the previous reporting year. The Kubota Group continuously promotes various initiatives, including such as improving loading efficiency and realizing a modal shift through the use of ships.

Trends in CO_2 Emissions during Distribution and Emissions per Unit of Sales (Japan)



(Not subjected to the third-party assurance)

Trends in Freight Traffic (Japan)



* CO_2 emissions during distribution per unit of consolidated net sales. The Kubota Group adopted International Financial Reporting Standards (IFRS) instead of accounting principles generally accepted in the United States of America from RY2018.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

CO_2 Emissions throughout the Value Chain

The Kubota Group makes concerted efforts to figure out CO_2 emissions throughout the value chain in addition to its business sites. Following guidelines*, we calculate CO_2 emissions based on Scope 3, and continue to expand the categories in the Scope of its calculation of CO_2 emissions.

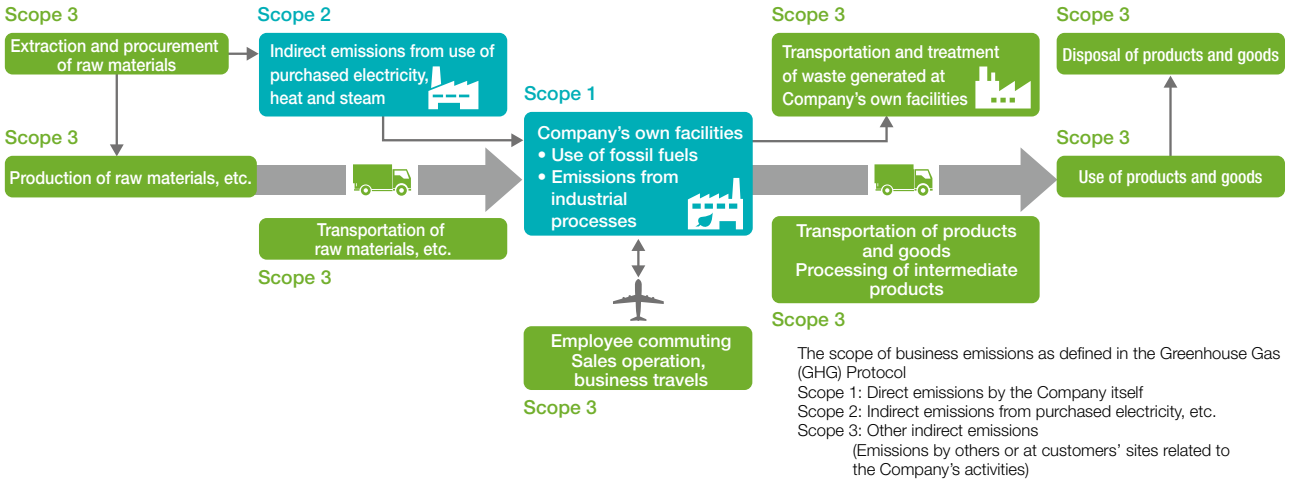
* Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain issued by the Japanese Ministry of the Environment and Ministry of Economy, Trade and Industry

CO_2 Emissions in Each Stage of Value Chain

Classification				Scope of calculation	CO_2 emissions (kilotons CO_2e)		
					2017	2018	2019
Emissions of the Kubota Group's business sites	Direct emissions (Scope 1)			Use of fossil fuels	292	309	303
				Non-energy-derived greenhouse gas emissions*1	8	7	7
	Indirect emissions (Scope 2)			Purchased electricity use	346	331	320
Upstream and Downstream emissions	Other indirect emissions (Scope 3)	Category	1	Resource extraction, manufacturing and transportation related to purchased goods/services	2,412	2,391	2,446
			2	Manufacturing and transportation of capital goods such as purchased equipment	175	215	290
			3	Resource extraction, manufacturing and transportation related to purchased fuels/energy	26	27	27
			4	Transportation of purchased products, etc.	Not calculated	Not calculated	Not calculated
			5	Disposal of wastes discharged from business sites	18	20	26
			6	Employee business travels	9	10	10
			7	Employee commuting*2	3	3	6
			8	Operation of assets leased to the Kubota Group	Not applicable	Not applicable	Not applicable
			9	Transportation of sold products*3	44	180	184
			10	Processing of intermediate products	59	173	320
			11	Use of sold products	21,486	21,060	21,176
			12	End-of-life treatment of sold products	44	42	42
			13	Operation of assets leased to other entities	Not applicable	Not applicable	Not applicable
			14	Operation of franchises	Not applicable	Not applicable	Not applicable
			15	Investments	Not applicable	Not applicable	Not applicable

*1 The value for RY2017 was corrected to improve accuracy.
*2 In addition to the data for Japan, CO_2 emissions from overseas subsidiaries have been included from RY2019.
*3 In addition to the data for Japan, CO_2 emissions associated with the overseas shipping of certain products from Japan have been included from RY2018.

Example Activities of Each Scope



For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Adaptation to Climate Change

Measures to Adapt to Climate Change

Various impacts are being felt by the progression of climate change, such as the frequent occurrence of weather disasters, changes in agricultural practices, and an increase in the number of heat stroke cases. The response to climate change needs to include measures to reduce greenhouse gas emissions, as well as to avoid or reduce damage brought on by climate change.

As part of its strategy to adapt to climate change, the Kubota Group is implementing a number of initiatives at its business sites and in its products and services.

Initiatives on Products and Services

Category		Major initiatives
Food		• Provision of tractors that are capable of deep plowing necessary for growing rice in abnormally high temperatures without lowering the quality/yield, and the provision of information useful for soil cultivation, such as the proper distribution of fertilizers appropriate for high-temperature conditions • Provision of the Kubota Smart Agri System (KSAS) which uses ICT and robot technology, and high-performance machinery that lightens the workload in fields such as agriculture, where workers often labor in scorching heat • Provision of information for farmers on changes in temperature, precipitation, and the amount of solar radiation, as well as the impact thereof on crops
Water	Flooding	• As a measure for floods or other disasters caused by abnormal climate, provision of disaster-relief pumper vehicles, ultra-light, emergency sump pump units, rainwater storage and filtration products, and piping systems for manhole toilets, and so on • Provision of ductile iron pipes with tough tube body and excellent joint performance, which is highly effective during disasters such as typhoons and torrential rainfall
	Drought	• To address water shortage, the provision of management systems using IoT, which contribute to the efficient operation of water supply and sewage treatment systems and treatment plants • Provision of tank-submerged-type ceramic membrane filtering equipment and submerged membranes that purify wastewater for reuse
	Management systems	• Provision of the Kubota Smart Infrastructure System (KSIS) that leverages IoT technology to manage a variety of facilities, from dams to drainage locations, using weather information in collaboration with the NTT Group • Provision of the WATARAS farm water management system that allows accurate water management for remote rice paddies
Living environment		• Provision of diesel engines for use as generators for emergency power supply during disasters and power outages • Provision of construction machinery to contribute to disaster prevention, as well as recovery and reconstruction • Provision of highly efficient air-conditioning equipment that creates a clean and comfortable indoor environment, even amid abnormal weather conditions

Provision of Water Pump Vehicle for Disaster Recovery

With all the equipment necessary for effective drainage, including a drainage hose, a control panel, and a generator, as well as a lightweight specialized submersible pump that a person can easily carry, the equipment can be dispatched immediately to sites where flooding is in progress due to torrential rains and rapidly drain water from the location.

Drainage Pump with Vehicle for Disaster Recovery

Initiatives taken at Business Sites

Efforts at our business sites include the formulation of BCPs and disaster response manuals. To be prepared for high tides and torrential rain, the sites have also installed sump pumps, hold emergency drills, and are equipped with water tanks for use during water shortages.

Installation of Weather-Resistant Roofing Material

Kubota Manufacturing of America Corporation (US) installed weather-resistant roofing material (thermoplastic olefin sheets) to improve resistance against torrential downpours and high temperatures.

Installation of weather-resistant roofing material (left) and the roof after installation (right)

Working towards a Recycling-based Society

As a result of being a mass-production, mass-consumption and mass-disposal society, we now face many problems such as the depletion of resources and increasing waste. The increase in plastic waste that resulted in marine plastic pollution in the world's oceans has now become a new problem for society.

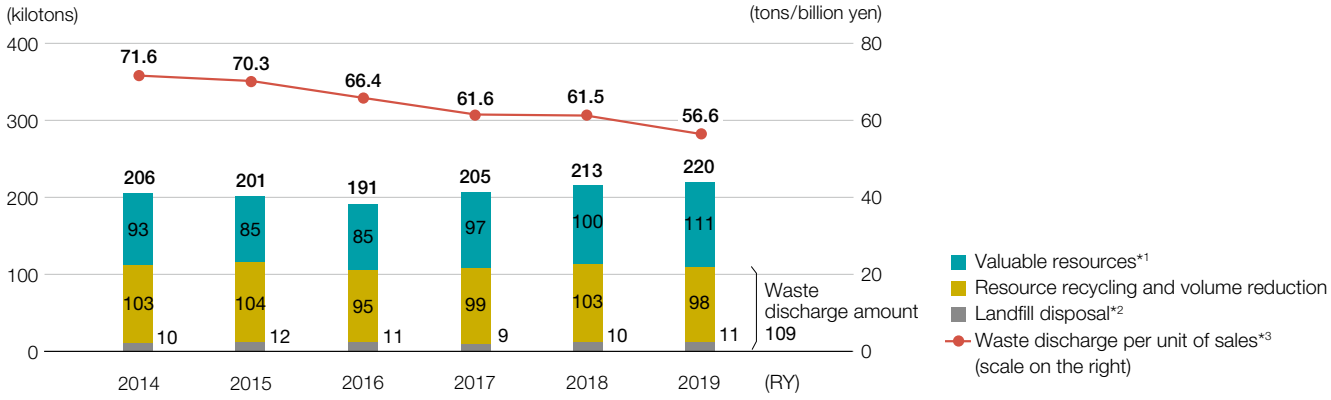
The Kubota Group sees working towards a recycling-based society as one item of its materiality, and has been advancing initiatives to promote "reduce" (reducing the amount generated), "reuse" (internal recycling and reuse), and "recycle" (improving the recycling ratio) of waste, in addition to initiatives to promote the effective use of resources and resource saving.

Waste, etc., from Business Sites

In RY2019, the waste discharge amount was 109 kilotons, a decrease of 4.4% compared to the previous reporting year. Additionally, waste discharge per unit of sales improved by 7.9%. These are mainly due to promoting conversion to valuable material of the waste casting sand at cast iron production sites, as well as a reduction in production volume at cast iron production sites in Japan.

Of the waste, etc., discharge amount in RY2019, the amount of hazardous waste discharge was 3.1 kilotons in Japan and 2.7 kilotons overseas.

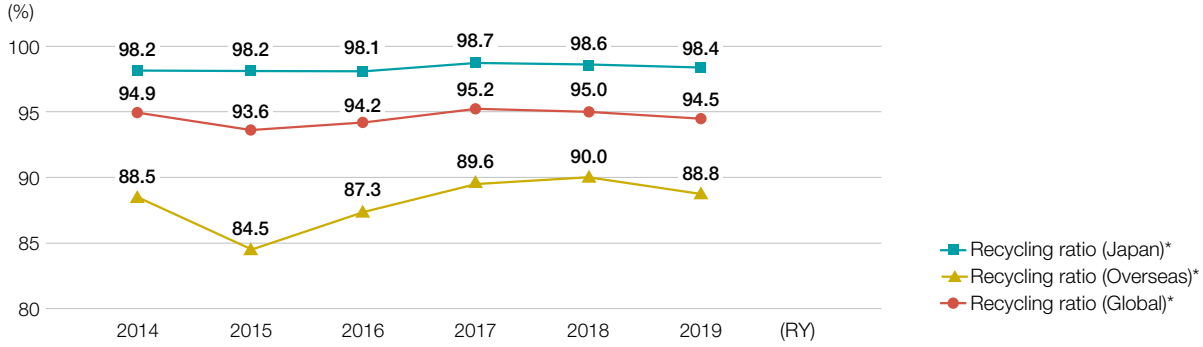
Trends in Waste, Etc. (including valuable resources) and Waste Discharge per Unit of Sales



*1 To reduce overall emissions to the outside of the Group, including valuable resources, metal scraps generated at machinery production and related sites are collected for recycling at cast iron production sites within the Group. From RY2019, as a way of evaluating the progress of these activities, calculation standards have been changed so that transfer of valuable resources between business sites within the Group is no longer included in the valuable resources figure, but is counted instead as in-house recycling and reuse. The valuable resources figure for RY2019 calculated using the previous standard would be 117 kilotons.
*2 Landfill disposal = Direct landfill disposal + Final landfill disposal following external intermediate treatment
*3 Waste discharge per unit of consolidated net sales. The Kubota Group adopted International Financial Reporting Standards (IFRS) instead of accounting principles generally accepted in the United States of America from RY2018.
Waste discharge = Resource recycling and Volume reduction + Landfill disposal

The recycling ratio in RY2019 was 98.4% in Japan, maintaining about the level of previous years. The recycling ratio overseas was 88.8%, a 1.2-point decrease compared to the previous reporting year. We will make continuous efforts to further improve the resource recycling ratio.

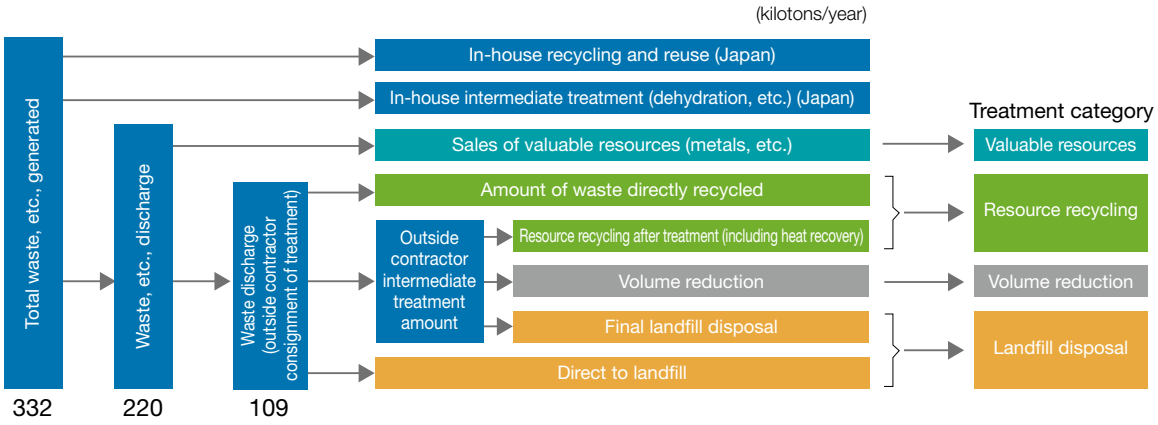
Trends in Recycling Ratio



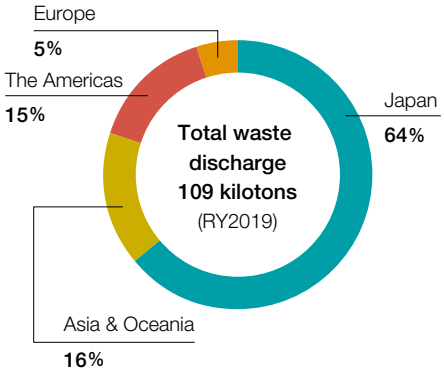
* Recycling ratio (%) = (Sales amount of valuable resources + External recycling amount) / (Sales amount of valuable resources + External recycling amount + Landfill disposal) × 100.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

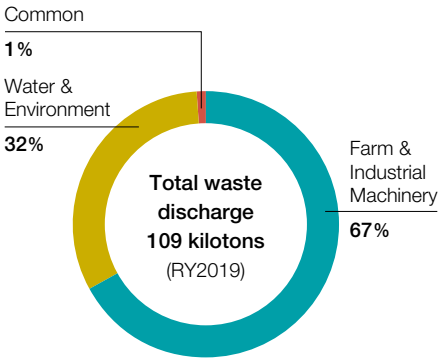
Waste Recycling and Treatment Flow (RY2019 results)



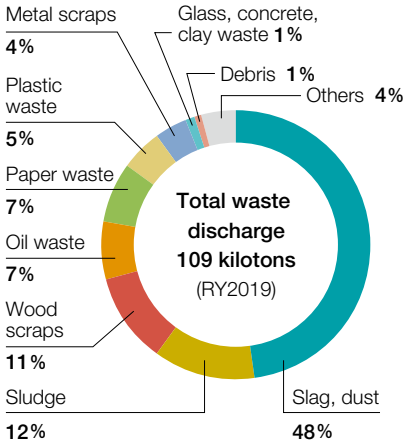
Waste Discharge by Region



Waste Discharge by Business

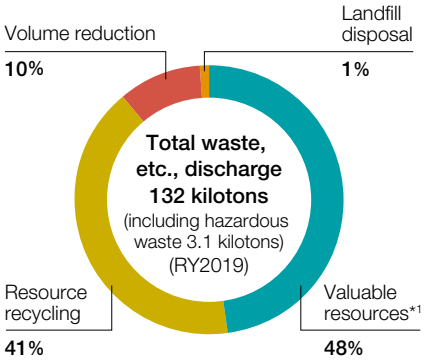


Waste Discharge by Type

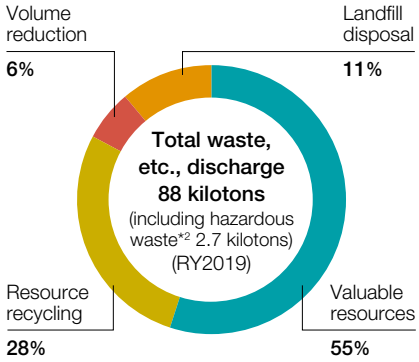


Waste, Etc., Discharge by Treatment Category

Japan



Overseas



*1 To reduce overall emissions to the outside of the Group, including valuable resources, metal scraps generated at machinery production and related sites are collected for recycling at cast iron production sites within the Group. From RY2019, as a way of evaluating the progress of these activities, calculation standards have been changed so that transfer of valuable resources between business sites within the Group is no longer included in the valuable resources figure, but is counted instead as in-house recycling and reuse.
If calculated according to the previous calculation standards, the RY2019 figures would be as follows: waste, etc., discharge amount in Japan 137 kilotons; valuable resources 50%; resource recycling 39%; volume reduction 10%; landfill disposal 1%.
*2 Overseas hazardous waste includes items sold as valuable resources.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Measures to Reduce Waste

The Kubota Group has established its Medium-Term Environmental Conservation Targets 2020 (p.36) and is working on the reduction of waste discharge from its business sites and the improvement of the recycling ratio. The Group has been promoting various measures, such as the thorough separation of waste according to the type and disposal method of waste, the introduction of returnable packaging materials, and shared waste recycling between sites. The Group is also committed to the reduction of hazardous waste through ensuring thorough monitoring and management thereof.

In RY2019, cast iron production sites, which generate a large amount of waste, achieved a reduction of approximately 12,000 tons in the amount of discharged waste through conversion of casting sand to valuable resources. Machinery production sites continued working to reduce the amount of sludge generated in the painting booth as well as volumes of waste oil and oil-containing wastewater. Meanwhile, as measures to reduce disposable plastics, we introduced initiatives at certain worksites to withdraw the use of disposable tableware in the employee cafeteria and reduce the issue of plastic carrier bags in on-site stores.

Conversion of waste casting sand to valuable resources led to a major reduction in the amount of waste discharged.
SIAM KUBOTA Metal Technology Co., Ltd. (Thailand)

As a result of the efforts toward achieving the Medium-Term Environmental Conservation Targets 2020 for waste reduction, global production sites achieved a reduction of 15,800 tons of waste in RY2019 compared with the case where countermeasures were not implemented from the base year (RY2014). The economic effects of these measures reached 52 million yen compared to RY2014. Waste discharge per unit of production in RY2019 improved by 21.4% compared to RY2014. The recycling ratio was 99.7% at production sites in Japan and 91.8% at production sites overseas, both achieving the targets of the Medium-Term Environmental Conservation Targets 2020.

Moreover, production sites in Japan have raised the utilization rate of electronic manifests to 96.3%, enabling real-time assessment of the reduction effects. We will continue to promote the reduction of waste through promoting sharing of good reduction practices and visualization of waste by utilizing electronic manifests.

VOICE

Reduction in Waste Discharge through Introduction of Recycling Equipment for Transmission Oil

At the Kubota Utsunomiya Plant, we introduced equipment to recycle transmission oil removed from products, thus promoting the reuse of raw materials and reducing the amount of waste materials.

Our plant manufactures rice transplanters, combine harvesters, and other agricultural machinery. On the rice transplanter assembly line, after quality inspection of the product's functioning in the final process, we remove the transmission oil supplied to the machine. Once used, deterioration in the quality of the oil means that it cannot be reused and it had previously been discarded.

We worked to find a way of recycling the removed oil. Taking the required quality as a benchmark, we undertook regeneration tests and quality checks using samples to design and evaluate the equipment specifications. Introduction of the equipment has allowed us to successfully recycle and reuse waste oil. This not only promotes reuse of raw materials and waste reduction, but also contributes to business efficiency by reducing the yearly amount of oil purchased by around 100 kiloliters.

Going forward, we are committed to further action to reduce environmental burden.

Kubota Utsunomiya Plant
Staff members involved in the initiative:
Kyohei Takezawa
Shinji Takayama
Takashige Tajima
Yuta Hiratsuka
Ryota Kobayashi
Takuma Yuki
Tatsuya Mizunuma
Sadayuki Suzuki
Yuki Sakamaki

Reducing Plastic

Marine plastic pollution caused by used plastic that flows down rivers and waterways to be discharged along coasts and oceans has become a global issue. The Kubota Group's business sites promote the 3Rs and efforts to convert the plastic waste generated through their business activities into valuable resources.

Kubota ChemiX Co., Ltd., involved in the manufacture and sale of plastic pipes and fittings, manufactures and sells recycled rigid PVC pipes made from recycled waste material (PVC made by reusing discarded PVC pipe collected in cities) as a way of promoting the effective use of resources. Kubota Environmental Service Co., Ltd., involved in business activities related to the construction, maintenance, and operational management of water and environmental facilities, provides engineering services to facilities that pulverize and sort plastic waste for use as fuel. Meanwhile, logistics services provider KBS Kubota Co., Ltd. is promoting the reduction of plastic usage in logistics services, including the reduction of stretch film usage through the introduction of returnable packaging materials.

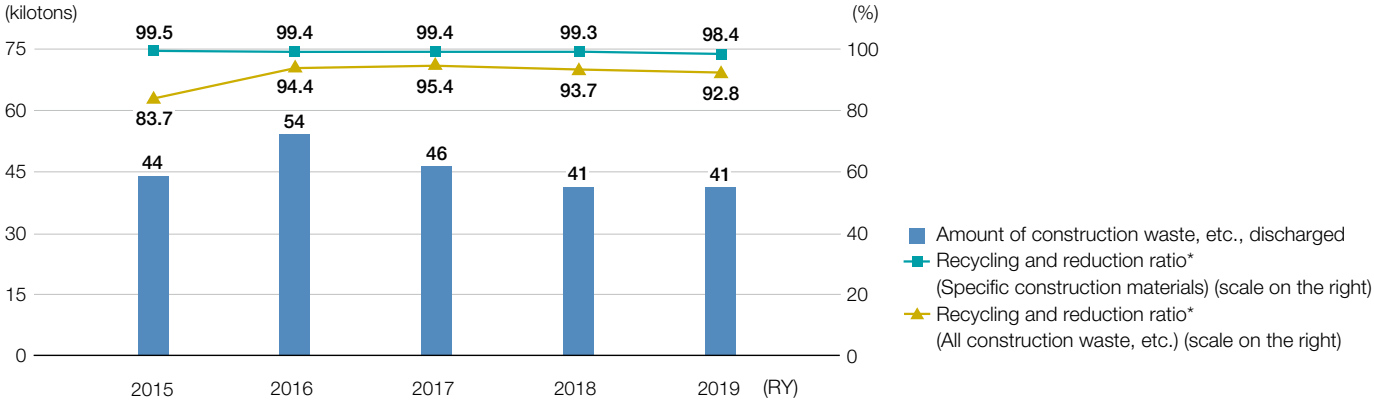
The Kubota Group works to reduce the plastic emissions through initiatives including the effective use of resources and reducing waste throughout the business value chain.

Returnable packaging materials
(left: environmentally friendly strapping;
right: environmentally friendly cover)
KBS Kubota Co., Ltd.

Waste, etc., Generated from Construction Work

The type and the amount of waste generated from construction work vary depending on the type of work being done, resulting in fluctuation in the amount of discharge, and the recycling and reduction ratio. However, the Kubota Group has maintained its existing recycling and reduction ratio.

Trends in Discharge, and Recycling and Reduction Ratio of Construction Waste, Etc. (Japan)



* Recycling and reduction ratio = [Sales of valuable resources + Resource recycling (including heat recovery) + Volume of reduction] /Amount of construction waste, etc. discharged (including sales amount of valuable resources) x 100 (%)

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Handling and Storage of Equipment Containing PCB (in Japan)

Transformers, capacitors and other equipment containing polychlorinated biphenyls (PCB) are properly reported, stored and handled based on the Japanese Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes, and the Japanese Waste Management and Public Cleansing Law. Waste with a high concentration of PCB is being disposed of steadily, beginning with sites where PCB-treatment facilities are available. Waste with a low concentration of PCB will be properly disposed of by the disposal deadline of March 2027.

PCB-containing equipment in storage is thoroughly managed by multiple means, such as the locking of storage cabinets, periodic inspection, and environmental audits.

Conserving Water Resources

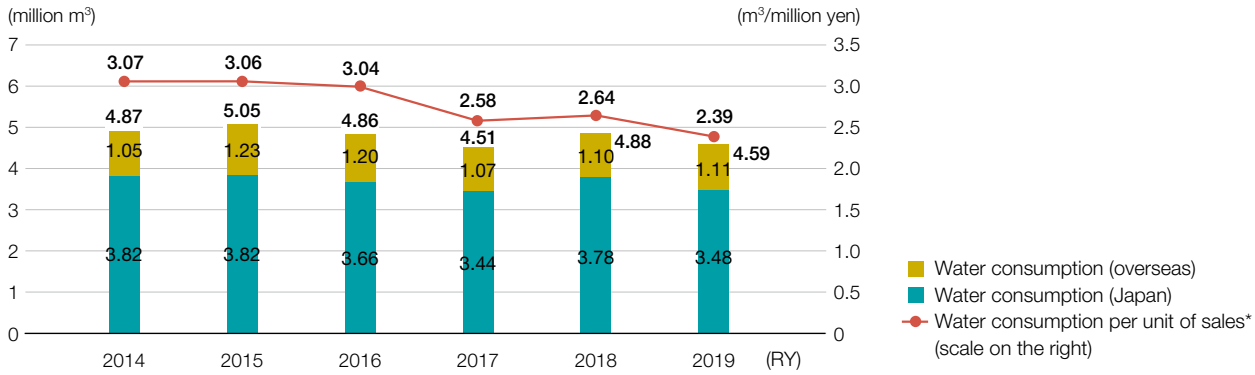
The OECD's 2012 report entitled Environmental Outlook to 2050 states that during the period between 2000 and 2050, global demand for water will increase by approximately 55% owing to economic development and population increase, while more than 40% of the world's population will be living in river basins that suffer from severe water shortages.

The Kubota Group sees conserving water resources as one of its materiality issues, and has been advancing initiatives to promote the effective utilization of water resources and to address water risks, such as the reduction of water consumption by promoting water saving and wastewater recycling, and the proper management of wastewater treatment and wastewater quality. Production sites promote measures not to cause adverse effects on local ecosystems and the lives of local residents, taking into consideration the status of water stress in the respective regions.

Water Consumption in the Business Sites

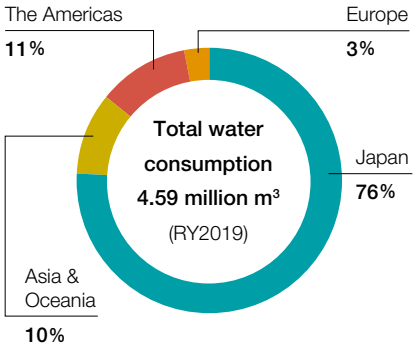
In RY2019, water consumption was 4.59 million m³, a decrease of 5.9% compared to the previous reporting year. Additionally, water consumption per unit of sales was improved by 9.3% compared to the previous reporting year. These are mainly due to a reduction in water usage due to water-saving activities, the use of recycled water, and the efficiency improvement of cooling facilities at some production sites in Japan, as well as a reduction in production volume at cast iron production sites in Japan.

Trends in Total Water Consumption and Consumption per Unit of Sales

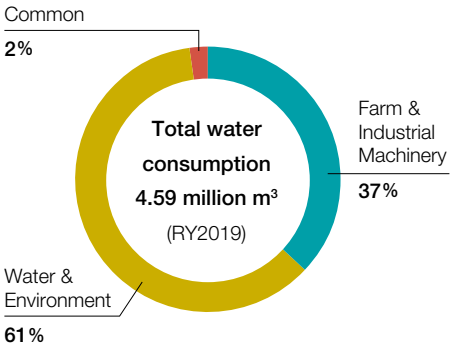


* Water consumption per unit of consolidated net sales. The Kubota Group adopted International Financial Reporting Standards (IFRS) instead of accounting principles generally accepted in the United States of America from RY2018.

Water Consumption by Region

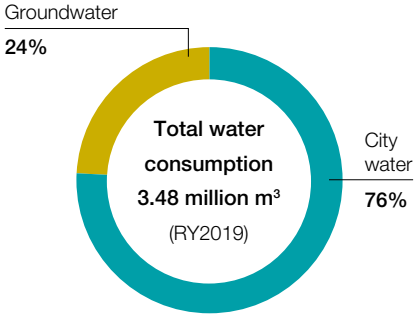


Water Consumption by Business

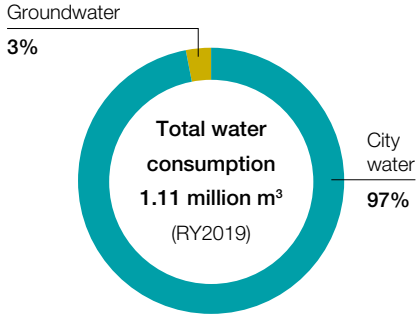


Water Consumption by Type

● Japan



● Overseas



For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Measures to Reduce Water Consumption

The Kubota Group has established its Medium-Term Environmental Conservation Targets (p.36), and is working on the reduction of water consumption at its business sites. Its production sites, such as those in China, Thailand, Indonesia and the United States, have introduced wastewater treatment facilities or wastewater recycling systems utilizing technologies of the Kubota Group.

In RY2019, we carried on with daily activities such as raising employees' awareness of saving water and conducting patrols to check for water leakage. We also continued to install water-saving valves and introduce improved methods of watering green areas. Additionally, we worked to reduce the amount of water used for cleaning and cooling in production processes. As a result of the efforts toward achieving the Medium-Term Environmental Conservation Targets 2020 for water consumption reduction, global production sites achieved a reduction of 175,000 m^3 in RY2019 compared with the case where countermeasures were not implemented from the base year (RY2014). The economic effects of these measures reached 45 million yen compared to RY2014. Water consumption per unit of production in RY2019 improved by 19.5% compared to RY2014.

We will continue to promote the reduction of water consumption through initiatives to promote the 3Rs of water, such as conducting water-saving activities and promoting water recycling by using the Kubota Group's technologies.

VOICE

Reducing Water Consumption through Recycling of Wastewater from Production Processes

At P.T. Kubota Indonesia (PTKI) (Indonesia), we worked to reduce water consumption in the painting process by recycling wastewater from other processes.

At PTKI, we manufacture compact diesel engines. In the painting process, a water curtain is used to catch paint that fails to adhere to the product surface to prevent spattering. Up till now, city water was used for the water curtain, so that the painting process accounted for around 20% of the plant's total water consumption.

As the purpose of the water curtain was to catch spattered paint, we realized that it did not require city water, so we switched to using water processed at a wastewater treatment plant. We identified other operations where city water was not necessary, and also began using treated water to mix the chemicals used in wastewater treatment. With these initiatives, we realized a reduction of approximately 6% in the plant's total water consumption.

Going forward, we will continue with initiatives to reduce water consumption.

P.T. Kubota Indonesia
Human Resources, General Affairs Section
Ahmad Ansory (left), MH Saeri (right)

Controlling Wastewater

The Kubota Group has set its own control values that are stricter than the emission standards of relevant laws and regulations. To ensure that the standard values are not exceeded, the Kubota Group carries out regular measurement of designated monitoring items. We also implement thorough daily management activities, such as monitoring the trends in water quality data and inspecting the wastewater treatment facilities.

At our sites, continuing measures to restrict water consumption have resulted in reduced wastewater discharge. In RY2019, the amount of wastewater discharge was 4.77 million m^3 (3.26 million m^3 into public water areas, 1.51 million m^3 into sewage lines), a decrease of 7.0% compared to the previous reporting year.

We will continue to reduce load on the local water environment through activities to manage water discharge and reduce water consumption.

* The amount of wastewater discharge includes rain and spring water at some business sites.

Survey on Regional Water Stress

In order to identify the risks related to the use of water resources and find effective responses to such water risks, the Kubota Group conducts surveys concerning water stress*1 for all of its production sites.

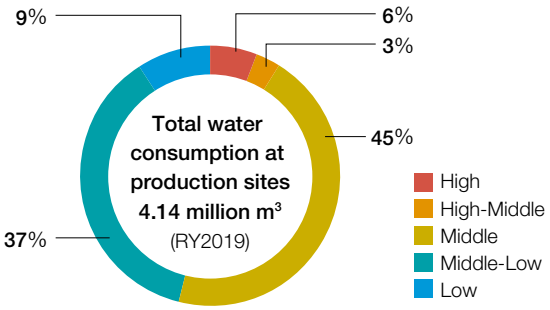
The results of a survey on water stress of a total of 50 sites in 14 countries using Aqueduct*2 (water risk assessment tool developed by the World Resource Institute (WRI)) are as follows:

Results of the Survey on Water Stress of Production Sites (RY2019)

Region, country		Water stress level / Water consumption (thousand m³) <number of sites>				
		High	High-Middle	Middle	Middle-Low	Low
Asia	Japan	0	0	1,672〈8〉	1,513〈11〉	19〈2〉
	China	0.3〈1〉	90〈1〉	0	0	16〈2〉
	Indonesia	0	0	17〈1〉	0	0
	Thailand	206〈3〉	16〈1〉	7〈1〉	0	0
	Saudi Arabia	19〈1〉	0	0	0	0
Europe	Russia	0	0.4〈1〉	0	0	0
	Norway	0	0	0	0	23〈1〉
	Denmark	0	0	43〈1〉	0	0
	Netherlands	0	0	0	0	11〈1〉
	Germany	0	0	8〈1〉	0	4〈1〉
	France	0	0	4〈1〉	0	1〈1〉
	Italy	15〈1〉	0	0	0	0
North America	Canada	0	0	0	0	295〈1〉
	United States	0	0	130〈2〉	26〈6〉	0
Total		240〈6〉	106〈3〉	1,881〈15〉	1,539〈17〉	369〈9〉

The survey results showed that “High” or “High-Middle” levels of water stress applied to 9 production sites, located in the Chinese cities of Daqing and Suzhou, central Thailand, Saudi Arabia, Russia and Italy, which account for approximately 9% of the Group’s total water consumption. In the next “Middle” level category were 15 production sites situated in Japan’s Kanto region and Aichi Prefecture, Indonesia, coastal regions of Thailand, the southeast United States and a number of locations in Europe, which together account for approximately 45% of total water consumption. Production sites in the “Middle-Low” and “Low” categories accounted for approximately 46% of total water consumption.

Water Consumption by Water Stress Level



Although the majority of the water used in the Kubota Group’s production activities is sourced in areas with stress levels in the “Middle” or lower categories, the survey showed that some of the main sites in Thailand and China are located in areas of high water stress. At these production sites, the Kubota Group is now promoting the horizontal rollout of regional examples of good practice in areas including the reduction of water consumption and appropriate management of wastewater.

The Group will also conduct water stress surveys in each case for the water areas around new sites that are scheduled for construction as part of the Group’s more globally oriented business growth.

*1 Water stress refers to the state where the annual water availability per capita is less than 1,700 tons and people feel inconvenience in their daily life. Water stress in this survey is the water stress for each river basin, which is calculated based on the ratio of water intake to the amount of available water resources. (World Resources Institute (WRI))

*2 An update of the Aqueduct survey in August 2019 using a revised statistical model improved the accuracy of the water risk evaluation. As a result, the RY2019 water stress survey at Kubota Group production sites also showed major changes from the RY2018 results.

Controlling Chemical Substances

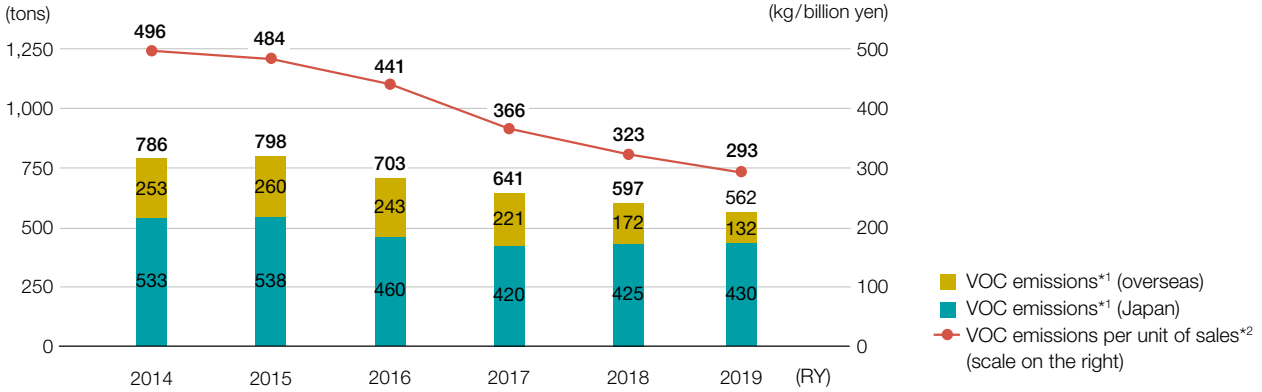
The World Summit on Sustainable Development (WSSD) held in 2002 adopted a resolution that chemical substances would be managed in such a manner as to minimize the impact of the chemical substances on human health and the environment, and relevant regulations therefore have been formulated by each member country.

The Kubota Group sees controlling chemical substances as one of its materiality issues, and has been advancing initiatives toward reducing the burden on the environment from chemical substances, including the reduction of VOCs (volatile organic compounds) generated in coating processes at production sites, as well as the replacement of fluorocarbons and the prevention of leakage.

VOC Emissions

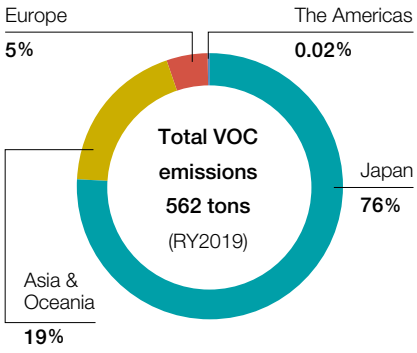
In RY2019, VOC emissions were 562 tons, a decrease of 5.9% compared to the previous reporting year. Additionally, VOC emissions per unit of sales improved by 9.3%. These were mainly due to increased use of low-solvent paint and reduced use of solvent-based paint at overseas machinery production sites as well as a reduction in production volume at cast iron production sites in Japan.

Trends in VOC Emissions and Emissions per Unit of Sales

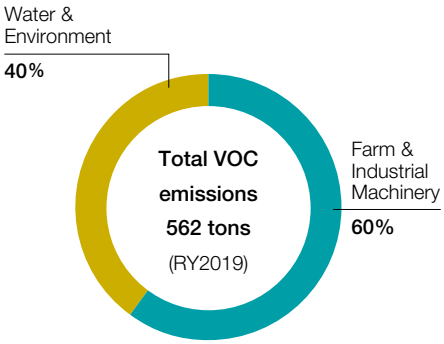


*1 VOCs comprise the six substances that are most prevalent in emissions from the Kubota Group: xylene, toluene, ethylbenzene, styrene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.
*2 VOC emissions per unit of consolidated net sales. The Kubota Group adopted International Financial Reporting Standards (IFRS) instead of accounting principles generally accepted in the United States of America from RY2018.

VOC Emissions by Region

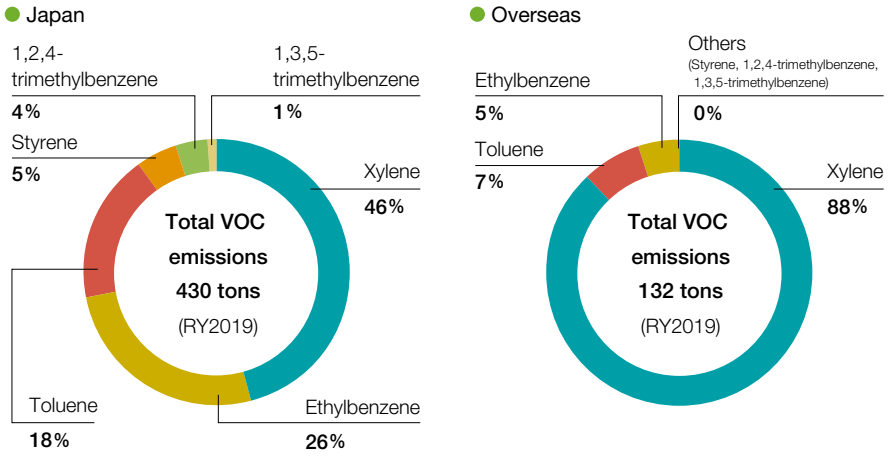


VOC Emissions by Business



For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

VOC Emissions by Substance



For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Measures to Reduce VOCs

The Kubota Group has established its Medium-Term Environmental Conservation Targets (p.36) and is working on the reduction of VOC emissions from its business sites. The Group has been promoting the risk management of chemical substances handled at production sites and the reduction of VOC-containing materials, such as paint and thinner.

In RY2019, the Kubota Group continued to adjust the pressure setting and nozzle diameter of paint guns for improved painting efficiency. Among its other ongoing initiatives to reduce VOC use were switching to VOC-free materials and recycling used thinner. Additionally, by promoting the introduction of paint robots, the Group achieved not only a reduction in VOC, but also improved productivity.

As a result of the efforts toward achieving the Medium-Term Environmental Conservation Targets 2020 for VOC reduction, global production sites achieved a reduction of 72 tons in RY2019 compared with the case where countermeasures were not implemented from the base year (RY2014). The economic effects of these measures reached 59 million yen compared to RY2014. VOC emissions per unit of production in RY2019 improved by 38.1% compared to RY2014.

We will continue to promote the reduction of VOC emissions by introducing exhaust treatment equipment that is conscious of compliance with laws and the reduction of impacts on neighborhoods, in addition to the efforts to stop the use of VOC-containing paint and thinner or replace them with substitutes.

VOICE

Reducing Use of Chemical Substances (VOC) through Measures Including Revision of Solvent Use and Introduction of Recycling Equipment

At Kubota Farm Machinery Europe S.A.S (KFM) (France), we took steps to reduce our use of chemical substances (VOC), including a revision of operations in the painting process and introduction of thinner recycling equipment.

In addition to paints, the paint workshop of our plant, which manufactures tractors, uses large amounts of other chemicals with high VOC content. Previously, cleaning with solvent and replacement of the liquid used in the degreasing pretreatment were carried out at regular fixed intervals, so that the same amount of chemicals was used regardless of fluctuations in production volume. From 2017, we adjusted the replacement of the painting pre-treatment liquid and the cleaning of the heat exchanger and paint gun to match production status in order to reduce the use of chemicals. Also, we introduced thinner recycling equipment in the paint workshop.

Besides, the disposal of the spray cans used for cleaning of parts in the assembly and inspection processes had caused release into the atmosphere of solvent residue. We introduced spray can refilling equipment to promote reuse of the cans and reduce solvent residue waste to zero.

With these measures, we achieved a reduction of approximately 4,370 kg in VOC use over a two-year period. Going forward, we will continue with initiatives to reduce VOC emissions to contribute further to global environmental conservation.

Kubota Farm Machinery Europe S.A.S
Staff members involved in the initiative:

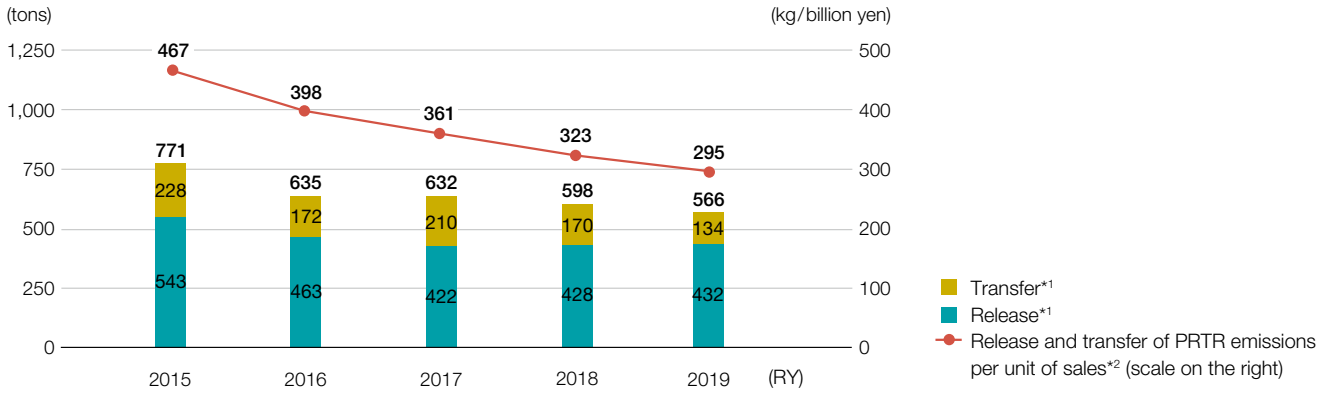
Nicolas Huyghe
Thomas Godin
Arnaud Cousin
Michaël Mercier
Romain Ruchebusch
Steven Bruwaert
Rachid Benkhouia
Jean Vanhille
Elodie Vanhee
Masashi Tsuchiya

Release and Transfer of PRTR-designated Substances

In RY2019, a total of 566 tons of substances stipulated in the PRTR Law* were released and transferred, a decrease of 5.2% compared to the previous reporting year. Additionally, the release and transfer per unit of sales improved by 8.7% compared to the previous reporting year. Similar to reduction of VOC emissions, the Group is promoting the ongoing measures to reduce the PRTR-designated substances.

* Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

Trends in Release and Transfer of PRTR-designated Substances, and Release and Transfer per Unit of Sales (Japan)



*1 Total amount of reported substances that are handled at each site (annual volume of 1 ton or more (or 0.5 tons for Specific Class I designations))
*2 Release and transfer of PRTR-designated substances per unit of consolidated net sales. The Kubota Group adopted International Financial Reporting Standards (IFRS) instead of accounting principles generally accepted in the United States of America from RY2018.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Control of Ozone-depleting Substances

The Kubota Group prohibits specified CFCs, which are ozone-depleting substances, from being contained in products or added*1 in manufacturing processes of products. In Japan, replacement of materials containing dichloropentafluoropropane with substitute materials was completed during RY2016, and no ozone-depleting substances subject to notification under the PRTR Law*2 are handled and released at present.

In Japan, CFCs that are used in air-conditioners and refrigerating or freezing equipment as refrigerant, are thoroughly managed to control leakage, in accordance with the standards specified by the Fluorocarbons Emission Control Law.*3

*1 For HCFC, intentional adding in products as refrigerant or heat insulator is prohibited.
*2 Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements in the Management Thereof
*3 Act on the Rational Use and Proper Management of Fluorocarbons

Emissions of Air Pollutants

The Kubota Group has set its own control values that are stricter than the emission standards of relevant laws and regulations. In order not to allow the exceeding of standard values, the Group implements thorough daily management activities, such as monitoring operation of the smoke and soot-generating facilities and inspecting the dust-collecting equipment.

The amounts of emissions of air pollutants in RY2019 were 3.7* tons for SOx (down by 60.2% from the previous year), 47.3 tons for NOx (down by 4.3%), and 10.8 tons for soot and dust (up by 9.5%). We will continue to reduce emissions of air pollutants through initiatives such as controlling sources by fuel conversion and maintaining dust-collecting equipment.

* If sulfur contained in the slag managed onsite at end of year (December 31, 2019) by some sites in Japan is included, SOx emissions for RY2019 amounted to 5.2 tons.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Monitoring Groundwater

Results of groundwater measurements conducted on the premises of the business sites that used organic chlorine-based compounds in the past are as shown below.

Groundwater monitoring (RY2019)

Business site	Substance	Measured groundwater value	Environmental standard
Tsukuba Plant	Trichloroethylene	Non-detected (less than 0.0001 mg/L)	Less than 0.01 mg/L
Utsunomiya Plant	Trichloroethylene	Non-detected (less than 0.001mg/L)	Less than 0.01 mg/L

Reduction of Chemical Substances Contained in Products

The Kubota Group has set rules for identifying and properly managing chemical substances in products in order to comply with REACH Regulations* in Europe and other chemical substance regulations.

Since 2010, chemical substances in products have been classified as one of the three following categories and managed appropriately. With cooperation from our suppliers, we investigate chemical substances in products on a global basis.

* The European Union (EU) Regulations for Registration, Evaluation, Authorization and Restriction of Chemicals

■ Three Control Levels

1. Substances to be Prohibited: Should not be contained in products
2. Substances to be Restricted: Should not be contained in products under certain conditions and applications
3. Substances to be Controlled: Presence in products should be recognized

Conserving Biodiversity

Our corporate activities rely on various ecosystem services, which are provided by natural capital comprising soil, air, water, animals and plants, and other elements. Meanwhile, biodiversity is facing various crises in areas around the world, and the Aichi Biodiversity Targets adopted in the SDGs (goals 14 and 15) and the CDB-COP10 (Tenth meeting of the Conference of the Parties to the Convention on Biological Diversity), require business operators to protect biodiversity and make sustainable use of ecosystem services.

The Kubota Group sees conserving biodiversity as one of its materiality issues. In its corporate activities, provision of products and services, and social contribution initiatives, in view of its impact on natural capital, the Group is endeavoring to ensure that care is taken to conserve biodiversity and protect the natural environment.

Approach to Conserving Biodiversity

The Kubota Group has set Conserving Biodiversity as one of its five basic items for environmental conservation. In December 2009, we incorporated corporate activities that consider biodiversity into the Kubota Group Environmental Action Guidelines. Then, in our ECO FIRST Commitment submitted to the Japanese Minister of the Environment in 2010, we also included a commitment to promoting activities for conserving biodiversity.

Approach to Conserving Biodiversity

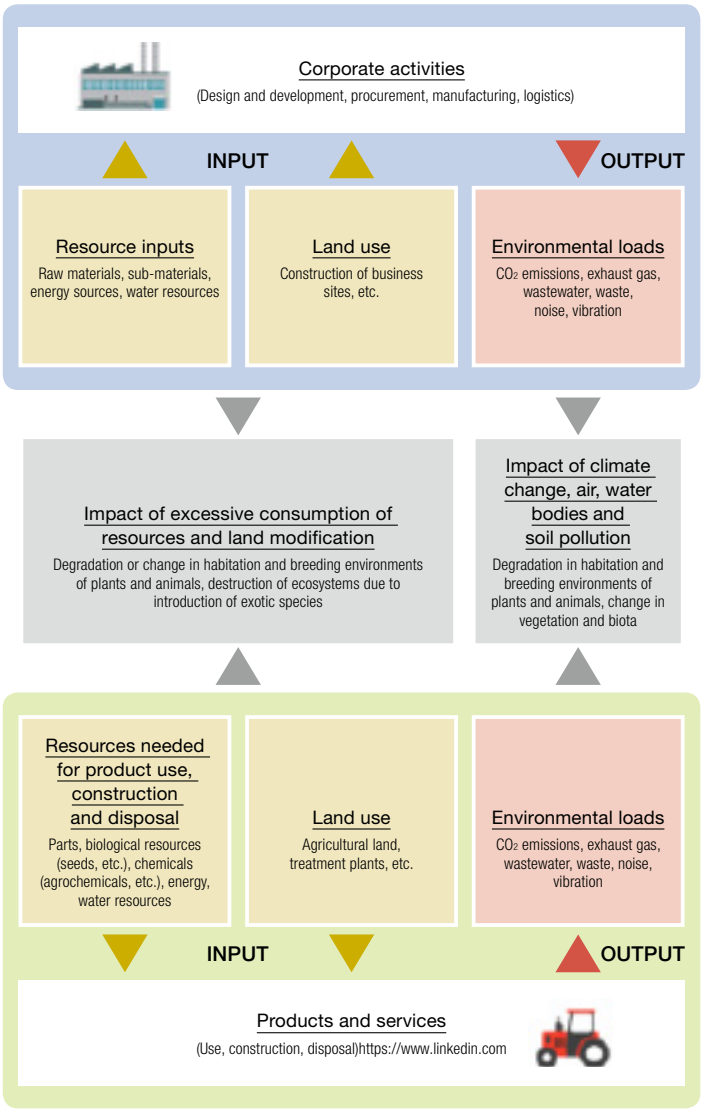
The Kubota Group has included Conserving Biodiversity as one of its five basic items for environmental conservation. In its corporate activities, provision of products and services, and social contribution initiatives, in view of its impact on natural capital, the Group will endeavor to ensure that care is taken to conserve biodiversity and protect the natural environment.

[Major Initiatives]

1. Corporate activities
   1) At the design and development stage, we conduct product environmental assessments to evaluate the impact on natural capital.
   2) At the procurement stage, we present our Green Procurement Guidelines to our suppliers and require them to give consideration for biodiversity.
   3) At the production and logistics stages, we strive to reduce the environmental loads and environmental risks associated with operations at our sites and transport of materials.
   4) As part of our environmental management, we conduct environmental education and awareness-raising for employees to foster their recognition of the value of biodiversity and the importance of conservation activities.
   5) Our environmental communication initiatives include efforts to disseminate information about our biodiversity conservation activities.
2. Provision of products and services
   1) By providing products and services with less environmental loads through fuel efficiency and exhaust gas purification, for example, we are striving to lessen our impact on biodiversity.
   2) By providing water environment solutions such as wastewater treatment and waste treatment, we contribute to improving the ecosystems and nurturing environment for plants and animals.
   3) By providing products and services that contribute to urban infrastructure development that considers smart agriculture and the environment, we contribute to sustainable use of ecosystem services.
3. Social contribution activities
   1) Through our social contribution activity the Kubota e-Project supporting reclamation of abandoned farmland and conservation activities in rural and forest areas, we are promoting protection of the natural environment.
   2) We are promoting the beautification and greening of business sites and neighborhoods as well as protection of plants and animals.

Relationship with Biodiversity

Relationship between the Kubota Group and Biodiversity



Management and reduction of environmental loads involved with corporate activities

Reduce environmental loads due to the Kubota Group's corporate activities, consider the impact on biodiversity

- Green procurement
- Environmental impact assessment on land use
- Tackling climate change (energy conservation, etc.)
- Working toward a recycling-based society (conserve resources, 3Rs for waste, etc.)
- Conserving water resources (3Rs for water resources, etc.)
- Controlling chemical substances (reduce the use of substances of concern, reduce VOC emissions, etc.)
- Environmental Management (prevent air, water bodies and soil pollution, provide employees with environmental training, etc.)

Contributions through social contribution initiatives

Collaborate with NPOs, etc., work for protection of the natural environment

- Kubota e-Project (supporting reclamation of abandoned farmland, Kubota Forest, nature experiences for elementary school students, etc.)
- Kubota e-Day (environmental beautification volunteers)
- Greening our establishments, inside and outside
- Protect regional animals and plants

Impact reduction and environmental contributions through products and services

Reduce the impact of the use, construction and disposal of products and services, contribute to preservation of biodiversity and use of sustainable ecosystem services.

[Impact reduction]

- Product environmental assessment
- Develop environmentally conscious products (energy saving, resource conserving, prevent air, water bodies and soil pollution, etc.)

[Contributions]

- Provide water environment solutions for wastewater treatment and waste disposal treatment, etc.
- Provide products and services for smart farming and establishment of urban infrastructure considering the environment

Initiatives Taken at Business Sites

Participation in Beach Cleanup Activities

In June 2019, Kubota Farm Machinery Europe S.A.S (France) ran a clean-up activity on Dunkirk Beach. 83 employees participated, collecting around 30 kg of rubbish.

Mangrove Planting

SIAM KUBOTA Corporation Co., Ltd. (Headquarters) (Thailand) holds a mangrove planting activity every year. In 2019, the activity was held in Rayong Province. Around 50 employees participated, planting approximately 150 mangrove trees.

Releasing Juvenile Fish

SIAM KUBOTA Metal Technology Co., Ltd. (Thailand) hosts a juvenile fish release activity every year. In 2019, the activity was held at a river nearby the factory. 10 employees cooperated with the local community to release approximately, 3,000 juvenile fish.

Expanding Environment-friendly Products and Services

The Kubota Group is contributing to protecting the global environment and solving social issues in the food, water and living environment fields through the provision of environment-friendly products and services. The Group conducts environmental assessment of products in the design and development stages, and promotes environment-friendliness over the entire product life cycle, from the procurement of raw materials to the disposal of products. The Group internally certifies exceptionally environment-friendly products as Eco-Products, and is working to expand its lineup of certified products.

Environmental Considerations in the Product Life Cycle

Major Initiatives to Ensure Environment-friendliness

Design and development
- Product environmental assessment to ensure environment-friendly design
- Internal certification of Eco-Products

Raw materials and parts procurement
- Green procurement
- Optimal regional procurement

Production
- Reduction of waste and loss in the use of energy and other resources
- 3Rs for waste and water resources, use of recycled materials
- Reduction of VOC emissions, replacement of organic solvents with substitutes

Distribution
- Improving loading efficiency
- Modal shift
- Reduction of packing materials

Construction
- Improving efficiency and saving labor for construction work
- Shortening of construction period
- Reduction of resources used for construction

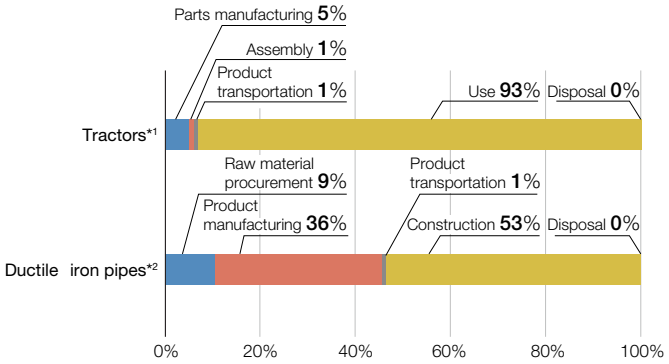
Use
- Reduction of fuel consumption
- Improving efficiency and saving labor for work and management
- Improving ease of maintenance, extending product life
- Reduction of exhaust gas
- Reduction of noise, vibration

Disposal
- Collecting/reuse/recycling of used products and parts
- Proper disposal

Analysis of Greenhouse Gas Emissions Volume in the Product Life Cycle

The Kubota Group handles a diverse range of products, from agricultural and construction machinery to pipe systems and water treatment equipment. As part of its product environmental assessment, the Group conducts life cycle assessment (LCA) for its major products to determine the amount of greenhouse gas emissions over each product life cycle. The results of the LCA were subject to third-party review in 2014 by the Japan Environmental Management Association for Industry.

Results of LCA: Proportions of Greenhouse Gases



*1 LCA results for tractors were calculated based on the assumption of towing and transporting work for 5,000 hours by the M9540DTHQ-EC agricultural tractor in France.
*2 LCA results for ductile iron pipes were calculated based on the data reported in the "Study on Piping Technologies for Sustainable Water Supply Service" (Japan Water Research Center). The proportions of raw material procurement, manufacturing, and product transportation were determined according to Kubota's CO_2 emissions data.

Greenhouse gases emitted in the use stage account for around 90% in the life cycle of agricultural tractors, while gases emitted in the manufacturing and construction stage account for around 90% in ductile iron pipes. Thus, the frequency and scale of environmental loads in the life cycle vary depending on the product type. The Kubota Group enhances its environment-friendly products and services by reflecting the results of the analysis of environmental loads in the product life cycle in its environment-friendly design development.

Examples of Initiatives to Ensure Environment-friendliness

Environment-friendly *Johkasou*, Decentralized Wastewater Treatment Plant

Johkasou is used to treat wastewater from houses, public and commercial facilities in areas not served by an adequate sewerage system. This product was developed in Japan but is currently also in widespread use overseas, particularly in Southeast Asia, where rapid urbanization has led to problems with contamination of the aquatic environment.

The Kubota Group offers customers a varied range of *Johkasou* depending on the quality and volume of the wastewater. In addition to contributing to improving the local aquatic environment, the development of high-performance, compact *Johkasou* brings environmental benefits at each stage of the product lifecycle.

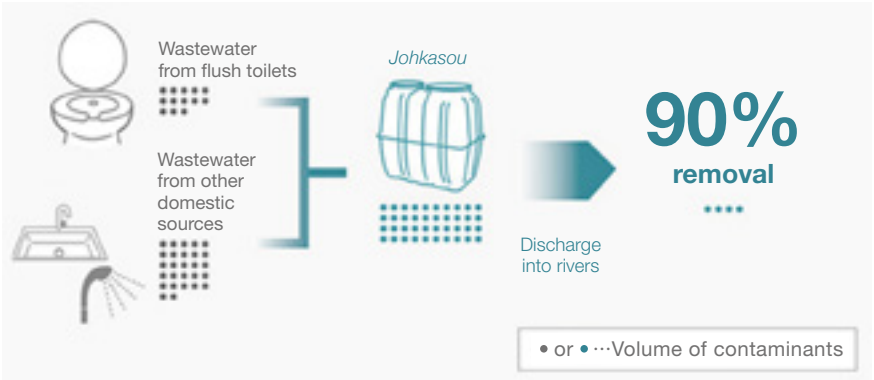
[Examples of Kubota-manufactured *Johkasou* in Use Overseas]

Small *Johkasou* in use for detached housing (Indonesia)

Large *Johkasou* in use at a hospital (Vietnam)

How a *Johkasou* Works

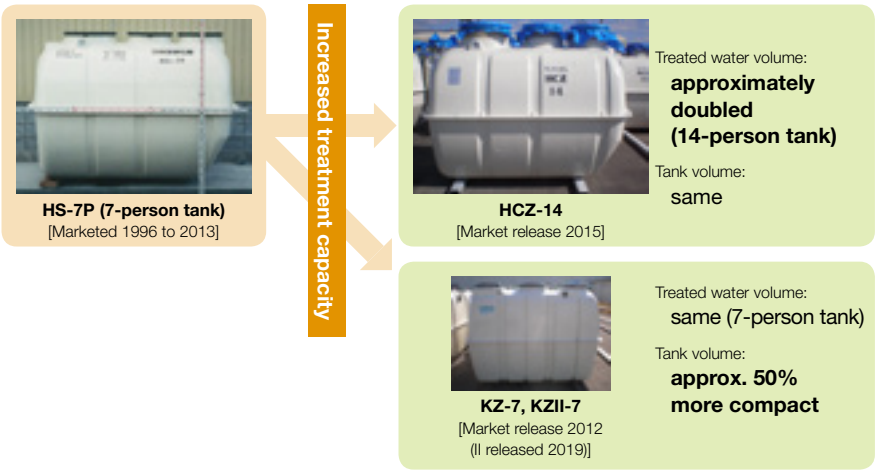
Johkasou uses the action of microorganisms to remove contaminants from domestic wastewater including effluent from flush toilets. Advanced treatment *Johkasou* removes not only contaminants but also nitrogen, which is a cause of red tides in enclosed bay and algal blooms in wetlands.



Treatment capacity of *Johkasou*

Development of *Johkasou* with Higher Performance and More Compact Dimensions

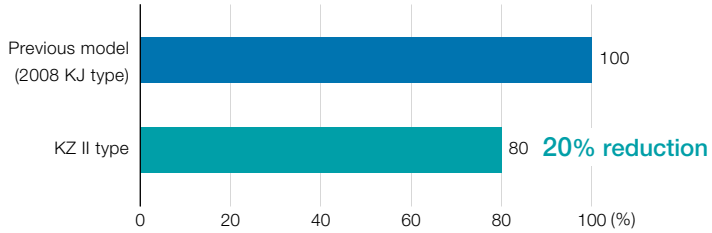
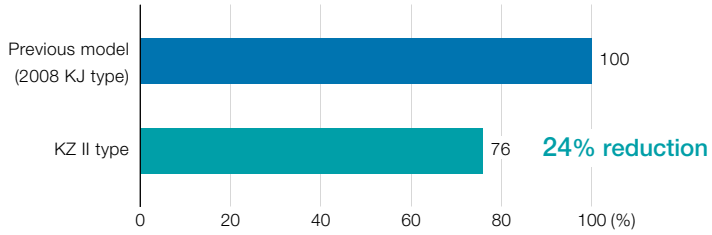
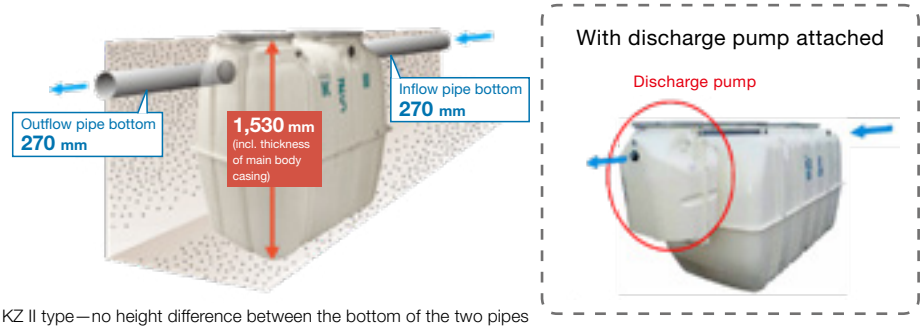
By using sponge-type carriers that can hold a larger number of microorganisms and making other improvements, the Kubota Group's *Johkasou* increases the treatment capacity per unit of volume to realize a compact design that fits neatly into any underground space. As it requires little excavation, it makes for less labor-intensive and speedier installation. In environmental terms too, it realizes savings in energy and resources.



Increased treatment capacity realizes increase in treated water volume and more compact dimensions

Johkasou with Environment-friendly Features at Each Stage of the Lifecycle

As illustrated below, Kubota Group *Johkasou* displays environment-friendly features at each stage of the lifecycle.

Lifecycle stage	Environmental issue	Environment-friendly feature of *Johkasou* (KZ II-5,7,10)
Procurement	Reduction of chemical substances	・Use of raw materials free of certain substances restricted by RoHS*1 directive
Production	Energy saving	・Number of assembly parts reduced through integration of functions, parts designed to be fitted in a single action—removing need for electric power tool operations such as screw fixing, reducing energy consumption in assembly process
	Resource conservation	・20% weight reduction in main body of product through more compact dimensions, resulting in 20% reduction in raw material use **Comparison of weight** 
Transportation	Energy saving	・Increased transportation efficiency through more compact dimensions, resulting in reduced fuel consumption
Installation	Energy saving	・24% reduction in excavation volume through more compact dimensions, resulting in shorter time using heavy machinery and reduced fuel consumption **Comparison of excavation volume* associated with installation**  * Excavation volume calculated based on Kubota in-house standards
		・The base plate used for installation is a dedicated product realizing weight reduction of around 85% and requiring less use of heavy machinery for laying, resulting in reduced fuel consumption*2
	Resource conservation	・As the outflow pipe is installed at the same high position as the inflow pipe, with no height difference between the bottom of the two pipes, a natural flow arises readily with no need for a discharge pump*3  KZ II type—no height difference between the bottom of the two pipes
Operation	Energy saving	・Switching to an energy-saving type for the blower that aerates the inside of the *Johkasou* results in reduced electric power consumption
	Ease of maintenance	・Simple opening and shutting of the attached valve effects cleansing of the interior (anaerobic filter tank) for easy maintenance

*1 RoHS directive: EU directive issued on July 1, 2006, limiting the use of certain hazardous substances in electric and electronic equipment (major revision on July 21, 2011)
*2 As the *Johkasou* must be installed on a level surface, in general concrete is either cast on-site or a precast concrete base plate is laid. The Kubota Group markets the KB plate, a dedicated KZ II lightweight foundation base plate weighing 48 kg for a 5-person tank.
*3 Depending on conditions at the installation site, if the water level at the discharge point is higher than the bottom of the outflow pipe, a discharge pump may be needed.

For detailed information on *Johkasou* follow this link:
www.kubota.com/products/johkasou/

Major Initiatives to Ensure Environment-friendliness by Product Group

C Tackling Climate Change
R Working towards a Recycling-based Society
W Conserving Water Resources
Ch Controlling Chemical Substances
B Conserving Biodiversity, etc.

Farm & Industrial Machinery

Product group	Major initiatives to ensure environment-friendliness	Life cycle				
		Procurement production	Distribution	Construction	Use	Disposal
Tractor	Reducing the number of parts	R				
	Reducing environmentally hazardous substances contained in paint	Ch				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing fuel consumption by introducing an energy-saving mode				C	
	Conforming to exhaust gas regulations				Ch	
	Reducing noise, vibration				B	
	Indicating parts materials, providing information on points to be noted for disposal					R
Rice transplanter	Reducing environmentally hazardous substances contained in paint	Ch				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing fuel consumption by introducing an energy-saving mode or a multiple-function capacity to simultaneously perform five farming operations				C	
	Reducing seedling cultivation-related materials by sparse planting or dense-sown seedling transplantation, and a straight-line maintenance function				R	
	Conforming to exhaust gas regulations				Ch	
	Indicating parts materials, providing information on points to be noted for disposal					R
Combine harvesters	Reducing the number of parts and weight	R				
	Reducing environmentally hazardous substances contained in paint	Ch				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing fuel consumption by introducing an energy-saving mode				C	
	Reducing fuel consumption with improved reaping accuracy by horizontal control of the vehicle body				C	
	Conforming to exhaust gas regulations				Ch	
	Reducing noise, vibration				B	
	Indicating parts materials, providing information on points to be noted for disposal					R
KSAS (Kubota Smart Agri System)	Reducing fuel consumption per unit yield of agricultural machinery by improving farm work efficiency and increasing yield				C	
	Proper fertilizer application to prevent excessive fertilizers from flowing downstream				W	
	Facilitating self-maintenance and reducing mechanical problems by monitoring the operation status of agricultural machinery				R	
Cultivators	Reducing environmentally hazardous substances contained in paint	Ch				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing CO_2 emissions by electrification				C	
	Achieving zero CO_2 emissions by electrification				Ch	
	Conforming to exhaust gas regulations				Ch	
	Reducing noise, vibration				B	
	Indicating parts materials, providing information on points to be noted for disposal					R
Riding mowers	Reducing environmentally hazardous substances contained in paint	Ch				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing fuel consumption by introducing a unique mowing method to alleviate power load				C	
	Conforming to exhaust gas regulations				Ch	
	Indicating parts materials, providing information on points to be noted for disposal					R
Utility vehicles	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Conforming to exhaust gas regulations				Ch	
	Indicating parts materials, providing information on points to be noted for disposal					R
	Reducing RoHS-designated substances					Ch
Agricultural-related products (color sorter, rice-milling machine, etc.)	Reducing the number of parts and weight		C			
	Reducing air consumption necessary for sorting of defective rice by improving the air injection accuracy of color sorters				C	
	Reducing power consumption of electronic circuits				C	
	Reducing power consumption of improved thermal insulation efficiency of low-temperature brown rice storage containers				C	
	Reducing electric power consumption during waiting time for fruit selector measurement				C	
	Reducing the noise of rice-milling machines				B	
	Indicating parts materials, providing information on points to be noted for disposal					R
	Reducing RoHS-designated substances					Ch
Engines	Reducing fuel consumption by improving combustion efficiency and reducing losses				C	
	Accepting bio diesel/gasoline				C	
	Conforming to exhaust gas regulations				Ch	
	Reducing noise, vibration				B	
	Reducing RoHS-designated substances					Ch
Construction machinery	Reducing environmentally hazardous substances contained in paint	Ch				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing fuel consumption by introducing an energy-saving mode				C	
	Conforming to exhaust gas regulations				Ch	
	Reducing noise, vibration				B	
	Indicating parts materials, providing information on points to be noted for disposal					R
	Reducing RoHS-designated substances					Ch
Precision machinery (Measuring instruments)	Reducing the number of parts and weight	R				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing power consumption of electronic circuits				C	
	Reducing electric power consumption of peripheral equipment during waiting time for truck scale measurement				C	
	Reducing the number of waste batteries by introducing energy-saving measuring instruments					R
	Reducing RoHS-designated substances					Ch
Air-conditioning equipment	Using recycled resin	R				
	Reducing power consumption by installing a heat pump and a highly efficient motor				C	
	Easier maintenance by reducing the number of parts and adopting designs that are easy to disassemble				R	
	Providing information on points to be noted for disposal					R
	Reducing RoHS-designated substances					Ch

C Tackling Climate Change
R Working towards a Recycling-based Society
W Conserving Water Resources
Ch Controlling Chemical Substances
B Conserving Biodiversity, etc.

Water & Environment

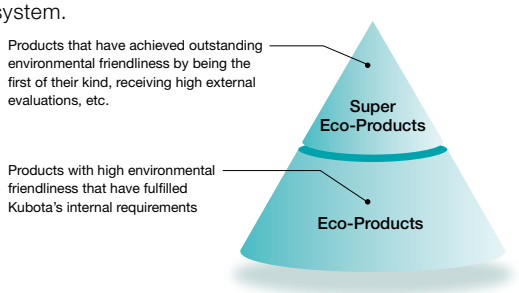
Product group	Major initiatives to ensure environment-friendliness	Life cycle				
		Procurement production	Distribution	Construction	Use	Disposal
Ductile iron pipes	Reducing weight by thinning pipes or changing the structure of couplings	R				
	Reducing VOC by changing the paint for the inner surface	Ch				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing the width of the excavation groove by reducing the insertion force at the time of jointing couplings to decrease the number of items necessary for jointing			C		
	Reducing polyethylene sleeves by improving anti-corrosion performance			R		
	Improving maintenance performance by introducing a coupling structure with reduced insertion force or reducing the number of parts				R	
	Extending product life by improving anti-corrosion performance and introducing earthquake-resistant couplings				R	
Plastic pipes	Reducing chemical substances specified under the technical standards based on the Water Supply Act	Ch				
	Reducing power consumption when joining pipes by a fusing process			C		
	Indicating parts materials, providing information on points to be noted for disposal					R
	Reducing RoHS-designated substances					Ch
Valves	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing the width of excavation grooves by reducing the insertion force at the time of jointing couplings to decrease the number of items necessary for jointing			C		
	Reducing polyethylene sleeves by improving anti-corrosion performance			R		
	Extending product life by improving anti-corrosion performance				R	
Pumps	Reducing the cut amount during processing by introducing compact casings	C				
	Reducing the weight and volume by introducing compact and thinner casings	R				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing power consumption by improving pump efficiency				C	
	Reducing RoHS-designated substances					Ch
Businesses related to water purification, sewage and wastewater treatment (Condensation, dehydration, agitator, etc.)	Reducing weight and the number of parts by eliminating frames or introducing multi-function parts	R				
	Reducing the power consumption of dehydrators by downsizing hydraulic units, etc.				C	
	Reducing the power consumption by introducing agitating blades capable of efficient agitation with low power				C	
	Reducing the power consumption of fans by introducing a low-pressure membrane-type air diffuser				C	
	Reducing dehydrated sludge volume				R	
KSIS	Saving energy by the efficient operation of equipment through remote monitoring/ diagnosis using IoT				C	
	Extending equipment life by failure diagnosis using AI				R	
	Reducing water consumption through field water management systems				W	
Submerged membranes	Reducing weight and volume by reducing the weight per unit membrane area or the membrane filling rate	R				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing power consumption per unit processing quantity by improving the membrane filtration performance and expanding the membrane-carrying area				C	
	Collecting/recycling of used membrane cartridges					R
	Reducing RoHS-designated substances					Ch
Membrane-type methane fermentation units	Generating biogases by the methane fermentation of food waste and palm oil mill effluent				C	
	Reducing the volume of food waste				R	
Decentralized wastewater treatment plant *(Johkasou)*	Using recycled resin	R				
	Reducing the weight and volume of *Johkasou* by improving the processing capacity per unit volume	R				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing the amount of excavated soil at the time of burying by reducing volume			C		
	Reducing RoHS-designated substances					Ch
Steel pipes	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing energy during construction by mechanical couplings			C		
	Reducing RoHS-designated substances					Ch
Ethylene thermal cracking pipes	Reducing the use of rare metals, using recycled rare metals	R				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Reducing fuel consumption necessary for decoking (maintenance) by changing the internal structure of pipes				C	
	Reducing RoHS-designated substances					Ch
Rolls	Using recycled rare metals	R				
	Reducing fuel consumption by improving loading efficiency in product transportation		C			
	Extending product life by improving the roll surface strength				R	
	Reducing RoHS-designated substances					Ch

Internal Certification System for Eco-Products

Regarding the Internal Certification System for Eco-Products

The Kubota Group's internal certification system for Eco-Products was introduced to internally certify products with exceptional environmental friendliness. We evaluate products in accordance with matters related to the five basic items for environmental conservation in the Kubota Group's environmental management, namely, "Tackling Climate Change," "Working towards a Recycling-based Society," "Conserving Water Resources," "Controlling Chemical Substances," and "Conserving Biodiversity," and certify those products that satisfy our internal standards as Eco-Products.

We have also received third-party assurance for our "Sales Ratio of Eco-Products," which is the ratio of sales generated by Eco-Products certified under our internal system.



Example of an Eco-Product label

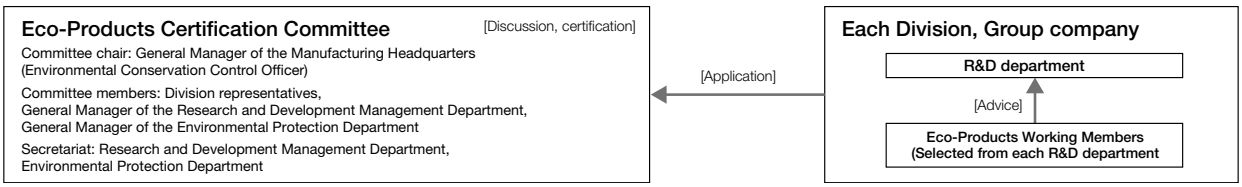
Reduced fuel consumption by xx% (vs. Kubota XX model, RYXXXX)

Eco-Products feature a label that shows their certification as Eco-Products.

Five basic items for environmental conservation	Evaluation items	Relationships with SDGs
• Tackling Climate Change	1. Energy saving (CO_2 reduction) Reducing energy consumption during production, transportation, construction and use, etc.	
• Working towards a Recycling-based Society	2. Resources saving Reducing weight and volume, extending product life, etc.	
• Conserving Water Resources	3. Recycling Using recycled materials and recycled rare metals, etc.	
• Controlling Chemical Substances	4. Reducing environmentally hazardous substances Reducing RoHS-designated substances, reducing gas emissions, etc.	
• Conserving Biodiversity	5. Information disclosure Notes about energy-saving operations, recycling and disposal, etc.	

Eco-Products Certification Committee

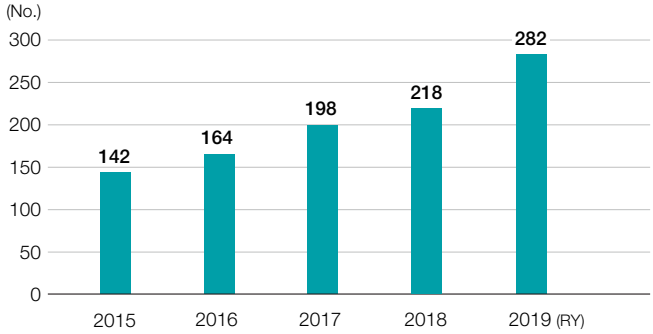
The Eco-Products Certification Committee, chaired by the General Manager of the Manufacturing Headquarters, consists of the committee members elected from each Division, as well as the Research and Development Management Department and the Environmental Protection Department. Upon receiving an application from each Division for the certification of a product, the Committee examines the product's adequacy as an Eco-Product and gives certification.



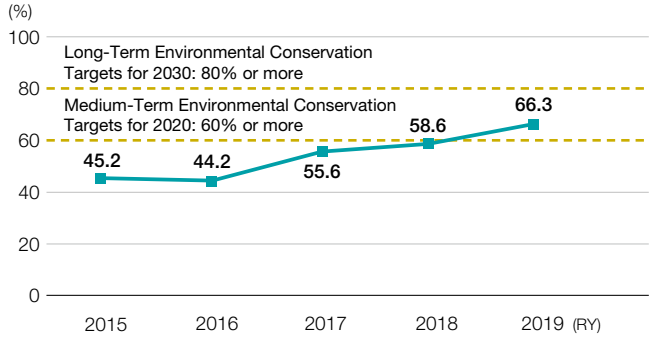
The Pathway to Expanding Certified Eco-Products

Based on our internal certification system established for Eco-Products, the Kubota Group certified an additional 64 products in RY2019, including 3 Super Eco-Products, bringing the total number of certified Eco-Products to 282. The sales ratio of Eco-Products grew to 66.3%, meaning that the Group reached its Medium-Term Environmental Conservation Targets for 2020 one year ahead of plan. We will continue to carry out initiatives focusing on the development of environment-friendly products and expand our Eco-Products lineup.

Trends in No. of Eco-Product Certifications (Total)



Trends in Sales Ratio of Eco-Products*



* The sales ratio of products that have fulfilled the internal requirements in our own Eco-Products Certification System
Sales ratio of Eco-Products (%) = Sales of Eco-Products / Sales of products (excluding construction work, services, software, parts and accessories) × 100

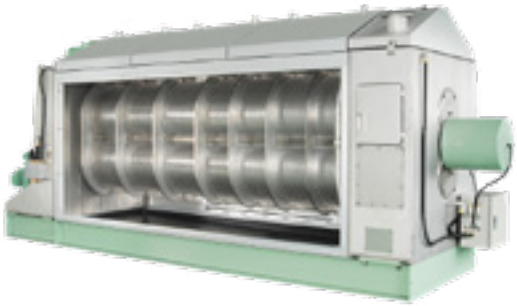
Products Certified as Super Eco-Products in RY2019

Combine harvester
Agri Robo combine harvester
WRH1200A

This is the industry's first combine harvester featuring automated driving assist functions, which will contribute to the realization of smart agriculture. As well as complying with the latest exhaust gas regulations, it also contributes to conserving energy and resources in agriculture.

Ride-on-type rice transplanter
NAVIWEL
NW8S-GS

This is the industry's first rice transplanter fitted with a keep-straight function, which will contribute to the realization of smart agriculture. As well as complying with the latest exhaust gas regulations, it also contributes to conserving energy and resources in agriculture.



High-efficient twin screw press dehydrator*
SHD-030W to 090W

This is the industry's first compact, high-performance sludge dehydrator with a high-efficiency twin screw. As well as the resource saving in the body of the product itself compared with conventional units (single screw), it contributes to reduction of waste materials by efficiently reducing sludge volume.

* A machine to reduce the volume of sludge from sewage treatment plants and similar sources through dehydration

Products Certified as Eco-Products in RY2019 (excerpt)

Tractor
Slugger Series
SL600H-GS

[Key certification point]
Compliant with exhaust gas regulations

Off-road vehicles
Utility vehicle
RTV-XG850 (North America)

[Key certification point]
Compliant with exhaust gas regulations

Construction machinery
Mini excavator
U-35-6S (Korea)

[Key certification point]
Compliant with exhaust gas regulations

Construction machinery
Compact track loader
SVL65-2 (North America)

[Key certification point]
Compliant with exhaust gas regulations

Non-destructive saccharimeter for vegetables and fruits
Fruit selector
K-BA800

[Key certification point]
Saving energy

Diesel engine
05-E5 Series
V1505-CR-TE5-BB (Europe)

[Key certification point]
Saving energy
Recycling
Compliant with exhaust gas regulations

Johkasou, Decentralized wastewater treatment plant
Small-size *Johkasou*
KZ II-5

[Key certification point]
Saving energy
Conserving resources/ Recycling
Reducing environmentally hazardous substances

Plastic pipe
Rigid PVC water supply pipes/joints
Nominal diameter 13-150 mm

[Key certification point]
Reducing environmentally hazardous substances

Click here for details on products certified as Eco-Products.
www.kubota.com/company/environment/ecopro/

Evolution and History of Environmentally Friendly Products and Services

Evolution and History of Rice Transplanters

The Kubota Group developed the world's first walk-behind rice transplanter using seedling mats in 1968 with the aim of reducing the burden of planting rice. In order to meet demand for labor-saving measures precipitated by the subsequent decline in the number of farmers and the aging of Japan's population, we continued to develop our lineup of rice transplanters—we made them rideable, bigger, and equipped them with more functions. We will continue to implement labor-saving efforts and reduce our impact on the environment by proposing efficient cultivation methods and refining agricultural practices with the use of ICT and automation.

Seedling mats grown in trays

■ Historical Development and Environmental Contributions of Rice Transplanters

Decade	Social trends in Japan	Progress in rice transplanter development	Environmental contributions
1950s	· High economic growth · Shift in labor from rural areas to cities	· Start of development	Increasingly lighter walk-behind rice transplanters
1960s	· The mechanization of rice transplanting lagged behind the emergence of tractors and binders · Increase in part-time farmers, the elderly, and women engaged in agriculture	· **Development and sales launch of SP model (2-row) walk-behind rice transplanter** (1968)	
1970s	· Shift from "walk-behind" to "ride-on" agricultural machinery · Boom in agricultural machinery · Convergence of high economic growth · Occurrence of so-called "red tide" at Lake Biwa (1977)	· **Sales launch of SPS model (2-row) walk-behind rice transplanter** (1970) · Start of volume production of SPS series (sales: 18,000 units in first year; 86,000 in second year) · **Sales launch of SPR600 model (6-row; tractor-driven), Kubota's first ride-on rice transplanter** (1976)	Increasingly larger ride-on rice transplanters and lower weight-to-power ratio
1980s	· Growing need to reduce burden of agricultural work [Rotary system] Adoption of rotational planting mechanism improved work speed by 50% and boosted efficiency  Miracle Rotary developed in 1991	· **Sales launch of NSR series of ride-on rice transplanters with row-side fertilizer applicator to reduce amount of applied fertilizer and prevent water contamination** (1980) **Pesticide spraying and other simultaneous features also subsequently developed** · **Sales launch of NSR85-D model (8-row) specialized ride-on rice transplanter** (1984) · Sales launch of S1-600R model (6-row) rotary-type ride-on rice transplanter (1988)	Expanding capabilities of ride-on rice transplanters to simultaneously perform other tasks
1990s		· Continued development of compact, lightweight rice transplanters, as well as larger ride-on rice transplanters · **Sales launch of SPM10 model (10-row) large ride-on rice transplanter** (1995)	
2000s	[Easy turning] Ability to complete smooth turns with only the steering wheel [Easy speed shifting] Prevents sudden acceleration and allows for smooth starts at ultra-low speed  World series performing smooth turns	· Sales launch of Welstar series of ride-on rice transplanters equipped with new easy turning and easy speed shifting capabilities to improve operability (2000) · **Sales launch of NSD8 model (8-row) ride-on rice transplanter capable of efficiently performing five functions simultaneously** (2007) · **Sparse planting proposal** (2009)	Proposing efficient cultivation methods
2010s	· Increasingly higher concentration of farmland among large-scale farmers · Skyrocketing fuel prices · Emergence of high-precision farming using ICT · Shift to driverless farm machinery [e-stop] Easy use of a lever to stop the engine when restocking seedlings or fertilizer reduces fuel consumption by around 12%* 	· **Sales launch of direct seeder for iron-coated rice seeds "Tetsumaki-chan"** (2010) · Sales launch of Racwel, the industry's first ride-on rice transplanters equipped with idling stop feature "e-stop" (2011) · **Sales launch of EP8D-GS model (8-row) ride-on rice transplanter equipped with industry-first straight-line keeping feature** (2016) · **Demonstration of dense seedling transplanting** (since 2017) · **Sales launch of NAVIWEL series of ride-on rice transplanters capable of maintaining planting distance, controlling amount of applied fertilizer, and keeping straight lines** (2019)	Eliminating inefficiencies with precision farming
2020		· **Sales launch of Agri Robo Rice Transplanter NW8SA, the industry's first self-driving rice transplanter**	

* Comparison of fuel consumption when planting rice seedlings under the following conditions (Kubota's estimates; fuel consumption may differ depending on the conditions): Rice transplanter capacity of 8 rows, area of 0.5ha, 20 seedling mats per 0.1ha, 40kg of fertilizer per 0.1ha, one transplanter operator, and one assistant


SP model—Kubota's first walk-behind rice transplanter

Increasingly Lighter Walk-behind Rice Transplanters

Even though the walk-behind rice transplanter first developed in 1968 increased in mass due to the addition of extra features through the 1980s, we made each model lighter and more streamlined mainly with the use of an aluminum gearbox housing and a plastic float. This meant we were able to conserve resources and make operations much more efficient.

<Changes in Weight and Horsepower of 2-row Walk-behind Rice Transplanters>

Launched	1968	1970	1981	1987	1990	2003
Model	SP	SPS-2	NS300-D	S1-25	S1-20	SP-2
Weight (kg)	**100**	**60**	80	**108**	**91**	**88**
		Weight reduction	Added features		Weight reduction	
Horsepower (PS)	3.0	1.7	1.4	2.1	2.3	2.3
Weight (kg) / Horsepower (PS) [vs. NS300-D]	33.3	35.3	**57.1**	**51.4 [-10%]**	**39.6 [-31%]**	**38.3 [-33%]**

Increasingly Larger Ride-on Rice Transplanters and Lower Weight-to-power Ratio

The ride-on rice transplanter that first went on sale in 1976 gradually increased in size so it could plant more rows at the same time, thus boosting work efficiency. However, the heavier it became, the deeper it sank into the mud, which easily hindered its running performance. We therefore strived to provide more horsepower when making the machine larger, but at the same time we took steps to make it lighter. By reducing its weight-to-power ratio (mass divided by horsepower), we were able to conserve resources and achieve higher operating efficiency.

<Changes in Size, Weight, Horsepower, and Planting Capacity of Ride-on Rice Transplanters>

Launched	1976	1984	1995	2014	2019
Model	SPR600 (Kubota's first ride-on model; tractor-driven)	NSR85-D (first specialized rice transplanter)	SPM10 (first 10-row transplanter)	EP10D	NW8S-GS
No. of rows	**6**	**8** Size increase	**10** Size increase	10	8
Weight (kg)	530	490	978	970	960
Horsepower (PS)	9	6.2	16.0	21.0	24.6
Weight (kg) / Horsepower (PS) [vs. NSR85-D]	58.9	**79.0**	**61.1 [-23%]**	**46.2 [-42%]**	**39.0 [-51%]**
			Lower weight-to-power ratio		
Time (min) required to plant 0.1ha	**25–30**	**15–20**	**7–**	7–	7–
	Higher work efficiency				

Expanding Capabilities of Ride-on Rice Transplanters to Simultaneously Perform Other Tasks

In the past, fertilizer was applied uniformly over the rice paddy after the seedlings were planted, but surface runoff from excessive application was one reason behind the occurrence of a so-called "red tide" at Lake Biwa in Shiga Prefecture in 1977. Kubota therefore developed a row-side fertilizer applicator to bury the right amount of fertilizer at the root of each seedling when it is transplanted. Not only did this prevent fertilizer runoff from overapplication, but the simultaneous application of fertilizer considerably reduced the amount of labor required and saved costs because less fertilizer was used. We took the idea of multi-tasking even further by developing a product in 2007 that can perform five jobs at once: transplanting, fertilizer application, herbicide application, pesticide application, and ground leveling. This equipment significantly reduced labor and made work more efficient.

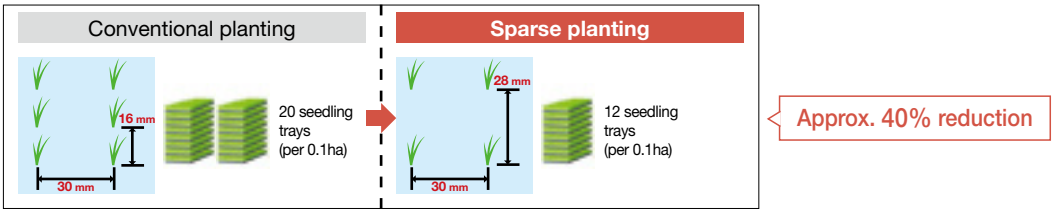
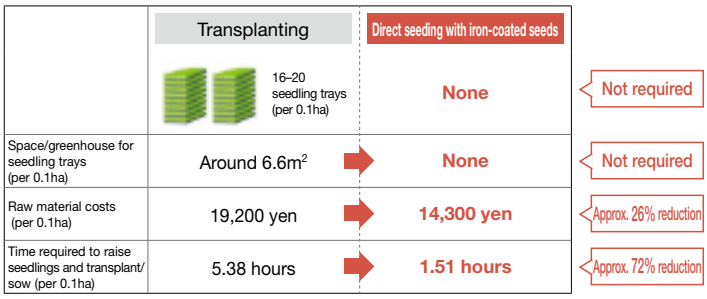
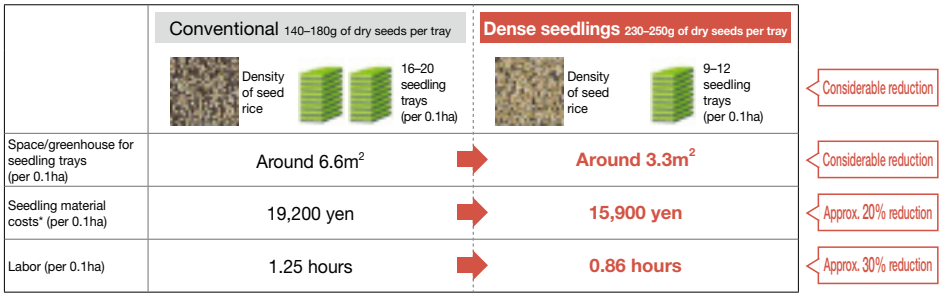
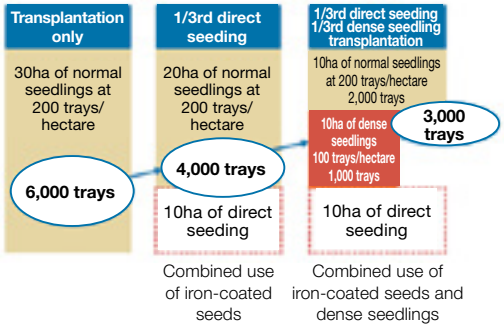
Five functions in a single rice transplanter

Proposing Efficient Cultivation Methods

The hours spent raising and transplanting seedlings account for approximately 30% of all wet-rice farming work. The Kubota Group proposes cultivation methods that can reduce the number of seedling trays used or even eliminate the very need to raise seedlings in order to reduce manpower, time, and costs involved in raising and transplanting seedlings.

Limiting the volume of seedlings raised, the number of seedling trays, and even the seedlings greenhouse reduces the resources introduced into the environment and also curtails the amount of energy required to maintain and manage a seedlings greenhouse.

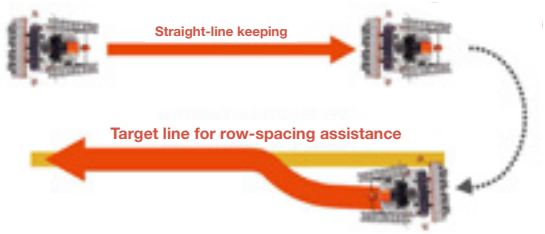
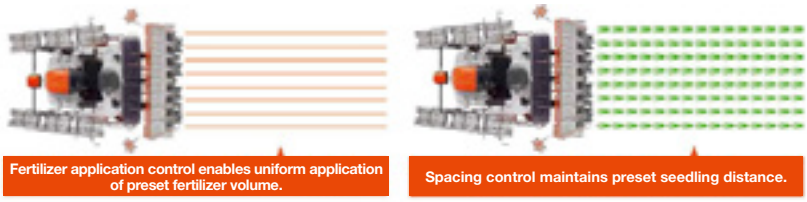
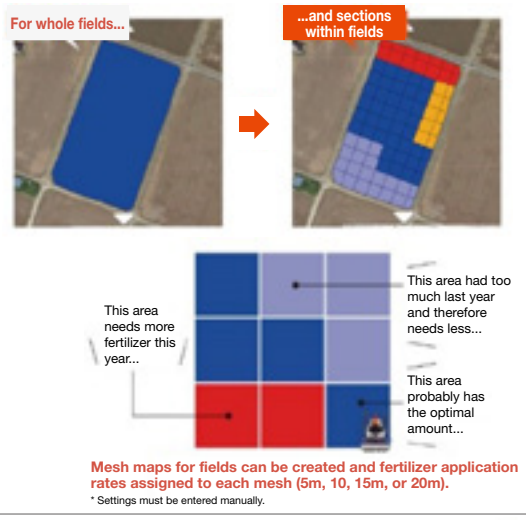
<Rice Cultivation Methods Proposed by the Kubota Group>

Method	Details
Sparse planting (since 2009)	This cultivation method employs a lower planting density by spreading out the clumps of seedlings. Reducing the density means fewer seedlings are required, thus reducing the number of seedling trays by around 40–50%. While this method results in somewhat fewer ears of rice, the volume per ear is higher, therefore the volume of unhulled rice per unit area is roughly the same as, or only slightly lower than, conventional planting. 
Direct sowing with iron-coated seeds (since 2010)	This method involves the dispersal of seeds coated with iron powder across the surface of the rice paddy. Unlike transplanting, the raising of seedlings is not required. If Kubota's direct seeder for iron-coated seeds is used, high-speed sowing at intervals, fertilizing, herbicide application, and grooving can be performed simultaneously to sharply reduce work time and conserve energy.  6-row direct seeder for iron-coated seeds (WELSTAR WORLD WP60D-TC)  * 2015 National Workshop on Agricultural Systemization (Yamagata)
Dense seedling transplantation (since 2017)	This cultivation technique involves the use of seedlings raised more densely than usual in a single tray. The seedlings are then planted in small amounts with a rice transplanter. The dense seedling transplantation method can halve the number of seedling trays compared to when using young seedlings grown the conventional way. Almost all Kubota rice transplanters are capable of transplanting dense seedlings.  * Results differ in each region. Please refer to region-specific information for more details. Source: 2017 National Workshop on Agricultural Systemization.
Combination of direct sowing with iron-coated seed and dense seedling transplanting	The Kubota Group proposes that the combination of direct seeding with iron-coated seeds and the high dense seedling transplantation can reduce seedling trays, spread out the harvesting season, and expand scale. Directly seeding iron-coated seeds, which significantly cuts down on labor, and transplanting a certain percentage of high dense seedlings, can reduce the number of seedling trays required. 

Eliminating Work Inefficiencies with Precision Farming and Helping Reduce Environmental Impacts

In Japan, more and more agricultural land is being managed by large-scale farming households, so it is vital that we develop high-performance, high-precision products to meet the needs of farmers to boost revenue and cut costs. In 2016, the Kubota Group outpaced its rivals in bringing to market a rice transplanter capable of maintaining straight planting rows. Ever since, we have continued to develop numerous functions to achieve high-precision rice transplanting. These features enable even the inexperienced to easily plant rice seedlings with great accuracy, while for seasoned farmers, they help improve work efficiency by alleviating fatigue.

<GPS-based ICT Functionality>

Function	Details	Environmental contributions
Straight-line keeping (GS) and row-spacing assistance	The straight-line keeping function uses GPS to self-steer when proceeding straight ahead so that even beginners can easily transplant seedlings in straight rows. When used in combination with the row-spacing assistance function, any deviations in distance between adjacent rows can be corrected.   Self-steering when checking the transplantation of seedlings	Planting seedlings in straight rows can help reduce the wasteful consumption of fuel and materials (seedlings, fertilizer, pesticide, etc.).
Spacing control and fertilizer application control	Owing to the fact that rice transplanters slog through the mud in rice paddies, the spacing between seedlings planted with the conventional wheel-linked mechanism can vary depending on the degree of slippage. Kubota's spacing control and fertilizer volume control functions use actual GPS-based speed data to accurately gauge distance travelled and correspondingly control the rotational speed of the planting claws and fertilizer rollers. This allows seedling transplantation and fertilizing to be carried out according to a preset distance between seedling clumps.  Fertilizer application control enables uniform application of preset fertilizer volume. Spacing control maintains preset seedling distance.	Farmers usually prepare 10% more seedlings and fertilizer than planned to compensate for errors caused by rice transplanter slippage. Kubota's spacing control and fertilizer application control functions can reduce these extras, thereby minimizing the materials and energy required to prepare seedlings and curtailing the amount of fertilizer resources actually used.
Adjustable fertilizing (NW8S-PF-GS)	KSAS* can be used to create fertilization maps of rice paddies that visualize where and how much fertilizer is needed. Rice transplanters equipped with adjustable fertilizing functionality can apply optimal amounts of fertilizer by syncing with this map data. * KSAS stands for Kubota Smart Agri System, our ICT-powered agricultural management support service.  Mesh maps for fields can be created and fertilizer application rates assigned to each mesh (5m, 10, 15m, or 20m). * Settings must be entered manually.	The optimization of fertilizer application rates minimizes unevenness in rice growth and delivers increased stability in terms of eating quality and yields. In turn, this reduces inputs per yield.

Furthermore, in 2020 we launched the self-driving Agri Robo Rice Transplanter NW8SA. Transplanting work is carried out by two people: one operator and one assistant to restock the seedling trays. However, the rice transplanter drives itself, thus reducing manpower and improving work efficiency. Stable cultivation is achieved because the machine plants the seedlings with minimum overlapping. It also curbs wasteful consumption of fuel and resources by automatically plotting the most economical route.

Agri Robo Rice Transplanter NW8SA

Feature: Developing Environmental Contribution Products

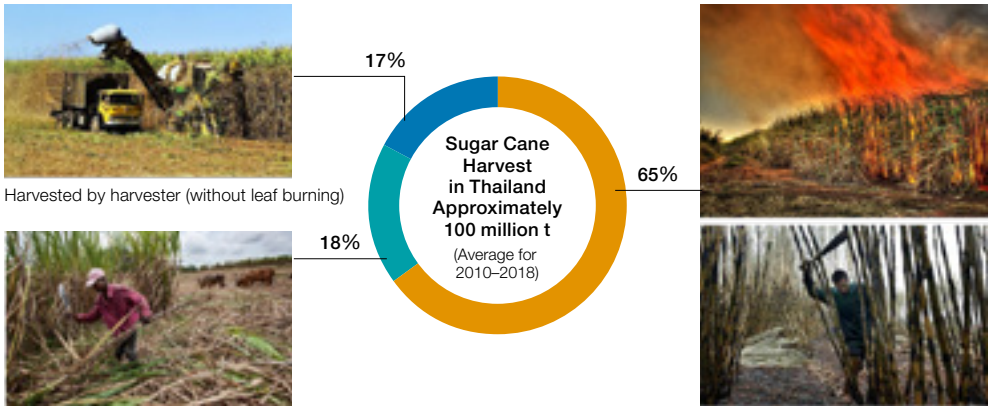
Contributing to Zero Burning through the Development of a Sugarcane Leaf Remover (Thailand)

KUBOTA Research and Development Asia Co., Ltd. (KRDA), an R&D site in Thailand, has developed the Sugarcane Leaf Remover (SLR110H), an implement that removes sugarcane leaves. The implement is contributing to the Thai government's zero burn policy and environmental conservation.

Sugarcane Leaf Burning and Air Pollution in Thailand

Thailand is the fourth largest sugar producer in the world and sugarcane production is widespread there. Because most sugarcane farmers are small-scale farmers who harvest by hand. As it reaches harvest time, the sugarcane produces a large quantity of covering leaves that obstruct the harvesting operation. Most farmers burn the leaves before harvesting to make the work more efficient. However, PM 2.5 air pollution is expanding in Thailand and agriculture-related burning, including leaf burning of sugarcane leaves, is thought to be one of the causes.

Ratio of sugarcane harvesting methods in Thailand*



Harvested by harvester (without leaf burning)

Harvested by hand (without leaf burning)

Harvested by hand after leaf burning

* Data by OCSB, Office of the Cane and Sugar Board

Development of the Sugarcane Leaf Remover

Leaf burning reduces the farmer's income by causing yield loss and quality degradation. KRDA has developed the SLR110H, an implement for removing sugarcane leaves, as a solution to eliminate leaf burning. SLR110H is an implement that can be used with small tractors that are already widely used by sugarcane farmers. It can efficiently remove leaves between sugarcanes inter-row by rotating a roller with a string-type trimmer attached. The trimmer removes leaves that it contacts. Its simple structure results in a highly cost efficient implement with a low price.

Since launching in the market in December 2018, unit sales have been steadily increasing and we are also focusing on exports to surrounding Asian countries.

SLR110H mounted on a small tractor

Before leaf removal Leaf removal using SLR110H After leaf removal

Click here to see the SLR110H in use
https://youtu.be/oDfvFmlpZIM

Contribution to Thailand's Zero Burn Policy

The Thai government has been advocating a zero burn policy since 2019 to resolve serious air pollution. At the "Thailand-Japan Environmental Solutions Week," held in Bangkok in January 2020, and jointly sponsored by Thailand's Ministry of Natural Resources and Environment and Japan's Ministry of the Environment, staff from SIAM KUBOTA Corporation Co., Ltd. of Thailand, which is in charge of sales of SLR110H, were invited to give a presentation about the company's initiatives, such as development of the SLR110H that is helping to reduce sugarcane burning in Thailand. The presentation drew a great deal of interest from the audience, which included officials, businesspeople, and researchers.

VOICE

Aiming to Eliminate Leaf Burning during the Sugarcane Harvest

Despite regulations prohibiting the burning of fields in Thailand, the ratio of farmers who conduct sugarcane leaf burning remains as high as ever, at 63% in 2009 and 66% in 2018. To ensure the success of the Thai government's zero burn policy, we developed the SLR110H to simultaneously satisfy the needs of farmers, harvest workers, and sugar mills.

In development, the specifications needed to be considered from various perspectives to cope with diverse sugarcane growing conditions. The size of the implement must be suitable for creating space for workers by removing leaves, while avoiding damage to the sugarcane. The trimmer material (string) must have sufficient weight and rotational speed to break the leaves without degrading the quality of the sugarcane.

Moreover, since the harvest season is just 3 to 4 months long, it is very important that the machine does not break down during this period. The SLR110H has a structure that makes it difficult for removed leaves to become entangled on the shaft, while the trimmer is designed to be easily replaceable without the use of tools. This enables users to keep working without losing time on faults or maintenance.

Since its launch in Thailand, SLR has been popular because it makes harvest operations more efficient while increasing quality and harvests compared with the leaf-burning method.

We will continue to develop products that solve customer needs and environmental issues to enrich the lifestyles of people living in ASEAN countries.

KUBOTA Research and Development Asia Co., Ltd.
Engineering Division
Krainara Muandet

Environmental Management

The Kubota Group has systematically established its environmental management systems in order to facilitate business operation throughout the entire value chain including business sites and operational divisions based on the Kubota Global Identity and the Environmental Charter. The Group also promotes environmental management that is appropriate for the type of business activities of the site/operational division. Production sites, in particular, are associated with large environmental loads related to energy and waste, as well as the risks of air pollution and water contamination. In order to properly address such risks, the Group has established environmental management systems based on ISO 14001 and EMAS, and is endeavoring to promote business management in accordance with the required rules and the continuous improvement of environmental conservation activities.

Compliance with Environmental Laws and Regulations

To ensure compliance with environmental laws and regulations and prevent environmental accidents, the Kubota Group conducts its business in accordance with the rules and regulations it has formulated in relation to environmental conservation.

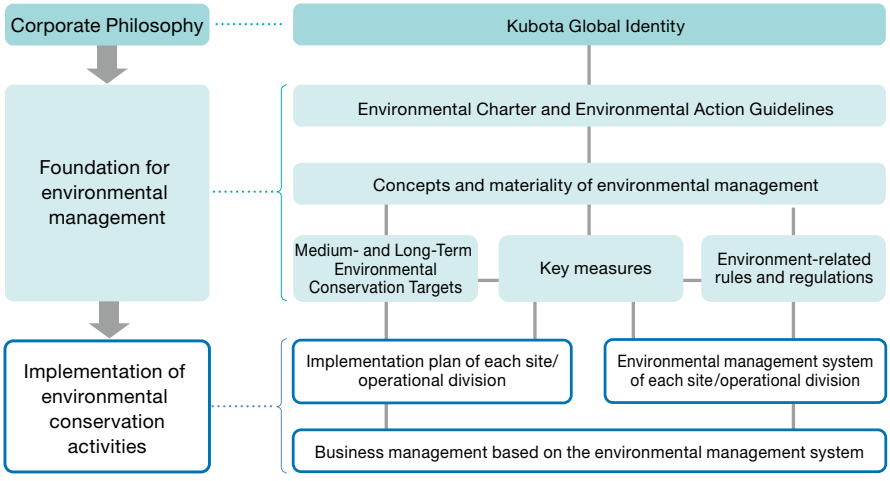
For exhaust gas, wastewater, noise, vibration and other variables, the Group has set and thoroughly manages its own control values at each production site, which are stricter than the corresponding laws and regulations, and has also established a system to promptly report any instances of non-compliance or complaints relating to environmental laws and regulations to relevant government bodies and the head office.

Each year, the Kubota Group also conducts environmental audits to confirm that the environmental conservation systems and activities are properly implemented at each site, as well as environmental risk assessments to clarify the status of environmental risks and establish improvements, with the aim of preventing the violation of environmental laws/regulations and environmental accidents.

Despite these efforts, however, in RY2019 in Japan we had three cases of inadequate disposal processing of fluorocarbons, one case of misunderstanding the type of service contracted in waste product treatment, one case of paint run-off due to rain, one case of diesel flowing into sewers, and one case overseas of wastewater exceeding regulation levels. We investigated any impact on the ambient environment and are working to prevent recurrence. Furthermore, we were not subject to any fines or punishments.

The Kubota Group's Environmental Management System

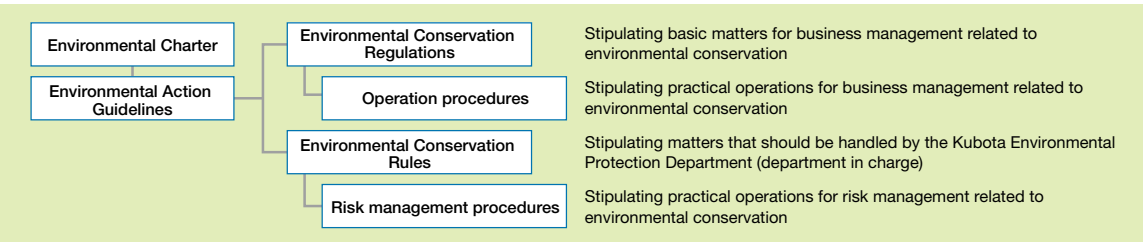
The diagram below shows the structure of the environmental management system of the Kubota Group.



Environment-related Rules and Regulations

The Kubota Group has formulated environment-related rules and regulations based on its internal control system, targeting Kubota Corporation, all of its consolidated subsidiaries and a part of its affiliated companies accounted for under the equity method that are highly significant in its environmental management.

The rules and regulations are classified as follows:



These rules and regulations are reviewed every year, according to the business environment and revisions of laws and regulations. The latest version of these rules and regulations are available on the Group portal site, allowing employees around the world to refer to them.

Environmental Auditing

Each year, the Environmental Protection Department conducts an environmental audit that incorporates a document audit targeting all production sites, service sites, offices, and construction and maintenance management departments in Japan, as well as overseas group production sites.

Moreover, in addition to the environmental audit by the Environmental Protection Department, annual internal environmental audits are conducted at production sites. Through these means, and by taking the initiative to self-check the status of environmental management, every effort is being made to further improve management levels.

RY2019 Environmental Audit Implementation Status

- Number of sites: 267 (254 bases and 13 agricultural machinery sales companies)
- Number of audit items: 21 (for maintenance and management departments) up to 50 (for service sites)
  * Details are as shown in the table below.
- Audit details: Water and air quality management, noise and vibration management, waste discharge and chemical substance management, climate change prevention, response to abnormalities and emergencies, and environmental management system

Environmental audit
Kubota Baumaschinen GmbH (Germany)

Environmental Audit Implementation Status

		Production sites	Offices	Service sites		Construction departments	Maintenance management departments*2	Total number of sites audited
				Agricultural machinery distributors	Other			
Group companies in Japan	Number of sites audited	24	70	13 companies*1	89	45	8	249
	Number of audit items	44	40	50	50	36	21	
Overseas group companies	Number of sites audited	18	–	–	–	–	–	18
	Number of audit items	30						

*1 For agricultural machinery distributors, the audit was conducted on a company basis instead of on a site basis.
*2 Departments engaged in the business of operation or maintenance of environmental plants

Environmental Risk Assessment

Environmental risks for facilities are evaluated from the function and management methods, etc., of environment-related equipment, and for facilities that are deemed to require countermeasures, risk reduction activities are promoted to strengthen equipment and management countermeasures until environmental risks are at an acceptable level.

The Kubota Group is proactively working to further reduce environmental risks by conducting environmental audits and environmental risk assessments—two activities with differing perspectives—in parallel.

Environmental risk assessment
Kubota Sakai Plant

Environmental Patrols

At each site, environmental patrols are carried out to meticulously assess the entire site and confirm the absence or presence of conditions that may lead to environmental accidents or violations of environmental laws and regulations. The Kubota Group aims to reduce environmental risks by conducting environmental patrols and finding situations that may cause any abnormalities at an early stage.

Environmental patrol
Kubota Okajima Business Center

Drills for Responding to Abnormal and Emergency Situations

The Kubota Group is working to identify and minimize environmental risks associated with its business activities through risk-specific response procedures.

We are also conducting drills each year based on response procedures that assume the outbreak of environmental accidents or situations that could arise in environmental accidents, in order to mitigate the impact on the ambient environment.

Emergency response drill simulating the leakage of oil
Kubota Utsunomiya Plant

On-site Investigations of Waste Treatment Contractors and Purchasers of Valuable Resources

In order to promote the proper treatment of waste and other materials including valuable resources at its operating sites in Japan, the Kubota Group is increasingly employing the services of top-rated certified operators. At the same time, the Group is conducting on-site investigations of industrial and other recyclable waste treatment contractors as well as purchasers of valuable resources.

As far as industrial waste where there are large numbers of treatment contractors, the Kubota Group has introduced its own on-site investigation appointing system that is run by its production sites, offices, sales companies, and other companies. In those cases where multiple sites including production sites use the same contractor for the treatment of waste, the officer responsible for the treatment of waste at the production site takes responsibility for the investigation. In this manner, successful steps are being taken to increase the effectiveness of investigations.

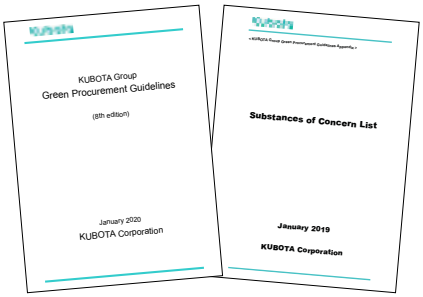
Green Procurement

Green Procurement Guidelines

For the purpose of providing products that are friendly to global and local environments, the Kubota Group is seeking to procure products with reduced environmental impact from ecofriendly suppliers.

In order to proactively promote these activities, the Kubota Group presents its policies on green procurement to suppliers through the Group's Green Procurement Guidelines, asking for their understanding and cooperation.

In addition, we conclude basic trading agreements with Japanese suppliers who deal with Kubota, and through these agreements we ask the suppliers to observe environmental laws and regulations, and take steps to reduce their environmental impact.



The Kubota Group's Green Procurement Guidelines and Appendix [Substances of Concern List]
(Published in Japanese, English and Chinese)

For details on the Kubota Group's Green Procurement Guidelines, click here
www.kubota.com/company/environment/procure/

Award System for Green Procurement

The Green Supplier Award System was launched in 2015 to award suppliers recognized as having made notable contributions in the area of environmental conservation, such as the supplies (materials, components, equipment, etc.) procured by the Kubota Group. The awards are presented every year.

In accordance with the Kubota Group's Green Procurement Guidelines, this award system quantitatively evaluates goods supplied to the Kubota Group and environmental conservation activities engaged in by suppliers from the perspective of resources and energy-saving and awards notably excellent examples.

In 2019, of the 129 environmental conservation activities that were submitted from our suppliers in Japan, 11 activities with particularly high achievements were awarded, one of which received the Excellent Prize.

We started expanding this system globally in 2018, and presented awards at overseas sites as well. We will continue to utilize the system and carry out activities in the name of green procurement and promote environmental conservation initiatives hand-in-hand with our suppliers.

Awarding ceremony (January 2020)

Supplier Management

The Kubota Group promotes measures to protect the environment, working closely with suppliers who support our environmental management.

As a specific example of activities, Kubota Agricultural Machinery (Suzhou) Co., Ltd. (China) conducts "environmental patrols" of existing suppliers to verify compliance with environmental laws and requests suppliers to take recommended steps for addressing any points for improvement found with the goal of minimizing the risk of supply stoppages for procured components. For new suppliers, patrols are carried out prior to their approval, with only those verified as legally compliant selected as new suppliers.

Environmental Education and Enlightenment

Results of Environmental Education in 2019

The Kubota Group offers environmental education programs to raise awareness among its employees. The education program for employees consists of rank-based training, professional training, and general training. The Group also assists external group's environmental education programs.

Classification	Course title	Frequency	No. of participants	Course descriptions
Education by employee-level	Training for new employees	1	173	Global and local environmental issues and Kubota's environmental conservation activities
	Training for newly appointed supervisors	2	42	Kubota's environmental management and efforts as supervisors
	Training for newly appointed foremen	1	12	Kubota's environmental management and efforts as foremen
	The Safety, Environment and Quality Forum for executive management	1	300	A lecture on "Risk Management that the Management Team Should Keep in Check" by Hideki Yoshinari, representative director of Yoshinari Consulting.
Professional education	Basics of environmental management	1	25	Basic knowledge of legal systems, environmental risk, and environmental conservation
	Waste management	2	58	Waste Management and Public Cleansing Law, practical training in consignment contracts and manifests, etc.
	Environment-related facility management	1	10	Pollution control technologies and pollution control laws
	Education to train ISO 14001 environmental auditors	1	49	The ISO 14001 standard, environment-related laws, audit techniques
Site training	Waste management	2	57	Waste management (storage and processing of construction waste)
	Total	12	726	

Waste management training on-site (Kubota Hanshin Plant Mukogawa Site)

Environment Month Report

Raising the Environmental Awareness of Employees and Family Members through the Kubota Eco Challenge

The Kubota Group designates June of each year as "Environment Month" and promotes various programs to raise awareness among its employees. In 2019, we promoted activities with the theme of "Let's work together to reduce plastic waste!"

As one of the Environment Month activities, each year the Group hosts the "Kubota Eco Challenge," an environmental photo contest that encourages Group employees and their families worldwide to submit photos of their eco-friendly activities at work or at home. In 2019, we received a total of 3,195 photographs from sites throughout the world—our highest number yet. The photos showed a wide range of activities at work and at home, such as using eco bags, reusable bottles, neighborhood clean-up activities, and tree-planting.

As we go forward, we will continue to raise awareness of the environment among employees and their families through Environment Month.

Environment Month poster (2019)


Using eco bags (Thailand)


Neighborhood clean-up activities (China)


Tree-planting on private land (India)

Environmental Achievement Awards

During the Environment Month in June every year, the Kubota Group presents the Environmental Achievement Awards to commend individuals and groups that have made notable contributions to environmental conservation, as well as to boost the Group's employees' environmental conservation awareness and activate their environmental activities.

In 2019, environmental conservation activities were evaluated targeting the four segments of production sites, non-production sites, product development, and education and awareness raising. As a result, 46 cases were awarded for their achievements in energy saving, waste reduction, VOC reduction, reducing environmental risks, development of environment-friendly products, and so on. Five cases were awarded as the Excellent Prize.

We will continue to award excellent initiatives that contribute to regional or global environmental conservation, and encourage sharing of the details of such initiatives within the Group, with the aim of further activating environmental conservation activities.

Environmental Achievement Award Excellent Prize in 2019

Boundary	Company, department	Theme
Production sites	Kubota Utsunomiya Plant	Waste reduction by introducing equipment for regenerating transmission oil for rice transplanters
	Kubota Manufacturing of America Corporation (US)	Reduce Water Resource by Reclaiming E-coat Post Rinse Carry-over
Product development	PW Technology Group, Electronic Equipped Machinery Marketing and Sales Department, Farm Machinery Products and Post-Harvest Division	Commercial humidified air cleaner Pure Washer PW24W-EW1, PW24W-EWL1, PW24G-EW1, PW24G-EWL1, PW24W-EW2, PW24W-EWL2
	Tractor Division Compact Tractor Engineering Dept.	AGRIROBO tractor SL60A
	Farm Machinery Products and Post-Harvest Division Kubota Air Conditioner, Ltd. Research & Development Dept.	Air handling unit Humidity control outdoor-air processing unit DHM-50C

Environmental Achievement Awards in 2019

Boundary	Classification, No. of winners
Production sites	Excellent Prize: 2, Encouragement Award: 10, Good Effort Award: 22
Non-production sites	Encouragement Award: 3

Boundary	Classification, No. of winners
Product development	Excellent Prize: 3, Encouragement Award: 5
Education and awareness raising	Encouragement Award: 1

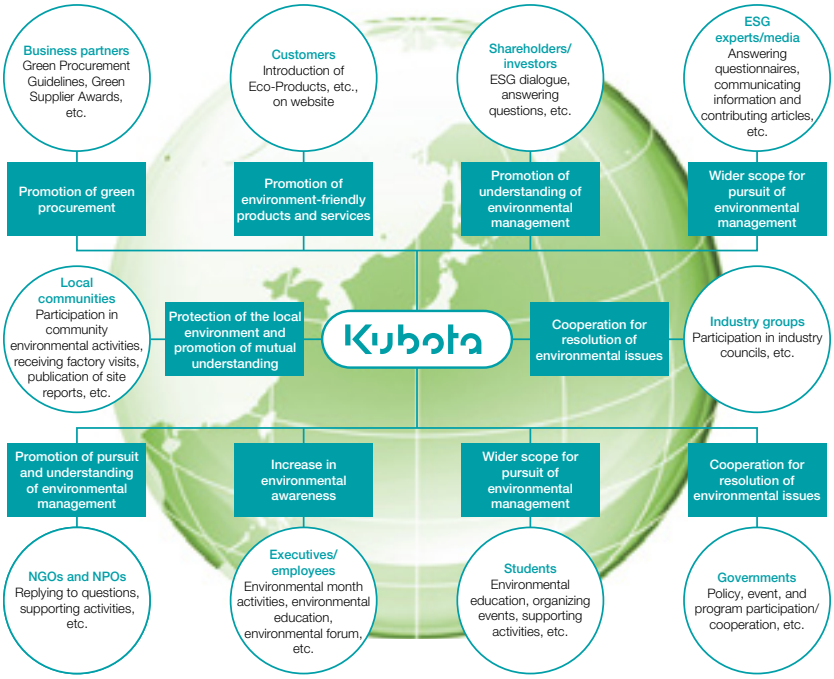
Environmental Communication

Since it published its first Environmental Report in RY1999, the Kubota Group has continued to disclose its environmental information. Along with the globalization of its businesses, the Group has enhanced the contents of the environmental information it discloses, to allow the Group's global initiatives to be understood. To expand and improve disclosures further, the Group will continue its dialogues with stakeholders and further disclosing information in line with international standards such as the environmental reporting guidelines by the Japanese Ministry of the Environment, the GRI standards and the recommendations of TCFD.

Each business site also works to enhance understanding of the environmental conservation activities by the local residents and family members of employees by participating in local environmental conservation activities and other environmental communication activities, such as environmental education and protection of the natural environment, for the purpose of achieving symbiosis with local communities.

Environmental Communication Activities

To practice environmental management globally, the Kubota Group is committed to deepening mutual understanding via dialogue with various stakeholders. The opinions and feedback gained from dialogue are used to improve Group environmental management practices with the aim of meeting social expectations and addressing societal issues.



Cooperation with Environment-related Industry Groups and Governments

The Kubota Group believes that in promoting environmental conservation, it is important to promote environmental conservation initiatives not only within its Group but also in cooperation with various sectors, such as the national or local government and relevant industry groups. Through participating in programs and campaigns hosted by government organs and establishing partnerships with various organizations, the Group aims to create synergy and conduct more effective environmental conservation activities.

Participating in Systems, Verification Programs, Campaigns by the National Government

In May 2010, the Kubota Group was certified by the Japanese Minister of the Environment as an "Eco-First Company," and has been a member of the Eco-First Promotion Council since then. Through the Council, the Group submits proposals to or exchanges opinions with the Ministry of the Environment, supports Eco-First companies promoting environmental conservation activities and enhancing cooperation between companies, and engages in activities to raise the environmental awareness of the public. The Group also participates in the "Fun to Share" campaign by the Ministry of the Environment to tackle climate change toward the realization of a low-carbon society, the "Cool Choice" national movement to encourage smart choices contributing to measures against global warming, and the Water Project to raise awareness concerning water circulation and conservation of the water environment. Moreover, the Group also participates in the Environmental Reporting Platform Development Pilot Project to promote ESG dialogues between investors and companies.

Participating in Industry Groups

The Kubota Group is a member of various environment-related committees in the Kansai Economic Federation and other industry groups it is participating in. The committee activities help deepen understanding of the roles that companies should play in addressing environmental issues such as climate change, while providing opportunities to share information and exchange opinions on energy and environmental policies. In addition, the Group actively participates in initiatives to promote global environmental conservation.

- Major participating groups

  Industry groups: Japan Business Federation, Kansai Economic Federation, Japan Society of Industrial Machinery Manufacturers, etc.
  Environmental initiatives: Japan Climate Initiative, Task Force on Climate-Related Financial Disclosures (TFCD)

Dialogue and Collaboration with Local Governments

The Kubota Group proactively participates in various committees of Osaka City and other local governments and their related groups, and works to establish partnerships with them. The Group promotes industry-government-academia collaboration through participating in discussions and opinion exchange on environmental issues, and various activities.

- Major collaborating groups/partners

  Gifu Prefecture "Consortium for Forest Technology Development and Promotion," Osaka City "Environmental Management Promotion Council," sponsored flowerbeds in front of the Kyuhoji Green Space in Osaka Prefecture, the "Carrying Water Project" by Ono City, Fukui Prefecture, and so on.

Climate Change-related Disclosure

The Kubota Group considers tackling climate change to be one of the material issues for environmental management. We are making efforts to respond to climate change through environment-friendly products, technologies, services, and corporate activities. To further enhance stakeholder communication, we expressed support for the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD)* in January 2020.

Looking ahead, we will enhance our disclosure through the KUBOTA REPORT, our website, and other means.

* The TCFD recommendations present a framework for corporations to disclose climate-related information to the financial markets. The recommendations call for companies to autonomously ascertain and disclose information related to Governance, Strategy, Risk Management, and Metrics and Targets, such as the financial impact of risks and opportunities engendered by climate change and the status of the company's response.

Disclosure Items in the TCFD Recommendations	Relevant Section	Page
Governance		
a. Describe the board's oversight of climate-related risks and opportunities.	Environmental Management Promotion System, Corporate Governance Structure	P33 P152
b. Describe management's role in assessing and managing risks and opportunities.	Environmental Management Promotion System	P33
Strategy		
a. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	Environmental Management Approach—Materiality, Environmental Management Approach—Risks and Opportunities	P30 P31
b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	Environmental Management Approach—Risks and Opportunities, Environmental Management Approach—Key Measures	P31 P32
c. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	(Disclosure to be considered going forward)	–
Risk Management		
a. Describe the organization's processes for identifying and assessing climate-related risks.	Environmental Management Approach—Materiality	P30
b. Describe the organization's processes for managing climate-related risks.	Environmental Management Approach—Materiality, Environmental Management Promotion System, Internal Control—Internal Control System, Internal Control—Internal Control System Operation Activities (Risk Management Activities)	P30 P33 P158 P158
c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	Environmental Management Promotion System, Corporate Governance Structure, Internal Control—Internal Control System	P33 P152 P158
Metrics and Targets		
a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	Long-Term Environmental Conservation Targets 2030, Medium-Term Environmental Conservation Targets 2020, Mitigation of Climate Change—Measures to Reduce CO_2 Emissions, Environmental Education and Enlightenment—Environmental Achievement Awards	P35 P36 P39 P75
b. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	Mitigation of Climate Change—CO_2 Emissions throughout the Value Chain	P41
c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Long-Term Environmental Conservation Targets 2030, Medium-Term Environmental Conservation Targets 2020	P35 P36

Environment-related External Evaluation

Kubota Given “A” Grade in CDP Water Security 2019 Survey and “A-” Grade in CDP Climate Change 2019 Survey

Kubota was selected for inclusion in the A list of companies—the highest position—in the CDP Water Security 2019 survey on water security conducted by the CDP*. It was the second time that we have been selected for the water security A list since CDP 2017. We were also awarded an “A-” rating—the second highest on an 8-point scale—in the CDP Climate Change 2019 survey, a survey on climate change conducted by the CDP.

The Kubota Group will further contribute to society through its global business activities, seeing the response to climate change and conservation of water resources as one of its materiality issues.

* Established in the UK in 2000, the CDP is a non-profit organization that works with institutional investors to encourage companies and cities to disclose their strategies and data related to climate change, water, and forests by providing institutional investors with research-based analytical results and environmental performance ratings.

Receiving Environmental Awards

KUBOTA REPORT 2019 <Full Version> Given Excellence Award in Environmental Reporting Category at 23rd Environmental Communication Awards

KUBOTA REPORT 2019 <Full Version> received the Excellence Award in the Environmental Reporting category at the 23rd Environmental Communication Awards co-sponsored by the Japanese Ministry of the Environment and the Global Environmental Forum.

By honoring excellence in environmental reporting for multiple stakeholders across multiple media, such as CSR reports, integrated reports, and environmental management reports, the Environmental Communication Awards aim to promote good environmental communications by people related to business operators and stimulate environment-related actions.

The Excellence Award that the Company received is presented for outstanding reports that exceed a certain standard and serve as models for other companies in the same industry or other businesses of similar scale. The Company received the award for the second consecutive year.

Logo for Excellence Award received at Environmental Communication Awards

Kubota Environmental Engineering (Shanghai) Co., Ltd. Received the Green Award

Kubota Environmental Engineering (Shanghai) Co., Ltd. (KEES) (China) received the “Green Award” at the 12th China Environmental Industry Conference, held in Beijing in May 2019.

The Green Award is presented to companies that are outstanding leaders in the environmental field. This is the fourth year that KEES has received the award. This time the company received the award as a model company in MBR (membrane separation activation sludge method) and purification tank facilities. KEES has been lauded for the excellence of its products and services, and has previously received the prize as a “model manufacturer of membranes for use in wastewater treatment,” a “leading firm in China in the wastewater treatment facility sector,” and a “model company for water treatment facilities and comprehensive services.”

Green Award plaque

SIAM KUBOTA Corporation Co., Ltd. (Headquarters) and KUBOTA Engine (Thailand) Co., Ltd. Receive Green Industry Award

SIAM KUBOTA Corporation Co., Ltd. (Headquarters) and KUBOTA Engine (Thailand) Co., Ltd. received the Green Industry Award from the Thai government in 2019 as clean plants that are environmentally considerate. Both sites scored Level 4 on the five-point evaluation scale (Level 5 being the highest), for having strongly rooted environmental conservation activities in their corporate culture.

The award has a three-year certification period, and SIAM KUBOTA Corporation Co., Ltd. (Amata Nakorn Plant) has previously received a Level 4 award, while SIAM KUBOTA Metal Technology Co., Ltd. and KUBOTA Precision Machinery (Thailand) Co., Ltd. have received Level 3 awards. They are still currently recognized as Green Industries.

Green Industry Award certificate

P.T. Kubota Indonesia Received the BLUE PROPER Award for the Ninth Time

P.T. Kubota Indonesia (PTKI) received the BLUE PROPER award for the ninth time from the environment minister of the Indonesian government for its corporate activities over a year from 2018 to 2019. PROPER (the Environmental Performance Rating Program) is a rating program of the Indonesian ministry of the environment, which assesses the companies' status of compliance with the environmental regulations and the status of implementation of environmental measures, and discloses them to the public. The aim of this program is to raise companies' awareness of environmental management, and encourage the implementation of activities for energy saving, conservation of biodiversity, and community development.

The BLUE PROPER award is given to companies that comply with 100% of the environmental regulations and properly operate the environmental management system. PTKI will make continuous efforts to enhance environmental management.

Certificate of Commendation for the BLUE PROPER Award

Environmental Communication Report

Practice Report

Environmental Education at a Local Elementary School

KUBOTA Engine (Thailand) Co., Ltd. (KET) (Thailand) visits a local elementary school each year to provide education on CSR. As part of this, KET organizes tree-planting activities and distributes personal drink bottles to help raise awareness of the environment among its various environmental education initiatives. In 2019, KET also conducted vegetable planting in addition to its tree-planting program.

KET will continue to run education activities at the elementary school, aiming to communicate with the local community while contributing to local environmental conservation activities.


A group photograph with the elementary school students

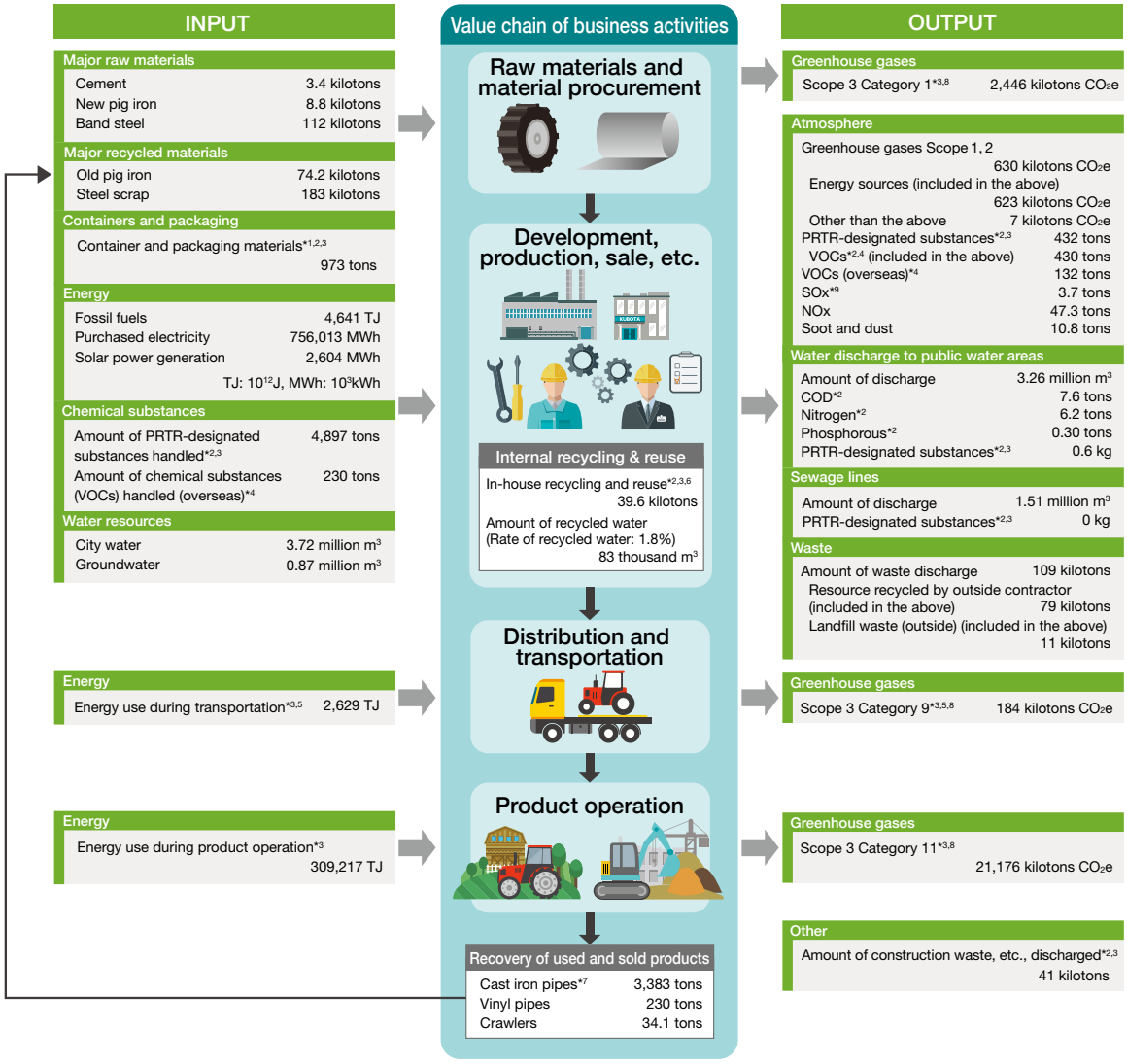

Tree-planting activities

Environmental Data

Overview of the Environmental Load on the Value Chain

This is an overall summary of the Kubota Group's environmental loads associated with its diverse business activities in Japan and overseas in RY2019. The results of the measurement of the overall environmental loads on the entire value chain, from the procurement of raw materials, to manufacturing, distribution, sales, consumption, and the recycling of waste are used for the reduction of greenhouse gas emissions and the effective utilization of resources.

Overview of the Environmental Loads on the Value Chain (Results in RY2019)



*1 Packaging materials subject to the Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging
*2 Data for Japan
*3 Not subject to the third-party assurance
*4 VOCs (volatile organic compounds) comprise the six substances that are most prevalent in emissions from the Kubota Group: xylene, toluene, ethylbenzene, styrene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.
*5 Data for Japan and data associated with the overseas shipping of certain products from Japan
*6 To reduce overall emissions to the outside of the Group, including valuable resources, metal scraps generated at machinery production and related sites are collected for recycling at cast iron production sites within the Group. From RY2019, as a way of evaluating the progress of these activities, calculation standards have been changed so that transfer of valuable resources between business sites within the Group is no longer included in the valuable resources figure, but is counted instead as in-house recycling and reuse. The in-house recycling and reuse figure for RY2019 calculated using the previous standard would be 34.0 thousand tons.
*7 Up to RY2018, the figure for cast iron pipes in some cases included a portion generated and reused within business sites. This portion is excluded from RY2019. Calculated using the previous method, the figure for cast iron pipes would be 8,993 tons.
*8 For Greenhouse gases Scope 3, only part of the categories are presented. For more details, see the CO_2 Emissions throughout the Value Chain (p.41).
*9 If sulfur contained in the slag managed onsite at end of year (December 31, 2019) by some sites in Japan is included, SOx emissions for RY2019 amounted to 5.2 tons.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Trends in Major Environmental Indicators

Energy

Environmental indicators				Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Energy	Within business sites	Energy consumption*1		TJ	11,450	11,295	11,602	12,234	12,075
			Fossil fuels	TJ	4,575	4,434	4,399	4,687	4,641
			Natural gas included in the above*2	TJ	1,980	2,056	2,267	2,501	2,561
			Purchased electricity	MWh	700,015	698,370	732,508	767,255	756,013
		Power generation for own use	Cogeneration*2	MWh	1,715	1,977	416	1,805	2,274
			Solar power generation*3	MWh	1,217	1,732	1,855	2,412	2,604
	Energy use during transportation*2,4			TJ	634	606	643	2,741	2,629

CO_2 Emissions

Environmental indicators			Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Greenhouse gases	Scope 1, 2		kilotons CO_2e	674	647	645	647	630
		Overseas included in the above*5	kilotons CO_2e	168	172	197	204	203
		Energy sources	kilotons CO_2e	666	639	638	640	623
		Other than the above*5	kilotons CO_2e	8	8	8	7	7
	Scope 3 Category 9 (Transportation of sold products)*2,6,7		kilotons CO_2e	44	42	44	180	184

Resources and Materials

Environmental indicators		Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Major raw materials	Cement	kilotons	8.7	6.8	4.4	4.9	3.4
	New pig iron	kilotons	7.5	6.7	7.2	9.7	8.8
	Band steel	kilotons	99.6	106	132	121	112
Major recycled materials	Old pig iron	kilotons	62.9	58.6	64.0	71.8	74.2
	Steel scrap	kilotons	271	224	182	193	183
Containers and packaging	Container and packaging materials (Japan)*2,8	tons	—	—	988	922	973

Waste

Environmental indicators				Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Waste, others	Amount of waste discharge			kilotons	116	106	108	113	109
			Overseas included in the above	kilotons	40	39	43	52	40
		Hazardous/non-hazardous waste	Hazardous waste	kilotons	—	—	6.0	5.3	5.5
			Non-hazardous waste*9	kilotons	—	—	102	108	103
		By treatment category	Resource recycled by outside contractor	kilotons	93	85	88	92	79
			Landfill waste (outside)	kilotons	12	11	9	10	11
	Amount of construction waste, etc., discharged (Japan)*2			kilotons	44	54	46	41	41

*1 Conventionally, energy use during transportation (Japan) was included in total energy consumption. But starting from RY2017, it is not retrospectively included.
*2 Not subject to the third-party assurance
*3 Values for RY2015 to RY2018 were corrected to improve accuracy.
*4 In addition to the data for Japan, energy use associated with the overseas shipping of certain products from Japan has been included from RY2018.
*5 Values for RY2016 and RY2017 were corrected to improve accuracy.
*6 For Greenhouse gases Scope 3, only part of the categories are presented. For more details, see the CO_2 Emissions throughout the Value Chain (p.41).
*7 In addition to the data for Japan, CO_2 emissions associated with the overseas shipping of certain products from Japan have been included from RY2018.
*8 Packaging materials subject to the Act on the Promotion of Sorted Collection and Recycling of Containers and Packaging.
*9 Non-hazardous waste = Amount of waste discharge - Amount of hazardous waste

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Water resources

Environmental indicators			Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Water resources	Water consumption		million m^3	5.05	4.86	4.51	4.88	4.59
		Overseas included in the above	million m^3	1.23	1.20	1.07	1.10	1.11
	City water*1		million m^3	4.08	3.99	3.60	3.89	3.72
	Groundwater		million m^3	0.97	0.87	0.91	0.99	0.87

Water system discharge

Environmental indicators		Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Water discharge to public water areas	Wastewater discharge	million m^3	3.82	3.71	3.26	3.62	3.26
	COD (Japan)*2	tons	9.9	10.1	7.7	8.6	7.6
	Nitrogen discharge (Japan)*2	tons	9.6	9.2	9.1	6.9	6.2
	Phosphorous discharge (Japan)*2	tons	0.35	0.36	0.27	0.38	0.30
	Amount of PRTR-designated substances released (Japan)*3	kg	0	0	0.8	0.9	0.6
Sewage lines	Wastewater discharge	million m^3	1.58	1.54	1.42	1.50	1.51
	Amount of PRTR-designated substances transferred (Japan)*3	kg	23	22	17	0	0

Chemical Substances

Environmental indicators		Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Chemical substances	Amount of PRTR-designated substances handled (Japan)*3	tons	5,143	4,875	4,457	5,309	4,897
	Amount of chemical substances (VOCs) handled (overseas)*4	tons	359	350	324	327	230

Atmospheric Discharge

Environmental indicators			Unit	RY2015	RY2016	RY2017	RY2018	RY2019
Atmosphere	Amount of PRTR-designated substances released (Japan)*3		tons	543	463	423	428	432
	VOC emissions*4		tons	798	703	641	597	562
		Overseas included in the above*4	tons	260	243	221	172	132
	SOx emissions		tons	24.7	31.5	17.5	9.4*6	3.7*6
	NOx emissions*5		tons	76.2	94.2	68.8	49.5	47.3
	Soot and dust emissions		tons	15.1	26.5	21.9	9.8	10.8

*1 City water includes service water and water for industrial use.
*2 Data for total discharge from business sites subject to total emission control.
*3 Not subject to the third-party assurance
*4 VOCs (volatile organic compounds) comprise the six substances that are most prevalent in emissions from the Kubota Group: xylene, toluene, ethylbenzene, styrene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.
*5 Values for RY2018 were corrected to improve accuracy.
*6 If sulfur contained in the slag managed onsite by some sites in Japan is included, SOx emissions to 7.3 tons for RY2018 and 5.2 tons for RY2019.

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Calculation Results of PRTR-designated Substances

RY2019 Results of PRTR Reporting (Japan)

Number specified in PRTR	Chemical substance	Releases				Transfers	
		Atmosphere	Public water areas	Soil	On-site landfills	Sewerage	Transfers to off-site
1	Zinc compounds (water-soluble)	0.0	0.0	0.0	0.0	0.0	876
53	Ethylbenzene	111,867	0.0	0.0	0.0	0.0	24,183
71	Ferric chloride	0.0	0.0	0.0	0.0	0.0	0.0
80	Xylene	198,661	0.0	0.0	0.0	0.0	34,355
87	Chromium and chromium (III) compounds	0.0	0.0	0.0	0.0	0.0	3,428
132	Cobalt and its compounds	0.0	0.0	0.0	0.0	0.0	2.1
239	Organic tin compounds	0.0	0.0	0.0	0.0	0.0	410
240	Styrene	21,155	0.0	0.0	0.0	0.0	0.0
277	Triethylamine	0.0	0.0	0.0	0.0	0.0	0.0
296	1,2,4-trimethylbenzene	16,750	0.0	0.0	0.0	0.0	4,803
297	1,3,5-trimethylbenzene	2,574	0.0	0.0	0.0	0.0	715
300	Toluene	78,600	0.0	0.0	0.0	0.0	15,029
302	Naphthalene	2,533	0.0	0.0	0.0	0.0	0.0
305	Lead compounds	41	0.60	0.0	0.0	0.20	6,834
308	Nickel	0.15	0.0	0.0	0.0	0.0	435
349	Phenol	0.0	0.0	0.0	0.0	0.0	0.0
352	Diallyl phthalate	92	0.0	0.0	0.0	0.0	0.0
354	Di-n-butyl phthalate	0.33	0.0	0.0	0.0	0.0	126
392	N-hexane	24	0.0	0.0	0.0	0.0	0.0
400	Benzene	3.4	0.0	0.0	0.0	0.0	0.0
405	Boron compounds	0.0	0.0	0.0	0.0	0.0	1,221
412	Manganese and its compounds	0.02	0.0	0.0	0.0	0.0	41,637
448	Methylenebis (4,1-phenylene) diisocyanate	0.0	0.0	0.0	0.0	0.0	0.0
453	Molybdenum and its compounds	0.0	0.0	0.0	0.0	0.0	0.0
Total		432,301	0.60	0.0	0.0	0.20	134,053

Scope: Total of substances with annual handling volume of one ton or more (0.5 ton or more for Specific Class 1 Designations) at each business site
Unit: kg/year (for dioxin: mg-TEQ/year)

Six VOCs substances targeted for reduction in Medium-Term Environmental Conservation Targets 2020

For the calculation method of each item of environmental data, see the Calculation Standards of Environmental Performance Indicators (p.86).

Environmental Accounting

The Kubota Group performs environmental accounting and publicizes data about the cost of investments in environmental conservation and the economic and environmental benefits of these investments.

Environmental Conservation Costs

(Yen in millions)

Classifications		Major activities	RY2018		RY2019	
			Investment	Expenses	Investment	Expenses
Within the business area cost			1,319	2,508	867	2,821
	Local environmental conservation cost	Prevention of air and water pollution, soil contamination, noise, vibration, etc.	200	425	180	436
	Global environmental conservation cost	Prevention of climate change, etc.	1,107	938	656	1,009
	Resource recycling cost	Minimizing waste production, reducing quantity of waste, and recycling	12	1,145	31	1,376
Upstream and downstream costs		Collection of used products and commercialization of recycled products	0	31	0	37
Management activities cost		Environmental management personnel, ISO maintenance and implementation, environmental information dissemination	2	1,599	18	1,613
R&D cost		R&D for reducing of product environmental load and developing environment conservation equipment	1,254	7,810	576	7,497
Social activities cost		Local cleanup activities, and membership fees and contributions to environmental groups, etc.	0	1.0	0	1
Environmental remediation cost		Contributions and impositions, etc.	0	212	0	224
Total			2,575	12,161	1,461	12,193

Total capital investment (including land) for the corresponding period (consolidated data)	86,700
Total R&D costs for the corresponding period	53,100

Environmental Conservation Effects

Effects	Items	RY2018	RY2019
Environmental effects related to resources input into business activities	Energy consumption (TJ)	7,670	7,615
	Water consumption (million m^3)	3.78	3.48
Environmental effect related to waste or environmental impact originating from business activities	CO_2 emissions (energy related CO_2) (kilotons CO_2e)	443	427
	SOx emissions (tons)	9.3	3.1
	NOx emissions (tons)*1	45.2	42.9
	Soot and dust emissions (tons)	2.8	2.7
	Releases and transfers of PRTR-designated substances (tons)	598	566
	Waste discharge (kilotons)	61.8	69.2
	Waste to external landfills (kilotons)	1.6	1.9

*1 The value for RY2018 was corrected to improve accuracy.

Economic effects

(Yen in millions)

Classifications	Details	Annual effects of the year ended December 31, 2019
Energy conservation measures	Improve the operations of production facilities and switch to more efficient lighting and air-conditioning systems	893
Zero-emissions measures	Reduce the amount of industrial waste; promote resource recycling	471
	Sales of valuable resources	1,024
Total		2,639

<Environmental accounting principles>

1) The period is from January 1, 2019 to December 31, 2019.
2) The data of business sites in Japan is considered in the calculation.
3) Data was calculated referring to the Environmental Accounting Guidelines 2005, published by Japan's Ministry of the Environment.
4) "Expenses" includes depreciation costs.
   Depreciation cost was calculated based on the standards applied to Kubota's financial accounting, and assets acquired in and after 1998 were considered in the calculation.
   "Management activities" and "R&D costs" include personnel expenses.
   "Resource recycling costs" does not include costs incurred during disposal of construction waste at construction sites.
   "R&D costs" represents that which was spent on environmental purposes, calculated on a pro-rata basis.
5) "Economic effects" is obtained only by adding up tangible results and does not include estimated effects.

Status of Environmental Management System Certification Acquisition

The Kubota Group requires all of its production sites to acquire ISO 14001 certification or other equivalent environmental certification (EMAS, etc.).

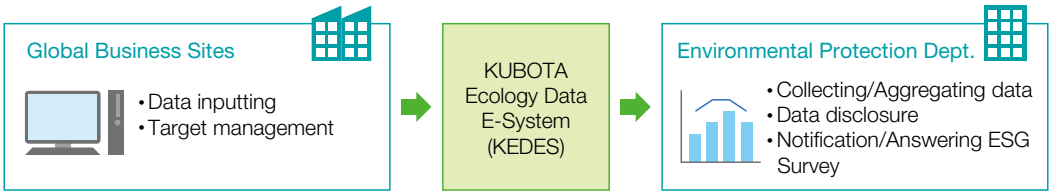
As of the end of RY2019, 41 of the Group's 55 production sites worldwide (acquisition rate of 75%) have acquired environmental management system certification. In Japan, 22 of its 23 production sites (acquisition rate of 96%) have acquired ISO 14001 certification. Of its 32 overseas production sites, 19 sites (acquisition rate of 59%) have acquired ISO 14001 certification or other certification for environmental management systems. The Kubota Group will make continuous efforts to raise the acquisition rate of the certification.

For details on the Kubota Group's Status of Environmental Management System Certification Acquisition, click here
www.kubota.com/company/environment/ems/

Calculation Standards of Environmental Performance Indicators

In order to practice environmental conservation activities on a global scale, the Kubota Group utilizes the "KUBOTA Ecology Data E-System" (KEDES) to collect environmental data, which includes information from our business sites on their energy usage, amounts of generated and discharged waste, water usage, and VOC emissions, etc.

"KEDES" is a system that collectively manages environmental data at global business sites. Staff at each business site register monthly environmental data, which is used for target management of their own site. The Environmental Protection Department aggregates and analyzes the data, and uses it for reporting inside and outside the group. The boundary of the environmental data aggregation covers Kubota Corporation and all (100%) of its consolidated subsidiaries.



Period and Organizations Covered by Environmental Data

RY	Period		Organizations covered (No. of companies)			
			Kubota/Consolidated subsidiaries*3			Affiliated companies accounted for under the equity method*4
	Data in Japan	Overseas data	Japan	Overseas	Total	
2015	April 2015 to March 2016*1	January 2015 to December 2015*1	52	102	154	13
2016	January 2016 to December 2016	January 2016 to December 2016*2	48	125	173	12
2017	January 2017 to December 2017	January 2017 to December 2017	49	125	174	9
2018	January 2018 to December 2018	January 2018 to December 2018	49	124	173	8
2019	January 2019 to December 2019	January 2019 to December 2019	49	126	175	8

*1 Although the accounting period of RY2015 is nine months (April 2015 to December 2015) due to the change of the account closing time, the period for the environmental data is set to be a year.
Consolidated net sales used to calculate the environmental load per unit of consolidated net sales (CO_2 emissions, energy use, CO_2 emissions during distribution, amount of waste discharged, water consumption, VOC emissions, amount of PRTR-designated substances released and transferred) for RY2015 are the total consolidated sales from April 2015 to March 2016.

*2 For RY2016, of the overseas consolidated subsidiaries, for Great Plains Manufacturing, Inc. (GP), which became a consolidated subsidiary in July 2016, the period of its environmental data is six months (July 2016 to December 2016), and the data except for its four major production sites (accounting for over 80% of sales of the GP Group in RY2016) and four major non-production sites (accounting for over 90% of the employees of non-production sites of the GP Group in RY2015) is estimated. Data of the amount of chemical substances (VOC) handled and VOC emissions is excluded from the calculation.
From RY2017, the data for all of the GP Group sites is calculated based on results.

*3 The coverage of consolidated subsidiaries is 100% for each year.

*4 Part of the affiliated companies accounted for under the equity method are covered by the data.

Energy and CO_2-related

Indicator (unit)	Calculation method
Energy use (J)	• Energy use = Amount of purchased electricity consumed at business sites × per-unit heat value + Σ [amount of each fuel consumed × per-unit heat value of each fuel] • Per-unit heat value is determined in accordance with the Enforcement Regulation for the Act on Rationalizing Energy Use, Japan.
CO_2 emissions (tons CO_2e)	• CO_2 emissions = CO_2 emissions from energy sources + non-energy source greenhouse gas emissions • CO_2 emissions from energy sources = Amount of purchased electricity consumed at business sites × CO_2 emission coefficient + Σ [amount of each fuel consumed at business sites × per-unit heat value of each fuel × CO_2 emission coefficient of each fuel] • Non-energy source greenhouse gas emissions = CO_2 emissions from non-energy sources + non-CO_2 greenhouse gas emissions • Per-unit heat value is determined in accordance with the Enforcement Regulation for the Act on Rationalizing Energy Use, Japan. • CO_2 emission coefficients [RY2014 to RY2015] <Fuel> Based on the Manual for Calculation and Report of Greenhouse Gas Emissions (Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry) <Electricity> Data for Japan is basic emission coefficients for each electricity utility, and overseas data is according to the GHG emissions from purchased electricity (GHG Protocol). [RY2016 to RY2019] <Fuel> Based on the Manual for Calculation and Report of Greenhouse Gas Emissions (Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry) <Electricity> • Data for Japan is effective emission coefficients for each electricity utility • Overseas data is according to effective emission coefficients for each electricity utility, CO_2 Emissions from Fuel Combustion (IEA) and The Emissions & Generation Resource Integrated Database (eGRID) (EPA). • The method for calculating non-energy source greenhouse gas emissions is based on the Manual for Calculation and Report of Greenhouse Gas Emissions (by Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry)
Freight traffic (ton-km)	• Freight traffic = Σ [Freight transportation amount (tons) × distance traveled (km)] • Freight traffic refers to the volume of products and Kubota's industrial waste transported during domestic distribution
Energy use during transportation (J)	• Energy use during transportation = Σ [Freight traffic by truck × Fuel consumption per ton-kilometer × per-unit heat value] + Σ [Freight traffic by rail and water × energy use (heat value) per unit ton-kilometer] • Calculation method is from the Manual to Support Merchants regarding Revisions to Energy Conservation Laws, 3rd Edition (April 2006, Japan's Energy Conservation Center of the Agency of Natural Resources and Energy, Japanese Ministry of Economy, Trade and Industry) • In addition to the data for Japan, energy use associated with the overseas shipping of certain products from Japan has been included from RY2018.
CO_2 emissions during distribution (tons CO_2e)	• CO_2 emissions during distribution = Σ [Fuel consumption for freight shipment by truck × CO_2 emission per ton-kilometer by fuel of transportation] + Σ [Fuel consumption for freight shipment by rail and water × CO_2 emission per ton-kilometer by means of transportation] • Calculation method is based on the ton-kilometer method stipulated in the Manual for Calculation and Report of Greenhouse Gas Emission (Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry)
Energy use during product operation (J)	• Energy use during product operation = Σ [Number of product units shipped × Fuel consumption per hour × Annual hours of use × Years of lifespan × Per-unit heat value of each fuel] • Products: agricultural machinery (tractors, rice transplanters, combine harvesters), riding mowers, utility vehicles, construction machinery (compact excavators, etc.) • Calculated by assuming the fuel consumption per hour, annual hours of use, and years of service life for each product. • Per-unit heat value is according to the Manual for Calculation and Report of Greenhouse Gas Emissions (Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry)

Energy and CO_2-related

Indicator (unit)	Calculation method
Scope 3 emissions (tons CO_2e)	• The calculation method is based on the Basic Guidelines regarding the Calculation of Greenhouse Gas Emissions throughout the Supply Chain (Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry) and the Emissions per Unit Database for the Purpose of Calculating the Greenhouse Gas and Other Emissions of Organizations throughout the Supply Chain (Ver2.6)
Resource extraction, manufacture and transportation related to purchased goods/ services	• Σ [Production volume × CO_2 emissions per unit] • Products: Agricultural machinery (tractors, rice transplanters, combine harvesters), construction machinery (compact excavators, etc.), and ductile iron pipe • Production volume: Number of units shipped for agricultural and construction machinery, and production weight for ductile iron pipes • CO_2 emissions per unit: Estimated from the CO_2 emissions per unit of production of the product
Manufacture and transportation of capital goods such as purchased equipment	• Equipment investment amount × CO_2 emissions per unit
Resource extraction, manufacture and transportation related to purchased fuels/ energy	• Purchased electricity consumed at business sites × CO_2 emissions per unit
Disposal of wastes discharged from business sites	• Σ [Amount of waste discharge by type × CO_2 emissions per unit]
Employee business travels	• Σ [Transportation expenses paid by method of transport × CO_2 emissions per unit] • Transportation expenses paid by method of transport are for airline tickets and railway tickets. • For a part of the overseas subsidiaries, estimate by multiplying the net sales of the subsidiaries in each of the regions and countries mentioned by the ratio of transportation expenses for each method of travel included in the net sales of major subsidiaries in Europe, America, Asia and China.
Employee commuting	• Σ [Transportation expenses paid by method of transport × CO_2 emissions per unit] • The amount of transportation expenses is for the amount paid for railway tickets and car travel. • From RY2019, CO_2 emissions from overseas subsidiaries have been included in addition to the data for Japan. For overseas subsidiaries, the data is partially estimated by multiplying the ratios of transportation expenses for each means of transportation among the number of employees at major subsidiaries by the number of employees at each subsidiary.
Transportation of sold products	• The calculation method is the same as that for CO_2 emissions during distribution. • In addition to the data for Japan, CO_2 emissions associated with the overseas shipping of certain products from Japan has been included from RY2018. Target products: Agricultural machinery (tractors, rice transplanters, combine harvesters), riding mowers, utility vehicles, construction machinery (compact excavators, etc.), engines • The scope of calculation includes CO_2 emissions associated with Kubota's transportation of waste.
Processing of intermediate products	• Σ [Sales volume of intermediate products × CO_2 emissions per unit] • Intermediate products: engines (external sales only) • CO_2 emissions per unit: CO_2 emissions per unit at Kubota Group's processing plants
Use of products sold	• Σ [Number of products sold × CO_2 emissions per unit] • Products: agricultural machinery (tractors, rice transplanters, combine harvesters), riding mowers, utility vehicles, construction machinery (compact excavators, etc.) • CO_2 emissions per unit: Fuel consumption per hour × Annual hours of use × Years of lifespan × per unit heat value of each fuel × CO_2 emission coefficient of each fuel (calculated by assuming the fuel consumption per hour, annual hours of use, and years of service life for each product) • Per-unit heat value is according to the Manual for Calculation and Report of Greenhouse Gas Emissions (Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry)
End-of-life treatment of sold products	• Σ [Number of products shipped × CO_2 emissions per unit] • Products: Agricultural machinery (tractors, rice transplanters, combine harvesters) and construction machinery (compact excavators, etc.) • CO_2 emissions per unit: estimated CO_2 emissions per unit of product

Waste-related

Indicator (unit)	Calculation method
In-house recycling and reuse (tons)	• The amount of resources that are reused or recycled in-house at each Kubota Group business site, and the amount of resources transferred for the purpose of reuse and recycling among Kubota Group business sites
Amount of waste, etc., discharge (tons)	• Amount of waste, etc., discharge = sales amount of valuable resources + amount of waste discharge
Amount of valuable resources sold (tons)	• The amount of unneeded resources generated within the Kubota Group that are sold outside the Group
Amount of waste discharge (tons)	• Amount of waste discharge = Amount of industrial waste discharge + Amount of general waste discharge from business activities
Hazardous waste (tons)	• In Japan, specially controlled industrial waste as defined in the Waste Management and Public Cleansing Law; Overseas, industrial waste as defined in each country
Amount of resource recycling (tons) Amount of volume reduction (tons) Amount of landfill disposal (tons)	• Amount of resource recycling = Amount of waste directly recycled + Amount of resource recycling after external intermediate treatment • Amount of volume reduction = Volume of external intermediate treatment – Amount of resource recycling after external intermediate treatment – Final landfill following external intermediate treatment • Amount of landfill disposal = Direct landfill disposal + Final landfill disposal following external intermediate treatment • Amount of resource recycling after external intermediate treatment includes heat recovery • Amount of resource recycling after external intermediate treatment, amount of final landfill disposal, amount of volume reduction are calculated based on the results of surveys at the contractor.
Recycling ratio (%)	• Recycling ratio = (Sales amount of valuable resources + external recycling amount) / (Sales amount of valuable resources + external recycling amount + amount of landfill disposal) × 100 • External recycling amount includes heat recovery
Amount of construction waste, etc., discharged (tons)	• Amount of construction waste, etc., discharged = Amount of construction waste discharged + sales amount of valuable resources generated from construction • Targeting construction work in Japan • Amount of construction waste discharged includes construction waste other than specific construction materials • Sales amount of valuable resources covers valuable material operators with whom the Kubota Group is directly contracted
Amount of construction waste, etc., discharged Recycling ratio (%) Recycling and reduction ratio (%)	• In RY2016, a new calculation method was adopted in which the reduction volume is calculated in accordance with the Promotion Plan for Recycling of Construction Waste 2014 (Ministry of Land, Infrastructure, Transport and Tourism) and the recycling and reduction ratio is determined. [RY2015] Recycling ratio = {Sales amount of valuable resources + resource recycling + volume reduction (heat recovery)} ÷ amount of construction waste, etc., discharged × 100 [RY2016 to RY2019] Recycling and reduction ratio = {Sales amount of valuable resources + resource recycling (including heat recovery) + volume of reduction} ÷ amount of construction waste, etc., discharged × 100

Water-related

Indicator (unit)	Calculation method
Water consumption (m^3)	• Water consumption = City water consumption + groundwater consumption • City water includes service water and water for industrial use
Wastewater discharge (m^3)	• Wastewater discharge = Amount of wastewater discharge to public water areas + amount of discharge to sewage lines • Wastewater discharge includes rain and spring water at some business sites
Amount of recycled water (m^3)	• Amount of water purified in on-site effluent treatment facilities and recycled (excluding the circulating cooling water used)
Rate of recycled water (%)	• Rate of recycled water = Amount of recycled water / (Water consumption + Amount of recycled water) × 100
COD (tons) Nitrogen discharge (tons) Phosphorus discharge (tons)	• COD = COD per unit wastewater discharge amount × wastewater discharge to public water areas • Nitrogen discharge = nitrogen concentration × wastewater discharge to public water areas • Phosphorous discharge = Phosphorous concentration × wastewater discharge to public water areas • Targeting business sites subject to total emission control in Japan

Chemical Substance-related

Indicator (unit)	Calculation method
Amount of PRTR-designated substances handled (tons)	• Total amount of chemical substances handled at Japanese sites, which are designated as Class I under the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (the PRTR Law) whose amount handled by each business site is one ton or more (or 0.5 ton or more for Specific Class I Designated Chemical Substances) per year
Amount of PRTR-designated substances released and transferred (tons)	• Total release and transfer amount of the chemical substances which are designated as Class I under the PRTR Law at Japanese sites and whose annual total amount handled by each business site is one ton or more (or 0.5 ton or more in case of Specific Class I Designated Chemical Substances). • Amount released = amount discharged to the atmosphere + amount discharged to public water areas + amount discharged to soil + amount disposed of by landfill in the premises of the business site • Amount transferred = amount discharged to sewerage + amount transferred out of the business site as waste • The amount of each substance released and transferred is calculated in accordance with the Manual for PRTR Release Estimation Methods Ver. 4.2 (March 2018) of Japan's Ministry of the Environment and the Ministry of Economy, Trade and Industry, and the Manual for PRTR Release Estimation Methods in the Steel Industry Ver. 13 (March 2014) of the Japan Iron and Steel Federation.
Amount of chemical substances (VOC) handled (tons)	• The total amount handled at overseas sites of the six substances of xylene; toluene; ethylbenzene; styrene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene that are at each site handled in amounts of one ton or more per year
VOC emissions (tons)	• The total emissions of the six substances of xylene; toluene; ethylbenzene; styrene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene that are at each site handled in amounts of one ton or more per year
SOx emissions (tons) NOx emissions (tons) Soot and dust emissions (tons)	• SOx emissions = Amount of fuel consumed (kg) × sulfur content in the fuel × (1 – desulfurization efficiency) × 64/32 or SOx emissions = {(amount of coke consumed × sulfur content in coke) - (amount of molten metal × sulfur content in molten metal) – (volume of slag, dust, etc. × sulfur content in slag, dust, etc.)} × 64/32 or SOx emissions = SOx concentration × amount of gas emitted per hour × annual operation hours of the relevant facility • NOx emissions = NOx concentration × amount of gas emitted per hour × annual operation hours of the relevant facility • Soot and dust emissions = soot and dust concentration × amount of gas emitted per hour × annual operation hours of the relevant facility • Targeting the smoke and soot generating facilities at business sites in Japan as defined by the Air Pollution Control Act, and the facilities at overseas business sites subject to the application of measurement obligations stipulated in the statutory and regulatory requirements of those countries in which sites are located

Product-related

Indicator (unit)	Calculation method
Sales ratio of Eco-Products (%)	• Sales ratio of Eco-Products = Sales of Eco-Products/sales of products (excluding construction work, services, software, parts, and accessories) × 100
Usage ratio of recycled materials (%)	• Usage ratio of recycled materials = Σ {production volume of target products at each production site × usage ratio of recycled materials at each production site} / total production weight of target products • Usage ratio of recycled materials at each production site = Amount of recycled materials input in the melting process at each production site / total material input amount of materials at each production site × 100 • Target products: Cast metal products and parts manufactured by the Kubota Group (such as ductile iron pipes, fittings, machine cast products (engine crankcase, etc.)) • The amount of recycled materials input and the total material input amount does not include the indirect materials that are not the constituent materials of the casting products and parts. • The amount of recycled materials input does not include the amount of reusage of defective processed products and offcuts, etc., that arise in the manufacturing process on the site.

Third-Party Assurance of Environmental Report

Since 2004, the Kubota Group has received third-party assurance for the purpose of improving the reliability and comprehensiveness of its environmental data. Information that is marked with a symbol indicates that that information has been assessed by a third party. Based on the third-party assurance obtained this reporting year, the KUBOTA REPORT 2020 <Full Version> received the J-SUS Symbol of the Japanese Association of Assurance Organizations for Sustainability Information (J-SUS). This symbol indicates that an assurance was undertaken by an assurance body certified by J-SUS regarding the reliability of the environmental data presented in the report.

KPMG

Independent Assurance Report

To the President and Representative Director of Kubota Corporation

We were engaged by Kubota Corporation (the "Company") to undertake a limited assurance engagement of the environmental performance indicators marked with "" (the "Indicators") for the period from January 1, 2019 to December 31, 2019 included in its KUBOTA REPORT 2020 <Full Version> (the "Report") for the fiscal year ended December 31, 2019.

The Company's Responsibility

The Company is responsible for the preparation of the Indicators in accordance with its own reporting criteria (the "Company's reporting criteria"), as described in the Report.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the Indicators based on the procedures we have performed. We conducted our engagement in accordance with the 'International Standard on Assurance Engagements (ISAE) 3000, Assurance Engagements other than Audits or Reviews of Historical Financial Information' and the 'ISAE 3410, Assurance Engagements on Greenhouse Gas Statements' issued by the International Auditing and Assurance Standards Board. The limited assurance engagement consisted of making inquiries, primarily of persons responsible for the preparation of information presented in the Report, and applying analytical and other procedures, and the procedures performed vary in nature from, and are less in extent than for, a reasonable assurance engagement. The level of assurance provided is thus not as high as that provided by a reasonable assurance engagement. Our assurance procedures included:

- Interviewing the Company's responsible personnel to obtain an understanding of its policy for preparing the Report and reviewing the Company's reporting criteria.
- Inquiring about the design of the systems and methods used to collect and process the Indicators.
- Performing analytical procedures on the Indicators.
- Examining, on a test basis, evidence supporting the generation, aggregation and reporting of the Indicators in conformity with the Company's reporting criteria, and recalculating the Indicators.
- Visiting one of the Company's subsidiaries selected on the basis of a risk analysis.
- Evaluating the overall presentation of the Indicators.

Conclusion

Based on the procedures performed, as described above, nothing has come to our attention that causes us to believe that the Indicators in the Report are not prepared, in all material respects, in accordance with the Company's reporting criteria as described in the Report.

Our Independence and Quality Control

We have complied with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which includes independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. In accordance with International Standard on Quality Control 1, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

KPMG AZSA Sustainability Co., Ltd.
Osaka, Japan
June 23, 2020

J-SUS Symbol

This symbol indicates that an assurance was undertaken by an assurance body certified by J-SUS regarding the reliability of the environmental data presented in the KUBOTA REPORT 2020 <Full Version>.

Japanese version www.j-sus.org/
English version www.j-sus.org/english.html

Factory Visit

Kubota Industrial Equipment Corporation (US)