Measures to Combat Climate Change (Disclosure in Line with the TCFD Recommendations and Carbon Neutrality Initiatives) Web

Mission of Creating Value

Although it uses fossil raw materials and fuels in its product manufacturing processes and emits a considerable amount of greenhouse gases (GHG), the Group has many products that contribute to energy conservation and the carbon cycle. We regard measures to combat climate change as a management priority in terms of both risks and opportunities. In May 2019, we announced our endorsement of the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). In accordance with these recommendations, we are promoting dialogue with our stakeholders while evaluating risks and opportunities related to climate change, conducting scenario analysis to inform initiatives that enhance our resilience, and disclosing information based on the TCFD framework.

Governance

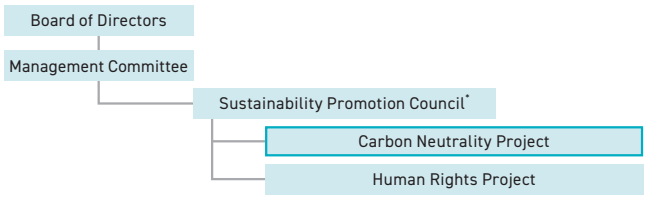
Role of board of directors and monitoring system

Sustainability is a building block for our company management, and we define our Purpose as "change society through the power of chemistry." To this end, we have established Sustainability Vision 2030, identified material issues for sustainability including climate actions to implement the major strategies of our long-term vision, and raised awareness throughout the Company.

The Group CEO supervises the risks and business opportunities, targets, and specific initiatives associated with climate change, while the Group CSO takes responsibility for promoting actions. After being discussed at the Carbon Neutrality Project, those issues are deliberated at the Sustainability Promotion Council and the Management Committee. The progress of each initiative is regularly monitored, and remedial measures are discussed when needed.

The Board of Directors receives periodic reports of what the Sustainability Promotion Council and the Management Committee discussed, and on which points they made decisions and deliberates and supervises them from the perspective of maximizing corporate value. From 2022, we have aligned the evaluation indexes for inside directors and executive officers with the initiatives in the long-term vision and countermeasures against sustainability issues, including climate change, with the aim to strongly incentivize them to manage the Group from a long-term perspective and promote the sustainable growth of the Group.

Positioning of carbon neutrality project (As of June 30, 2023)



*The members are composed of CEO and all CXOs and business division heads.

Targets and results of KPIs on material issues

P58 / Material Issues and Non-financial KPIs

KPIs and 2030 targets	Results in 2022
Reduction of greenhouse gas (GHG) emissions: ● 30% reduction in GHG emissions (Scope 1 + Scope 2) from fiscal 2013 (consolidated)	● 7.6% reduction in GHG emissions (Scope 1 + Scope 2) from 2013 (consolidated)

*Given the integration of the two companies, the actual reduction has been revised. Also, we consider starting the calculation and disclosure of Scope 3 emissions from upstream activities before setting a reduction target.

Risk Management

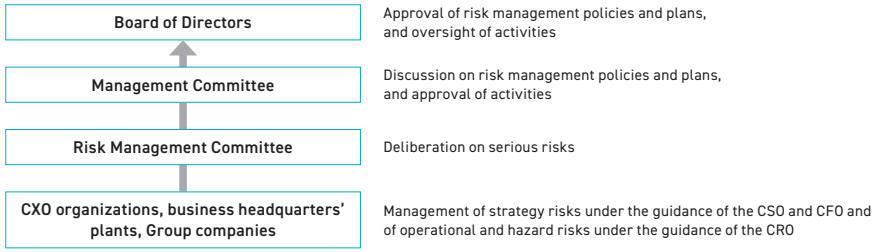
Process to assess, identify, and manage risks

The Group conducts a scenario analysis to assess "transition risks" and "physical risks" arising from climate change for each business, identifies material risks for the Group, and then develops countermeasures against them. Material issues in identifying risks and developing countermeasures are reported to the Board of Directors. We will continue to conduct the scenario analysis to update risks and countermeasures, along with monitoring the progress of the existing countermeasures.

Integration into enterprise risk management

Given the importance of building an enterprise risk management system, the Group pursues integrated risk management using a common framework across the Group. Information on climate change and other risks with the potential to impact the Group's management is registered in an integrated manner into our risk management system via companywide risk identification activities (as part of risk assessment procedures). Top risks, which are deemed to have a particularly high frequency or degree of impact, are deliberated by a dedicated committee (Risk Management Committee). Important matters examined by the Sustainability Promotion Council and the Risk Management Committee are submitted to the Management Committee for deliberation and decision before being reported to the Board of Directors.

Risk management structure (as of June 30, 2023)



Measures to Combat Climate Change (Disclosure in Line with the TCFD Recommendations and Carbon Neutrality Initiatives)

Strategies

Short-, medium- to long-term climate change-related risks and opportunities and responses to them
Amid the successful transition to a carbon-neutral society, the Group sees climate change as both a risk and opportunity. The Group will exercise its social responsibility as a company and build further competitive advantages to reduce GHG emissions across the value chain by providing products and services that contribute to decarbonization, achieving co-creation with partners, improving energy efficiency, and increasing usage of renewable energy. Given the above, the Group analyzes risks and opportunities to evaluate the impact of climate change on the Group businesses under the following two scenarios: (1) The average global temperature will increase by 4°C or more and (2) The average global temperature rise can be kept well below 2°C and continue efforts to limit it to 1.5°C based on the Paris Agreement, which were released by the Intergovernmental Panel on Climate Change (IPCC) or the International Energy Agency (IEA). Based on the analysis, we determine the necessary countermeasures.

Transition risks affecting the Group businesses include increased operating costs due to a rise in energy taxes including carbon pricing. We aim to reduce CO_2 emissions to about 3.2 million t-CO_2 by 2030, or a 30% reduction from 4.6 million t-CO_2 in 2013. Assume that Scope 1 and 2 emissions in fiscal 2030 resulting from sales growth are estimated to be about 5 million t-CO_2, the carbon pricing is set at ¥10,000/t-CO_2 based on the IEA's 2°C scenario (SDS)*1 and others, and we need to offset the portion that falls short of reduction target through emission trading. In that case, if we fail to reduce emissions by 30%, the operating cost will increase by about ¥18 billion per year, implying that hitting the reduction target will lead to reducing operating costs. As a company that interrelates with society, we will continue to use other scenario analyses to contribute to realization of a carbon-neutral society in various ways, take measures against climate risks, and achieve a sustainable growth.

Climate change-related risks and opportunities and major response measures (The following is a selected extract—please see our Web for full details)

	Impact of climate change	Domain	Risk category	Opportunity category	Time frame*2	Response
Transition risks and opportunities	Increase in tax (cost) due to the introduction of carbon pricing (ICP)	All business domains	○ Policy/ Regulation		Medium term	● Revision of GHG emissions reduction targets for 2030 and establishment of the roadmap P99 ● Implementation of carbon neutrality initiatives pertaining to chemicals and petrochemicals P87 ● Participation in the GX League
	Government support under the policies for decarbonization initiatives of companies		○ Policy/ Regulation	○ Product/Service/ Market	Short to medium term	● Development of eight-inch SiC wafers for next-generation green power semiconductors (adopted as part of the NEDO Green Innovation Fund project) P79 ● Development of a low-concentration CO_2 separation system employing an innovative separation agent (adopted as part of the NEDO Green Innovation Fund project) P87 ● Reinforcement of the global semiconductor material supply chain (adopted under the Ministry of Economy, Trade and Industry subsidiary program for overseas market survey projects for building resilient supply chains in the Indo-Pacific area) P80
	Increases/decreases in sales due to changes in consumer behavior and awareness		○ Market/ Technology	○ Product/Service/ Market	Short to medium term	● Promotion of products, development of new products, and improvement of competitiveness in response to the needs of a decarbonized society P59 ● Advancement of R&D based on long-term themes at the Stage for Co-creation (new research facility) P15
	Greater request for initiatives and disclosure related to decarbonization from customers		○ Market/ Technology		Short term	● Establishment of life cycle assessment (LCA) P66 and carbon footprint of products (CFP) calculation frameworks, tracking of CO_2 emissions, and formulation of reduction plans P66 P99
	Re-evaluation by investors depending on how effectively the Group captures needs from society and customers to solve environmental issues		○ Reputation	○ Product/Service/ Market	Short to medium term	● Adding value to our products/services to help solve the problems that society and customers face P59 ● Attracting investments through proactive measures against climate change and promotion of a recycling-oriented society
	Response to technological innovation and reductions to the electricity consumption of semiconductor devices	Semiconductor and Electronic Materials	○ Market/ Technology	○ Product/Service/ Market	Short to medium term	● Establishment of the JOINT2 consortium to develop next-generation semiconductor packaging technologies (adopted as part of the advanced semiconductor manufacturing technology development project under the NEDO post-5G telecommunications system platform reinforcement R&D program) P15 ● Assessment of environmental standard conformity of product designs, and development of low-carbon products
	Growing demand for energy-saving, next-generation power semiconductors in conjunction with an increase in data processing volumes brought about by digitalization		○ Market/ Technology	○ Product/Service/ Market	Short to medium term	● HD media R&D to reduce electricity consumption of data centers P79 ● Response to increased demand for SiC power semiconductors
Physical risks	Suspended operation of manufacturing sites due to flooding, and decrease in profit caused by an increase in the equipment repair cost	All business domains	○ Acute		Short term	● Analysis of flood risks at manufacturing sites ● Regular risk identification and reduction activities, and enhancement of business continuity planning P109

*1 2°C scenario (SDS): Sustainable development scenario *2 Time frame: Short term: less than three years; Medium term: three to less than 10 years; Long term: 10 to 30 years

Measures to Combat Climate Change (Disclosure in Line with the TCFD Recommendations and Carbon Neutrality Initiatives)

Indicators and Targets

GHG emissions reduction targets and results

Toward carbon neutrality in 2050, upon the formation of the new company, we reviewed our GHG emissions reduction targets for 2030 in 2021 and set the target of a 30% reduction relative to the 2013 level. We will review medium- to long-term plans for each business, aiming to create a low-carbon economy. To achieve our GHG emissions reduction targets for 2030, we will further reduce our GHG emissions and promote energy conservation. Carbon neutrality will also be pursued leading up to 2050, to accomplish the goal of becoming a company that contributes to a sustainable global society as put forth by our long-term vision. In 2022, we reduced our GHG emissions by 7.6% compared to the level in 2013, due to a decrease in production volume in some products and a procurement of renewable energy.

Gold Award in the 2022 global award program: Initiatives toward carbon neutrality - Resonac Automotive Products (Thailand) Co., Ltd.

Resonac Automotive Products (Thailand) Co., Ltd. manufactures interior and exterior automotive parts such as instrument panels and bumpers. To achieve our Purpose and respond to the requirements that the automotive industry should achieve a decarbonized and recycling-oriented society, we have established short-, medium-, and long-term goals and accelerated our efforts. Specifically, we choose low-carbon, eco-friendly materials, reduce component weight, review manufacturing processes, switch fuels with lower CO_2 emissions, reuse resources, electrify transportation equipment, and train employees. As a result, we have reduced GHG emissions by more than 20% compared with the 2013 level (base year) at our plants.

We do not regard carbon neutrality as just a concept or philosophy that people must learn, but as an important theme changing people's minds and actions. We will continue to make efforts to achieve a net zero society.

Life cycle assessment and carbon footprint of products initiatives

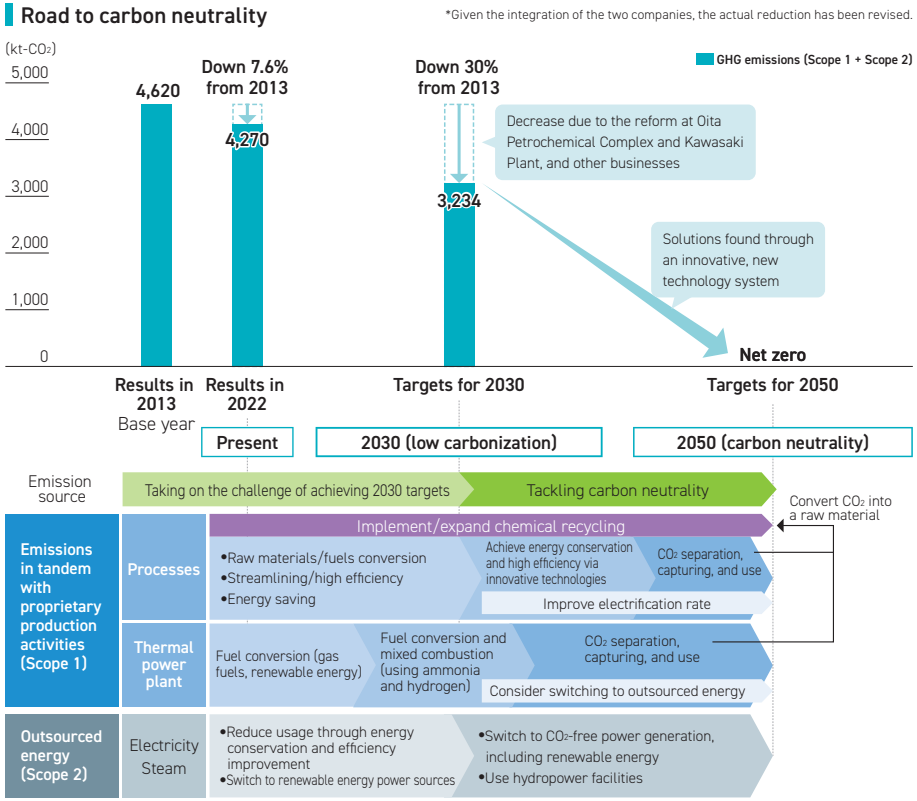
Eriko Takeda
Sustainability Department

Life cycle assessment (LCA) is a means of quantitative assessment of the environmental impacts of products and services throughout their entire life cycle, or within a specified portion of the life cycle. As part of measures to achieve the GHG emissions reduction target in the new company, based on the accumulated experience and insight on life cycle assessments, we work to apply LCA methodologies to measure the total amounts of greenhouse gas emissions, or carbon footprint of products (CFP).

During 2022, we accumulated the calculation data of our CFP through the pilot operation, while preparing calculation guidelines and appointing persons in charge at each business division to roll out the initiatives throughout the Group. In 2023, we will prioritize the CFP calculation of products manufactured in Japan to grasp the current status of the GHG emissions. Then, we will go further to reduce GHG emissions throughout the supply chain and other environmental loads. With these perspectives in mind, we will engage in research and product development based on LCA.

Roadmap to carbon neutrality in 2050

Toward carbon neutrality in 2050, we will streamline our businesses, increase efficiency, save energy, and switch to gas fuels (high-efficiency co-generation system) until 2030. Furthermore, the Group will develop technology for sustainable plastic chemical recycling and facilitate new technology for CO_2 separation, capturing, and use. From 2030 onward, with the aim to achieve 2050 target, the Group plans to promote fuel conversion and mixed combustion to ammonia and hydrogen, as well as electrification of manufacturing processes. We will also change our manufacturing process to those using our own hydroelectric power generation and renewable energy sources. We pursue carbon neutrality by implementing sustainable plastic chemical recycling technologies, applying innovative CO_2 separation and capturing technologies, and using recycled CO_2 as chemical materials. To achieve the target, we have broken it down to business division level targets, reduction measures, and actions.



*We consider starting the calculation and disclosure of Scope 3 emissions from upstream activities before setting a reduction target.

Realization of Recycling-oriented Society Web

Mission of Creating Value

Resonac globally promotes activities underpinning value creation by reducing the environmental load of our products throughout their life cycles and contributing to global environmental preservation.

Policies and Management

Cyclical use of resources and improvement of per-resource productivity are vital to the long-term use of limited natural resources and energy on the earth. Toward a recycling-oriented society, we work hard to recycle waste and use resources efficiently. To this end, our business and R&D divisions promote their activities by paying attention to the entire product life cycle from product design and development to disposal.

Strategy for Realizing the Long-Term Vision

Toward a recycling-oriented society, we focus on the following agendas, while considering setting specific goals and KPIs going forward.

- **Design and development:** Reduce consumption of minerals, fossil fuels and other resources; Use recyclable materials; Control waste generation; Improve recyclability; Extend product life; Quantify environmental impact of products through the life cycle assessment
- **Manufacturing:** Minimize consumption of energy, water, and other resources throughout the product life cycle
- **Value chain:** Pursue co-creation with diverse stakeholders such as suppliers, customers, government agencies, municipalities, and international bodies

Roadmap for realizing the long-term vision

Results in 2022	Plan for 2023	Vision for the future (2030)
Resources ● Captured/integrated data about resource consumption and waste volume **Products** ● Recycling of plastic chemicals: Achieved one million tons of cumulative throughput	**Resources** ● Reinforce global environment management systems **Increase product-related initiatives** ● Boost up production capacity of lithium-ion battery conduction additives by 30% to contribute to extending battery lifespan and reduce CO_2 emissions ● Conduct a joint study to promote recycling businesses of used plastics and fibers	Implement a number of relevant initiatives to realize a recycling-oriented society through the power of chemistry (targets and KPIs currently under development) Improve traceability and visualization of recycling toward a recycling-oriented society

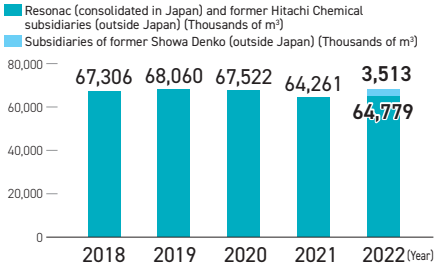
Targets and results of KPIs on material issues

P58 / Material Issues and Non-financial KPIs

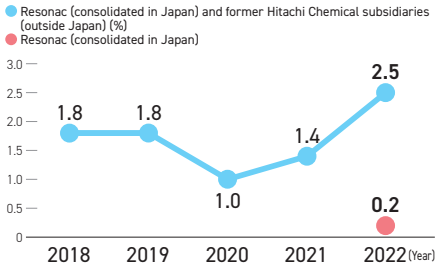
KPIs and 2025 targets	Results in 2022
Reduction of industrial waste sent to landfills: ● 0.5% or less of waste generated (consolidated in Japan)	● 0.2% of waste generated (consolidated in Japan)

* For more integrated reporting, targets for subsidiaries outside Japan are currently being reconsidered, and their results are also in the process of scrutiny.

Water intake (excluding marine water)



Ratio of industrial waste sent to landfills



Initiatives for reducing water consumption

The importance of water resources is recognized globally, and it is regarded as a social requirement to use water resources in an appropriate and efficient manner, thereby reducing the consumption of water. It is also necessary to ensure that water circulates through its natural cycle with its quality and functions maintained at a level that is suitable for human activities and environmental conservation. The Resonac Group regards a shortage of water as a global issue and is working to make effective use of water and reduce its consumption. We also treat the water used in our activities to reduce its environmental impact before releasing it back into the environment.

Electronics Production Center of the Electronics Business Headquarters is working to reduce water consumption under the environmental target of efficiency improvement by 1% per year. The Environmental Management Committee, held monthly, monitors the status of efficiency improvement of each department to help achieve the water consumption reduction target. In 2022, we successfully improved efficiency by about 1.8%. The Shimodate Plant took measures such as the reduction of the cooling water consumption through improved efficiency of heat exchangers, the prevention of water leakage by renewing aging underground piping, and the increase in the recycled and reused amount of cooling water by bolstering chiller facilities. As a result, we reduced groundwater consumption by about 70%.

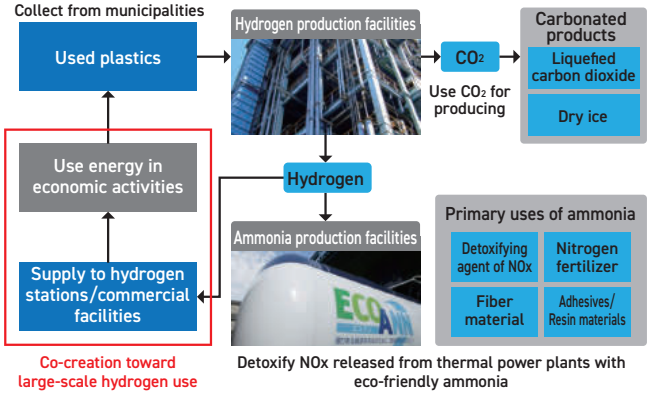
Initiatives for achieving zero emissions

By defining zero emissions as the state in which the ratio of industrial waste sent to landfills to total waste generated is 0.5% or less, we reduce the generation of waste and promote the effective use and recycling of resources. We also inspect our sub-contractors for intermediate treatment and final disposal of waste to confirm that they appropriately treat and dispose of our waste. In 2020, to enhance measures against the inappropriate disposal of waste, the government mandated companies that generate specially controlled industrial waste in the annual amount of 50 tons or more to use the electronic manifest for the reporting of their wastes. The Resonac Group's relevant sites have already put this system in place and started producing reports using the electronic manifest.

Realization of Recycling-oriented Society

Basic chemicals and Industrial gases: Promotion of plastic chemical recycling and co-creation toward large-scale hydrogen use

Under the Kawasaki Plastic Chemical Recycling (KPR*1) operations, the Kawasaki Plant implements various initiatives, such as providing hydrogen extracted through the decomposition of used plastics to fuel cells for hotels. Resonac is the only provider of ammonia in the world with a long history of synthesizing ammonia by utilizing low-carbon hydrogen extracted from gas produced through the process of used plastic chemical recycling, and as a result, the total volume of used plastic recycled reached one million tons in January 2022. Moreover, the Company aims to establish hydrogen fueling stations in the coastal area of Kawasaki City to create a virtuous cycle for expanding supply and demand to use hydrogen. Since March 2022, we have promoted this initiative by coordinating with six other partners across various sectors*2 as a collaborative network for hydrogen use to track medium- to long-term hydrogen demand and supply network feasibility within the area.



*1 KPR is an acronym for Kawasaki Plastic Chemical Recycling, a plastic recycling business operated at the Kawasaki Plant.
*2 Six other partners across various sectors are Asahi Kasei Corp., Ajinomoto Co., Inc., ENEOS Corporation, East Japan Railway Company, Toshiba Energy Systems & Solutions Corporation, and Kawasaki City.

P85 / Chemicals

Almic-can, an eco-friendly product that also contributes to reducing food loss

Almic-can enables the foods to keep their flavor and prevent their color from changing, whereby reducing food loss. KAWASHO FOODS CORPORATAION, known as its flagship product, Nozaki's Corned Beef, tested for preservation of its corned beef using Almic-can. The test showed that Almic-can helped extend its best-before date to three and a half years from three years when using the traditional trapezoidal "makura kan" (pillow-shaped can). Almic-can is suitable for an emergency food stock as you can keep the foods at room temperature and eat without cooking.

Almic-can also contributes to eco-friendly packaging. These days, plastic containers are used for many food products, but microplastics are regarded as a cause of extensive marine pollution. When TANEYA CO., LTD., a Japanese confectionery company, changed its packaging for Japan agar to Almic-can, the company successfully reduced plastic usage per unit from 38.3 g to 12.1 g, or a whopping 68% reduction in plastics. Assuming that the amount of energy required to develop aluminum base metal from mineral (bauxite) is 100, the amount of energy required to create recycled base metal from collected aluminum would be only about three, meaning recycling aluminum contributes to decarbonization. Leveraging the strengths of Almic-can, we plan to enter into the fields, such as nursing care foods, pet foods, and pharmaceuticals.

Nozaki's Corned Beef of KAWASHO FOODS CORPORATAION

Honnama Yokan of TANEYA CO., LTD.

Environment Risk Measures Web

Policies and Management

We appropriately assess the impact of our business on the environment and work to reduce our environmental load and implement measures for preserving the environment based on the findings of such assessments, while contributing to achieving a sustainable society. The Group CEO is the highest authority for environmental preservation activities and environmental risk measures. The environment & safety managers at each business division and site are appointed, and information on the environment is shared through the environment & safety managers meeting. At the same time, instructions from the Management Committee are circulated throughout the Group. At each site, the head of the site and the environment & safety manager lead environmental preservation activities based on their environment and safety action plans.

Strategy for Realizing the Long-Term Vision

To identify environmental risks and opportunities, and compliance obligations, and to ensure that we address them appropriately, we will establish and implement an environmental management system, which covers an implementation structure, securing of resources, education, communication, monitoring and measurement, emergency preparedness and response, and internal audits, whereby consistently improving our environmental risk measures.

Roadmap for realizing the long-term vision

Results in 2022	Plan for 2023	Vision for the future (2030)
● Developed the system to understand and manage environmental risk events ● Prepared the regulations for environment & safety management system	● Establish a system to manage environmental risk events ● Roll out an environment & safety management system globally ● Implement the compliance system	● An integrated environment & safety management system is in place on a global scale. ● The environment management status is visible on a global scale so that we can understand issues and take countermeasures against them promptly.

Targets and results of KPIs on material issues

P58 / Material Issues and Non-financial KPIs

KPIs and 2025 targets	Results in 2022
Zero environmental accidents ● Zero environmental accidents (consolidated)	● 0 (consolidated)

Environmental measures in Kitakata City, Fukushima

In October 2020, at our production base for the aluminum specialty components business located in Kitakata City, Fukushima Prefecture, substances including fluorine were detected in an amount exceeding the regulatory standards in the groundwater flowing beneath the premises. In response, we have implemented remediation measures in line with the Soil Contamination Countermeasures Act.

Niigata Minamata disease

Regarding the Niigata Minamata disease, the outbreak of which was officially confirmed in 1965, we acknowledge that former Showa Denko's wastewater polluted the Agano River, causing great inconvenience to victims and people living around the site. Resonac, in cooperation with the national and local governments, will continue to respond in good faith to the victims of the incident and work to solve the related problems in line with the laws and regulations that provide for compensation to be paid for the damage caused by the pollution.

Efforts for Preservation of Biodiversity Web

Mission of Creating Value

In order to pass down to the next generation the beautiful scenery provided by ecosystems and rich natural resources, the Resonac Group will work to conserve, restore, and improve biodiversity.

Policies and Management

While biodiversity, the gift of nature, supports human life and business activities, biodiversity is rapidly being eroded and faced by various environmental issues. The Group regards biodiversity conservation as essential to recovering the natural power that ecosystems generate. This is why we work to assess business activities' impact on ecosystems so that we can sustainably use natural resources including forests, soil, water, air, and biological resources. Not only assessing the impact of the business activities on ecosystems, but we also cooperate with various stakeholders, such as society, customers, business partners, central and local governments, international bodies, non-profit organizations (NPOs), and non-government organizations (NGOs) to protect biodiversity.

Strategy for Realizing the Long-Term Vision

For protecting biodiversity, we take the following to set concrete targets and KPIs in the future.

- Evaluate and reduce the impact of the Resonac Group's business activities on biodiversity
- Work to restore threatened biodiversity
- Reinforce initiatives through dialogue and cooperation with stakeholders

Roadmap for realizing the long-term vision

Results in 2022	Plan for 2023	Vision for the future (2030)
Actively engaged in a reduction of environmental load by ensuring appropriate maintenance and management of green spaces and reducing wastewater ● Surveyed aquatic life living in the stream flowing in Kitakata Plant in Fukushima Prefecture ● Engaged in conservation activities of ecosystem in Kasumigaura area in Ibaraki Prefecture ● Volunteers from Resonac Asia Pacific Pte. Ltd. participated in cleanup program of national gardens	● Collect examples of activities serving biodiversity conservation and draw up action plans ● Examine biodiversity indicators ● Reinforce existing initiatives	Assess impact of Group's business activities on ecosystems and partner with various stakeholders to use natural resources in a sustainable way, while preserving, restoring, and improving them (Targets and KPIs are currently under review)

Biodiversity conservation, restoration, and improvement activities at Kitakata Plant in Fukushima Prefecture

We survey aquatic life in the stream flowing within the premises of Kitakata Plant to protect endangered life and maintain biodiversity in the area. The survey confirmed the presence of many types of organisms, including fish such as amur minnow and Japanese dace, amphibians such as Japanese tree frogs and wrinkled frog, insects such as water stick insect and agabus japonicus, and shellfishes.

We will make a new plan of preparing waterway while preserving the habitat of aquatic life and start biodiversity conservation activities as the plant-wide initiative.

Wrinkled frog

Water stick insect

Biodiversity conservation in Kasumigaura area (Environmental Rehabilitation Activity around Kasumigaura)

The Resonac Group obtains water for industrial use from Kasumigaura. From fiscal 2012, we are working with an NPO named "Asaza Fund" to undertake the Environment rehabilitation activity around Kasumigaura. Specifically, we have been carrying out activities to regenerate the Satoyama environment (undeveloped woodland near populated areas) while also growing rice and improving the environment on abandoned cultivated land in Sakuragawa City, Ibaraki Prefecture, where we place our operation base.

In cooperation with the locals, we improve the surrounding environment by cutting grass and creating biotopes in line with programs, such as rice planting, weeding, and harvesting, and keep the organism living in the area under observation from certain point. According to the observation, the abundance of life such, as pleuroceridae and brown frogs is increasing compared with those before the activity, and we aim to see more organisms in the future. We also confirm the existence of species such as giant water bug, whirligig beetle, and Japanese eight-barbel loach, which are on the red lists released by The Ministry of the Environment. We continue to work on ecosystem conservation. Due to the spread of COVID-19, those on-site activities had been suspended since 2020, but we resumed our activities in 2023.

April 2023: Rice planting and aquatic life survey

Jumbo dragonfly larvae