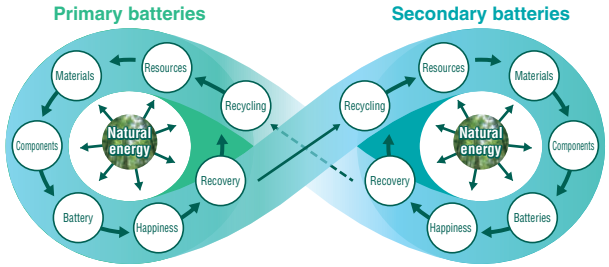
Contribution to the Environment

Realizing a Circular Society

KPI	FY2023	FY2031
Recycled material utilization rate (cathode materials, copper foil)	0%	Compliance with local regulations in each country
Recycling rate (in-house waste)	98.7%	99% or more (less than 1% going to landfill)

Policy

As a company that uses large amounts of natural resources in its business, we believe that using the earth's limited resources in a sustainable manner and passing them on to the next generation is crucial. For the future of children born today, we are increasing recycling to reduce the consumption of new natural resources while reducing waste to lower our environmental impact. We are also working to reduce CO_2 emissions related to the production of materials and disposal of products. We will advance these efforts in tandem with our commitment to achieving decarbonization.



Increasing recycling

Promoting use of recycled materials

In our battery production, we have been using recycled materials, mainly recycled PET and other plastics, because using such materials instead of newly manufactured materials leads to lower consumption of natural resources and lower CO_2 emissions. Committed to realizing a recycling-oriented society and reducing CO_2 emissions, we are also stepping up efforts to extend the use of recycled materials to electrode materials and other components.

In fiscal 2023, we signed an agreement with Redwood Materials Inc., a U.S. battery recycling company, to purchase recycled cathode materials and copper foil for EV lithium-ion batteries. Under the agreement, we will establish a system to recycle process waste and used batteries into lithium-ion battery materials, such as cathode materials and copper foil. Recycled cathode materials derived from waste generated at our US factories will be used at our new factory in Kansas, while recycled copper foil will be used at our factory in Nevada. By also increasing the local procurement rate, this initiative will also lead to lower CO_2 emissions in the resource extraction and logistics processes.

In addition to the United States, we will verify the use of material recycling*1 for cobalt, nickel, and lithium cathode materials with material suppliers and gradually start using cathode materials containing recycled materials in some of our products. In addition, we aim to start utilizing process waste and other materials as battery materials. To this end, we will establish a recycling system for reusing black mass*2 generated from process waste materials and used lithium-ion batteries, as a cathode material.

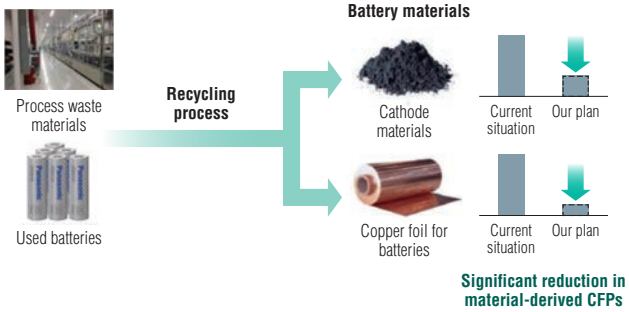
*1. Reuse of waste as materials or raw materials for products
*2. Black powder containing cobalt, nickel, lithium, etc., obtained by heat-treating batteries

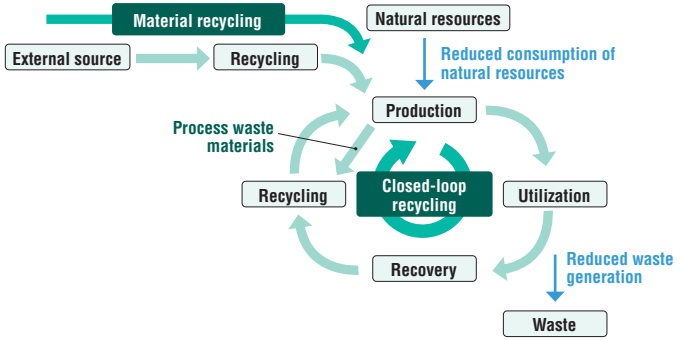
Redwood Materials Inc.
Message from J.B. Straubel, Founder and CEO

We have been working with Panasonic Energy for many years to build a sustainable supply chain.

I am convinced that promoting the spread of EVs will have a great deal of impact on sustainability worldwide. Our collaboration with Panasonic Energy will reduce the carbon footprint of battery production, enabling us to establish a better supply chain and increase local procurement in North America.

We are very honored to work with a company that is innovative, cares deeply about environmental issues, and is committed to solving them. I expect Panasonic Energy will have a tremendous impact on us in the future.





Contribution to the Environment

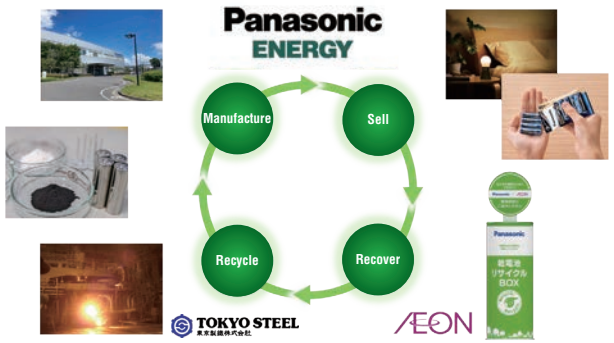
Establishing a battery recycling scheme in collaboration with stakeholders

1. New initiatives for primary batteries: Moving away from "disposable batteries"

For dry batteries, which are primary batteries that cannot be used repeatedly, we are conducting demonstration tests for collecting used dry batteries in Thailand, where the battery collection system is still underdeveloped. In fiscal 2023, in cooperation with CP All Public Company Limited, a local convenience store operator in Thailand, we started demonstration tests for collection and recycling of waste dry batteries at 31 stores. In fiscal 2024, we began similar demonstration tests in Japan in collaboration with AEON RETAIL Co., Ltd. and Tokyo Steel Manufacturing Co., Ltd. In addition to broadening coverage regions and promoting full-scale collecting and recycling in Thailand and Japan, we will expand the know-how we have gained to other regions as well.

In our effort to recycle collected dry batteries, we will first perform recycling to create new materials, such as steel. At the same time, we will conduct R&D aimed at using recycled materials in dry battery components with the aim of realizing "battery-to-battery" recycling.

Primary battery recovery model in Japan



2. Initiatives related to secondary batteries

For secondary batteries, countries around the world are developing legal systems and mechanisms for recycling aimed at using resources more effectively and preventing environmental pollution. In Japan, we are a member of Japan Portable Rechargeable Battery Recycling Center (JBRC), a recycling promotion organization established mainly by Matsushita Battery Industrial Co., Ltd. and SANYO Electric Co., Ltd. (our predecessors). In this role, we engage in collection and recycling of secondary batteries from cooperating stores, municipalities, and businesses nationwide. In fiscal 2023, the industry as a whole collected and recycled 1,700 tons of secondary batteries (around 50% of which were made by our company).

In North America, we collaborated with other battery manufacturers to launch the Call2Recycle program, which offers recycling schemes for secondary batteries in the United States and Canada. We are also helping various other countries create the most efficient systems that match the actual recycling infrastructure situation in each country.

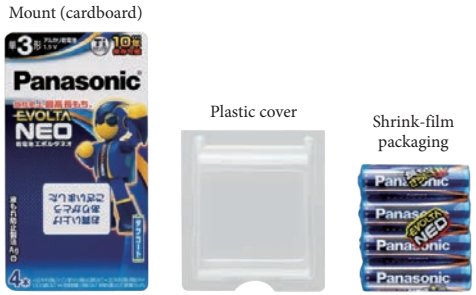
Waste reduction initiatives

Reducing dry battery packaging materials

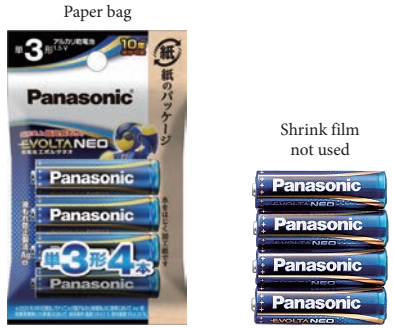
In response to the growing demand among people for ethical consumption (consumption that considers the ethical value of products and services in addition to their functional value), we began selling dry batteries in Japan in fiscal 2022 and Thailand in fiscal 2023 with "ethical packaging" containing minimal materials and less plastics. The introduction of ethical packaging has enabled us to reduce the volume of packaging materials, including plastics, by 38–70% compared with conventional packaging. It also helps reduce total CO_2 emissions throughout the lifecycle of packaging materials, including procurement of raw materials, production, use, and disposal.

In 2023, we will expand our use of ethical packaging by adopting it for our "eneloop" rechargeable nickel-metal hydride batteries. We will also promote global adoption of ethical packaging, starting with the Asia–Pacific region.

● **Conventional packaging**



● **Ethical packaging**



Reduced waste from the factory

We work continuously to reduce waste generated by our factories and increase the volume of valuable materials and resources recycled. Our aim is to reduce the final disposal amount (amount of waste ending up in landfill) to as close to zero as possible.

We have set the factory recycling rate (Amount recycled ÷ [Amount recycled + Final disposal amount]) as a KPI, with a target of 99% or higher. In fiscal 2023, we achieved a factory recycling rate of 98.7% globally.