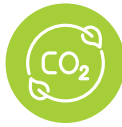


Contribution to the Environment



Achieving Decarbonization

KPI	FY2023	FY2031
Environmental Contribution Index	4.5	15
Avoided CO2 emissions (10,000 t-CO2)	1,493	6,000
Achieving carbon neutrality at our own factories*1	10 sites	All sites (FY2029)
Renewable energy ratio*2	23%	100%
Carbon footprint (per unit of battery capacity)	100% (FY2022)	Vs FY2022: -50%

*1. Factories that have achieved virtually zero CO2 emissions by conserving energy, introducing renewable energy, and using credits.
 *2. Percentage of electricity, fuel, etc. used by Panasonic Energy that is derived from renewable energy sources (includes certificates, credits, and other externally procured items)

Policy

Our Mission is to “Achieve a society in which the pursuit of happiness and a sustainable environment are harmonized free of conflict,” and therefore, responding to climate change, an urgent issue common to all humankind, is our most important challenge. To address this challenge, we will work to increase avoided CO2 emissions (when our products are used by end-users, mainly in the in-vehicle business) and reduce CO2 emissions during battery production (from raw material procurement to product completion at our factories). By increasing our contribution and reducing our impact, we are working together as a Group and in collaboration with our stakeholders to maximize the value we provide.

Increasing avoided CO2 emissions

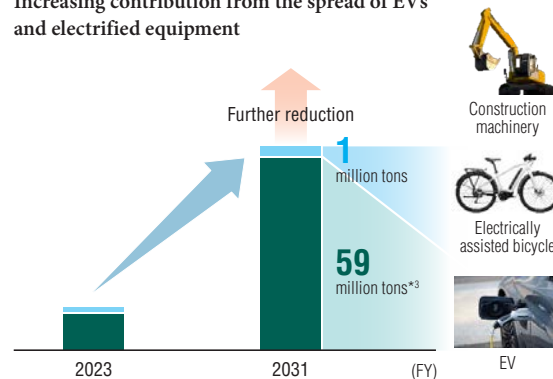
Contribution to mobility electrification

Since the introduction of lithium-ion batteries for in-vehicle use into the market in 2008, we have supported the shift from gasoline-powered vehicles to electric vehicles (EVs) by greatly extending the driving range per charge through tireless technological innovation. To date, we have supplied batteries for a cumulative total of 2.3 million EVs. In addition to the proliferation of electrically assisted bicycles powered by our battery packs, the replacement of gasoline-powered vehicles with EVs powered by our batteries avoided CO2 emissions of approximately 15 million tons in fiscal 2023.

By stepping up our support for mobility electrification, we are targeting avoided CO2 emissions of around 60 million tons in fiscal 2031 (approximately four times the fiscal 2023 level).

To achieve this target, we will increase our annual production capacity of automotive batteries to 200GWh by fiscal 2031. We will also expand the scope of our products and services to fields such as construction machinery, where electrification has not progressed due to higher output and longer operation time requirements compared with automotive batteries. Furthermore, our efforts will be extended to the aerospace sector, where both high output power and weight reduction are required.

Increasing contribution from the spread of EVs and electrified equipment



*3. Avoided CO2 emissions due to EVs equipped with our batteries (our own calculation assuming 140,000km of travel over 10 years)

Reducing CO2 emissions during battery production

Initiatives to reduce CO2 emissions at Panasonic Energy

In addition to helping reduce CO2 emissions in society through our business, we are working to reduce our own environmental impact by both introducing renewable energy and conserving energy.

Regarding the introduction of renewable energy, in Japan we have introduced photovoltaic power generation at each of our sites. At the same time, we are converting around 10% of the electricity we use domestically to renewable energy through a photovoltaic off-site power purchase agreement (PPA)*4.

By also procuring environmental value, such as credits and non-fossil certificates, on a global basis, we have achieved virtually zero CO2 emissions at 10 sites in Japan and overseas as of September 2023, which has been verified by a third-party organization. In addition, our renewable energy ratio has reached around 20%.

In another initiative, we started demonstration tests of a power and heat supply system using small-scale pure hydrogen fuel cells at the factory of Panasonic Energy Wuxi (China) in February 2023. We will expand the scale of these tests in stages with the aim of actively using the next-generation energy sources in the future.

*4. Arrangement in which an electric utility company installs power generation facilities at a location separate from the demand location and supplies the user with the power generated.

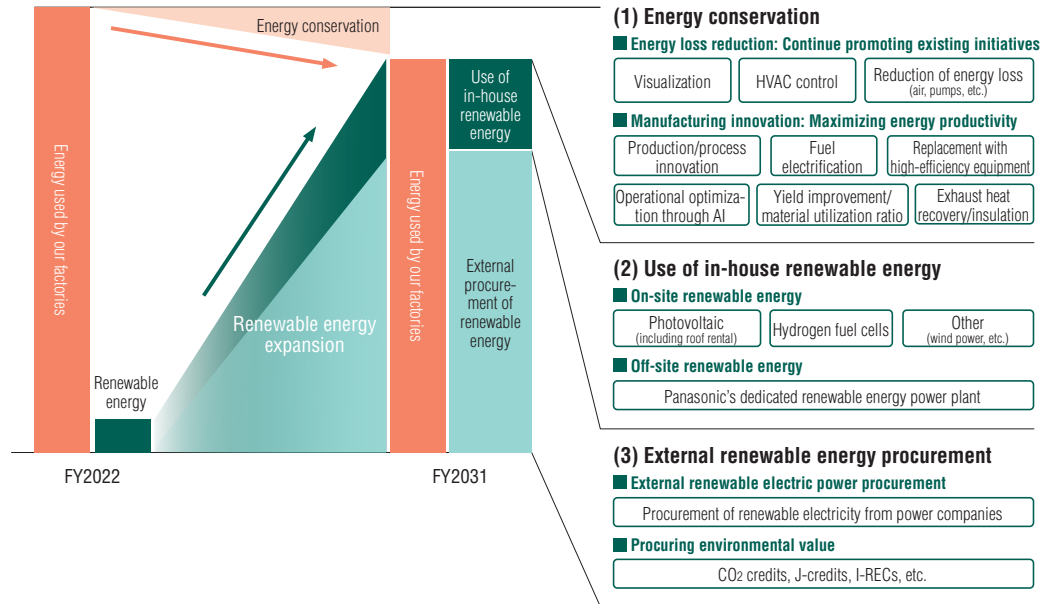


Demonstration tests using hydrogen fuel cells

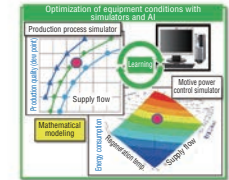
Contribution to the Environment

We also engage in various activities to conserve energy. These include visualization of energy consumption, reduction of losses in HVAC systems and heating equipment in the battery manufacturing process, electrification of heating equipment and factory transport vehicles, replacement of existing equipment with high-efficiency equipment, and introduction of AI-based control systems to save electricity throughout our factories. To horizontally deploy our know-how globally and standardize our activities at a high level, we share information about our energy conservation efforts and issues at each manufacturing site through our “Environmental Commendation System” and at our “Energy Saving Network Events.”

We will continue focusing on the above efforts and achieve carbon neutrality at all our domestic manufacturing sites by fiscal 2026 and all sites globally by fiscal 2029.



Installation of high-efficiency equipment



Operational optimization through AI



Introduction of photovoltaic power generation

Achieved zero-CO₂ factory* status at 10 sites globally (as of March 2023)



* Zero-CO₂ factory
Factories that have achieved virtually zero CO₂ emissions by conserving energy, introducing renewable energy, and using credits, etc.

Contribution to the Environment

Initiatives to reduce CO2 emissions upstream in the supply chain

Nearly 90% of our CO2 emissions (carbon footprint) from the production of batteries comes from resource extraction, raw material processing, and logistics prior to the manufacturing process at our company. To achieve our target of halving the carbon footprint of our battery production by fiscal 2031 (vs fiscal 2022), we are collaborating with a wide range of stakeholders, including suppliers, partner companies from other industries, and research institutes, leveraging their knowledge and experience.

1. Initiatives with suppliers

We are working to reduce CO2 emissions in cooperation with suppliers across all processes involving the materials used in our company, including resource mining, raw material processing, and distribution.

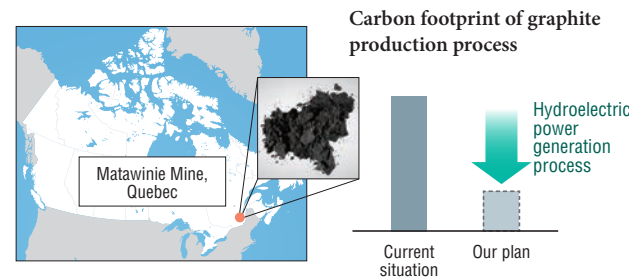
Specifically, we are building a system to reduce CO2 emissions in cooperation with our suppliers, who have gained an accurate understanding of our policy toward fiscal 2031 through annual partners' meetings and other forums. In fiscal 2023, we collected and analyzed carbon footprint information about specific products, identified parts/materials with high impact, and shared the results with suppliers for use in CO2 reduction efforts.



First Partners' Meeting

We are also working to establish new alliances with suppliers that will help reduce our carbon footprint. In fiscal 2023, we signed a memorandum of understanding with Nouveau Monde Graphite, a Canadian graphite producer, to enter a long-term supply agreement. Under the agreement, we will procure anode materials with significantly lower carbon footprint than those made by other companies. This will be achieved through integrated production covering all stages, from resource mining to final product, in Canada, which has a high ratio of electricity derived from hydroelectric power and other renewable energy sources. It will also enable us to procure materials used for our U.S. battery production from Canada, which will shorten the supply chain and lead to a significant reduction in CO2 emissions at the logistics stage.

In other efforts to reduce our carbon footprint going forward, we are looking at resource mining and raw material processing, especially nickel and lithium, which are important minerals. Here, we will identify suppliers with low CO2 emissions, such as those that employ a high percentage of renewable energy, and position them as strategic procurement partners over the medium and long terms. We will also work together with those suppliers to promote the introduction of renewable energy sources, such as photovoltaic and wind power, the use of EV trucks in mines, the use of recycled materials, the development of low-CO2-emission processes, the reduction of energy use, and tree planting activities. At the same time, we will encourage the governments of the countries concerned to offer incentives.



2. Reducing CO2 emissions through technological innovation

We are also working to improve our production processes and the materials we use to reduce the carbon footprint of battery production.

In 2022, we began a joint research project with the Institute of Industrial Science of the University of Tokyo, Toyota Tsusho Corporation, and Prime Planet Energy & Solutions, Inc., with the aim of creating a new production process. Under the project, we are reviewing all stages of battery manufacturing, from the metal resource mining and refining processes to the production of battery materials.

Specifically, we are conducting research with two objectives. The first is to develop a new integrated process covering everything from resource development to battery material development and manufacturing, with the aims of reducing CO2 emissions, production costs, and material development lead times. The second is to develop a new process for recycling battery waste materials and waste batteries, with the aims of significantly reducing CO2 emissions and costs incurred in the recycling process.

Cobalt and other rare metals, which are scarce and expensive to mine and refine, emit large amounts of CO2 during refining, so reducing their content in batteries will help us reduce our carbon footprint. We were the first company in the world to develop and mass-produce a lithium-ion battery with a high nickel content, allowing us to reduce the cobalt content of our cathode active materials to less than 5%. In addition to already established cobalt-free technology, we are working to develop cathode materials with a significantly lower nickel ratio in order to meet the expected increase in battery demand and reduce our carbon footprint.