PROTERIAL

Vol.6
Feb. 29, 2024

NEWSLETTER

Approaches to CO_2 Emissions Reduction

— Initiatives Including the Use of Renewable Energy —

Proterial, Ltd.

About Proterial NEWSLETTER

The Proterial Newsletter is published to introduce and provide wider and deeper understanding of the signature products and technologies of the Proterial Group. Proterial hopes that this communication tool will help you gain a better understanding of the Group.

> Proterial's approach to CO_2 emissions reduction and targets (I)

PROTERIAL

As countries around the world intensify their efforts to address climate change in accordance with the Paris Agreement,[*1] the Japanese government announced in October 2020 its policy goal of reducing emissions of greenhouse gases, as typified by carbon dioxide (CO_2), to virtually zero by 2050. Accordingly, companies are expected to be more proactive than ever in their efforts to transition to a decarbonized society. Based on its Vision, "Leading sustainability by high performance," the Proterial Group is working to solve environmental issues by selecting the environment-related material issues of “Contributing to the realization of a decarbonized society” and “Expansion of resource-conserving, recyclable, and environmentally friendly products.”

Through collaborative creation with its stakeholders, the Group endeavors to reduce CO_2 emissions throughout its value chain, improve the efficiency of its use of water and resources, and minimize its impact on natural capital.[*2]

Specifically, in the promotion of carbon neutrality, the Group works to improve processes including through capital expenditures, the fuel conversion of melting furnaces, heating furnaces, and other equipment, the development of technologies for the use of zero carbon fuels, the introduction of renewable energy, and other initiatives, in addition to existing energy conservation activities. To promote the reduction of CO_2 emissions, the Group began to operate an internal carbon pricing system (setting a carbon price based on the total amount of CO_2 emissions after capital investment and calculating the effect of the CO_2 reduction of the capital investment as profit) in October 2021. The carbon price was set at 8,000 yen/t CO_2 referencing the procurement price of renewable energy in Japan and other countries, emissions credit prices, and other factors. The Group reviews the carbon price periodically and makes other efforts every day to enhance its initiatives.

*1: An international framework for addressing the climate change problem that was adopted at the United Nations Framework Convention on Climate Change (COP21) in 2015 and began to be implemented in 2016. It also includes the SDGs.

*2: Source: Proterial website sustainability page (https://www.proterial.com/e/sustainability/)

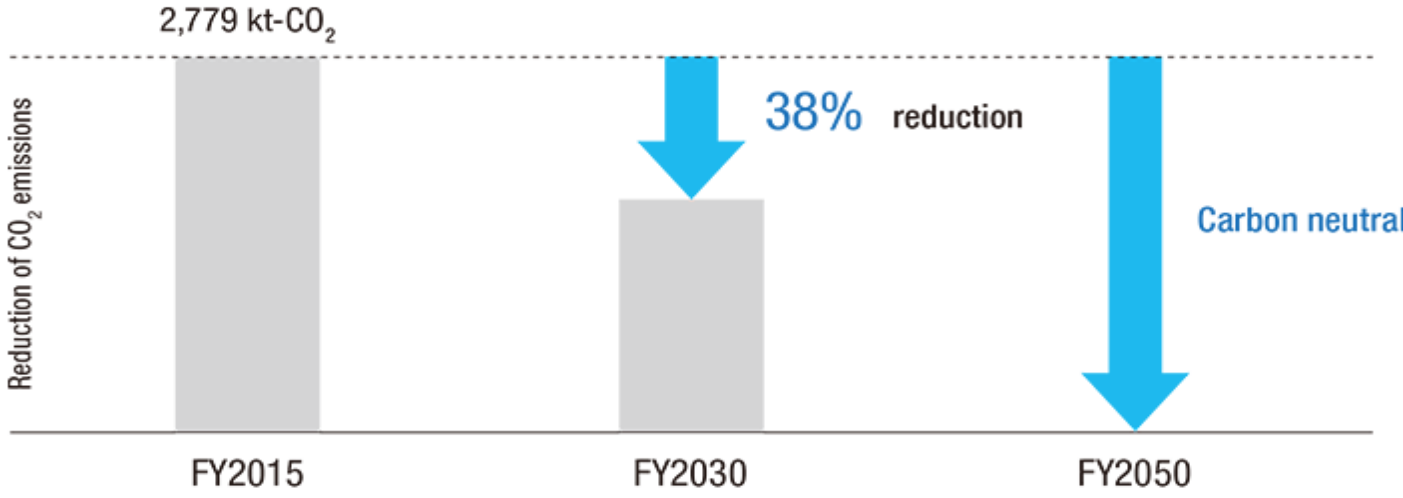
> Proterial's approach to CO_2 emissions reduction and targets (II)

PROTERIAL

What is the specific target?

■ The Proterial Group's CO_2 emissions reduction target

Quantitatively, the Group has set a long-term target as its vision for realizing decarbonized society by 2050 and aims to reduce CO_2 emissions to virtually zero by 2050.



Reduction of CO_2 through two measures: energy saving and introduction of renewable energy

CO_2 reduction by improving productivity efficiency as a base measure

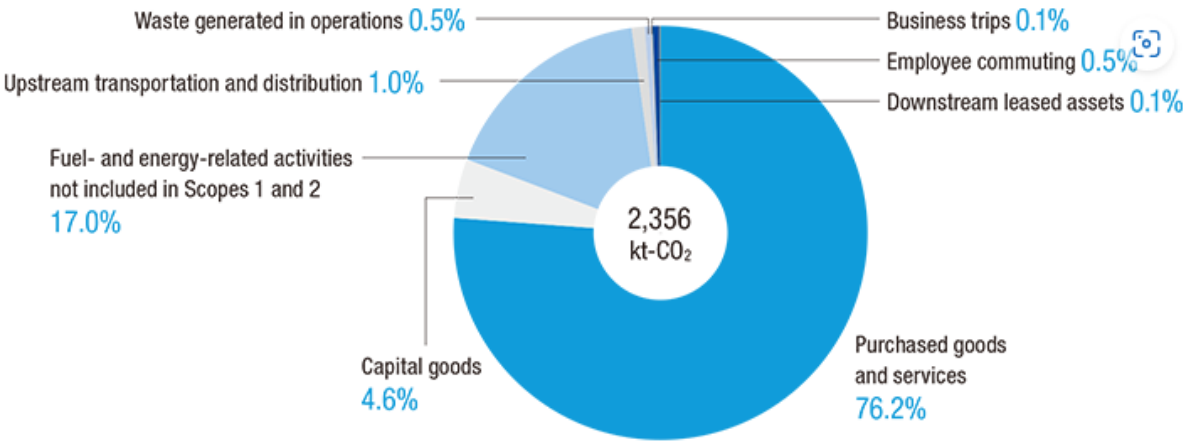
■ Group-wide results

- **Scope 1,2** (thousand t-CO_2)

Target	FY2020	FY2021	FY2022
Scope1	777	876	818
Scope2	1,218	1,340	1,095
Scope1 + Scope2	1,995	2,216	1,913

Scope 1: Direct CO_2 emissions by the company
Scope 2: Absolute volume of indirect emissions associated with use of electricity, heat, and steam supplied by other companies
Scope 3: CO_2 emissions from supply chains related to the company, which are indirect emissions other than Scope 1 and 2 emissions

- **Scopes 3** (FY2022)



> Participation in initiatives and external recognition

The Proterial Group considers the impact of climate change on its business as one of its most important management issues, and believes that enhanced disclosure of climate-change-related information is a key factor in building a relationship of trust with its stakeholders. Accordingly, in June 2021, the Group expressed its support for the TCFD Recommendations, and in accordance with the TCFD Recommendations, the Group will continue to enhance its disclosure of information about the impact of climate change on its business activities.

TCFD (Task Force on Climate-related Financial Disclosures) :
A taskforce for disclosure of climate-related financial information that was established by the Financial Stability Board (FSB) in 2015 in response to the G20's request for the disclosure of climate-related information. In June 2017, the TCFD published its final report recommending that companies and other entities disclose their climate-related risks and opportunities.

The Group proactively supports and participates in environmental initiatives, recognition, and other activities in Japan and other countries in addition to the above.

To achieve its decarbonization target, the Proterial Group considers CO_2 emissions reduction based on two core elements: *production* and *products*. For *production*, the Group is advancing initiatives from two perspectives: "increasing the introduction of renewable energy" and "promoting energy conservation." For *products* as the other core element, the Group contributes to reducing CO_2 emissions by producing products which can help reduce CO_2 emissions during their use by customers and the users that are upstream from customers.
In this issue, the newsletter introduces the Proterial Group's efforts to expand the introduction of renewable energy, which is one of the Group's CO_2 emissions reduction measures.

> Expansion of introduction of renewable energy (I)

■ Photovoltaic power generation initiatives

The Proterial Group is expanding its use of renewable energy and it aims to increase the amount of electricity it generates annually, which was approx. 480,000 kWh/year (484 MWh/year) in FY2022, to more than 35.0 million kWh/year (35,000 MWh/year) by FY2030. Furthermore, the project utilizes a TPO/PPA model of photovoltaic power generation (third party ownership/power purchase agreement) and uses owned land within the premises of a business office to efficiently introduce renewable energy. The TPO/PPA model is a mechanism in which a power user (the facility owner) purchases electricity generated with a PV power system installed by a company that owns and operates the system (the power seller) on the ground or roof of the premises of the facility owner. Its benefit for the facility owner (Proterial) is that it enables the facility owner to introduce renewable energy at a large scale while handling the photovoltaic power generation system as an off-balance sheet*3 item, reducing risk. This renewable energy is used by plants in the manufacturing process, and Proterial is pushing forward with this measure as a core measure for the realization of a decarbonized society.

What are specific examples of these initiatives?

In FY2023, Proterial installed photovoltaic power generation equipment using the TPO/PPA model in Kumagaya area in Saiatama Prefecture and Moka area in Tochigi Prefecture.
With longer hours of sunlight than other areas of Japan, both Kumagaya and Moka areas are appropriate locations for photovoltaic power generation. In addition, Proterial introduced large-scale, high-efficiency photovoltaic power generation equipment on properties where there were few obstacles on the properties' premises. The following pages introduce the most recent examples of these initiatives.

*3: Property that is not recorded as an asset on the balance sheet.

> Expansion of introduction of renewable energy (II)

◎ Example 1: Kumagaya area (Kumagaya City, Saitama Prefecture)

In Proterial's Kumagaya area, which houses its Kumagaya Works and the Global Research & Innovative Technology Center, the company built a photovoltaic power generation facility with solar cell modules with a total output of approximately 10 megawatts (MW), one of the largest off-grid photovoltaic power generation facilities in Japan. It began full-scale operation in February 2024. The 11.5 million kWh/year of electric power generated by the facility is expected to be used entirely within the area, and will amount to approximately 10% of its electric power consumption.*4 The CO_2 emissions will be reduced by 5,100 tons per year. In the Kumagaya area, a large-scale photovoltaic power generation system has been installed using approx. 90,000 m^2 of company-owned land, including unused land and sports fields.

One of the largest off-grid photovoltaic power generation facilities in Japan (Kumagaya area)

◆ Overview of the facility in the Kumagaya area (based on conditions assumed by the operating company)

Annual electricity production (estimated)	11.5 million kWh (First fiscal year)
Estimated annual CO_2 emissions	5,100 tons (First fiscal year)

Bird's-eye view of the photovoltaic generating facility (Moka area)

◎ Example 2: Moka area (Moka City, Tochigi Prefecture)

This facility has a generation capacity of 1,333 kW and will generate 2.5 Million kWh of electricity annually. All of the generated power is consumed within the property. This is equivalent to approx. 2.5% to 3% of the power consumed at Moka Works, and it is expected to reduce CO_2 emissions approximately 1,100 tons per year. Proterial's Moka Works and Group companies are located in the area. The use of the company-owned land with few obstacles has enabled the installation of a highly efficient photovoltaic power generation facility.

◆ Overview of the facility in the Moka area (based on conditions assumed by the operating company)

Annual electricity production (estimated)	2.5 million kWh (First fiscal year)
Estimated annual CO_2 emissions	1,100 tons (First fiscal year)

*4: Percentage at the time operation began

> Expansion of introduction of renewable energy (III)

>>International development

The overall Proterial Group is expanding this activity not only at its bases in Japan but also in countries international, aiming to reduce CO_2 emissions to achieve its targets. As its first major project, in January 2024 the Group introduced a large-scale on-premises off-grid photovoltaic power generation system at Proterial Vietnam Co., Ltd. (hereinafter, "Proterial Vietnam"), its production base in Vietnam.

◎ Example 3: Vietnam base (Hai Duong)

The system generates approximately 5.5 million kWh of electricity per year, which is expected to be about 27%[*5] of the electricity used by the plant equipment of Proterial Vietnam. The CO_2 emissions will be reduced by approximately 4,000 tons per year.[*6]

Vietnam is promoting the use of renewable energy as a nation, and local operators are actively developing the TPO/PPA model.

This has enabled Proterial to implement the large-scale project quickly, which has resulted in the installation of its first large-scale facility at one of Proterial's international bases. As was done at bases in Japan, a large-scale, highly efficient power generation system was installed using company-owned land with few obstacles.

Bird's-eye view of the photovoltaic power generation facility (Proterial Vietnam)

◆ Overview of the photovoltaic power generation facility at the Vietnam base (based on conditions assumed by the operating company)

Annual electricity production (estimated)	5.5 million kWh (First fiscal year)
Estimated annual CO_2 emissions	4,000 tons (First fiscal year)

Aiming to reduce its CO_2 emissions, Proterial promotes the effective utilization of its company-owned lands and plans to install more photovoltaic power generation facilities in Japan and other countries.

*5: Percentage of energy that is renewable energy (compared to electricity usage in FY2021).

*6: Estimated based on the 2022 list of CO_2 emission factors from Vietnam's Ministry of Natural Resources and Environment (MONRE).

> Using city gas to go carbon neutrality

City gas to go carbon neutrality is gas whose greenhouse gases generated in all processes, from natural gas extraction to combustion, are offset with carbon credits that are generated through the CO_2 reduction effects of environmental conservation projects in various parts of the world and other activities and certified by highly reliable certification bodies The introduction of the city gas to go carbon neutrality will help Proterial reduce the CO_2 emissions of its production processes.

◎ Example 1: Kuwana Works（Kuwana City, Mie Prefecture）

In October 2021, the company fully introduced carbon-neutral city gas for the first time at Kuwana Works, where piping components are produced in Proterial.
Specifically, the carbon-neutral city gas replaced the standard city gas used in not only the cast joint production process but also in welfare building facilities and other facilities. This helps reduce the CO_2 emissions of the Kuwana Works approx. 20% from the FY2020 level.
Proterial will continue to take various measures to reduce CO_2 emissions.

Certificate of use of carbon-neutral city gas (Kuwana Works)

Okegawa Works
(Okegawa City, Saitama Prefecture)

◎ Example 2: Okegawa Works（Okegawa City, Saitama Prefecture）

The Okegawa Works of Proterial signed a memorandum on carbon neutralization of supplied gas with the supplying company and introduced carbon-neutral gas in April 2023.
Moving forward, the Okegawa Works will increase the ratio of carbon-neutral gas in a stepwise manner and replace about half of the natural gas used there with carbon-neutral gas by FY2025. This is equivalent to approx. a 25% reduction of the CO_2 emitted from the facilities. With this initiative, the Okegawa Works will promote the reduction of the CO_2 emitted during the production of aircraft and energy materials, its mainstay products, and other production activities.

■ Regarding the promotion of the introduction of renewable energy (Yoshinori Sunaga, Environmental Strategy Department, Manufacturing & Engineering Division)

>> There are many options regarding renewable energy, which is not limited to solar power. Why are you promoting photovoltaic power generation?

Proterial believes that, at present, photovoltaic power generation is comprehensively excellent, looking at aspects such as the reliability of technologies, the ease of introduction including cost, and its limited impact on its surroundings. However, photovoltaic power generation requires a lot of space, and there are limited places where Proterial can install the equipment while controlling its disadvantages. Proterial has therefore begin to consider renewable energy other than solar power. Many operators have entered the photovoltaic power generation business, and the conditions they propose vary, such as the geographical area where they have an advantage, the scale of the facilities they propose, and construction method. Therefore, expertise is necessary in the selection of business operators and in negotiations. To enable Proterial to procure power at the lowest cost while conforming to the location and installation requirements of each base, I have established company-wide guidelines for the introduction of renewable energy and are working together with procurement departments to collect information, understand the details of each project and share examples internally.

>> Carbon neutrality initiatives are an issue in the steel industry as a whole. What is Proterial's view on this?

I understand that it is a significant issue, but Proterial uses electric furnaces, which Proterial believes allow Proterial to achieve carbon neutrality more easily than blast furnaces that require a large amount of coke to reduce iron ore to iron. However, because Proterial uses a lot of electric power as heat, I think Proterial has a great social responsibility to control CO_2 emissions by saving electricity and using renewable energy.

>> What are the advantages and disadvantages of the TPO/PPA model?

Its advantages are that it requires a minimum investment and it does not require to have expertise in the planning, operation, and maintenance of the facilities because the operating company installs and manages them. Its disadvantages are that it is difficult to change the use of the land and other matters during the long period until the expiration of the contract and that the total expense of procuring power is a little larger than in the case of self-financed facilities.

>>Will the introduction of renewable energy be expanded to all production bases? What is Proterial's vision of and future outlook for the achievement of carbon neutrality, including other measures?

Proterial has many bases with high demand for electricity, so Proterial will continue to increase the photovoltaic power generation. To do this, Proterial needs to introduce photovoltaic power generation systems in a well-planned manner in consideration of the status of empty lands and roofs, and also the surrounding environment. Proterial will increase the use of these systems gradually by additionally using virtual power purchase agreements (VPPAs, photovoltaic power generation agreements under which the equipment is installed in a remote location) while also examining the social situation. Unlike photovoltaic power generation, city gas to carbon neutrality is synonymous with the purchase of carbon credits. I think that Proterial will adopt it within a certain scope in consideration of the status of the achievement of Proterial's CO_2 reduction targets, feasibility, and further, Proterial's contribution to society (support for the CO_2 reduction activities of other companies).

To achieve the long-term targets towards 2030 and 2050, Proterial positions the improvement of productivity as Proterial's main measure, with energy conservation and renewable energy as Proterial's two pillars. Above all other energy conservation measures from the viewpoint of effectiveness and sustainability, the efficiency improvement of production equipment forms the core of Proterial's energy conservation measures.

Specifically, fuel conversion, heat insulation, use of exhaust heat, the optimization of utilities, and the building of a precise system for visualizing these types of energy are believed to be necessary. While Proterial has been working on energy conservation for many years, there is still room for consideration because technology is rapidly progressing, something that can be seen in the reduced fuel consumption of automobiles. The detailed visualization of energy data using digital technologies enables the overall optimization of production activities and the improvement of their efficiency.

Further, regarding renewable energy, I would like to consider the use of biofuels including biocoke and non-fossil sources of energy such as hydrogen and ammonia, in addition to photovoltaic power generation.

I would like to advance activities for achieving carbon neutrality in an integrated manner by regarding them as opportunities to upgrade Proterial's manufacturing, as well as measures for the good of the global environment.

The Proterial Group has clarified the risks and opportunities of future climate change and is transforming its scenario analysis annually, aiming to formulate business strategies to reduce risks and increase opportunities. The scenario analysis must encompass the entire Group, including its supply chains. In FY2021, Proterial analyzed the scenarios by limiting the number of scenarios and their scope. In FY2022, Proterial analyzed its domestic business. Further, in FY2023, looking at each business unit, Proterial reevaluated its domestic business in line with the transition to the new system. Moving forward, Proterial will push forward with scenario analyses that include international businesses as well, thus steadily moving forward as a company “Leading sustainability by high performance" based on the Vision by Proterial.

[Media Inquiries] Corporate Communications Department, Proterial, Ltd. https://www.cntct.proterial.com/contact/publish/inquiry_eng?g=01&c=001-01

■About PROTERIAL

PROTERIAL

"Proterial" reflects the essence of our corporate philosophy, which consists of three elements: Mission: "Make the best quality available to everyone;" Vision: "Leading sustainability by high performance;" and Values: "Unfaltering integrity" and "United by respect." It combines "pro-" with the word "material."

"Pro-" represents our "three pros":

・Professional — work that exceeds expectations ・Progressive — a spirit that keeps challenging ・Proactive —an enterprising attitude

"Material" refers to the high-performance materials that our original technologies produce and underpinned by the three pros. With our focus on solving customer issues and bringing new levels of value, we promise to contribute to the realization of a sustainable society through the products and services that embody our philosophy.

■Proterial, Ltd. — Company Overview

Established: April 1956
Head office: Toyosu Prime Square, 5-6-36 Toyosu, Koto-ku, Tokyo 135-0061, Japan
Capital: 310 million yen (as of March 31, 2023)
Representative: Sean M. Stack Representative Director, Chairman, President, and Chief Executive Officer(CEO)
Sales revenue: 1,118.9 billion yen (Term ended March 2023)
History: 1910: Founded as Tobata Foundry Co.
1937: Merged with Hitachi, Ltd.
1956: Established separately as Hitachi Metals Industries, Ltd.
2023: Company separated from the Hitachi Group, and renamed from Hitachi Metals, Ltd. to Proterial Ltd.

PROTERIAL