MISSION NET ZERO

Since announcing its Carbon Neutrality Declaration, MISSION NET ZERO, in October 2021, MHI Group has been steadily promoting it as a key growth strategy for both solving social issues and achieving sustained growth.

MISSION NET ZERO = Growth Strategy

MISSION NET ZERO is a core growth strategy of the Group that organically links initiatives to reduce Scopes 1, 2, and 3 emissions. Rather than viewing CO_2 reduction as a management challenge, we see it as a growth opportunity and a means of driving business expansion.

As decarbonization remains a major social challenge in addressing climate change, the Group is working to reduce Scope 3 emissions by providing products and services that foster decarbonization on both the energy supply and demand sides. On the supply side, we have identified the gas turbine and nuclear power businesses as growing core businesses. Here, we are promoting the social adoption of solutions that balance S+3E[1]. At the same time, we are developing conversion technologies for carbon-neutral fuels including hydrogen, and expanding our CCUS business to prepare for future progress in decarbonization. On the demand side of energy, there is still significant potential to reduce CO_2 emissions using existing products and technologies, such as heat pumps and cogeneration systems. Accordingly, we will strive to provide attractive products that enable more customers to adopt these solutions. In light of the worldwide expansion of data centers, we will also leverage our cooling technologies and engineering expertise to help address the energy challenges of data centers. Meanwhile, in industrial sectors where reducing CO_2 emissions from process heat is particularly challenging, we are focusing on developing high-temperature heat pumps that help lower energy consumption.

Scopes 1 and 2 emissions primarily refer to CO_2 emissions generated from the use of energy, such as gas and electricity, associated with the manufacturing of products in our factories. Through further energy conservation and streamlining efforts, we will work to reduce Scopes 1 and 2 emissions. At the same time, we will establish technology development topics for the challenges we face in reducing Scopes 1 and 2 emissions to acquire the technologies needed to advance decarbonization. We view the reduction of CO_2 emissions as an excellent opportunity to improve productivity and develop new technologies, so we will forge ahead without simply treating decarbonization as an additional cost. By sharing expertise gained from tackling Scopes 1 and 2 emissions with customers and business partners, we will also foster substantial CO_2 reduction across the entire value chain.

We will continue to broadly provide the decarbonization technologies and expertise we have cultivated through our businesses to deliver exponentially greater contributions to society.

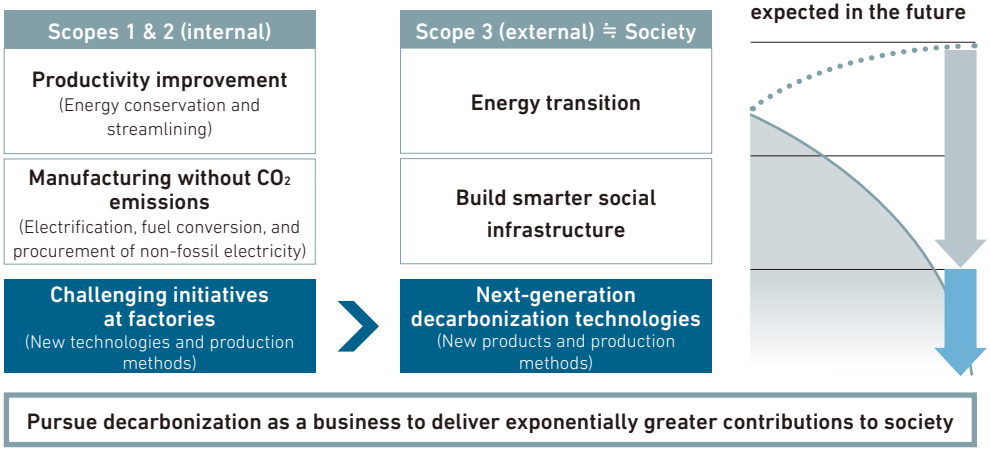
1 S+3E: Safety + Energy security, Economic efficiency, and Environment

CO_2 Emissions: Trends and Targets

Under MISSION NET ZERO, MHI Group will reduce CO_2 emissions (Scopes 1 & 2 and Scope 3 + reductions from CCUS) throughout the value chain by 50% by 2030 (versus 2014 levels for Scopes 1 & 2 and 2019 levels for Scope 3 + reductions from CCUS) and achieve Net Zero by 2040.

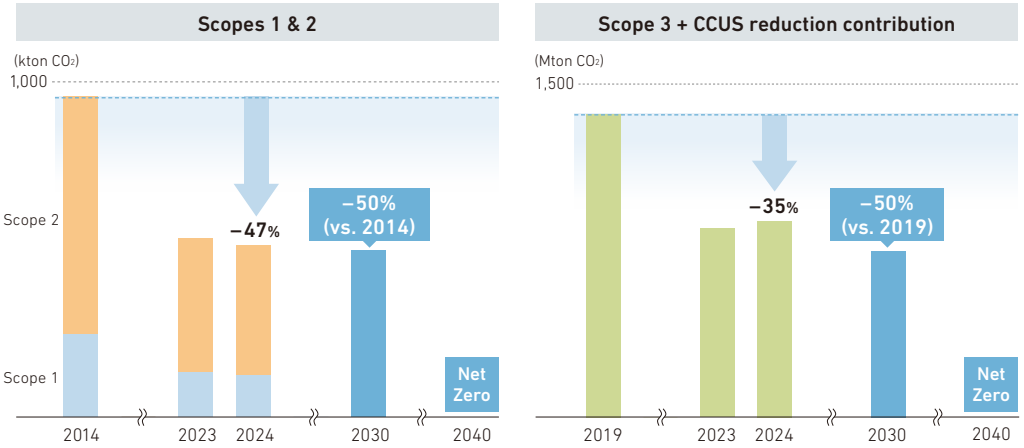
In FY2024, Scopes 1 and 2 emissions totaled 518 kton, down 16 kton from the previous year. This reduction was achieved primarily

Decarbonization as a Growth Strategy



Rising CO_2 emissions expected in the future

CO_2 Emissions: Trends and Targets



Note: CCUS: Carbon dioxide Capture, Utilization and Storage

through two initiatives: energy conservation and streamlining (5-kton reduction) and the installation of solar power generation facilities (11-kton reduction). At the beginning of FY2024, we expected CO_2 emissions to rise due to higher energy use associated with increased production. However, the reduction effects from our unique, globally implemented energy conservation and streamlining initiatives more than offset this. Combined with the lower CO_2 emission factor for Japanese domestic electricity, this led to a net emission reduction of 5 kton. In addition, the solar power generation facility that commenced operation in March 2024 at our Mihara Machinery Works (Wadaoki Plant) in Hiroshima Prefecture operated as planned throughout the year, contributing to CO_2 reduction for the first time on a full-year basis. The electricity generated by this plant enabled us to decarbonize all the power used at Mihara Works and part of the power used at nearby Company sites, resulting in year-on-year emissions reduction of 11 kton. Meanwhile, Scope 3 plus reductions from CCUS totaled 882 Mton, up 32 Mton from the previous year. This increase was due to higher product sales volumes and aligns with the rise in revenue. Scope 3 emissions per ¥1 million of revenue were 175 tons, down steadily from 183 tons in FY2023. This demonstrates that, by realizing S+3E, our products are making steady progress toward the decarbonization of society.

Future Outlook and Utilization of the MAC Curve

At present, the Group is receiving a large number of orders, particularly in the gas turbine, nuclear power, and defense-related businesses. In response, we are planning production increases that exceed the levels initially assumed when we announced MISSION NET ZERO. With the increase in production, we expect energy use to rise by around 40% from current levels, bringing Scopes 1 and 2 emissions to an estimated 700 ktons in FY2030. This indicates that the CO_2 emissions outlook underlying MISSION NET ZERO has increased.

To effectively control and reduce the anticipated increase in Scopes 1 and 2 emissions associated with business growth, MHI Group uses the MAC Curve[2] at its factories and sites. The MAC Curve is a graphical representation of the effectiveness of individual reduction measures to reduce CO_2 emissions and the costs associated with them. It can serve as a roadmap for decarbonizing factories.

We have already established guidelines for creating MAC Curves and have been gradually rolling them out across the Group since FY2023. We have completed MAC Curve–based analysis of emission sources covering 62% of the projected emissions for FY2030. Of this, 130 kton (18% of projected emissions) are expected to be reduced through energy conservation and streamlining measures. By applying MAC Curves across the Group to refine energy-saving and streamlining ideas and solutions at each factory and site, and by broadly deploying them within the Group, we believe we can achieve MISSION NET ZERO.

2 MAC Curve: Marginal Abatement Cost Curve

TOPIC

Carbon Neutral Transition Hub Mihara

Since 2022, we have engaged in the Mihara Machinery Works' Advanced Carbon Neutrality Project, positioning our Mihara Machinery Works as a model facility for reducing Scopes 1 and 2 emissions. When the project began, annual Scopes 1 and 2 emissions at the facility totaled 10,410 tons. Thanks to the operation of the solar power plant installed at the site, along with energy-conservation and streamlining initiatives, we reduced emissions to 220 tons in FY2024.

In May 2025, we commercially launched Prismo, a more environmentally friendly next-generation Automated Guideway Transit (AGT) system, at Mihara Machinery Works. Prismo is a groundbreaking offering that reduces CO_2 emissions during both construction and operation utilizing a center guidance system and a proprietary energy management system. Prismo has earned high recognition by being manufactured with low CO_2 emissions at Mihara Machinery Works, our model plant for Scopes 1 and 2 reductions. By organically linking Scope 3 with Scopes 1 and 2 emissions in practice in this way, our Mihara Machinery Works has evolved from being a model plant for Scopes 1 and 2 reductions into a model plant for MISSION NET ZERO.

Going forward, we will continue our efforts by experimentally gathering and introducing technologies and expertise that enable more effective use of energy based on six key concepts: utilize, separate, consolidate, exchange, circulate, and synthesize. We will also further develop Mihara Machinery Works as a site for co-creation among internal and external stakeholders working to achieve factory decarbonization.