

Evolution and Challenges in the Field of Automobile Paint Finishing Systems

Toward the realization of a carbon-neutral society

Against the backdrop of the shift to a carbon-neutral society on a global scale, the automobile industry is undergoing a once-in-a-century revolution. The Company is promoting the proposal of CO₂ reduction technologies, such as automobile paint finishing systems, and it is concentrating its development efforts on technological innovations such as significant upgrades to existing technologies, technological proposals to respond to changes in primary energy, and changes in production technologies, thereby contributing to the resolution of social issues.

Toward carbon neutrality in automobile painting processes

In response to the growing demand for a carbon-neutral society around the world, each country announced specific targets for greenhouse gas (GHG) reduction at the Leaders Summit on Climate in 2021. In the automotive industry, which is one of the industries that will be most significantly affected by this, automakers have expressed support for the Task Force on Climate-related Financial Disclosures (TCFD). They emphasize the inclusion of reduction targets in their business strategies in light of risks and opportunities from climate change.

Against this backdrop, the Company believes that its mission is to work with automobile manufacturers to develop and provide paint facilities that reduce CO₂ emissions to zero in order to achieve carbon neutrality in the automobile manufacturing process, particularly at paint finishing factories.

Trends in each country

Japan revised its target upward from 26% to 46% reduction in CO₂ emissions from FY2013.

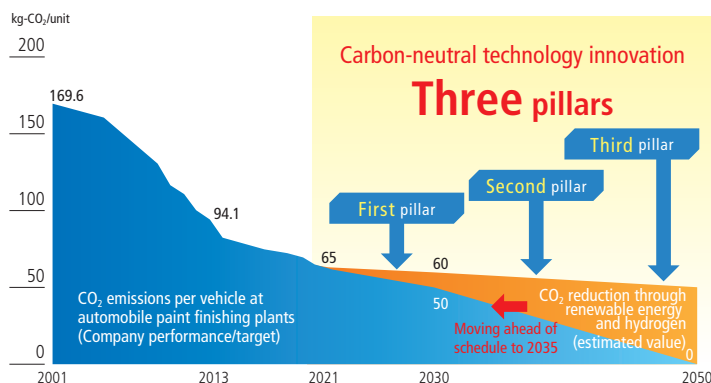
	Target rate of CO ₂ reductions (%)			Reference Reduction rate from 1990 to 2018	
	Base year	2030	2050		
U.K.	1990	-68% or more	Net zero	U.K.	-42%
EU	1990	-55% or more		EU	-25%
U.S.	2005	-50% to 52%		U.S.	-4%
Japan	2013	-26% → -46%		Japan	-2%

The Company's carbon neutrality strategy and future policy

In alignment with high environmental targets set by automobile manufacturers around the world, the Company was early to examine and deploy technologies to reduce CO₂ emissions (see page 54). We are in a position to take great advantage of being able to receive direct input from customers from diverse automobile manufacturers regarding their technological needs and points for improvement and, when necessary, even engage in collaborative development while developing and proposing CO₂ reduction technology.

As for our future carbon neutrality strategy, we are going to keep in step with the basic strategies of automobile manufactures. We plan to refine our current low CO₂ production technologies until 2030, and then reduce emissions by using renewable energy and hydrogen by 2050. At the same time, we will work to develop technological innovations such as changing production technologies. Specifically, we have established the following three pillars.

The Company's carbon neutrality goals and basic policy



First pillar

CO₂ reduction activities based on improvement through the upgrade of our technologies

Second pillar

Energy management and CO₂ reduction activities in response to primary energy reforms such as Usage of electrification and hydrogen Utility

Third pillar

CO₂ reduction activities through an innovative shift in production technology from wet painting to dry decoration

Vision and image of Taikisha's three pillars of carbon-neutral technology

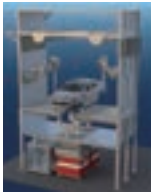
First pillar CO₂ reduction activities based on improvement through the upgrade of our technologies

Even in the conventional painting process, we are developing and expanding a product lineup called the "i-series" that will reduce CO₂ emissions by significantly upgrading basic items.

Equipment products of paint booth

i-LAVB (low air volume booth)

By creating airflow for each function, the air volume of the booth will be largely reduced. CO₂ emissions: reduced by approximately 30%



Equipment products of paint oven

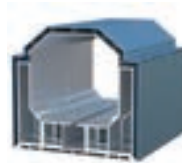
i-VACH (indirect furnace with VOC treatment function)

A new heat source system that eliminates the need for VOC after-treatment equipment. CO₂ emissions: reduced by approximately 20%.



i-HEB high-efficiency block oven

An oven with a compact module structure capable of efficiently raising the baking temperature in the oven.



System products of paint finishing system

i-Navistar (AI/IoT system for paint finishing factories)

A system that manages the entire painting process from a bird's-eye view by utilizing AI and IoT.

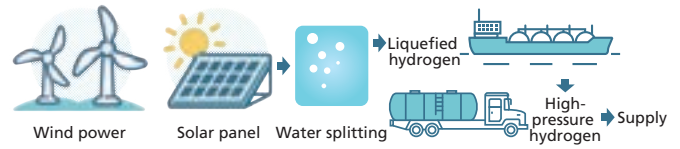


Second pillar

Energy management and CO₂ reduction activities in response to primary energy innovation such as electrification and hydrogen utilization

Trends in primary energy CO₂ reduction

In light of the moves of automobile manufacturers that have expressed their intention of considering introducing hydrogen and electrification, we will also consider putting into practice CO₂ reduction technology that incorporates hydrogen and electrification. In the future, we will also promote technological proposals that can be applied in a timely manner for the spread of synthetic methane and various types of energy.



Hybrid energy system

A hydrogen burner and a ceramic electric heater will be installed in the dryer test equipment in the Company's Technical Center to propose a system capable of handling various types of energy such as hydrogen, gas, and electricity. Depending on the primary energy utility situation, it is possible to choose either single combustion of hydrogen and gas or mixed combustion. In addition, we consider proposing a hybrid system in accordance with the application and situation of operation at each stage from heat up and steady operation, by utilizing IT technologies.



Fully electrified facilities

Based on the assumption that it will be possible to supply carbon-free power sources in the future, the company is considering to fully electrifying its paint finishing factories, by the use of a Heat pump of hot water or hot air heat source type, and aiming to reduce electricity consumption by combining this with its energy-saving technology.



Third pillar

CO₂ reduction activities through an innovative shift in production technology from wet painting to dry decoration

Automobile manufacturers' efforts to achieve carbon neutrality

Automobile manufacturers and emerging EV manufacturers in Japan and overseas are exploring an alternative painting method to conventional spray painting in order to make the painting process carbon neutral. As an example, they are examining various decorating systems.

Toward the practical application of film decoration systems for automobile exteriors

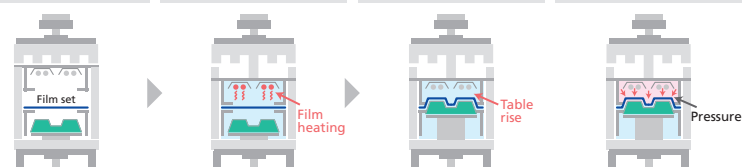
The use of film OMD (Out Mold Decoration) eliminates the spray coating process, resulting in low carbon emissions, and eliminates the need for wastewater and exhaust treatment equipment, which is expected to have environmental benefits.

In addition, it is technically possible to expand the design features of decorating films such as patterns, marks, and lighting, and to add functionality (solar cells, heat shielding, etc.).

The Company is promoting the development of dry decorating technology that will provide added value to the exterior of automobiles.

Decorating film vacuum molding system

- 1 Material and film set
- 2 Vacuum suction and heating
- 3 Molding
- 4 Extraction and processing



Dry decoration technology using high-performance film can be applied not only to automobile exterior, but also to all fields of exterior decoration and exterior multifunction.