

## R&D Strategy

The world is seeing the emergence of numerous problems that are difficult to solve by using methods of prior years. To help solve these problems, we will use many partnerships to further upgrade our ability to create innovative ideas.

**How Shareholder Value Is Maximized** » See pages 3-4.

	Our pursuit	Relevant financial information
Innovation & Product Stewardship	Develop sustainable products (NPSI) / monitor LCA + Chemicals of concern	Sales (contribute to new products/new markets) Expenses: R&D Assets, Intangible assets (patents, etc.)

### Our approach to achieving MSV

Our technology mission is to drive and sustain growth and market share in Japan and globally as a leading technology organization for coatings and adjacent markets. We have formulated our innovation strategy with three pillars: 1) build an adaptive organization; 2) develop core enabling technology competency; and 3) expand into adjacencies and emerging markets. These are initiatives for MSV from a technology perspective. We believe that our technology organization's culture of being customer-centric, socially responsible and collaborative is the key driver to success.

LSI (Leveraging, Sharing, and Integration) is a collaborative activity within our global R&D partner companies. It involves 14 projects from multiple regions or segments, with a projected business impact of USD530 million over the next three years. In addition to these projects, the technology teams in decorative paints have established a global technical community to exchange best practices and leverage research capabilities in joint technology development projects as part of LSI. These initiatives aim to break down silos, encourage collaboration, and optimize the organization's collective expertise and assets for MSV.

### Governance

Nippon Paint Group has approximately 4,300 technical staff globally, including about 990 in Japan. They are the driving force of our powerful innovation and core enabler of competitiveness for achieving sustainable business growth.

We have established a framework that allows the reinforcement of global technology collaboration for increasing the added value of intellectual property. For instance, technology teams in decorative paints have formed a global technology community to share best practices and leverage research capabilities in joint technology projects, which have produced successful outcomes in addressing the needs of customers in each market. We have also started LSI (Leverage, Share & Integrate) activity aimed at driving technology sharing and capability enhancement among partner companies to facilitate technology exchange platforms and cross-organizational projects among partner companies.

Nippon Paint Group manages intellectual property by classifying its core technologies involving paint and coatings in 12 categories: polymer chemistry, color science, formulation, curing technology, dispersion technology, application technology, process technology, rheology, weathering and corrosion, measurement science, AI and sustainability. Experts in each core technology field are working in core R&D teams in the R&D centers and collaborating with scientists from the global network of technical centers to support product development across the Group.

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#### Innovation initiatives

We developed the New Product Sales Index (NPSI) as one of the indicators for measuring the sales volume of products produced using innovative technologies, as part of our efforts to foster innovation. Nippon Paint Group has defined NPSI as the percentage of sales revenues generated from new products commercialized in the past three years to the total sales revenues. NIPSEA Group started using the NPSI in 2018 and Japan Group in 2022. Japan Group and NIPSEA Group achieved a combined NPSI of 25% and launched approximately 10,000 new products in 2023.

#### Sustainability of our products

We define sustainable products and technologies by aligning with the United Nations Sustainable Development Goals (SDGs) and adopting a portfolio sustainability assessment (PSA) process to enable identification of sustainable products. This encompasses a systematic approach that includes main lifecycle stages of a product: Product feedstock, Production, Applications and End of life. At each of these stages, we evaluate how our paint and coatings products outperform market products by mapping specific SDG targets to their attributes. To support this sustainable framework, we have developed the Sustainability Scoreboard, an assessment tool now integrated into the NPSI systems of our partner companies in Japan Group and most NIPSEA Group partner

### Our sustainable products

AQUATERRAS is an innovative marine coating product from Nippon Paint Marine that improves ship operations, fuel and cost efficiency and reduces CO<sub>2</sub> emissions in the marine industry. This product, a biocide-free self-polishing coating (SPC), took eight years to be developed and tested, and can reduce ship friction by approximately 15% and fuel consumption and CO<sub>2</sub> emissions by approximately 10%. Applying cutting-edge medical antithrombotic polymer technology, the hydrophilic and hydrophobic microdomain structure prevents biological adhesion. This effectively prevents marine organisms from attaching to and growing on the ship's hull, contributing to the efficient operation of the ship.

» For more information on our sustainability innovations, please visit "[Results of sustainable products](#)" under the "Creation of Sustainable Products" section on our website.



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companies. Moreover, we have established the "Green Design Review" within our R&D project management systems, which serves as a process to assess each project's contribution towards building a sustainable society.

### Risk management

In 2021, Japan Group launched the "Green 30" chemicals management system to minimize the impact of chemicals on the environment and public health. This system is designed to manage Chemicals of Concern (CoC) based on regulations or treaties such as REACH regulations in EU, TSCA in the USA and CSCL in Japan. We classify chemical risks into three categories (Rank A, Rank B, Rank C) according to the laws and regulations in the countries where we operate. Japan Group started using this system in 2021 and the system is being expanded to our partner companies outside Japan.

Alkylphenol ethoxylates (APEs) are mainly used for surfactants and include the subcategory of nonylphenol ethoxylates (NPEO/NPE). Nonylphenols (NP), raw materials for NPE, are regulated by REACH and TSCA. Nippon Paint Group has been steadily phasing out APEs-containing surfactants.

In addition, we have been replacing UV absorbers such as UV-328 and UV-327 that are considered as persistent organic pollutants (POPs) with other substances. In Japan Group, the phase-out of UV-328 was completed by the end of 2023. Moreover, in Japan we are reducing the use of chlorinated paraffins, including other POPs, medium-chain chlorinated paraffins (MCCP, with carbon chain lengths in the range C14-17 and chlorinated content of 45% by weight or more).

\* The definitions of categories

Rank A (Prohibited): Prohibition of introduction

Rank B (Restricted for new introduction): Prohibition of new introduction with some exceptions

Rank C (Avoid new introduction): Decide whether or not to introduce based on regulatory trends, environmental impact, and the business environment

No rank: No impact on raw material introduction

» For our risk management initiatives, please refer to "Initiative" under the "Management of chemical substances" section on our website.

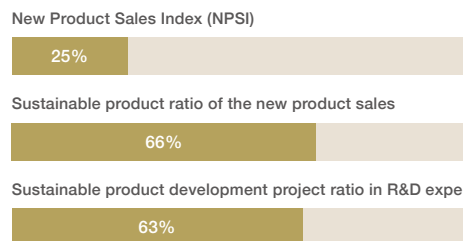
## Metrics and targets

### Roadmap

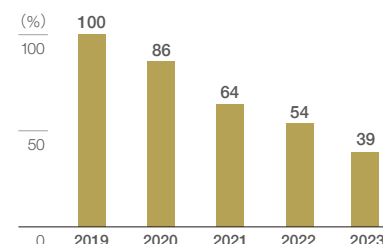
	2023	2024	-2030
<b>Sustainable Products</b>	<ul style="list-style-type: none"> <li>Life Cycle Assessment (LCA) of selected products can be calculated at each PCG</li> <li>DuluxGroup: Implementation of sustainable product sales and packaging roadmaps</li> </ul>	<ul style="list-style-type: none"> <li>Develop methodologies and modeling of LCA (PCF<sup>1</sup>, software, database)</li> <li>IT Tool implementation for product sustainability scoring in system</li> <li>Sustainable products portfolio optimization</li> <li>DuluxGroup:                             <ul style="list-style-type: none"> <li>Develop recommendation for Scope 3 reduction target and roadmap</li> <li>Continue implementation of sustainable products sales and packaging roadmaps</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Manage the performance of Sustainability Scoreboard of each PCG every quarter</li> <li>Promote creation of more innovative sustainable products</li> <li>Implement sustainable products and Scope 3 reduction roadmaps</li> <li>DuluxGroup: Deliver 2030 Best in Class sustainable product sales target</li> </ul>
<b>Chemicals of Concern (CoC)</b>	<ul style="list-style-type: none"> <li>The execution of the phase-out plan of CoC in each PCG</li> <li>NIPSEA Group: Focus on 4 hazardous heavy metals<sup>2</sup></li> <li>DuluxGroup: Completed position statements for 75% of CoC and developed a structured program of CoC in Europe</li> </ul>	<ul style="list-style-type: none"> <li>Proceed with the CoC phase-out plan by regions and business units based on local status</li> <li>Continuously evaluate other CoC restriction requirements and implementing action plans</li> <li>DuluxGroup: Continue development of positions statement for 95% of CoC</li> </ul>	<ul style="list-style-type: none"> <li>Create sustainable products based on phase out plan</li> <li>Phase-out 4 heavy metals before the end of 2030 globally</li> </ul>
<b>R&amp;D</b>	<ul style="list-style-type: none"> <li>R&amp;D activities for sustainable products from PCG beyond Japan and NIPSEA, e.g., DuluxGroup, Dunn-Edwards, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Initiate and drive flagship projects in sustainability</li> <li>Create sustainable project portfolio and drive sustainable business growth</li> </ul>	<ul style="list-style-type: none"> <li>Drive innovation towards UN SDGs and carbon neutrality</li> </ul>
<b>Product Stewardship</b>	<ul style="list-style-type: none"> <li>Identified inquiry items</li> <li>Stakeholder questionnaire</li> <li>NIPSEA Group: Reinforced PS&amp;RA<sup>3</sup> team</li> <li>DuluxGroup: Implemented Product Vision to help with formulation management and regulatory tracking</li> </ul>	<ul style="list-style-type: none"> <li>Monitor, record and communicate the change of global regulations</li> <li>Assess raw materials introduction, register new substances and ensure SDS and GHS label generation, registration hazard chemical permits correctly and precisely</li> <li>Respond to customers' requests, i.e., RoHS, IMDS etc.</li> </ul>	<ul style="list-style-type: none"> <li>Implement inquiry management database</li> <li>Inquiry response training</li> <li>Training for customers and business partners</li> <li>DuluxGroup: Implement packaging roadmaps</li> </ul>

\*1 Product Carbon Footprint \*2 Lead, Chromate (Cr6+), Cadmium, and Mercury \*3 Product Stewardship & Regulatory Affairs

Sustainable products data (2023)



Chlorinated paraffins usage (2019=100)



UV-328 usage (2019=100)

