

Sustainable Products and Resource Management

Strategy

Green Business

Business Portfolio Transformation

Under the ESG slogan ‘Green Future with Green Energy,’ HD Hyundai Oilbank has established three strategic directions and is advancing the transformation of its business portfolio with Green Growth as a key execution pillar. This strategy is intended to respond to the global energy transition and growing demand for sustainable energy by further advancing its business structure with a focus on green products. In its existing oil refining business, the Company is strengthening its profit base through process efficiency improvements and operational optimization, while also focusing its capabilities on expanding the production of low-carbon and green fuels such as biofuels and circular products. In the petrochemical sector, the Company is also increasing the share of high value-added, environmental-friendly, and advanced materials, thereby seeking to secure both sustainability and profitability.

Key Green Business

HD Hyundai Oilbank is advancing its green business, centered on bio and circular resources business. In addition, the Company is establishing a mid- to long-term plan to promote the Hydrotreated Vegetable Oil (HVO) business, which produces biofuels by hydrogenating vegetable oil and used cooking oil.

Category		Key Activities	Future Plans
Bio business	Biodiesel business	This business produces biodiesel (FAME) using renewable feedstocks such as vegetable oils and animal fats. Major feedstocks include Palm Fatty Acid Distillate (PFAD) and Used Cooking Oil (UCO), which are procured and fed into HD Hyundai Oilbank’s processes.	- Diversification of feedstock procurement sources, including China - Expansion of ISCC certification and sales markets
	Bio-marine fuel business	The Company operates a bio-marine fuel business by blending externally procured biodiesel with marine fuel in optimal combinations and supplying it through long-term contracts with shipping companies.	Expansion of sales volumes and product offerings, including B24 and B100
	Co-Processing	This business produces fuels by additionally feeding bio-based raw materials into existing oil refinery processes. By utilizing existing facilities, the Company secures economic feasibility and creates low-carbon fuel value by receiving credits for bio-based raw material inputs through ISCC EU certification.	Expansion of the co-processing ratio
Circular resources business	Circular product manufacturing	This business produces various circular products by procuring pyrolysis oil produced through high-temperature pyrolysis of waste such as waste plastics and waste tires under oxygen-free conditions and feeding it into HD Hyundai Oilbank’s processes.	- Promotion of feedstock diversification, including Ocean Bound Plastic (OBP) and End-of-Life Vehicle (ELV) plastics - Expansion of sales of circular naphtha and circular benzene

Sustainable Products and Resource Management

Strategy

Green Business

Status of Bio Business

HD Hyundai Oilbank is expanding its business scope by broadening its product portfolio based on bio-feedstocks. Since June 2024, the Company has been operating a biodiesel plant on a commercial basis and has established a production system that enables catalyst-free manufacturing by adopting a supercritical process. In addition, the Company produces bio-based products through co-processing, which involves the simultaneous input of petroleum and bio-feedstocks into existing oil refining facilities. Its main feedstocks include Palm Fatty Acid Distillate (PFAD) and Used Cooking Oil (UCO), and it is strengthening feedstock supply stability by expanding its supply chain to China, Vietnam, and Indonesia.

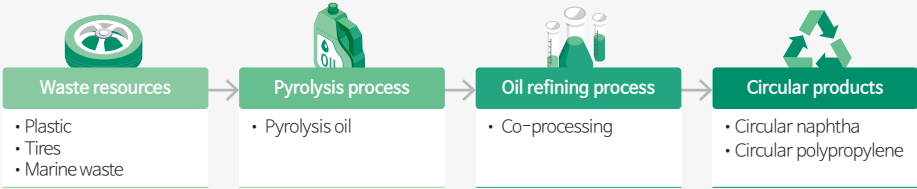
Bio Product Portfolio

Category	Product Name	Details	Characteristics
Biodiesel business	Biodiesel (FAME)	Renewable diesel fuel derived from vegetable oil like Palm Fatty Acid Distillate (PFAD) and animal fats	Renewable resource-based diesel fuel contributing to GHG reduction
Bio-marine fuel business	Bio-marine fuel	Environmentally friendly marine fuel consisting of certain share of biofuel blended with conventional marine fuel	Compliant with CII standards, market demand of green shipping fuel increases
Co-Processing business	Sustainable Aviation Fuel (SAF)	Aviation fuel manufactured from bio-feedstocks, aimed at reducing carbon emissions in the aviation sector	Expand vendors through acquisition of ISCC CORSIA and ISCC EU certifications
	Bio-naphtha	Bio-naphtha produced by refining used cooking oil-based bio-feedstocks within the refining process	Credit transition through ISCC PLUS certification

Status of Circular Economy Business

HD Hyundai Oilbank is advancing its circular economy business by utilizing diverse feedstocks, starting with waste plastic pyrolysis oil. The Company is also reviewing investments in direct pyrolysis oil production and pretreatment facilities to expand its business foundation. Circular products are manufactured by feeding pyrolysis oil, obtained by subjecting waste resources such as waste plastics and waste tires to high-temperature pyrolysis in an oxygen-free environment, into the oil refinery process. Through this process, the Company produces circular-based products such as circular naphtha. As of 2025, the Company utilized 32.66 million liters of waste plastic pyrolysis oil, 2.87 million liters of waste tire pyrolysis oil, and 8.35 million liters of refined waste lubricants as feedstocks.

Circular Product Manufacturing Flow Chart



Acquisition of ISCC Certifications

HD Hyundai Oilbank applies the ISCC certification framework to major products in its bio business and circular economy business, thereby responding to international certification standards and environmental regulations in various countries. Bio-aviation fuel has obtained ISCC EU and ISCC CORSIA certifications, meeting export requirements for Europe, while bio-naphtha, circular naphtha, and circular propylene have secured a tracking and verification system for the use of sustainable feedstocks through ISCC PLUS certification. The Company also plans to continue expanding the acquisition of relevant certifications for newly introduced feedstocks and newly produced products in the future.

List of Certifications

ISCC PLUS

ISCC EU

ISCC CORSIA



Sustainable Products and Resource Management

Strategy

Green Business

Implementation of the Business Agreement on Building a Plastic Circular Economy

HD Hyundai Oilbank continues to cooperate with related organizations and companies to build a plastic circular economy. In April 2024, the Company signed a business agreement with Hyundai Department Store to establish a plastic circular economy and is promoting a project to convert waste vinyl collected by Hyundai Department Store into green materials through the pyrolysis oil process. Following 54 tons in 2024, the Company received 130 tons of waste vinyl from Hyundai Department Store in 2025, and new green vinyl products produced using this feedstock are being supplied to Hyundai Department Store stores nationwide. Through these efforts, the Company is contributing to the practical recycling of waste vinyl and the establishment of a circular economy system.

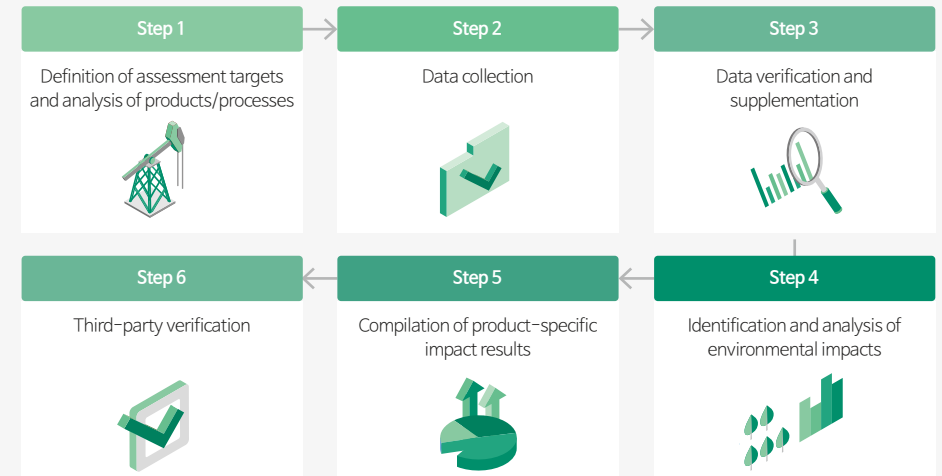
Green Vinyl



Implementation of Life Cycle Assessment (LCA)

HD Hyundai Oilbank conducts Life Cycle Assessments (LCA) on its major products to systematically manage their environmental impacts. The assessment analyzes and evaluates the entire process from raw material extraction through production (Cradle-to-Gate). Environmental impacts are calculated in accordance with the methodologies and procedures of the international standards ISO 14040 and ISO 14044, and product carbon emissions are quantified in accordance with ISO 14067. In 2025, the company calculated the greenhouse gas emissions of its biofuel products for ISCC EU and CORSIA certification. In 2026, it plans to enhance its LCA evaluation based on 2025 data, and over the medium-to-long term, to establish an LCA calculation system.

LCA Process



Sustainable Products and Resource Management

Strategy

Green R&D

Green R&D Roadmap

HD Hyundai Oilbank has established a mid- to long-term R&D roadmap focused on hydrogen, CO₂ reduction, and circularity and recycling, and is pursuing phased technological advancement. In the short- to mid-term, the Company is concentrating on securing core technologies, including material development, demonstration, process efficiency enhancement, and high value-added applications, while in the long term, it plans to generate tangible commercialization outcomes by applying these technologies to commercial-scale processes.

R&D Roadmap

Research Area	Short- to mid-term (2024–2027)	Long-term (2028–2030)
Hydrogen	- Development of electrolyte membranes and separator materials for fuel cells and water electrolysis - Securing a differentiated technological advantage and customer certification	Development of next-generation electrolyte membranes and separator materials
	Demonstration and application expansion of ammonia decomposition catalysts	Completion of catalyst package technology acquisition
CO ₂ reduction	Enhancement of biofuel production technology efficiency	Completion of technology development and application to commercial scale processes
	Development of CO₂ separation materials and process technologies	–
Circularity and Recycling	- Development and differentiation of pyrolysis oil treatment technologies - Securing feedstock conversion technologies for the high value-added utilization of process by-products	Completion of technology development and application to commercial scale processes
	Development of low-carbon and carbon neutral fuel technologies	–

Green R&D Achievements

HD Hyundai Oilbank is strengthening its technological competitiveness by advancing phased R&D initiatives. Centered on core material development and process efficiency enhancement, some projects have entered the demonstration stage, further improving their technological maturity. In addition, the Company is continuing to review the commercial applicability of its research outcomes in connection with its business divisions and is expanding the foundation for technology commercialization by strengthening its capabilities to respond to customer requirements.

Detailed Green R&D Achievements

Research Area	Achievements
Hydrogen	- Focusing on the development of high-performance, high-durability electrolyte membranes essential for hydrogen production and utilization - Promoting the development and commercialization of fluorine-based reinforced composite polymer electrolyte membranes¹⁾ and fluorine-based separator membranes²⁾, which are their core component materials - Preparing for product commercialization by expanding R&D facilities related to electrolyte membranes and response capabilities for customer evaluation and certification, while internally conducting self-assessments based on the establishment of performance and durability evaluation infrastructure
	Promoting the development of catalysts for reconverting hydrogen stored and transported in the form of ammonia back into hydrogen, and pursuing domestic and international patent registrations and applications
CO ₂ reduction	- Developing technologies capable of separating and capture CO₂ generated from high-emission industries such as oil refinery and cement through exhaust gas - Conducting economic feasibility analyses of technologies and processes
Circularity and Recycling	- Developing refining technologies to expand circular naphtha processing volumes - Securing differentiated technologies, including C-LGO³⁾, to process pyrolysis oil based on diverse feedstocks
	Securing core technologies, including catalysts and processes, to produce fuels through carbon circulation

1) Poly Electrolyte Membrane/Proton Exchange Membrane
 2) Expanded Polytetrafluoroethylene, e-PTFE
 3) Co-processed LGO (Light Gas Oil)