NEWS RELEASE

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Asahi Group Japan, Ltd.

Seino Transportation Co., Ltd.

NEXT Logistics Japan, Ltd.

Yamato Transport Co., Ltd.

Japan's First Heavy-Duty Fuel Cell Electric Truck Verification Tests to Start

Tests will verify feasibility and practicality of using hydrogen fuel to realize sustainable logistics

Asahi Group Japan, Ltd., Seino Transportation Co., Ltd., NEXT Logistics Japan, Ltd. (NLJ), and Yamato Transport Co., Ltd. are beginning on-the-road trials of heavy-duty fuel cell electric trucks (heavy-duty FCETs), which are powered by hydrogen, with the aim of realizing sustainable logistics. These are the first ever heavy-duty FCETs to operate in Japan, from May 2023.

1. Background and Objectives

The need to cut greenhouse gas emissions and enact other measures to realize sustainable logistics has been on the rise in recent years. Heavy-duty trucks account for approximately 70 percent[*1] of all greenhouse gas emissions generated by commercial vehicles in Japan. The heavy-duty trucks used in highway transportation particularly must have adequate range and load capacity as well as being able to refuel quickly, and fuel cell systems, which are powered by high-energy-density hydrogen, are believed to be effective.

The purpose of these test runs is to verify the feasibility and practicality of using hydrogen fuel

through the utilization of heavy-duty FCETs jointly developed by Toyota Motor Corporation and Hino Motors, Ltd. in the transportation operations of each company.

*1: According to research by Hino Motors, as of March 31, 2023.

2. Overview of the Trials

(1) Start date: Staged rollout beginning from May 2023

(2) Transportation details

Asahi Group & NLJ	Trial start date: May 19, 2023 Load beer and soft drinks at Asahi Breweries Ibaraki Brewery (Moriya City, Ibaraki Prefecture) →Load whiskey, spirits, wines, and other products at Asahi Breweries Heiwajima Delivery Center (Ota-ku, Tokyo) →Unload the products at NLJ Sagamihara Center (Sagamihara City, Kanagawa Prefecture) →Load cargo from Kansai →Return to Asahi Breweries Ibaraki Brewery
Seino Transportation	Trial start date: June 2023 Refuel at a hydrogen station near the company's Tokyo Branch (Koto-ku, Tokyo) →Load cargo at Tokyo Branch →Unload designated cargo at Odawara Branch (Odawara City, Kanagawa Prefecture) →Unload designated cargo at Sagamihara Branch (Sagamihara City, Kanagawa Prefecture) →Return to Tokyo Branch
Yamato Transport	Trial start date: May 17, 2023 Refuel at a hydrogen station near the company's Haneda Chronogate Base (Ota-ku, Tokyo) →Load cargo at Haneda Chronogate Base →Unload cargo at Gunma Base (Maebashi City, Gunma Prefecture) →Load cargo at Gunma Base →Return to Haneda Chronogate Base

(3) Main targets of verifications

<Operational aspects>

1) Usability for drivers during actual operation

2) Servicing, including refueling times at hydrogen stations

<Vehicle development>

1）Operation of the fuel cell system and electric system in general

2）Assessment of changes in hydrogen consumption due to environmental and driving-style differences, and acquisition of information on refueling at hydrogen stations

3）Acquisition of information on drivability (vehicle operability) and overall usability

3. Vehicle Features

The heavy-duty FCETs scheduled for use have a cruising range of approximately 600 km, and have both environmental performance and practicality as commercial vehicles. The vehicles are eco-friendly as they run on hydrogen and emit no greenhouse gases while in operation.

◁Fuel Cell System and High-Pressure Hydrogen Tanks

The vehicles are equipped with two FC stacks[*2] optimized for heavy-duty trucks via application of fuel cell technology developed by Toyota. They are also equipped with six large high-pressure hydrogen tanks recently developed to be capable of storing large volumes of hydrogen. The system generates electricity by injecting the stored hydrogen into the FC stacks together with atmospheric oxygen. This electricity is then used to drive the motor to operate the vehicle.

*2: Devices that generate electricity through chemical reactions between hydrogen and oxygen

◁Hydrogen Refueling Port

The trucks are equipped with hydrogen refueling ports that are also compatible with the high-speed hydrogen fueling standards planned for future implementation.

Vehicle Specifications

Vehicle	Base model	Hino Profia FR1AWHG
	Length / width / height	11,990 / 2,490 / 3,780mm
	Total vehicle weight	25 t
FC stack	Name (type)	Toyota FC Stack (solid polymer electrolyte)
Motor	Type	AC synchronous
High-pressure hydrogen tank		Newly developed large-capacity high-pressure (70 MPa) hydrogen tank
Battery	Type	Lithium-ion battery

Cruising range	Approx. 600 km *In integrated city and highway driving cycle; Toyota and Hino internal measurements

Reference initiatives

■ Asahi Group

Asahi Group has set forth "Asahi Carbon Zero[*3]" as its medium-to-long-term target in response to climate change. "Asahi Carbon Zero" is a climate change target to achieve zero CO2 emissions in Scopes 1, 2, and 3 by 2050. By 2030, Asahi Group aims to achieve a 70% reduction in Scopes 1 and 2, followed by a 30% reduction in Scope 3 (both compared to 2019). In addition to introducing heavy-duty FCETs in Japan through this project, Asahi Group Japan also plans to introduce six light-duty FCETs over the course of 2023 and 2024 for use in making deliveries within Tokyo. Moving forward, the company will also continue to accelerate its efforts through implementation of an array of other energy-saving and environmental measures.

■ NEXT Logistics Japan

NEXT Logistics Japan is working with 20 partner companies, including shippers and logistics companies, to create a framework and system for transporting more goods with fewer trucks and drivers by utilizing new technologies, with the aim of achieving carbon neutrality.

Together with Asahi Group Japan, NLJ will proceed with testing with the aim of maximizing CO2 reduction impact by combining highly productive logistics with heavy-duty FCETs.

■ Seino Transportation

The Seino Group is working to achieve green logistics by strengthening cooperation with customers and various partners in order to implement environmentally friendly transportation practices such as modal shifts, drone delivery, introduction of double articulated trucks, and joint delivery.

In this testing, Seino is working to make FCETs practical commercial vehicles.

■ Yamato Transport

The Yamato Group has set the goals of virtually zero in-house greenhouse gas emissions by 2050 and a 48% reduction in greenhouse gas emissions by 2030 (versus fiscal year 2020 in order to achieve sustainable logistics. To these ends, it is proceeding with a range of initiatives with a target date of 2030, centered on the introduction of 20,000 electric vehicles and 810 solar power generation facilities, reduction of dry ice use to zero, and other key measures to increase the use of electricity derived from renewable energy sources to 70% of total use.

Through on-the-road trials for heavy-duty FCETs, Yamato Group will help to develop vehicles aiding in the popularization of heavy-duty FCETs, helping to bring about a sustainable society.

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