

Kawasaki Motors, Ltd.  
Suzuki Motor Corporation  
Honda Motor Co., Ltd.  
Yamaha Motor Co., Ltd.

## **Ministerial Approval Granted to Form Research Body “HySE” for Development of Hydrogen Small Mobility Engines to Help Build Decarbonized Society**

Tokyo, May 17, 2023 — Kawasaki Motors, Ltd. (hereinafter “Kawasaki Motors”), Suzuki Motor Corporation (hereinafter “Suzuki”), Honda Motor Co., Ltd. (hereinafter “Honda”), and Yamaha Motor Co., Ltd. (hereinafter “Yamaha Motor”) jointly announced today that they have received approval from the Ministry of Economy, Trade and Industry to form a technological research association called HySE (Hydrogen Small mobility & Engine technology) for developing hydrogen-powered engines for small mobility.\*

To realize a decarbonized society, a multi-pathway strategy to address various issues in the mobility sector is necessary, rather than focusing on a single energy source. Against this backdrop, research and development targeted at commercialization of mobility with engines powered by hydrogen – deemed a next-generation energy source – is gaining momentum.

However, the use of hydrogen poses technical challenges, including fast flame speed and a large region of ignition, which often result in unstable combustion, and the limited fuel tank capacity in case of use in small mobility vehicles. In addressing these issues, the members of HySE are committed to conducting fundamental research, capitalizing on their wealth of expertise and technologies in developing gasoline-powered engines, and aim to work together with the joint mission of establishing a design standard for small mobility’s hydrogen-powered engine, and of advancing the fundamental research endeavors in this area.

The members of HySE will continue to deepen their collaborative relations in order to provide a variety of small mobility options to users and meet their diverse needs, thereby contributing to the realization of a decarbonized society.

■ Kenji Komatsu, Chairman nominee of HySE and Executive Officer of Technical Research & Development Center, Yamaha Motor Co. Ltd., comments, “We are extremely pleased to announce the planned formation of the association. There are many challenges in the development of hydrogen-powered engines, but we hope to see the association’s activities advance the fundamental research in order to meet those challenges. We are committed to this endeavor with a sense of mission to

preserve the use of internal combustion engines, which epitomize the long-time efforts that our predecessors have invested.”

■ Main research and development areas, and the role of each company:

### **1. Research on hydrogen-powered engines**

Research on the model-based development of hydrogen-powered engines (Honda)  
Element study on functionality, performance, and reliability of the hydrogen-powered engines (Suzuki)

Hands-on research using real hydrogen-powered engines on their functionality, performance, and reliability (Yamaha Motor, Kawasaki Motors)

### **2. Study on hydrogen refueling system**

Studying the requirements for a hydrogen refueling system and hydrogen tanks for small mobility (Yamaha)

### **3. Study on fuel supply system**

Studying the auxiliary equipment required for a fuel supply system and tanks, and the equipment installed between the fuel tank and the injector (Kawasaki Motors)

In addition to the full members (the four aforementioned motorcycle manufacturers), Kawasaki Heavy Industries, Ltd. (hereinafter “Kawasaki Heavy Industries”) and Toyota Motor Corporation (hereinafter “Toyota”) support the association as special members. Kawasaki Heavy Industries, being one of the main organizers of the “CO2-free Hydrogen Energy Supply-chain Technology Research Association” (hereinafter “HySTRA”), will drive forward HySE’s activities, based on the knowledge gained from its activities for HySTRA. Toyota, on the other hand, will assume the role of leveraging HySE’s research results to the maximum benefit for the development of hydrogen-powered engines, utilizing its know-how on experiments, analyses, and the designing of large hydrogen-fueled power units for four-wheel vehicles.

■ Overview of HySE (Details, including members, are still in the planning stage)

【Name】 Hydrogen Small mobility & Engine technology (HySE)

【Address】 Yaesu Central Tower 2-2-1 Yaesu, Chuo-ku, Tokyo

【Chairman】 Kenji Komatsu (Executive Officer, Yamaha Motor Co. Ltd.)

【Members】 Regular Members: Kawasaki Motors, Suzuki, Honda, and Yamaha Motor

Special Members: Kawasaki Heavy Industries and Toyota

【Establishment】 Establishment procedures in progress

\*Small mobility: motorcycles, Japan-originated mini-vehicles, small marine vessels, construction equipment, drones, etc.