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Mazda Motor Corp.
ELIY Power Co., Ltd.
Ube Industries, Ltd.

**Mazda, ELIY Power and Ube Industries Agree to Jointly Develop 12-Volt
Lithium-ion Starter Batteries for Vehicles**

Developing Safe, Durable Lithium-ion Batteries to Replace Lead-Acid Batteries

HIROSHIMA, Japan—Mazda Motor Corporation, ELIY Power Co., Ltd. and Ube Industries, Ltd. have agreed to jointly develop lithium-ion batteries for use in automobiles. The three companies will work together to develop durable, heat- and impact-resistant 12-Volt lithium-ion batteries as a viable replacement for lead-acid starter batteries in motor vehicles by 2021.

Lithium-ion batteries offer a promising alternative to conventional lead-acid car batteries, as environmental regulations in some regions restrict the use of lead and engineers aim to reduce vehicle weight for improved fuel economy. But their application in motor vehicles so far has been limited due to the need for car batteries to withstand the high temperatures of the engine room and the potential impact forces of a collision. With this new project, Mazda, ELIY Power and Ube Industries will combine their technical strengths to overcome such issues.

Making use of the industry-leading computer-aided model-based development techniques it honed while developing SKYACTIV Technology, Mazda will conduct model-based research of the chemical reactions that occur inside batteries, develop technologies to manage high-performance batteries from a vehicle-total perspective and develop a general purpose model for their use.

ELIY Power makes high-quality stationary batteries and starter batteries for motorcycles. The safety and performance of its lithium-ion starter batteries for motorcycles is widely recognized, and the company started supplying them to a major Japanese motorcycle manufacturer in 2016. ELIY Power will leverage its experience in developing safe, water-proof, impact-resistant battery technologies with excellent cold-weather performance to lead design and development of the basic battery unit.

As a leader in the development of key components such as electrolytes and separators, Ube Industries has made significant contributions to improving the performance of lithium-ion batteries and expanding their range of applications. Its functional electrolytes have brought improvements in battery safety and longevity, and enabled higher capacity for higher voltage batteries. The company will use its accumulated expertise and engineering prowess to develop an electrolyte with a higher flash point and better heat resistance.

In light of global trends in environmental regulations, the joint development project aims to make a next-generation battery for widespread use in place of conventional lead-acid starter batteries and contribute to the realization of a safe and stress-free motorized society. In addition, the three companies will assess prospects for further collaboration in a range of fields, including using the technologies that result from this project as base for other low-voltage lithium-ion batteries applicable to vehicle electrification technologies other than starter batteries.

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