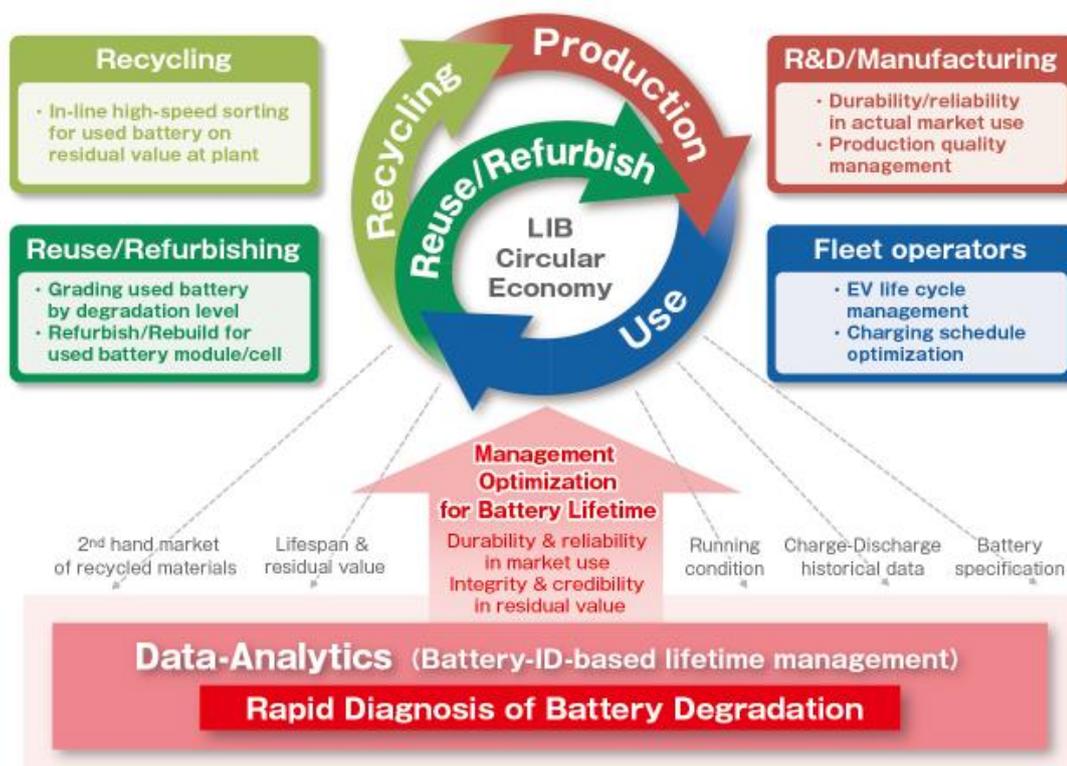


News Release

FOR IMMEDIATE RELEASE

Development of a Rapid Diagnostics of Battery Degradation to Instantly Evaluate the Performance Degradation and Remaining Lifespan of Lithium-Ion Batteries

Tokyo, November 20, 2020 – Hitachi High-Tech Corporation (President and CEO: Masahiro Miyazaki/ Hitachi High-Tech) today announced that it has developed a Rapid Diagnostics Method of Battery Degradation (the evaluation method) that can instantly evaluate the performance degradation and remaining lifespan of used lithium-ion batteries and those that are currently in use. Hitachi High-Tech will aim to develop a business based on the evaluation method that offers comprehensive management services for residual value analysis and management of lithium-ion batteries, and to quickly bring it to market.



[Relationship between lithium-ion battery-related circular economy business area and the evaluation method]

In recent years, climate changes such as air pollution and global warming have continued to progress on a global level. To reduce CO2 emissions, the automotive industry is shifting from vehicles powered by gasoline and diesel-fueled combustion engines to electric vehicles (EVs) powered by batteries and motors, and this shift is

expected to accelerate in the future. At the same time, lithium-ion batteries that are no longer capable of performing as EV batteries are being reused and remarketed as power supplies for forklifts and golf carts, and as storage batteries for stores and homes. For this reason, it is important to properly measure and identify the remaining capability of lithium-ion batteries in order to reuse and remarket them appropriately.

It will also be necessary to create a platform for a circular economy*¹ that will generate new value by increasing the efficiency of the entire product lifecycle without wasting the energy and resources used. The new challenge facing lithium-ion battery-related value chains in this situation is avoiding the immediate disposal of used lithium-ion batteries, and instead promoting their reuse and remarketing and finding out how to extend their lifetime.

As a solution to this challenge, Hitachi High-Tech, in cooperation with Hitachi, Ltd.'s Research and Development Group, has developed this evaluation method using algorithms (computational methods) devised by the R&D Group. Currently, it takes two to four hours to determine state of health (SOH)*², a key indicator of the remaining lifespan of lithium-ion batteries, but this evaluation method enables dynamic analysis of factors such as current and voltage in an instant, reducing the amount of time required to as little as a few seconds or minutes. Since the evaluation method can be used with standard charge/discharge analysis instruments, it is easy to construct a measurement system that utilizes instruments that are already installed. It is a highly versatile system that can be expanded to meet customer-specific needs.

The evaluation method system will be introduced starting with lithium-ion batteries used in EVs, for example those used by fleet operators*³, and will monitor battery usage, allowing the user to obtain advance warning of battery degradation. By incorporating the method into a battery refurbishing factory as an In-line system, it is possible to semi-automate or fully automate the process of identifying remaining battery performance, further improving the efficiency of reusing and remarketing lithium-ion batteries. As above, we expect the evaluation method will contribute in the future to a new platform for promoting a circular economy for lithium-ion batteries.

Hitachi High-Tech will develop a data management platform based on analysis and visualization of lithium-ion battery degradation, thereby expanding the life cycle of lithium-ion batteries used in EVs and supporting the commercialization of related businesses. In the future, we will continue to create high-value-added businesses based on resolving our customers' issues. As we provide solutions that contribute to resolving the issues facing manufacturing companies, we will also contribute to

creating a sustainable society that results in the effective use of resources and reduction of environmental impact.

*1 Circular Economy: An economic concept that aims to achieve a balance between economic growth and reduction of environmental impact by creating value through circulation process while also reducing the consumption of natural resources and energy, and reducing waste.

*2 SOH (State of Health): Indicates the performance degradation of a battery.

*3 Fleet Operators: Businesses based on owning or controlling a large number of vehicles for the purpose of transferring people or goods, such as logistics companies and bus, taxi and car rental companies, as well as companies that offer vehicles for rent or sharing purposes.

Website about Rapid Diagnostics of Battery Degradation

<https://www.hitachi-hightech.com/global/products/advanced/lcm/>

■ Contact

Business Development Department,
Business Development Division, Industrial Solution Business Group,
Hitachi High-Tech Corporation (Contact: Ueda)

Phone: +81-70-4890-3390

Email: yutaka.ueda.zh@hitachi-hightech.com

■ For Media inquiries

CSR & Corporate Communications Department, CSR Div.
Hitachi High-Tech Corporation (Contact: Nishikawa)

Phone: +81-80-9207-5949

###