

October 31, 2024
Toshiba Corporation
Naturenix Inc.

**Toshiba and Naturenix Launch Demonstration Test of
Battery Subscription Service for Electric Motorcycle Taxis in Bangkok**

- Developing markets in emerging economies by utilizing
SCiB™^{*1} with long life performance in hot environments -

Toshiba Corporation and Naturenix Inc., a battery tech startup from Shimane University, have started a demonstration test of a battery subscription service for drivers of electric motorcycle taxis in Bangkok, Thailand on September 30, 2024.



The battery pack using SCiB™ cells and battery charging locker used in the demonstration test, with a motorcycle

In Bangkok, electric motorcycle taxis help people avoid traffic congestion, but face the problem of high temperatures that degrade battery performance and life. The demonstration test will use Toshiba rechargeable lithium-ion batteries “SCiB™”, known for reliable, long-life performance in high temperatures, to ensure extended stable operation of electric motorcycle taxis, eliminate the large initial investment in a battery, and to reduce running costs. Improved battery life will also reduce materials consumption and contribute to lower environmental impact.

Lithium-ion battery performance degrades in high temperatures. The problem is particularly pronounced in two- and three-wheeled vehicles, where it is difficult to add cooling mechanisms, especially in hot countries like Thailand. Expensive lithium-ion batteries often need to be replaced after only one or two years of use, making their use economically impractical and

limited. There have also been accidents where batteries have caught fire, highlighting the need for batteries with high-level safety features.

While demand for lithium-ion batteries in emerging economies is expected to exceed 600GWh by 2035, only 2.8% of that is expected to be from lithium-ion batteries for motorcycles and three-wheeled vehicles, both widely used in daily transportation. The reasons for this low demand in a sector where batteries could play a major role degradation and safety issues. Solutions in these areas will help to unlock a significant market for batteries for motorcycles and three-wheelers.

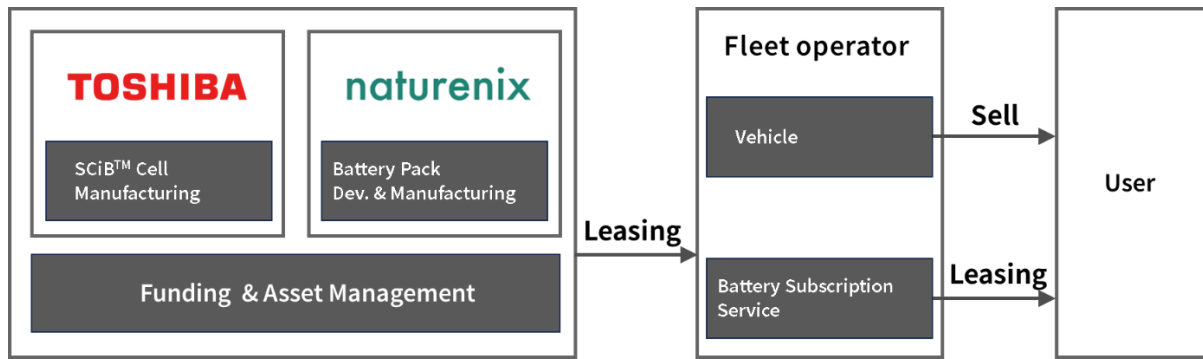
Working with Windee International, a joint venture with a local parking management servicer, Naturenix will provide a battery replacement service for electric motorcycles. The demonstration test will use Toshiba's battery SCiB™. It will be mounted with sensors that monitor its characteristics and the collected data will be transmitted to Naturenix for analysis with AI. User of the service will be asked to complete a questionnaire on the service. The company will also monitor carbon dioxide emissions and examine the effectiveness of the service in reducing environmental impacts. The data collected will determine the effectiveness of the service and support preparations for a wider roll out in FY2025.

The Toshiba's battery SCiB™ used in the demonstration test is characterized by its long life and high level safety, with minimal performance deterioration even after over 20,000^{*2} charge-discharge cycles. This longevity is particularly important in hot environments like Thailand. It also has excellent safety features, making it less likely to experience abnormal heating or ignition, even in the event of an internal short circuit.

Naturenix's packing and charging technologies minimize heat generation by reducing internal resistance to the extent possible. By utilizing these technologies, the company aims to achieve longer battery life and higher output, as well as faster recharging, in as short a time as six minutes. It also expects to reduce the number of batteries on standby for recharging, and by doing so cut the service operating costs.

This battery pack's data analysis functions constantly monitor the state of the battery. This is communicated to AI that can provide highly accurate estimates of battery degradation. Depending on the degree of degradation, after use on e-motorcycles it can be reused in a number of applications, such as being converted to a stationary storage battery.

Through Fleet operators, Naturenix will lease batteries to its customers, electric motorcycle drivers, on a subscription model. It allows Fleet operators to provide electric motorcycles to their customers without the cost of the batteries, reducing initial costs that are high barrier to entry for electrification. As the battery manufacturer, Toshiba expects to generate sustained revenue from battery rentals, as well as from manufacturing and sales.



Business scheme of Battery Subscription model

For this demonstration, Toshiba will supply SCiB™ and Naturenix will be responsible for development and manufacturing the battery packs. Both will work for asset management, system development, installation, and providing the subscription services to customers. Naturenix will also establish a subsidiary in Thailand in FY2025 to mass produce battery packs with SCiB™, with the aim of supplying batteries not only for electric motorcycles and three-wheeled vehicles, but also for forklifts and golf carts.

About Toshiba

Toshiba Corporation leads a global group of companies that combines knowledge and capabilities from almost 150 years of experience in a wide range of businesses—from energy and social infrastructure to electronic devices—with world-class capabilities in information processing, digital and AI technologies. These distinctive strengths support Toshiba in building infrastructure that everyone can enjoy, and a connected data society, and in achieving the Company’s ultimate goal, a future that realizes carbon neutrality and a circular economy. Guided by the Basic Commitment of the Toshiba Group, “Committed to People, Committed to the Future,” Toshiba contributes to society’s positive development with services and solutions that lead to a better world.

For more information, visit <https://www.global.toshiba/ww/top.html> or follow Toshiba Corporation on [LinkedIn](#).

About Naturenix

Naturenix is a start-up company that aims to create a world where nature and electronics coexist through the provision of battery longevity technologies and next-generation energy platforms. By collecting dynamic data on batteries in actual use and analyzing it with AI technology, the company promotes open innovation in batteries and ensures long-term use across multiple applications by guaranteeing asset value based on an understanding of battery use and degradation. For more information, please visit www.naturenix.co.jp

Note 1: SCiB™ is a trademark of Toshiba Corporation.

Note 2: Characteristics may vary with conditions of use.