

November 10, 2020

To the press

Michinori Holdings, Inc.  
Aizu Bus Co., Ltd.  
DENSO Corporation  
ABB Bailey Japan Limited  
DAIHEN Corporation  
Deloitte Tohmatsu Financial Advisory LLC

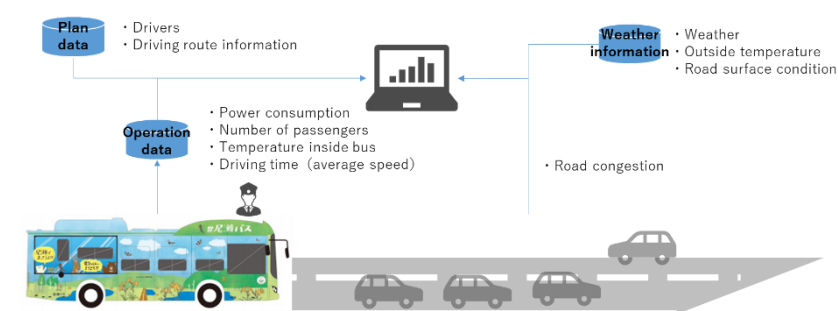
## **Commencement of a Study of an Energy Management System for Full-scale Deployment of EV Buses for Fixed Route Bus Services**

Japan (Nov. 10, 2020) – Michinori Holdings, Inc. (Michinori HD), Aizu Bus Co., Ltd. (Aizu Bus), DENSO Corporation (DENSO), ABB Bailey Japan Limited (ABB Bailey Japan), DAIHEN Corporation (DAIHEN), and Deloitte Tohmatsu Financial Advisory LLC (Deloitte Tohmatsu) were awarded a contract for the R&D and Demonstration Project Toward Realization of Logistics MaaS (Mobility as a Service) Using Commercial Vehicles financed by the National Institute of Advanced Industrial Science and Technology in FY2020. The demonstration project started in October 2020. In this project, Aizu Bus gathers data from three EV buses, which were manufactured by BYD and have been operated since December 2018. DENSO will analyze electric mileage and verifies the predictive algorithms using AI technology, and DAIHEN validate the charging management technology for an efficient charge of the EV buses using quick chargers equipped with Synergy Link. The possibility of deploying EV buses will also be studied for each operation office belonging to group companies of Michinori HD.

### **Outline of the demonstration test**

#### **1. Gathering data from the EV buses and verifying electric mileage**

Data are gathered from the EV buses operated by Aizu Bus. It includes vehicle data, such as power consumption and route distances traveled by the EV buses; number of passengers as measured by in-vehicle cameras; operation delay information transmitted from the bus location system; and external environment data, such as weather and snowfall. DENSO will analyze the gathered data using AI technology and verify the predictive algorithms that takes into account changes due to the number of users and the weather per time zone. The results of the demonstration will be used as basic data for deploying EV buses in the future.



## 2. Demonstration of the charging management technology

In this demonstration, ABB Bailey Japan will create charging schedules optimized based on data such as the operation plan, electricity price and system capacity, using OPTIMAX®, which is the ABB Ability™ Energy Management Suite solution. The EV buses will be charged based on the schedules at Juso Business office of DAIHEN by the Synergy Link\*1 technology developed by DAIHEN. The purpose is to establish a technology to charge buses at an appropriate timing, control the charging amount, and manage operations in case of large-scale deployment of EV buses.

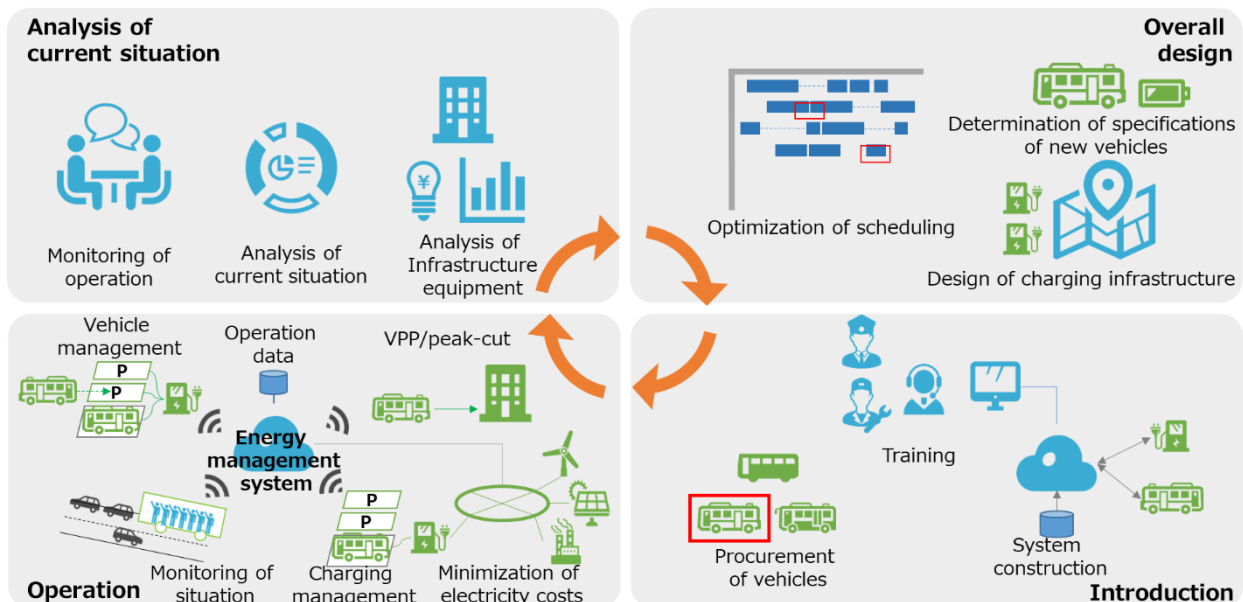
\*1) Synergy Link is a new autonomous distributed control technology for optimizing energy usage by linking devices and systems through coordination (synergy) without requiring a high-performance management controller.

## 3. Study of the possibility of deploying EV buses for each operation office

The possibility of full-scale deployment of EV buses will be studied for the operation offices belonging to the group companies of Michinori HD by using the knowledge gained from the demonstration.

### Future development

An energy management system for EV buses will be built to monitor the energy consumption, coordinate the electricity purchase and formulate operation plans in an integrated manner. The purpose is to rationalize initial and operational cost of the EV buses.



By optimizing the operation of EV buses, the feasibility of reduction of the on-board battery capacity and power interchange from on-board batteries will be studied. EV buses will be deployed by taking advantages of the know-how from this study, to contribute to a more sustainable society.

**About Michinori Holdings, Inc.**

Head office: Gran Tokyo South Tower 8F, 1-9-2 Marunouchi, Chiyoda-ku, Tokyo, 100-6608, Japan

Established: March, 2009

Representative: Jun Matsumoto, Group CEO

Main business: Bus (collective, express, chartered), railway, tourism (travel agency, hotel), vehicle maintenance, real estate

Website: <http://www.michinori.co.jp/> (Japanese)

**About Aizu Bus Co., Ltd.**

Head office: 195 Byakko-machi, Aizuwakamatsu City, Fukushima, 965-0024, Japan

Established: July, 1943

Representative: Toshiki Sato, President

Main business: Bus (collective, express, chartered), taxi, tourism, temporary staffing service

Number of vehicles: 196 buses, 99 taxis

Website: <https://www.aizubus.com/> (Japanese)

**About DENSO CORPORATION**

Head office: 1-1, Showa-cho, Kariya City, Aichi, 448-8661, Japan

Established: December, 1949

Representative: Koji Arima, President & CEO

Main business: Development, manufacturing, and sales of automotive parts, systems, and lifestyle and industrial-related equipment

Website: <https://www.denso.com/global/en/>

**About ABB Bailey Japan Limited**

Head office: 511 Baraki, Izunokuni City, Shizuoka, 410-2193, Japan

Established: March, 1971

Representative: Joerg Josef Theis, President & CEO

Main business : Thermal power; LNG storage plants; biomass power; fuel cells; waste processing plants; automatic control systems for plants; data processing systems; automation solutions and measuring devices; development, design, manufacturing, sales, erection, adjustment and construction of control equipment

Website: <http://www.bailey.co.jp> (Japanese)

**About DAIHEN Corporation**

Head office: 2-1-11 Tagawa, Yodogawa-ku, Osaka City, Osaka, 532-8512, Japan

Established: December, 1919

Representative: Tetsuya Tajiri, President

Main business: Manufacturing of transformers, welding machines, industrial robots, RF/MW

generators for semiconductor equipment and energy management systems

Website: <https://www.daihen.co.jp/en/>

### **About Deloitte Tohmatsu Financial Advisory LLC**

Head office: Marunouchi Nijubashi Building, 3-2-3 Marunouchi, Chiyoda-ku, Tokyo, 100-8363, Japan

Representative: Kazuhiro Fukushima, Financial Advisory, CEO

Established: June, 2001

Professionals: 1,052 (As of the end of May, 2020)

Main business: M&A Advisory, Corporate Revitalization, Fraud/Dispute Support, Intellectual property Advisory, Government & Public Services, Sports Business

Website: [www.deloitte.com/jp/en/dtfa](http://www.deloitte.com/jp/en/dtfa)

#### **Contact**

Michinori HD	Kudai	Email: <a href="mailto:m.kudai@igpi.co.jp">m.kudai@igpi.co.jp</a>	Tel: +81-3-6250-1075
Aizu Bus	Kikuchi	Email: <a href="mailto:yoshihiro@aizubus.com">yoshihiro@aizubus.com</a>	Tel: +81-242-24-6620
DENSO	Suzuki	Email: <a href="mailto:denso-pr@jp.denso.com">denso-pr@jp.denso.com</a>	Tel: +81-566-55-9752
ABB Bailey Japan	Ito	Email: <a href="mailto:jpbai.communications@jp.abb.com">jpbai.communications@jp.abb.com</a>	Tel: +81-55-949-3311
DAIHEN	Matsuba	Email: <a href="mailto:matsuba@daihen.co.jp">matsuba@daihen.co.jp</a>	Tel: +81-6-4977-6727
Deloitte Tohmatsu	Okumura	Email: <a href="mailto:press-release@tohatsu.co.jp">press-release@tohatsu.co.jp</a>	Tel: +81-3-6213-3210