

A woman with blonde hair is shown in profile, looking towards the right. She is positioned in front of a large screen that displays a complex circuit board pattern. The background is dark, with some blurred lights visible on the left side. The overall scene suggests a high-tech or industrial environment.

**HITACHI**  
Inspire the Next

## Hitachi is Empowering EV Value Chain

Eric Yoshimura  
Manager  
Hitachi High Tech America

Company  
Overview

GLOBAL

\$82+B  
REVENUE

350K+  
EMPLOYEES

\$3.4+B  
R&D INVESTMENT/YR

NORTH AMERICA

\$10+B  
REVENUE

35K+  
EMPLOYEES

60+  
YEARS IN THE U.S.

**OT** 111 years  
Operational excellence  
And industry experience

Industry    Mobility    Smart Life    Energy

**IT** 60 years LUMADA  
Of digital innovation

IoT    Cloud    AI  
Machine Learning    Advanced Analytics

Ensure sustainable growth and profitability through the Social Innovation Business

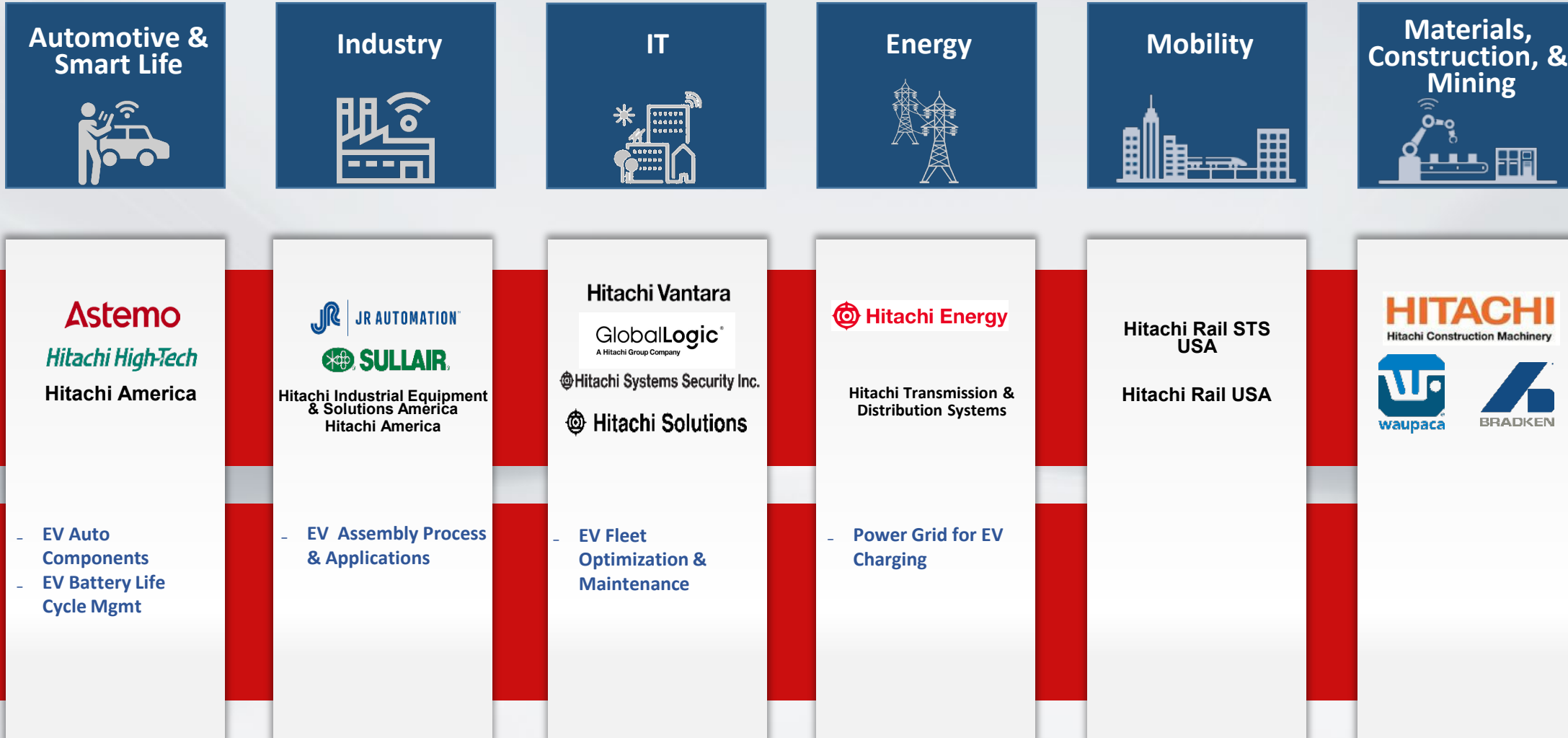
Improve Quality of Life | Add Value for Customers

Social  
Value

Environmental  
Value

Economic  
Value

Deliver superior value to customers through collaboration among Group Companies with  
“One Hitachi Approach”



**Identify issues together with customers & co-create solutions**

**Silicon Valley**

**Customer Co-creation**

- Manufacturing
- Transportation
- Energy
- Financial

**Focus Verticals**

- AI/ Analytics/ Big Data
- Industrial IoT
- Cloud and IT Platform
- 5G Networks
- Design Approach



**Detroit**

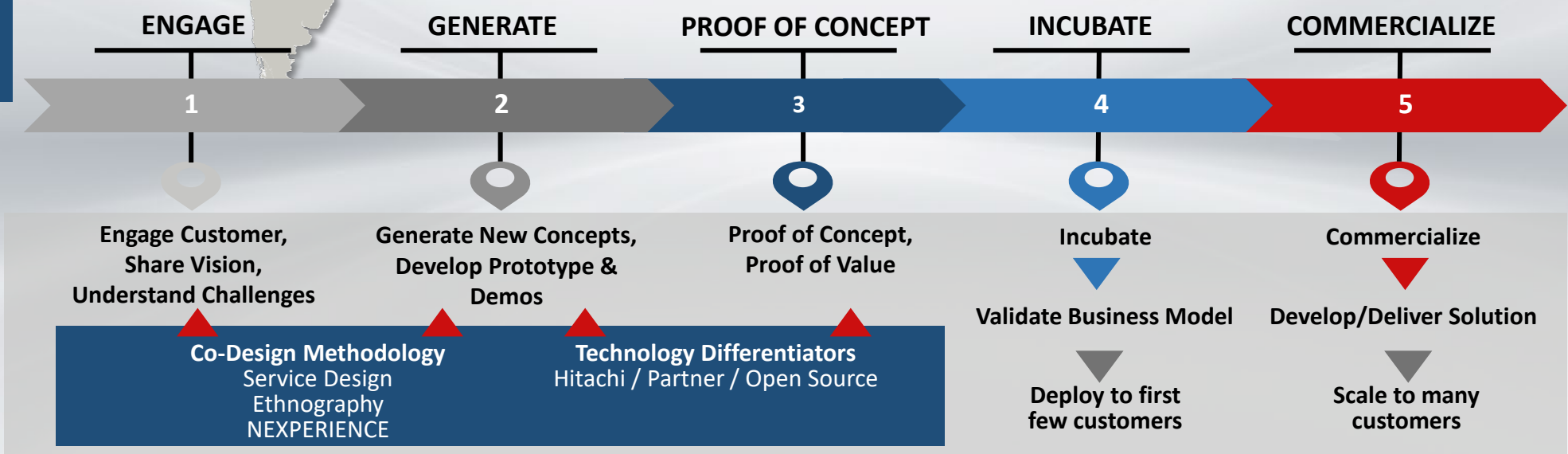
**Customer Co-creation**

**Focus Verticals**

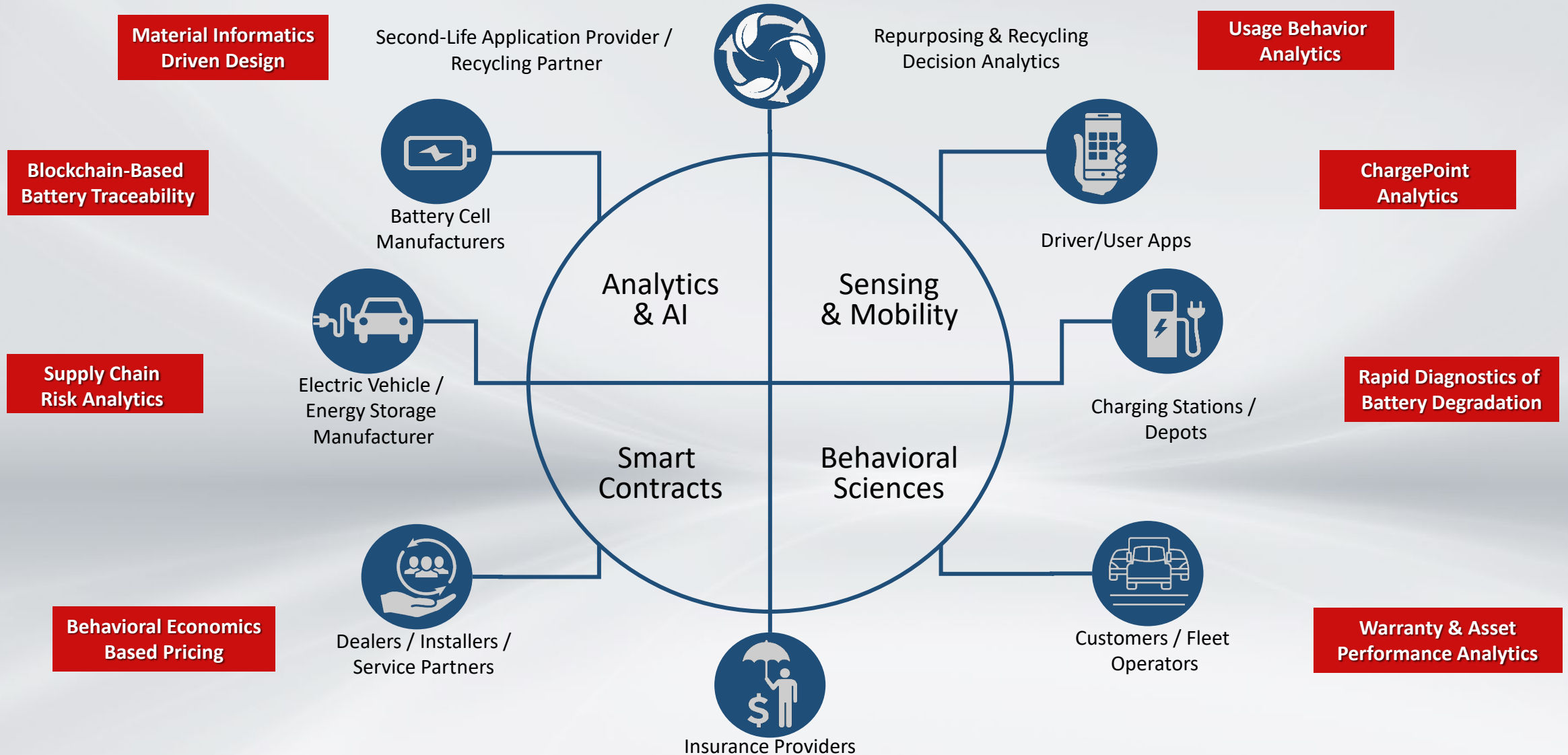
- Automotive
- Manufacturing

- Autonomous Driving
- Automotive Components
- Manufacturing Technology

**CO-CREATION APPROACH**



## Innovations for enabling circularity in the Battery Value Chain



Hitachi High-Tech developed a Remote LiB degradation analysis solution. Remotely compute estimated State Of Health utilizing vehicle's existing BMS raw data

## Remote LiB degradation analysis outline

Utilize LiB's operational data collected via fleet operator's telematics system

Physical model + time-series data processing for highly accurate SOH estimation

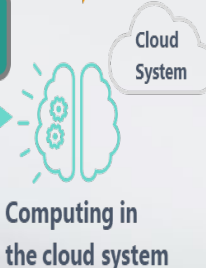
Customer



LiB operational data with certain sampling rate

timestamp	V	I	Temp.	...
2022/04/01 09:00:00	30.2	50	25,25,23,23,...	
2022/04/01 09:00:10	32.2	40	25,25,23,23,...	
2022/04/01 09:00:20	0	0	25,25,23,23,...	
⋮				

Hitachi High-Tech



INPUT

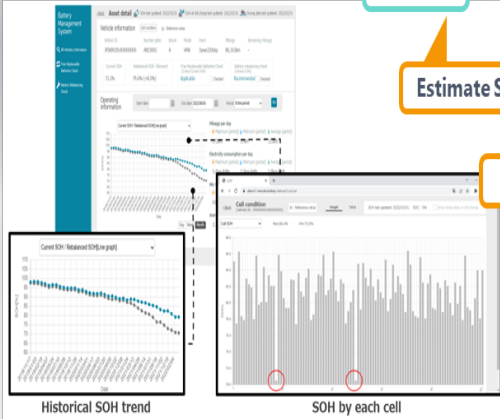
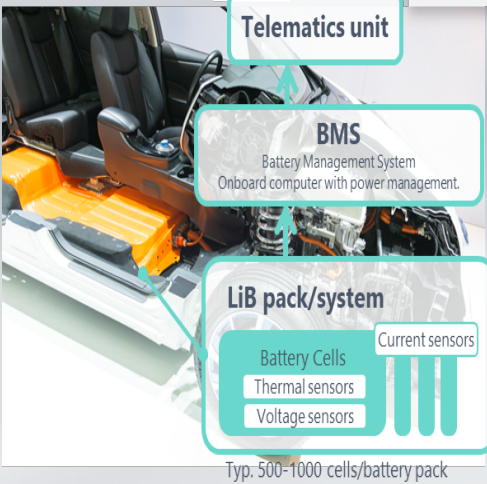
Computing in the cloud system

SOH

OUTPUT

Estimate SOH by each cell

Customer specific apps



Various POC, POV in progress globally

Client type #1  
Commercial EV Rental Company

**Tens of thousands**  
fleet vehicles

- Value Proposition**
1. Facilitate assessment of LiB's **residual value**
  2. Reduce operational burden to monitor fleet's battery conditions **utilizing connected data**
  3. Improve **LiB rebalancing operations** by knowing **SOH by each cell** in a LiB pack
  4. Improve LiB **warranty operations**
  5. Facilitate judgement of **repurposing timing** etc.

Various POC, POV in progress globally

Client type #2  
EV Fleet Management Company

Client type #3  
Industrial machinery OEM

Diagnostic result (SoH of LiB)

Operational support Application

**Core Analysis Application**

IoT Data Management

Hitachi High-Tech

Hitachi R&D



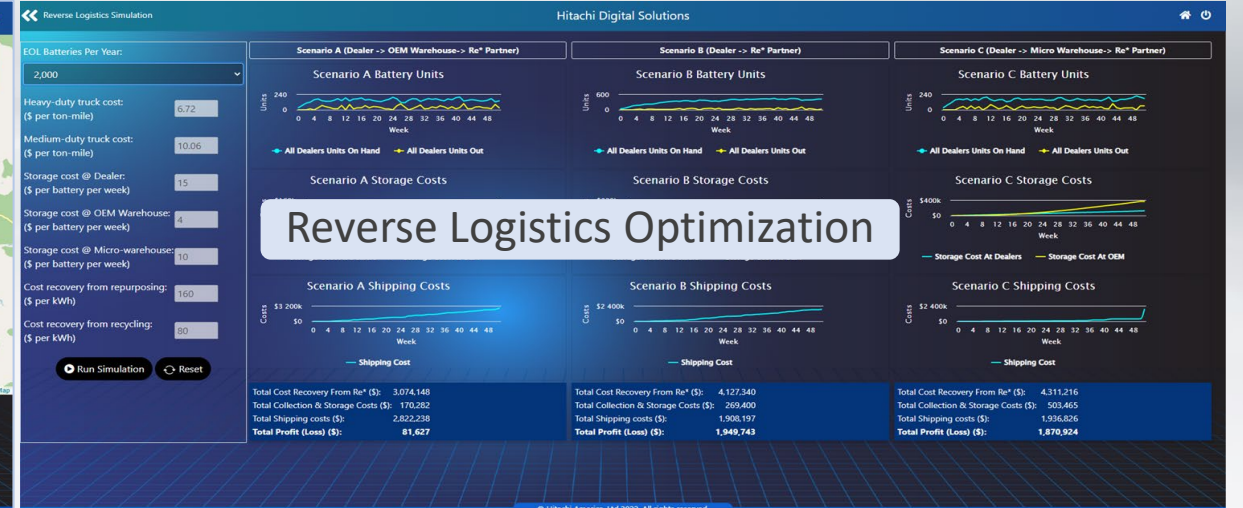
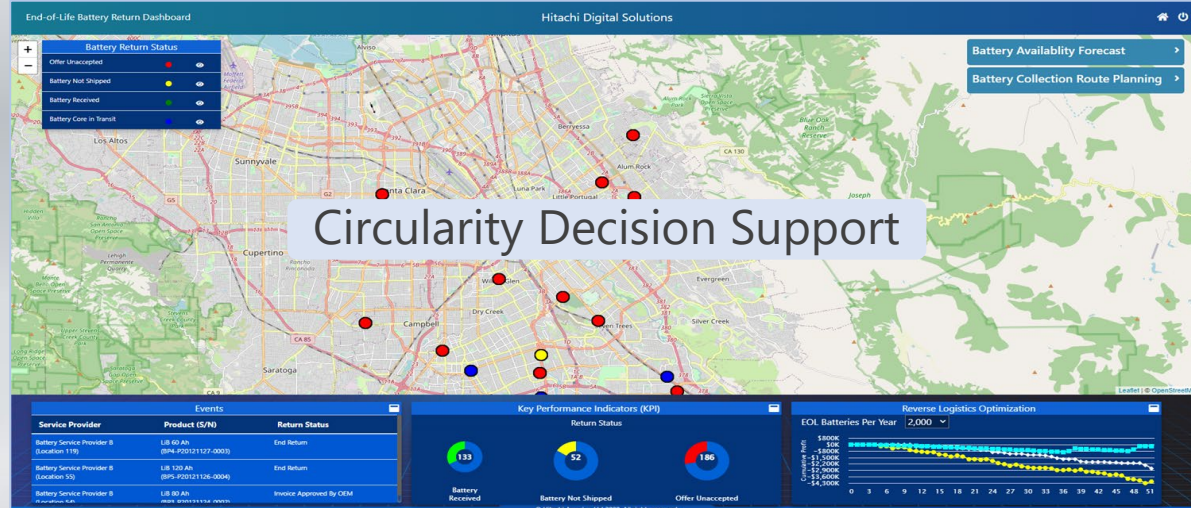
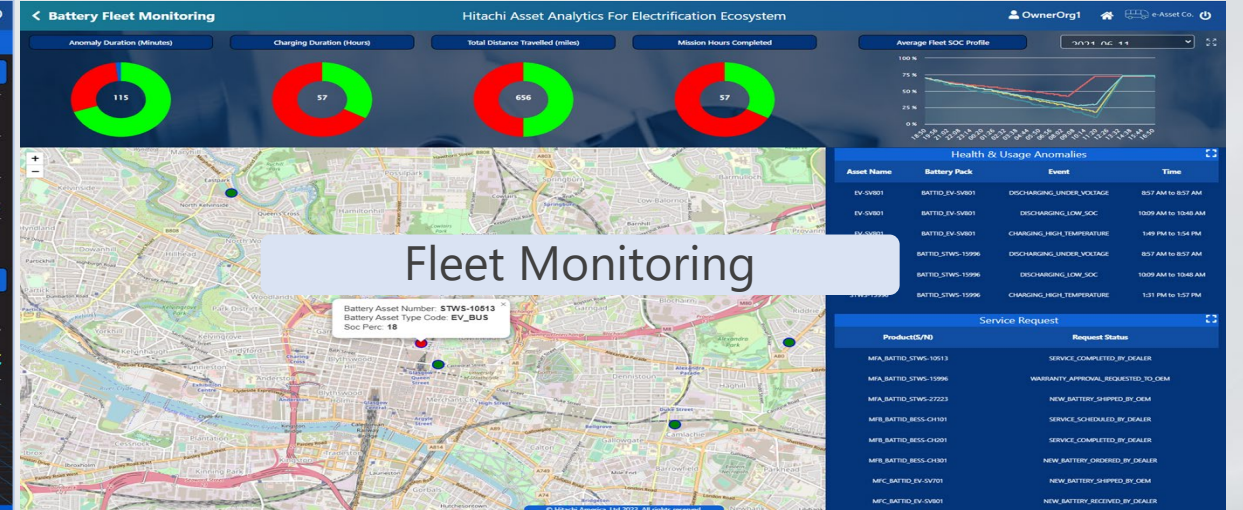
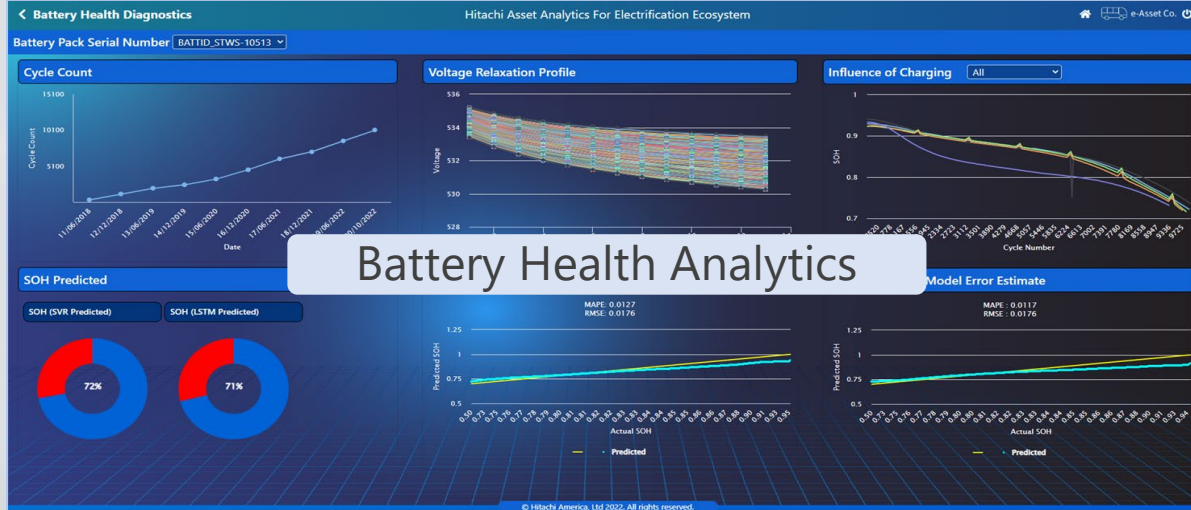
Real operating LiB data from actively operating commercial vehicles

	2020	2021	2022	2023
POC	A few hundred vehicles	Several thousand vehicles	A few tens of thousands vehicles	
POV				

Utilize Hitachi R&D's extensive expertise in LiB material, cell technologies

Client type #4  
Retail/last-mile delivery Company

A comprehensive solution to track and forecast availability of end-of-life batteries, connect ecosystem stakeholders, optimize reverse logistics, and enable informed decision-making in repurposing and recycling of batteries.



Please visit Hitachi Exhibit – Booth # 15.

Eric Yoshimura, Manager  
Hitachi High Tech America

10 N. Martingale Road, Suite 500  
Schaumburg, IL 60173-2295  
Tel: +1-847-273-4354  
E-mail: [eric.yoshimura@hitachi-hightech.com](mailto:eric.yoshimura@hitachi-hightech.com)



Amit Kumar, Senior Manager, R&D  
Hitachi America, Ltd.

<https://www.linkedin.com/in/amitkumar-strategist/>



Key  
Contacts

**HITACHI**  
Inspire the Next 