

# Hitachi Energy Investor Days 2023

## Digitalization across the energy value chain

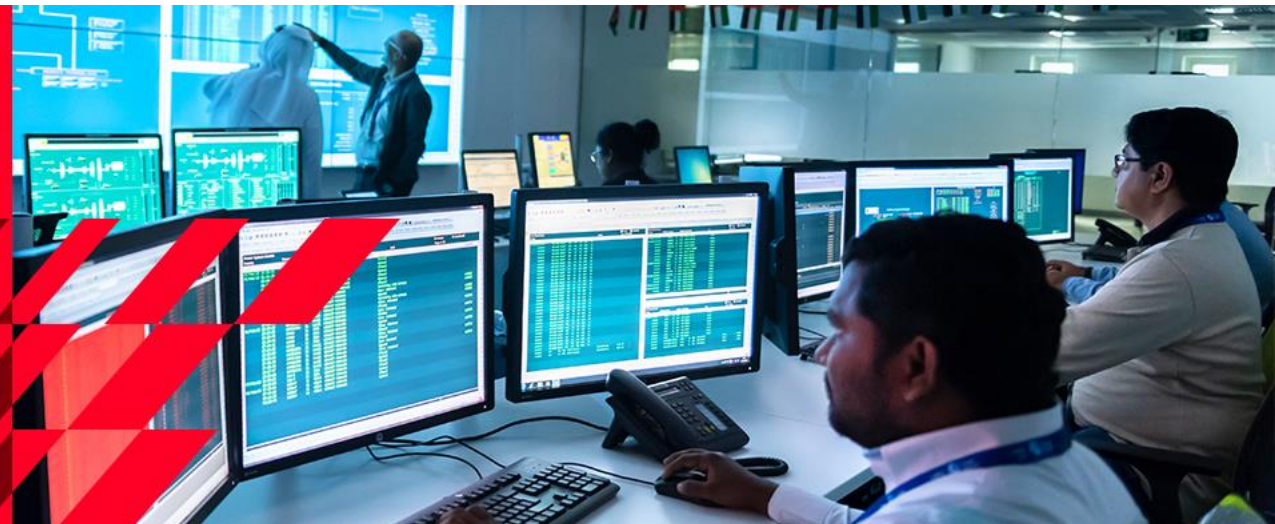


**Massimo Danieli**

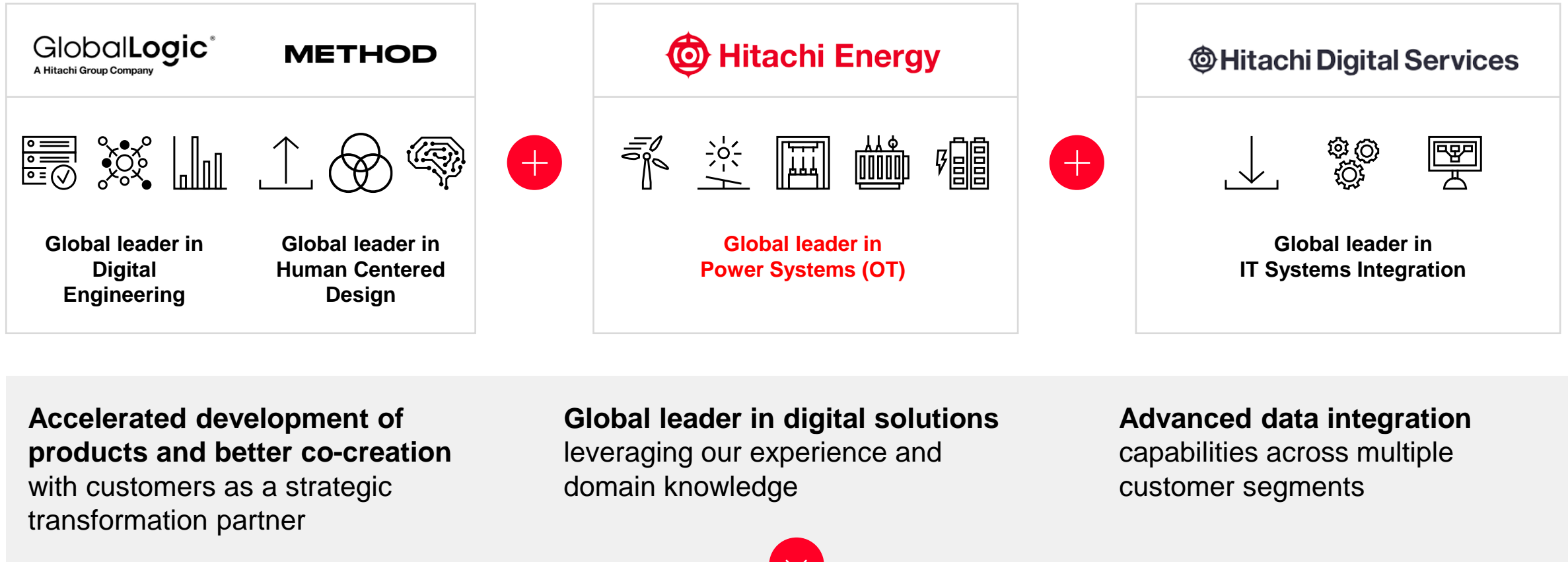
BU Managing Director Grid Automation  
Hitachi Energy



Hitachi Energy –  
Advancing a sustainable  
energy future for all



# Synergies between Hitachi Energy, GlobalLogic and Hitachi Digital Services give us an unparalleled competitive advantage



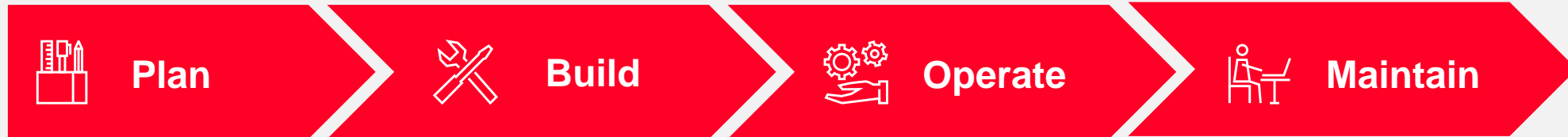
**Accelerated development of products and better co-creation** with customers as a strategic transformation partner

**Global leader in digital solutions** leveraging our experience and domain knowledge

**Advanced data integration capabilities** across multiple customer segments

**Hitachi's leadership in software engineering, data integration and investments in GenAI gives Hitachi Energy expanded go-to-market capabilities and faster innovation**

# Hitachi Energy has leading digital capabilities to serve customers throughout the life cycle



Help customers **plan and optimize investments and schedule assets**

**Reduce costs and risks** when expanding infrastructure

**Ensure reliable, safe and economic operation** by automation

**Optimize maintenance and increase system reliability** with software and service solutions



**Enable & optimize market operations and the trading of electricity**

With digital solutions, we help our customers  
**Connect and Automate**  
their physical and business processes

“  
Leading  
digitalization  
solutions  
from edge to  
enterprise

## Digital transformation & integration services

GlobalLogic®  
A Hitachi Group Company

Hitachi Digital Services

### 01 Software systems



Energy Trading & Planning



Asset Management



Network Control Systems

### 02 Connectivity



Mission Critical Networking



Industrial IoT

### 03 Digital in the field



Automation & Protection



Connected Products



Embedded Control

SELECTED EXAMPLES - NOT EXHAUSTIVE

**Energy Portfolio Management (EPM) solutions help our customers plan & optimize investments, schedule assets**

**Energy pricing data**



**Velocity Suite Power Prices powered by Google Cloud is an Energy Portfolio Management solution** delivering sub-hourly, high-quality energy pricing data to allow developers to guide investment decisions

**Transmission expansion planning**



**Southwest Power Pool relies on the Energy Portfolio Management solution PROMOD® to evaluate transmission upgrades** and their economic impact to assure reliable grid operation and competitive energy markets in the United States



**3,000+ GW of renewable projects globally await grid connection planning**

SELECTED EXAMPLES - NOT EXHAUSTIVE

Digital solutions help customers build infrastructure more efficiently

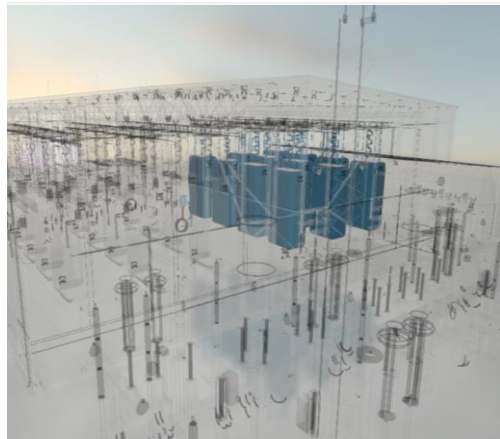
**Digital substations**



Digital substations are faster to deploy, have smaller footprint and reduce construction costs, while increasing safety



**Digital twins**



**Digital twins of assets** are delivered via Hitachi Energy's **IdentiQ** solution with HVDC installations to provide seamless workflow integration from design and construction to operations and maintenance

30 km of copper wiring avoided with a digital substation

SELECTED EXAMPLES - NOT EXHAUSTIVE

Ensure  
reliable, safe  
and economic  
operation by  
automation

Grid operation  
with substation  
automation



The use of grid automation technologies for digital substations allows greater **visibility and understanding of connected power systems**, while enabling **safe and reliable grid operation** and renewable interconnections



Mission critical  
communications



EnBW, one of the largest suppliers of energy in Europe is **modernizing its communications network linking grid assets** with Hitachi Energy's utility-grade fiber optic communications solution featuring quantum-safe encryption



E-mobility  
system  
supervision



Geneva public transport system (TPG Geneva) uses Hitachi Energy's e-bus charging solution **Grid eMotion Flash**

**Supervision of bus operation and in-route charging** from Hitachi Energy's Network Manager control system





SELECTED EXAMPLES - NOT EXHAUSTIVE

Software solutions help improve reliability, optimize maintenance and reduce OpEx

Enterprise Asset Management



Leading nuclear generation companies use Hitachi Energy's enterprise asset management solutions to manage the full lifecycle of their fleet of generation stations

75k+ managed assets in every nuclear unit

Asset Performance Management



Ameren uses Lumada Asset Performance Management (APM) to increase reliability and reduce OpEx by prioritizing maintenance activities

Lumada APM offers a secure, scalable analytics platform to enable fleet-wide visibility, predictive analytics, and clear, actionable information for asset lifecycle management



IT / OT asset supervision



Mainstream Renewable Power uses TXpert™ to monitor performance of transformers

TXpert™ provides data-driven insights allowing to reduce costs, optimize operations, extend life expectancy, and enhance environmental performance



Lumada APM offers a secure, scalable analytics platform to enable fleet-wide visibility, predictive analytics, and clear, actionable information for asset life cycle management



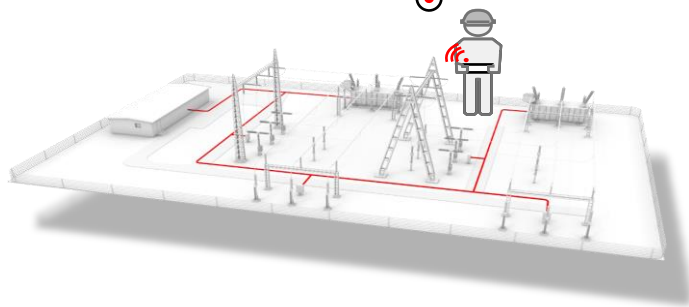
Hitachi Energy's installed base of 200+ BUSD will grow additional 50+ BUSD by 2030

A **connected asset strategy** for service is key to delivering value to customers

## The traditional way



Troubleshooting  
Corrective actions  
Hands-on Support



## New Digital Services enable:



**Insights & Uptime**  
Real-time asset visibility  
Data-driven service planning  
Faster reaction time



**Resilience and Reliability**  
Enhanced control,  
optimal upgrade timing,  
Installed base analytics



**Sustainability**  
Health, Safety and  
Environment coverage.  
Extended lifetime

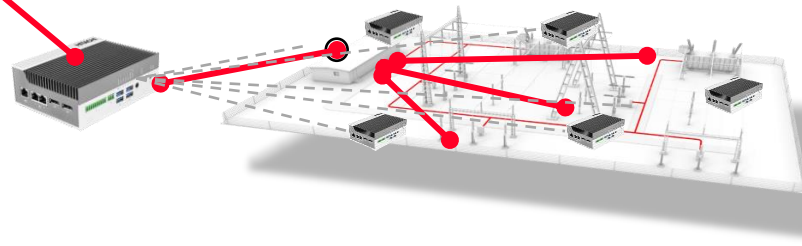
## Customer Value through digitally enabled offers



### Collaborative Operations Center

Dedicated 24/7 expert team for instant support, troubleshooting and rectification through secure remote access to Hitachi Energy technologies

Industrial IoT



SELECTED EXAMPLES - NOT EXHAUSTIVE

## New ways to support customers installed base

We use digital to develop innovative services for customers installed base and generate additional service business

## Digitally connected collaborative operations



**Digitally connected Collaborative Operation Centers** make possible **faster commissioning** and **better service** for automation and communications systems on remote offshore stations

## Digitally enabled service



**GCCIA<sup>1</sup>** uses Hitachi Energy's **RelCare** digital service application to **manage and optimize service activities** for their transmission substations in the Middle East



هيئة الربط الكهربائي  
للمجلس التعاون لدول الخليج العربية  
Gulf Cooperation Council Interconnection Authority

SELECTED EXAMPLES - NOT EXHAUSTIVE

**Digital solutions for market operations and energy trading**

**Market restructuring and energy transformation require adoption of sophisticated software systems**

**Market operations**



**Market operators and participants in North America, Europe and Japan** rely on Hitachi Energy software **to manage electricity markets with economic efficiency while relieving congestion and ensuring grid security**

**Energy trading**



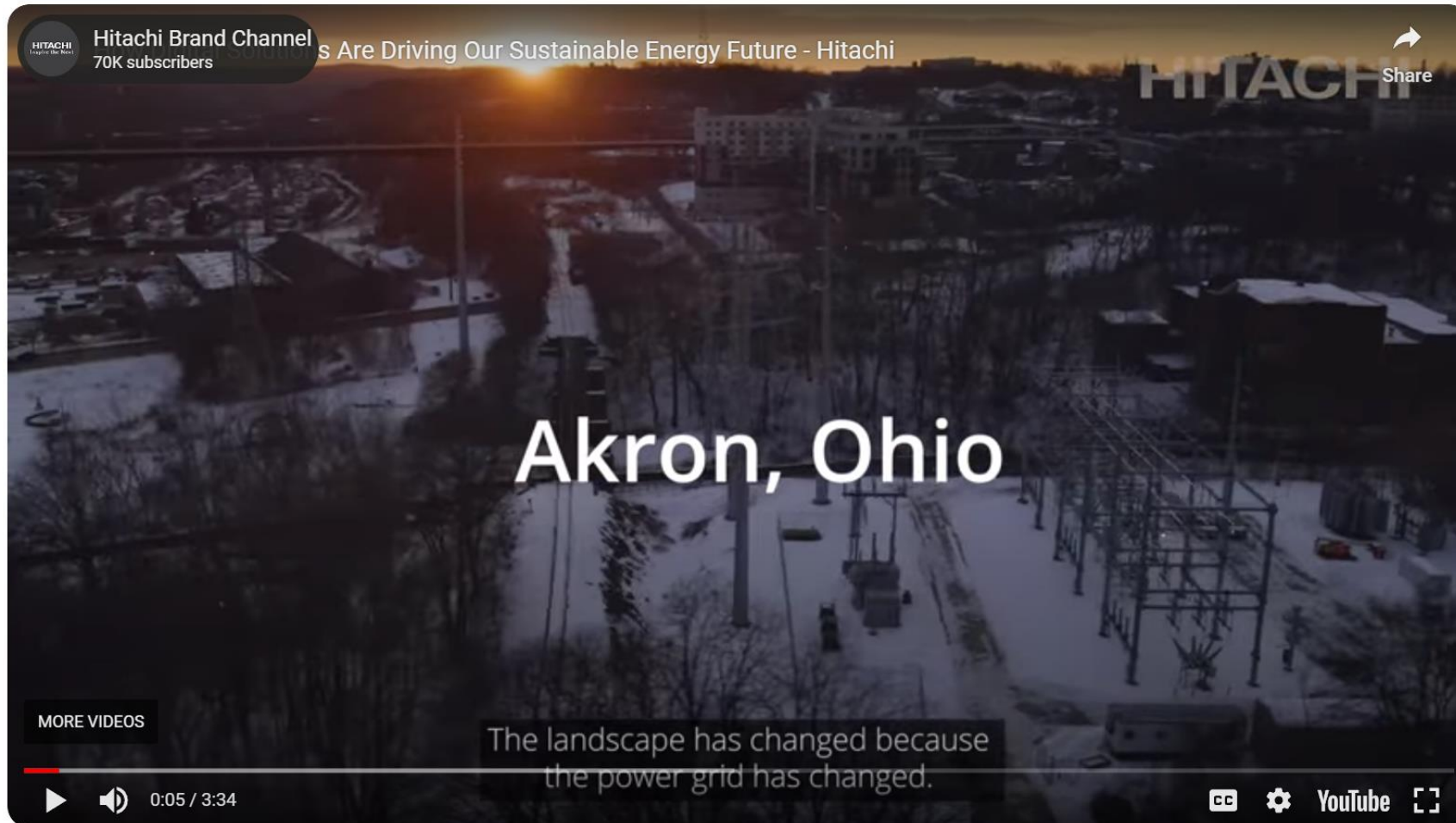
**Energy Harbor**, a producer and retail supplier of energy serving nearly 1M customers **uses TRMTracker** to manage wholesale trades, retail load forecasting and forecasts for the company's carbon-free inventory



**Chemical products leader** uses Hitachi Energy's **TRMTracker** software to buy and sell electric energy and manage risks from energy price volatility

**75k+** managed assets in every nuclear unit

# Energy Harbor uses energy trading and risk management solutions to help its customers achieve sustainability goals



# Digital initiatives also help us to optimize our operations and delivering increased efficiency and quality while reducing costs

SELECTED EXAMPLES - NOT EXHAUSTIVE

**Life cycle  
traceability**



**The Digital Passport System is a core element of our quality management system**, enabling the seamless end-to-end traceability and transparency across the global value chain

**Service process  
automation**



**Lumada EAM software establishing the digital capability foundation** for own Hitachi Energy service operations leveraging own digital and service capabilities to deliver enhanced customer satisfaction and service growth

**Factory  
digitalization**



**Applying digitalization** to optimize activities across engineering, supply chain, operations and quality in Hitachi Energy's **factories**

# Operate and Trade – Hitachi combines strengths to unify grid and market operation for Japan



“

First of its kind system integrating nationwide grid and market operations, enabled by combining Hitachi and Hitachi Energy IT/OT world-leading capabilities

## Challenge

10 T&D companies in Japan seek to improve reliability, flexibility, and economy for the whole nation, but operate with separate control systems

## Solution

Comprehensive Network Manager SCADA/EMS<sup>1</sup> and Market Management software system integrated with Hitachi solution for operational grid planning

## Impact

Makes possible Japan's goal of accelerating market deregulation while assuring reliable, resilient, and cost-effective energy delivery for customers

**Energy expertise and technology leadership make Hitachi Energy the unique partner to manage the complexity of tomorrow's energy systems**

## Key takeaways

- 01** The uptake of renewable power and massive electrification creates a complex power "system of systems"
- 02** Digitalization is essential to enable efficiency, reliability, resilience and flexibility in this complex and interconnected power system
- 03** Hitachi Energy provides pioneering connected products, software-based solutions, and digitally-enabled services
- 04** Synergies between Hitachi Energy, GlobalLogic and Hitachi Digital Services give us an unparalleled competitive advantage





**HITACHI**  
Inspire the Next 