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Hitachi Investor Day 2022

Innovation Strategy

13 June 2022

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and General Manager of the Research & Development Group,
Hitachi, Ltd.

Today's key message

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1 | Generating digital service business with the Lumada Growth Model

2 | Backcasting from 2050 to create radical innovation

3 | Accelerating outside-in innovation through startup investment

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1. Early investment in innovation supporting Hitachi growth
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1-1. Innovation strategy in Mid-term Management Plan 2024

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Focus on digital technology to generate innovation for global business growth

Planetary boundaries
Protect Earth
Sustain human society

Solving customers' and society's issues through data and co-creation

Well-being
A society in which every individual is comfortable and active

Mid-term Management Plan 2018	Mid-term Management Plan 2021	Mid-term Management Plan 2024
Innovate through collaborative creation 3-center structure consisting of CSI: Co-creation with customers, CTI: Technology innovation, and CER: Exploratory research		**Establish Innovation Growth Strategy Div.** Develop innovation investment strategy to address the challenges faced by customers and society
Launch NEXPERIENCE / Lumada Establish global collaborative creation hubs for co-creation with customers in Japan, North America, Europe, China and Asia	**Revise technology platforms** Integrate technology platforms with Hitachi Energy, Hitachi Astemo, Hitachi Vantara & GlobalLogic and generate synergy	**Generate digital service business** Provide value through IT × OT × Products to support customers' growth
Open labs Univ. of Tokyo, Kyoto Univ., Hokkaido Univ., Univ. of Cambridge, Tsinghua Univ., KOBE Biomedical Innovation Cluster	June 2019 **Set up new CV fund company** Acquire business models through startup investment/collaboration	**Create radical innovation** Solve customers' future management challenges by backcasting from 2050

LUMADA

CSI: Center for Global Social Innovation, CTI: Center for Technology Innovation, CER: Center for Exploratory Research,
CV: Corporate Venturing, IT: Information Technology, OT: Operational Technology

1-2. Innovating for global business growth through DX/GX

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Drive innovation with the full strength of the Hitachi Group leveraging technology platforms, human talent, and customer channels

Research & Development Group 2,300

Drive innovation with technology and digitalization to offer value through co-creation

Norihiro Suzuki
CTO

Global Intellectual Property Group 200

Establish an intellectual property platform to provide value to global customers

Stephen Manetta
CIPO

Europe R&D / Hitachi Energy

Sugimura GM

Salge CTO

Europe

Create Environment business in collaboration with Hitachi Energy and Hitachi Rail. Participate in the European Environment ecosystem

China R&D / Hitachi China

Chen GM

Harada CTO

China

Enhance industrial GX/DX business together with local group companies. Reinforce efforts for decarbonization

America R&D / GlobalLogic

Nakaya GM

Dayal

Singh CTO

North America

Enhance digital service businesses creation working closely with GlobalLogic/Hitachi Vantara/Hitachi Digital

India R&D / APAC R&D

Banerjee GM

Kitagawa GM

South & Southeast Asia

India: Increase digital engineering
Asia: Focus on green building and smart city

Japan R&D

Sameshima

Nishizawa

Kusumi

Nishimura

Suzuki

Kashimura

Japan

Promote customer co-creation toward DX/GX.
Establish world-leading technology platforms.
Create radical innovation addressing planetary boundaries and well-being

DX: Digital Transformation, GX: Green Transformation

1-3. Increasing Hitachi Group investment in innovation

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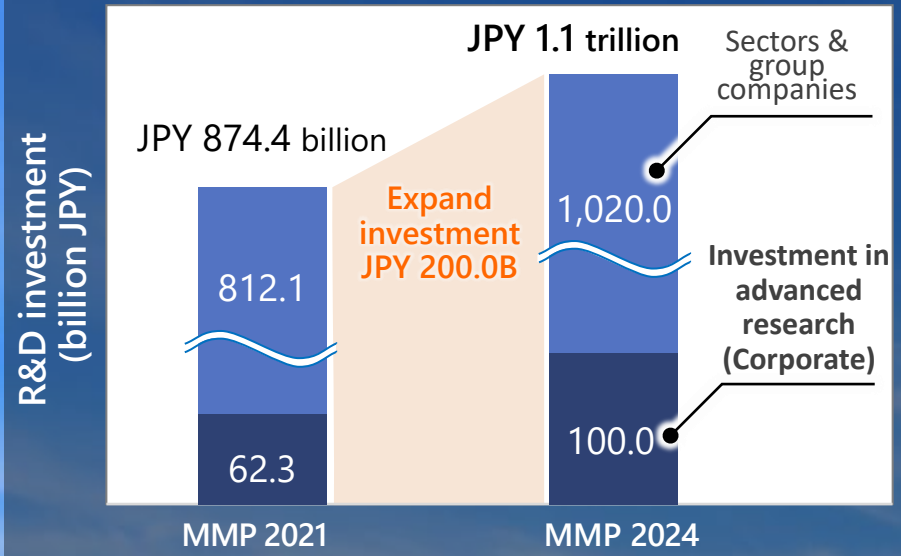
Increase investment based on backcasting from 2050 to drive innovation

Cumulative investment (over 3 years)

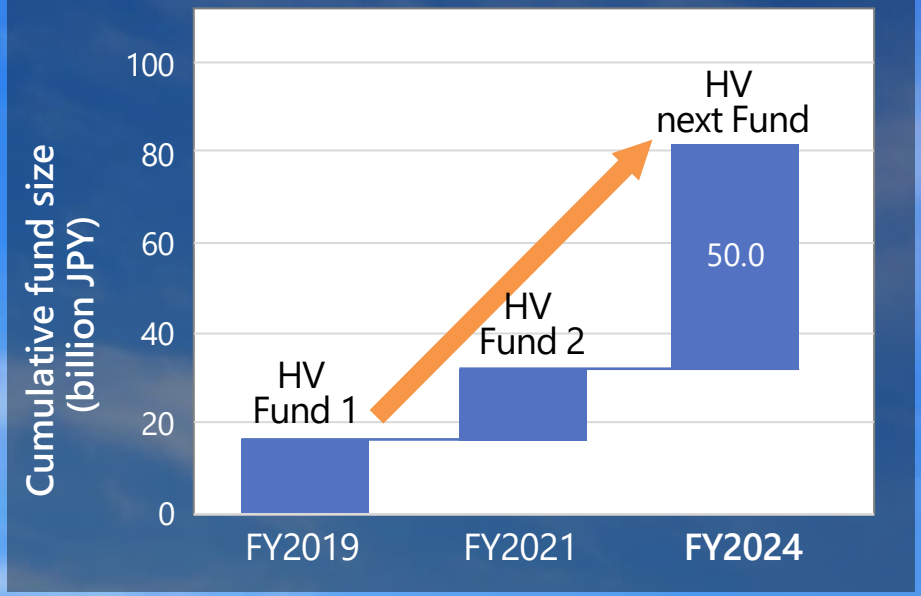
Investment in advanced research: JPY 100.0 billion

CV investment: JPY 50.0 billion

Enhance R&D investment in advanced research



Enhance investment in corporate venturing (CV)



CV: Corporate Venturing, MMP: Mid-term Management Plan

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2-1. Capability backing Lumada growth

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Supporting customer growth with our experience in providing value through IT x OT x products

Digital/AI talent

Digital talent * / Top-class AI talent in R&D Group
1,226 / 226 [2018] → 2,000 / 400 [2021]
* Total incl. planning & mgmt. staff

International AI competitions
Acquiring top awards and organizing competitions for natural language processing, acoustics, and video
SemEval 2020, Interspeech 2021, CVPR 2021, Kaggle, etc.

World-leading technology & intellectual property

High-speed trains (UK)
Excellent design, dual-mode

National Commendation for Invention "The Imperial Invention Prize" [2019], Okochi Memorial Production Prize [2020]

Automotive inverter
Insulated resin structure for 800V-compatible rapid charging

Best 10 New Products Awards [2019], Ichimura Prize in Industry against Global Warming for Distinguished Achievement [2021], National Commendation for Invention "The Prime Minister's Invention Prize" [2022]

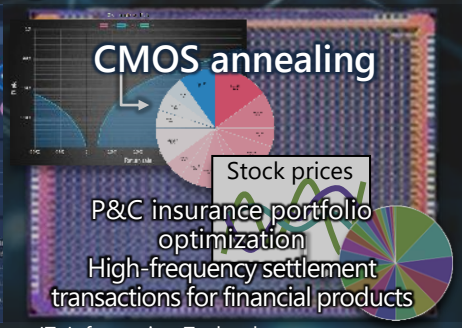
Enhance Lumada solutions through co-creation with customers

Visualization of human flow and behavior
Adopted by more than 100 stations worldwide
Good Design Award [2017], SSII Takagi Prize [2022]

IoT compass

Integrated management & analysis of mfg. process, workers, materials and equipment data

CMOS annealing



P&C insurance portfolio optimization
High-frequency settlement transactions for financial products

PBI (Public biometric infrastructure)
Best 10 New Products Awards - Masuda Prize [2020], R&D100 [2020], Ichimura Prize in Industry for Excellent Achievement [2021]

AI: Artificial Intelligence, CMOS: Complementary Metal-Oxide Semiconductor, IoT: Internet of Things, IT: Information Technology, OT: Operational Technology, P&C: Property and Casualty, SSII: Symposium on Sensing via Image Information

2-2. The Lumada Growth Model supporting customers' growth

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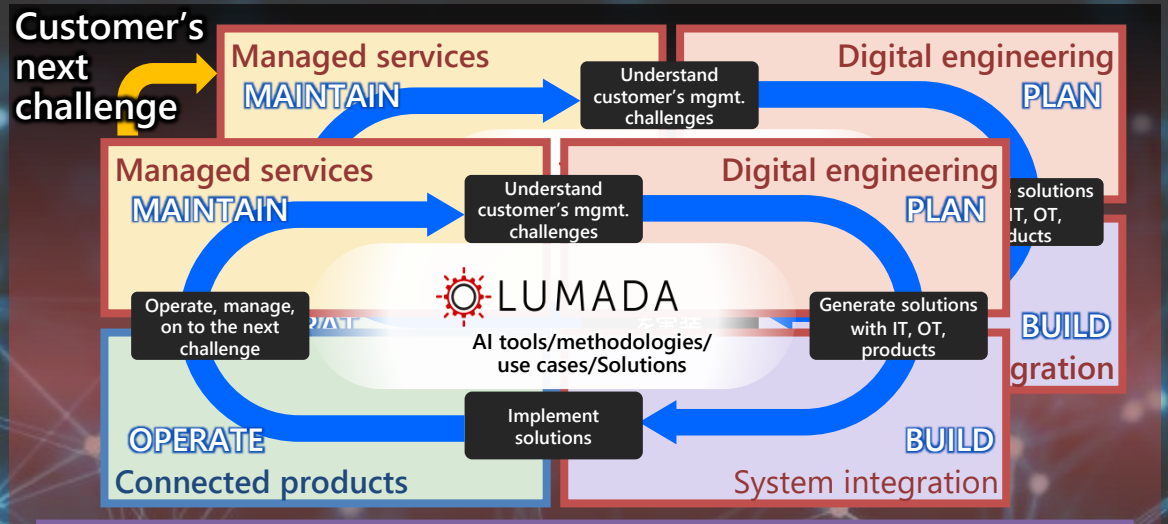
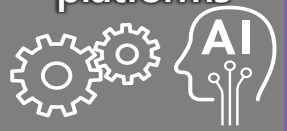
Promote innovative co-creation and digital services for the customer's next challenge



Understand *kizashi* of change in society/customer & offer innovation

NEXPERIENCE Co-creation techniques and tools

Technology platforms



Strengthen global front line operations and marketing CRM to categorize growth models & promote co-creation

Financial/Public services area

Offer customer service content providing economic inclusion

Energy, Railway/Transport area

Asset-linked services aimed at decarbonization and regional revitalization

Manufacturing/Logistics area

Offer value through improved resilience, high added value and circular economy

CRM: Customer Relationship Management

2-3. Lumada Growth Model: Financial/Public Services area

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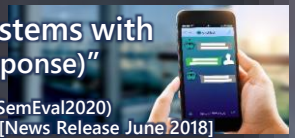
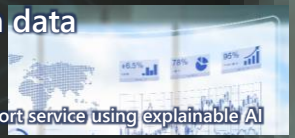
Accelerate coordination between operational processes in financial services for financial inclusion using knowledge from various industries

	Operational Excellence Customers: Financial organizations	Creating new demand Customers: Financial organizations, manufacturers, distributors, etc.
PLAN	Optimize work processes with design thinking 	Design cross-industry financial/public service products based on OT knowhow 
BUILD	Increase efficiency in work systems with "AI (RPA/dialogue/automatic response)"  Won first place in the international competition (SemEval2020) Launch of Chatbot service with machine learning [News Release June 2018]	Implement an inter-industry coordinated IoT information distribution system  Launch of Sustainable Finance Platform Recognized as a Leader in Gartner® Magic Quadrant™ for Industrial IoT Platforms
OPERATE	Analyze & evaluate operation data using "Explainable AI"  Launch of AI implementation and operation support service using explainable AI [News Release January 2020]	Data analysis with assured security in Blockchain/NFT and DFFT base  PBI won Masuda Award of the 10 most innovative products award. WEF C4IR published white papers and distributed it on GTGS2021. Launch of demonstration experiment using digital currency in distribution SC [News Release May 2022]
MAINTAIN	Offer improved customer service by automatically analyzing "customer voice"  Launch of voice-to-text cloud service [News Release October 2021] Launch of sensitivity analysis service with additional perspectives of morality and unexpectedness [News Release October 2021]	Offer value distribution service leveraging Metaverse/Web3.0 

AI: Artificial Intelligence, DFFT: Data Free Flow with Trust, C4IR: Centre for the fourth Industrial Revolution network, GTGS: Global Technology Governance Summit, NFT: Non-Fungible Token, OT: Operational Technology, PBI: Public Biometrics Infrastructure, RPA: Robotics Process Automation, WEF: World Economic Forum

2-4. Lumada Growth Model: Energy, Railway/Transport area

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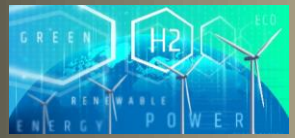
Progress optimized control of distributed multi energy to contribute to decarbonization

	Transformation in asset management Customers: Power utilities	Enhance user support for transition to carbon neutrality Customers: Power utilities, gas companies and commercial-scale utility customers
PLAN	Optimize facilities cost with design thinking 	Optimize assets including gas and hydrogen  Hitachi U.Tokyo Lab. Energy Forum [December 2021]
BUILD	Use digital twin to implement equipment diagnosis/management system  Launch of operation and maintenance optimization service for social infrastructure facilities using machine learning [News Release January 2022]	Co-creation and verification of "Area energy management system"  Verification environment in "Kyōsō-no-Mori" [News Release October 2021]
OPERATE	Implement remote & automated equipment inspection with "image diagnosis AI"  Achieved the top level in the international competition (TRECVID2020) Launch of Lumada Inspection Insights [News Release May 2022]	Implement "grid-edge control" system by introducing DERMS  Enhanced grid edge solutions for distributed energy sources [News Release November 2021]
MAINTAIN	Provide condition-based services in APM  Recognized as a Leader in IDC Market Scape 2020-2021 Vendor Assessment Launch of APM solution for industrial applications [News Release January 2021]	Provide multi-energy optimization service with EaaS and MaaS 

AI: Artificial Intelligence, APM: Asset Performance Management, CN: Carbon Neutrality, DC: Data Center, DERMS: Distributed Energy Resource Management System, EaaS: Energy as a Service, MaaS: Mobility as a Service

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3-1. Backcast innovation map from 2050

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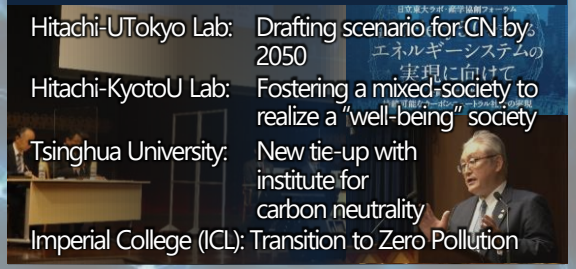
Discussions with stakeholders to explore future societal and customer issues

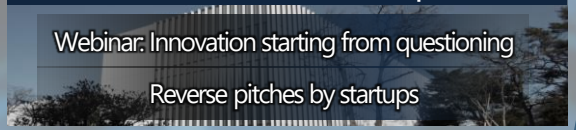
Society in 2050

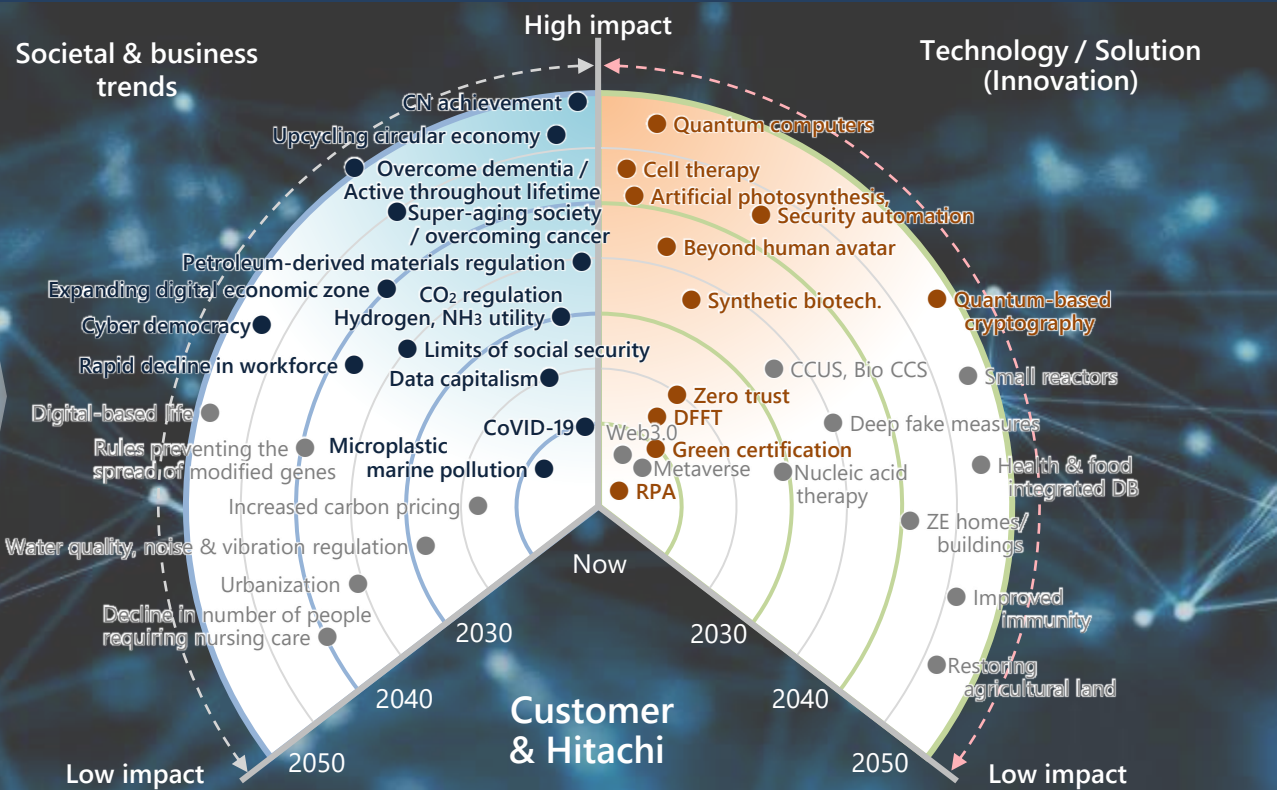
International conferences

Academia



Customer, Startup





C4IR: Centre for the fourth Industrial Revolution, CCS: Carbon dioxide Capture and Storage, CCUS: Carbon dioxide Capture, Utilization and Storage, GTGS: Global Technology Governance Summit, ICL: Imperial College London, RPA: Robotics Process Automation, WEF: World Economic Forum, ZE: Zero Emission

3-2. Societal Issues in 2050

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Backcasting from 2050 to take on the challenge of radical innovation to solve future issues that customers will face

Value	Present	2030	2050
 Environment	Arrival of a hydrogen-based society where carbon-neutrality is achieved • Carbon pricing • Hydrogen mobility	• Carbon neutrality • Full-scale utilization of hydrogen energy	Environmentally neutral society • Energy storage & supply • Direct air capture
	Progressing circular economy leading to zero waste and a complete recycling-based society • Restrictions on plastics	• Transition to bio-based material and zero pollution	
 Safety, Security & Healthcare	Eradication of cancers with biomedical technology • COVID pandemic is overcome	• Regenerative medicine/cell therapy markets expands	Society with 100-year active life • Minimally invasive cancer treatment • Designed cells
	Freedom in workstyle enabled by evolution of AR/VR • Remote working	• Remedy gaps using avatars and online education	
 Resilience	Wide range of automated operations enabled by advances in AI • RPA accelerated by shortage in human labor	• AI governance	Digital technologies, people and society evolve together • Ultra big data management • Silicon quantum computer
	Acceleration of technology development cycle by quantum computers • Risk analysis and traffic control	• Materials and new drug development	

AI: Artificial Intelligence, AR: Augmented Reality, RPA: Robotics Process Automation, VR: Virtual Reality

3-3. Innovation for a decarbonized society & carbon negative

Carbon negative with H_2 energy storage & transportation and CO_2 conversion to resource

Market size: JPY 7 trillion (2030)

Energy storage & supply

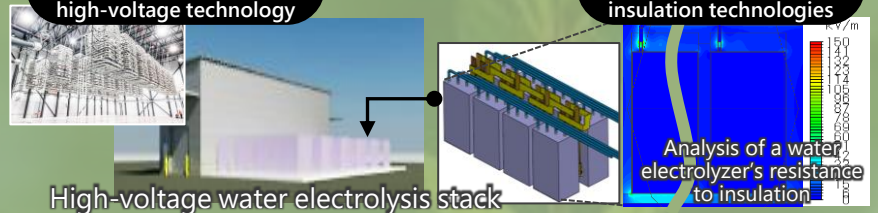
Support the stable supply of renewable energy and a hydrogen-based society with low-cost hydrogen production and grid stabilization solutions

Suzuki

Water-electrolysis hydrogen production

Hitachi Energy/ Electric power system and high-voltage technology

Hitachi/ electrochemical and insulation technologies



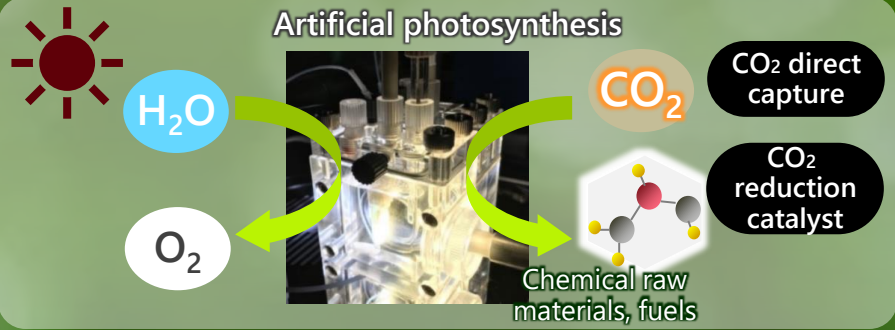
Milestone	**Commercialize a 100MW level water electrolyzer (2026)**
Scenario	Combine Hitachi Energy's electric power system and high-voltage technologies with the water electrolysis control technology to build a large, low-cost system for hydrogen production.
Ecosystem	Horizon Europe, Yokohama National Univ., Kyusyu Univ., Univ. of Tokyo

Direct air capture

Raise the rate of artificial photosynthesis and deliver carbon negative solutions through CO_2 recycling

Hayakawa

Artificial photosynthesis



Milestone	**Solar chemical system verification (2024)** (Achieve a solar energy conversion efficiency greater than that of plants)
Scenario	Realization of an artificial photosynthesis system that directly converts CO_2 from the atmosphere to chemical raw materials, fuels, and bio-raw materials without concentrating CO_2.
Ecosystem	Imperial College London, AIST and startups

AIST : National Institute of Advanced Industrial Science and Technology

3-4. Innovation to overcome cancers and intractable diseases

Environment
Safety, Security & Healthcare
Resilience

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Strategic move to the emergence of cell industries and healthcare innovation

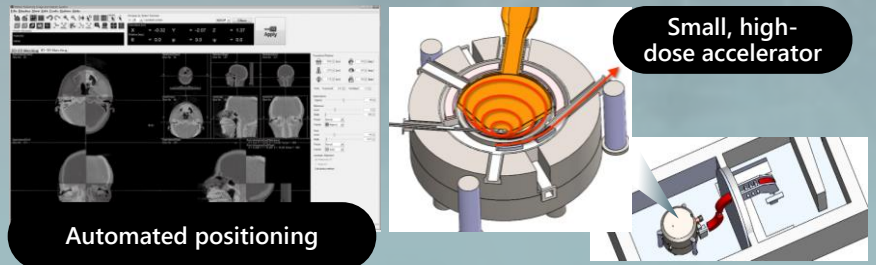
Market size:
JPY 2 trillion (2030)

Minimally invasive cancer treatment

Establish QoL-oriented cancer treatment through high-accuracy, minimally invasive radiotherapy, and reduce the social burden including those on patients and healthcare providers

Shen

High-accuracy particle beam radiotherapy equip.



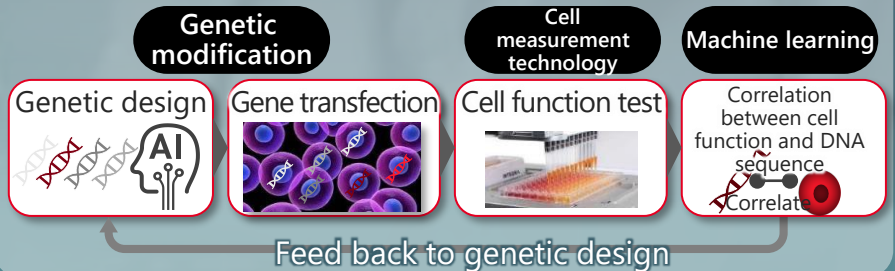
Milestone	Particle beam irradiation dose rate: 5 times (2024)
Scenario	Improve the accuracy of positioning and use small, high-dose accelerators to establish minimally invasive, accurate and high-throughput treatment.
Ecosystem	Osaka Univ. and Gunma Univ.

Designed cell

Develop designed cell to overcome cancer and other intractable diseases based on the technology for designing genetic modification accumulated through our biotechnological research

Takeda

Designed cell development platform



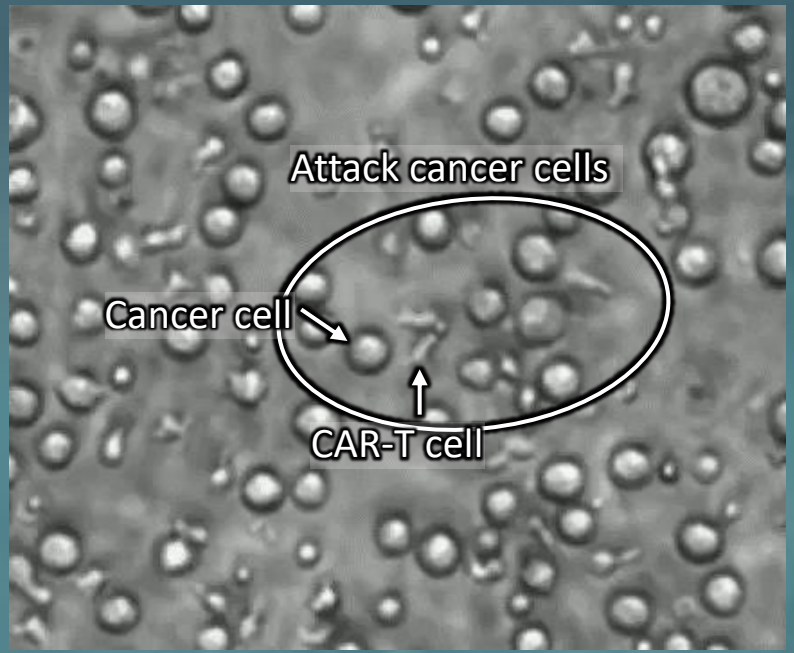
Milestone	Platform for development of designed cell (2024)
Scenario	Use our technologies for bio-analysis, manufacturing, genetic design and AI accumulated through regenerative medicine, to accelerate the development of designed cells to suit individual needs
Ecosystem	KOBE Biomedical Innovation Cluster

QoL: Quality of Life

3-4. Innovation to overcome cancers and intractable diseases

Strategic move to the emergence of cell industries and healthcare innovation

Market size: JPY 2 trillion (2030)



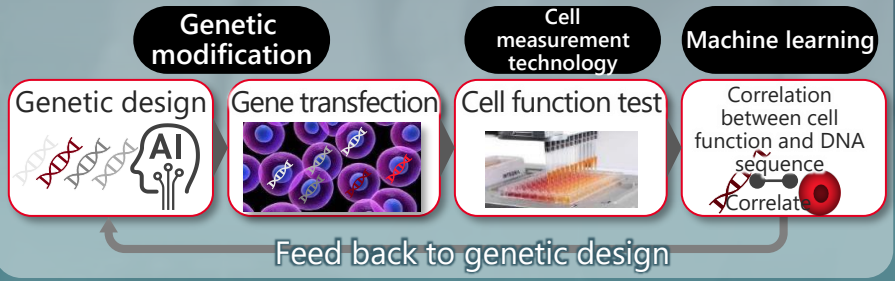
Proprietary CAR-T cells attack target cells

Designed cell

Develop designed cell to overcome cancer and other intractable diseases based on the technology for designing genetic modification accumulated through our biotechnological research

Takeda

Designed cell development platform



Milestone	**Platform for development of designed cell (2024)**
Scenario	Use our technologies for bio-analysis, manufacturing, genetic design and AI accumulated through regenerative medicine, to accelerate the development of designed cells to suit individual needs
Ecosystem	KOBE Biomedical Innovation Cluster

3-5. Innovation for the co-evolution of digital technologies, people and society

Environment
Safety, Security & Healthcare
Resilience

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Innovate the use of data and computing with view to expanding the data economy

Market size:
JPY 70 trillion (2035)

Ultra big data management

Utilize big data to create environmental and healthcare services. Automatically structure databases and optimize according to changes in usage

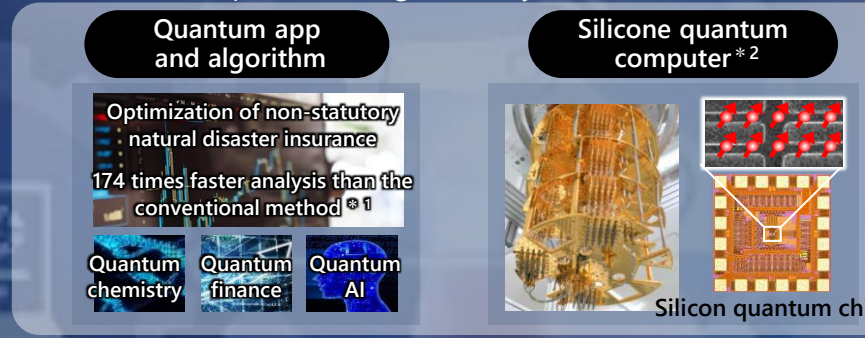
Mogi

Milestone	Data extraction performance more than 100 times greater than conventional one (2024)
Scenario	Automatically optimize environmental and healthcare services through automatic database generation using high-speed data and machine learning in partnership with the University of Tokyo.
Ecosystem	The University of Tokyo and startups (data brokers, business models)

Silicon quantum computer

Realized the world's first silicon quantum hardware with superior scalability. Roll-out for applications from finance to solutions for the development of drug-discovery biomaterials.

Mizuno



Milestone	1M bit-level quantum computer (2030)
Scenario	Simultaneously develop quantum apps, algorithm and silicon quantum hardware to accelerate the commercialization of quantum chemistry, quantum finance and quantum AI.
Ecosystem	Moon Shot, Quantum Innovation Initiative, Q-STAR and University of Cambridge

*1. This is a result of a test using our CMOS annealing machine. *2. The research is partly from a Moon Shot R&D project (JPMJMS2065) implemented by the Japan Science and Technology Agency (JST).
DB: Database, exabyte: 10^{18} bytes, Q-STAR: Quantum Strategic Industry Alliance for Revolution

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4-1. Accelerate outside-in innovation

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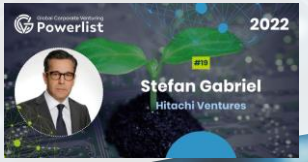
Expand the Lumada business leveraging "disruptive technology" and "innovative business models" from startups

■ Strengthen corporate venturing

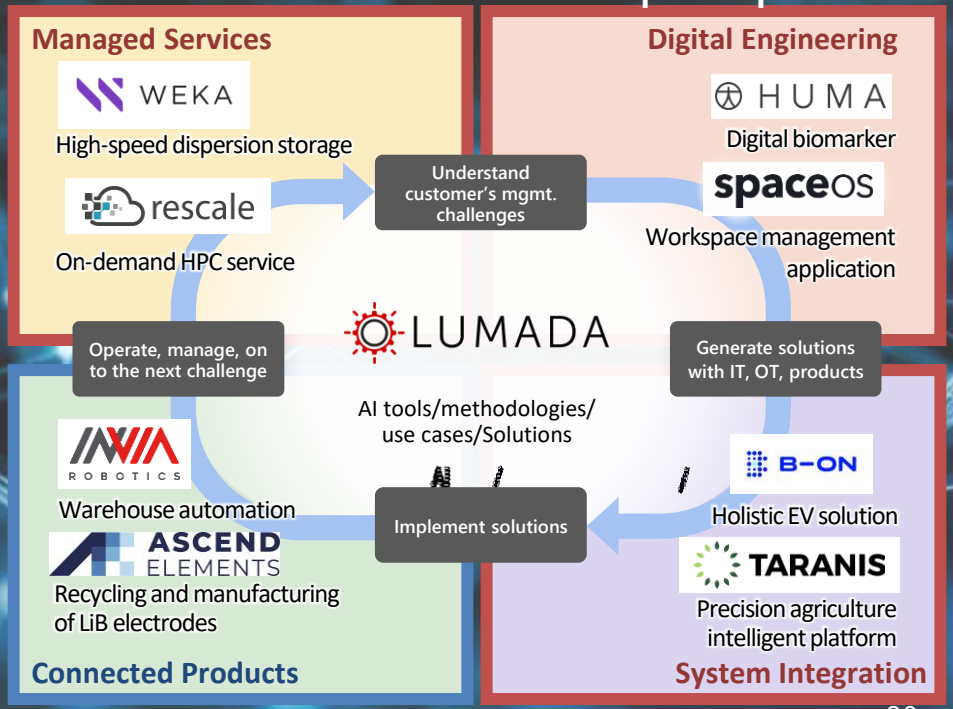
2019
- Established the Corporate Venturing Office (Apr.)
- Established Hitachi Ventures GmbH (HVG) (May)
- Set-up HV Fund1 (JPY 16.5 billion) (Dec.)

2020-21
- Set-up HV Fund 2 (USD 150 million) (Oct. 2021)
- Invested in a total of 15 companies through Fund 1 and Fund 2

2022-24
- Increasing investment in PB/WB and DX service-related areas (JPY 50.0 billion over 3 years)
- Selected top 19 in 2022 GCV



■ Accelerate the Lumada Growth Model in collaboration with startup companies



PB: Planetary Boundary, WB: Well-Being, GCV: Global Corporate Venturing, HPC: High Performance Computing

4-2. Speed-up the radical innovation process

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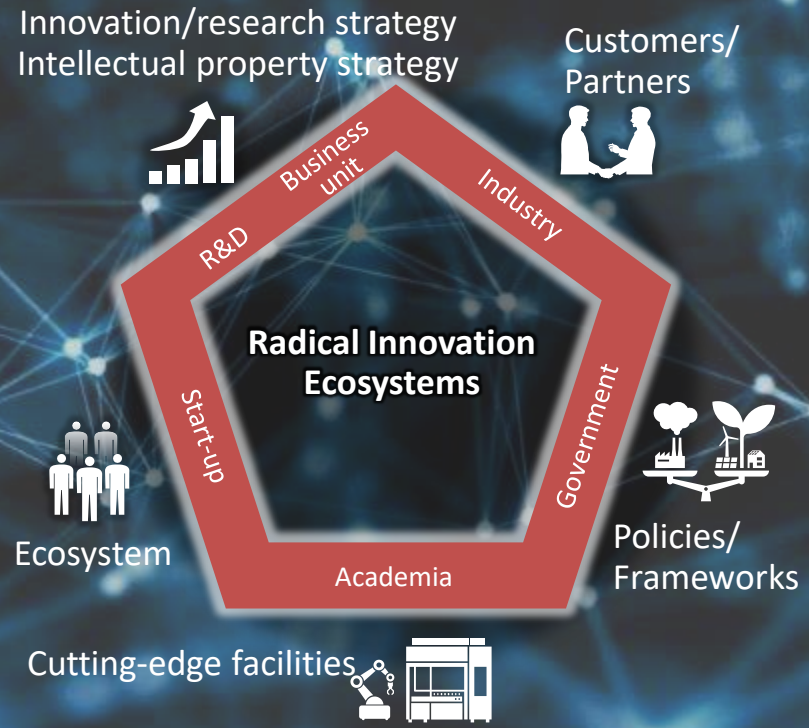
Expand innovation ecosystem thereby accelerating radical innovation

■ Foster an innovation ecosystem



■ Collaboration themes to accelerate radical innovation

Decarbonized society Carbon negative	• New approaches in carbon removal technology • Negative emissions business model • Improved efficiency of artificial photosynthesis (photocatalysts and new devices)
Overcoming of cancer, intractable and infectious diseases	• Fusion of biopharmaceuticals and radiotherapy • Designed cell innovation technology (Genetic design, cell manufacturing and evaluation of cell functions)
Co-Evolution of digital technology, people and society	• Metaverse/Web 3.0 applications and business models (Societal infrastructure and industry areas) • Quantum applications and use cases • Business models for quantum services

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5. Summary

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Grow globally by Digital, Green, and Innovation

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Hitachi Social Innovation is
POWERING GOOD

Cautionary Statement

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Certain statements found in this document may constitute "forward-looking statements" as defined in the U.S. Private Securities Litigation Reform Act of 1995. Such "forward-looking statements" reflect management's current views with respect to certain future events and financial performance and include any statement that does not directly relate to any historical or current fact. Words such as "anticipate," "believe," "expect," "estimate," "forecast," "intend," "plan," "project" and similar expressions which indicate future events and trends may identify "forward-looking statements." Such statements are based on currently available information and are subject to various risks and uncertainties that could cause actual results to differ materially from those projected or implied in the "forward-looking statements" and from historical trends. Certain "forward-looking statements" are based upon current assumptions of future events which may not prove to be accurate. Undue reliance should not be placed on "forward-looking statements," as such statements speak only as of the date of this report.

Factors that could cause actual results to differ materially from those projected or implied in any "forward-looking statement" and from historical trends include, but are not limited to:

- exacerbation of social and economic impacts of the spread of COVID-19;
- economic conditions, including consumer spending and plant and equipment investment in Hitachi's major markets, as well as levels of demand in the major industrial sectors Hitachi serves;
- exchange rate fluctuations of the yen against other currencies in which Hitachi makes significant sales or in which Hitachi's assets and liabilities are denominated;
- uncertainty as to Hitachi's ability to access, or access on favorable terms, liquidity or long-term financing;
- uncertainty as to general market price levels for equity securities, declines in which may require Hitachi to write down equity securities that it holds;
- fluctuations in the price of raw materials including, without limitation, petroleum and other materials, such as copper, steel, aluminum, synthetic resins, rare metals and rare-earth minerals, or shortages of materials, parts and components;
- estimates, fluctuations in cost and cancellation of long-term projects for which Hitachi uses the percentage-of-completion method to recognize revenue from sales;
- increased commoditization of and intensifying price competition for products;
- uncertainty as to Hitachi's ability to attract and retain skilled personnel;
- uncertainty as to Hitachi's ability to continue to develop and market products that incorporate new technologies on a timely and cost-effective basis and to achieve market acceptance for such products;
- fluctuations in demand of products, etc. and industry capacity;
- uncertainty as to Hitachi's ability to implement measures to reduce the potential negative impact of fluctuations in demand of products, etc., exchange rates and/or price of raw materials or shortages of materials, parts and components;
- credit conditions of Hitachi's customers and suppliers;
- uncertainty as to Hitachi's ability to achieve the anticipated benefits of its strategy to strengthen its Social Innovation Business;
- uncertainty as to the success of acquisitions of other companies, joint ventures and strategic alliances and the possibility of incurring related expenses;
- uncertainty as to the success of restructuring efforts to improve management efficiency by divesting or otherwise exiting underperforming businesses and to strengthen competitiveness;
- general socioeconomic and political conditions and the regulatory and trade environment of countries where Hitachi conducts business, particularly Japan, Asia, the United States and Europe, including, without limitation, direct or indirect restrictions by other nations on imports and differences in commercial and business customs including, without limitation, contract terms and conditions and labor relations;
- the potential for significant losses on Hitachi's investments in equity-method associates and joint ventures;
- uncertainty as to the success of cost structure overhaul;
- the possibility of disruption of Hitachi's operations by natural disasters such as earthquakes and tsunamis, the spread of infectious diseases, and geopolitical and social instability such as terrorism and conflict;
- uncertainty as to the outcome of litigation, regulatory investigations and other legal proceedings of which the Company, its subsidiaries or its equity-method associates and joint ventures have become or may become parties;
- the possibility of incurring expenses resulting from any defects in products or services of Hitachi;
- uncertainty as to Hitachi's ability to maintain the integrity of its information systems, as well as Hitachi's ability to protect its confidential information or that of its customers;
- uncertainty as to Hitachi's access to, or ability to protect, certain intellectual property; and
- uncertainty as to the accuracy of key assumptions Hitachi uses to evaluate its employee benefit-related costs.

The factors listed above are not all-inclusive and are in addition to other factors contained elsewhere in this report and in other materials published by Hitachi.