Research & Development Strategy
To become a global innovation leader

February 25, 2021

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General Manager, Research & Development Group
General Manager, Corporate Venturing Office
Hitachi, Ltd.
Today’s Key Messages

1. Expand R&D investment for carbon neutrality

2. Create innovation in the environment area with the new Hitachi Group companies, Hitachi ABB Power Grids and Hitachi Astemo

3. Accelerate R&D to expand Lumada business
Research & Development Strategy

Contents
1. Direction of the R&D Group
2. Innovation for value creation
3. Technology development for Lumada business expansion
4. Summary
Research & Development Strategy

Contents
1. Direction of the R&D Group
2. Innovation for value creation
3. Technology development for Lumada business expansion
4. Summary
### Global Social Issues
- Climate change
- Scarcity of resources
- Demographic changes due to aging
- Challenges in urbanization/Resilience

### Covid-19 Effects
- Restrictions on the movement of people and changes in lifestyles
- “Contactless,” “Remote,” “Automation”
- Disruption & restructuring of supply chain
- Sustainable & resilient society

## Direction of R&D

**From products/SI to customer co-creation (FY2015~)**
- Creating visions for the future & resolving customer issues through customer co-creation
- Digital innovation

**Value-based innovation (FY2020~)**
- Realization of “environmental value,” “social value” and “economic value” for a human-centric society
- Combined strength of OT × IT × Products
1-2 Research & Development Group policy

Become a global innovation leader driving Society 5.0 and SDGs

**Basic policy**

**Value-based innovation**

- Create innovation in “Environment,” “Resilience,” and “Safety & Security,” and pursue No. 1 technology
- Fully leverage the technology, human resource and customer channels of Hitachi ABB Power Grids and Hitachi Astemo to perform comprehensive strengths

**Contribute to Lumada business expansion**

Accelerate core technology development to expand Lumada business

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**Global R&D organization**

- Technology Strategy Office
  - Global R&D strategy
- Global Center for Social Innovation (CSI)
  - Driving creation of value-based innovation
- Center for Technology Innovation (CTI)
  - Global No.1 technology platform
- Center for Exploratory Research (CER)
  - Challenging future societal issues

**Regional centers**

- North America
- Europe
- China
- India
- APAC

**BU R&D (Hitachi ABB Power Grids, Hitachi Astemo, etc.)**
Increase R&D investment for growth in “Environment” and “Digital”

### R&D investment

<table>
<thead>
<tr>
<th>Year</th>
<th>R&amp;D expenditure (Billion JPY)</th>
<th>R&amp;D expenditure as a % of Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>2020*</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>2021*</td>
<td>450</td>
<td></td>
</tr>
</tbody>
</table>

**Ratio of adjusted operating income to revenue**

- 2016: 6.4%
- 2017: 7.6%
- 2018: 8.0%
- 2019: 7.5%
- 2020*: 5.1%
- 2021*: 4.0%

* Hitachi ABB Power Grids & Hitachi Astemo added

### R&D efficiency

**Past 3-yr. average of R&D expenditure**

- 2016: 0.0%
- 2017: 1.0%
- 2018: 2.0%
- 2019: 3.0%
- 2020: 4.0%
- 2021: 5.0%

**Profit/ R&D expenditure**

- Hitachi
- A (IT company)
- B (OT company)
- C (OT company)
Increase R&D investment for growth in “Environment” and “Digital”

**Hitachi Group R&D portfolio**

- **Publicly listed affiliated companies**: 7%
- **Mobility**: 9%
- **IT**: 20%
- **Energy**: 11%
- **Industry**: 3%
- **Smart Life**: 19%
- **Hitachi Astemo**: 17%
- **Corporate, misc.**: 13%

**Hitachi Group R&D investment**
298 billion JPY [FY2020 forecast]

**R&D investment**

<table>
<thead>
<tr>
<th>Year</th>
<th>R&amp;D expenditure (Billion JPY)</th>
<th>R&amp;D expenditure / Revenue (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>200</td>
<td>0.0%</td>
</tr>
<tr>
<td>2017</td>
<td>300</td>
<td>1.0%</td>
</tr>
<tr>
<td>2018</td>
<td>400</td>
<td>2.0%</td>
</tr>
<tr>
<td>2019</td>
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<tr>
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<td>4.0%</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>6.4</td>
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<tr>
<td>2017</td>
<td>7.6</td>
</tr>
<tr>
<td>2018</td>
<td>8.0</td>
</tr>
<tr>
<td>2019</td>
<td>7.5</td>
</tr>
<tr>
<td>2020*</td>
<td>5.1</td>
</tr>
</tbody>
</table>

* Hitachi ABB Power Grids & Hitachi Astemo added
### Research target

<table>
<thead>
<tr>
<th>BU initiatives</th>
<th>Business roadmap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponsored research BU funding</td>
<td>Current business</td>
</tr>
<tr>
<td>Adv. sponsored research BU funding</td>
<td>Next gen. business</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corp. initiative</th>
<th>Innovation strategy, Mid/Long term Technology Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontier &amp; Platform research Corp. funding</td>
<td>Customer co-creation, Common digital platform tech., Product/Core tech, Exploratory research, Build-up ecosystem</td>
</tr>
<tr>
<td>Corporate venturing</td>
<td>Introduction of technology, learnings on business models and incubation</td>
</tr>
</tbody>
</table>

### Research portfolio / Startup collaboration

- **R&D Group (approx. 70 billion JPY)**
  - Sponsored research: 42%
  - Adv. sponsored research: 18%
  - Other: 12%
  - Frontier & Platform research: 28%

### Value-based themes
- Environ.: 19%
- Safety & Security: 21%
- Resilience: 28%
- Digital: 24%
- Frontier & Platform: 7%

### Additional Notes
- Accelerate the creation of new values such as in life sciences, next-gen. trust platforms, computing, etc. through collaboration with startups (invested in 7 co.)
- Est. Happiness Planet Ltd. in July 2020
1-5 Major external recognitions

- Nikkan Kogyo Shim bun Best 10 New Products Awards / R&D100 (Masuda Prize)
- Ichimura Prize in Industry for Distinguished Achievement
- Ichimura Prize in Industry against Global Warming

**Safety & Security**

- Environment
- Resilience

**Environment**

- RoHS: Restriction of Hazardous Substances Directive

**Cho-Monodzukuri Innovative Parts and Components Award 2020**

- Safety & Security

**R&D100**

- Environment

**Good Design Awards: 11 items**

- Environment
- Safety & Security

- New train for Tokyo Metro 17000 series
- Beat wash BW-DXX120F

**Image processing module of immuno-analyzer**

**MgB₂ multi-core long wire (Magnesium di-boride)**

**Amorphous motor**

**Development & practical application Of simultaneous adsorbent for radioactive cesium and strontium**

**Public Biometric Infrastructure**

**Image processing module of immuno-analyzer**

**MgB₂ multi-core long wire (Magnesium di-boride)**

**Amorphous motor**
## 1-6 Contribution to Lumada business growth

### Co-creation with Lumada alliance program

**Business expansion with Hitachi assets × digital**

<table>
<thead>
<tr>
<th></th>
<th>FY2019</th>
<th>FY2020 *2</th>
<th>FY2021 *2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumada business revenues*1</td>
<td>3.4/10.4</td>
<td>3.6/11.0</td>
<td>4.5/14.0</td>
</tr>
<tr>
<td>RDG contribution / Corporate (100 billions of yen)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RDG: Research and Development Group, *1 Hitachi ABB Power Grids not included, *2 Expected or planned value

### Strengthening through the Lumada Alliance Program

- IoT platform for buildings co-creation with Microsoft Japan

### Research assets from other fields × Lumada

- Materials development solution
  - Materials • Measurement • Know-how × Lumada

### Energy/Mobility × Lumada

Integrate & expand Hitachi ABB Power Grids’ Digital Enterprise solutions within Lumada
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2-1 To solve challenges in society

Capture changes in society_customers, form visions with industry-government-academia, disseminate globally

**Hitachi U. Tokyo Lab.**
- Formulated scenario for 2050 carbon neutrality
- "Society 5.0を支える エネルギーシステムの実現に向けて: Energy Forum [18 Jan 2021]

**Hitachi Kyoto U. Lab**
- New vision for a societal system toward a sustainable society
- Changes caused by COVID-19
- Remote, contactless
- Diversification
- Published "Beyond Smart Life"

**Tsinghua Univ.**
- Tsinghua-Hitachi Future Innovation Linkage Program
- Digital city
- Elderly health
- Energy
- Mobility

**WEF-C4IR Japan***
- Formed G20 alliance for smart cities, Proposed DFFT

**Environment ecosystem**
- Participate in the European decarbonization community
- Collaboration with Fraunhofer, Imperial College

**Digital city**
- Western Sydney regional co-creation (Australia)
- Signed MoU for emergency/medical service collaboration system with the City of Liverpool [25 May 2020]

**Chulalongkorn University (Thailand)**
- Co-creation to identify Kizashi and societal challenges for the sustainable growth of Thailand

**WEF: World Economic Forum, C4IR: Center for the 4th Industrial Revolution, DFFT: Data Free Flow with Trust, MoU: Memorandum of Understanding.**

* [https://jp.weforum.org/centre-for-the-fourth-industrial-revolution-japan/](https://jp.weforum.org/centre-for-the-fourth-industrial-revolution-japan/)
2-2 Value-based innovation and technology platform enhancement

Development of global No.1 technology by focusing on “Environment,” “Resilience,” and “Safety & Security”

Business sector
- Energy
- Mobility
- Industry
- IT
- Life

Value-based innovation
- Electrification
- Security
- Data science
- Bio
- AI
- 5G

Technology platforms
- Power grids
- Control (2-wheeler)

Enhance technology platforms

MaaS: Mobility as a Service

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2-3 Innovation with Hitachi ABB Power Grids

Develop core business in environment through the synergy of Hitachi ABB Power Grids’ and Hitachi’s technology platforms

- Large-scale power sources (nuclear energy and others)
- HVDC
- Grid automation
- 100% RE supply services
- Distributed power services
- Energy management
- Mobility
- Industry
- Smart Life
- Energy users
- T&D products
- Mega solar
- Wind power
- Carbon cycle
- EV / hydrogen solutions
- Data center solutions
- P2P energy exchange
- Energy producers
- Transmission and Distribution
- Energy users
- Mobility
- Industry
- Smart Life
- Hitachi technology platforms


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2-4 Innovation with Hitachi Astemo

Become a global leader in CASE using Hitachi R&D advantage

- Multimodal transport solutions
- MaaS (Mobility-as-a-Service)
- Energy management systems

• Cybersecurity
• Data accumulation & AI analytics
• OTA

Hitachi technology platforms

Realize net zero emission by solving root problems in renewable energy, electrification and hydrogenation.
2-5 Initiatives in electrification

Maximizing the drive efficiency of the electrified system to realize carbon neutrality

Reducing CO₂ emission throughout the value chain

“Realizing carbon neutrality in our own production by FY2030” to accelerate the creation of environmental value throughout our business

FY2030 Carbon Neutrality Commitment

Raw material / Parts procurement Production Logistics / Use / Disposal, Recycling

High efficiency motor*
Ichimura Prize in Industry against Global Warming (2020)

Energy-saving industrial motors using amorphous magnetic alloy foil
Achieved IEC’s highest standard value of IE5 with rare-earth-free magnets

High efficiency inverter
Nikkan Kogyo Shimbun Best 10 New Products Award (2019)

High output inverter for EV with double-sided direct water cooling power module
Achieved 2 times higher voltage (800V) and 2.7 times higher power density (94.3kVA/L) than previous Hitachi product (October 2019)

Low-loss SiC power device

New SiC power device with both durability and low power consumption
Achieved industry’s highest-level performance (short-circuit tolerance improved by 20% and resistance reduced by 40%) of Trench Etched Double diffused MOSFET (TED-MOS) compared to 2018

*A part of this technology was developed as part of a NEDO, Japan, funded project
2-6 Initiatives in energy field (1)

Grid control and energy management systems for the expanded introduction of renewable energies

**Online grid control**
Enhance renewable energy amount by world’s first risk prediction type online grid control which synchronizes normal operation and emergency operation

- Normal (Economic)
- Synchronize
- Emergency (Post-fault)

Assume future possible faults and reflect on normal operation

Verification by simulation*

Achieve both renewable energy mass series and stable operation by utilizing existing power transmission and substation facilities

**Demand side energy management**
Integrate analysis of real-time forecasting and historical data to deliver operational efficiencies in office buildings, production facilities and others

- Load data
- Grid data
- Market data
- Weather data
- Historical data
- Real-time forecasting
  Hourly, daily, and weekly load profiles

**e-mesh™ EMS (Energy management system)**
Optimize operational setting of distributed energy / renewables

- Maximize renewable use and economic benefit
- Minimize grid consumption

*Created own system model from public information  RE: Renewable Energy

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Initiatives in energy field (2)

Visualization of renewable energy usage for each facility & service

Digital certification of 100% renewable energy usage

Utilizing smart meters and blockchain technology to digitally certificate RE usage for each product / service

Office/Residences
Factories
Electric mobility

Expand scope to entire supply chain
e.g. green procurement or product use / disposal stage
2-8 Initiatives for hydrogen energy

Develop system and material technology for the realization of a sustainable hydrogen value chain

**Highly efficient hydrogen co-firing power generation system**

- Flexible use of hydrogen with a power generation system dynamically responding to a combination of a wide variety of fuels and compositions
  - AI control: Optimize conditions for changing fuel compositions
  - Demonstration of hydrogen co-firing power generation

**Large-scale blue hydrogen production system**

- Realize sustainable large-scale economic H₂ production by reducing resource use by 30%

\[ \text{Coal} \xrightarrow{\text{gasification}} \text{CO} \xrightarrow{\text{Shift reaction}} \text{H}_2 \xrightarrow{\text{CCUS}} \text{H}_2\text{O} \xrightarrow{\text{Throttle, Combustion timing}} \text{Shift catalyst} \xrightarrow{\text{Operating conditions}} \text{Atomic level structural control} \xrightarrow{\text{AI control: Optimize conditions for changing fuel compositions}} \text{Flexible use of hydrogen with a power generation system dynamically responding to a combination of a wide variety of fuels and compositions} \]

*N: Conducted by business unit as a granted project "Support project to promote the introduction of renewable energy in Fukushima Prefecture in 2018" *2: Conducted as NEDO Grant Program, CCUS: Carbon dioxide Capture, Utilization and Storage, RE: Renewable Energy, NEDO: New Energy and Industrial Technology Development Organization, AIST: National Institute of Advanced Industrial Science and Technology

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Resilience

Improve customers’ business resilience towards changes in society and environment;
Improve resilience of societal infrastructure such as national land resilience

- IoT compass
- Supply chain optimization
- Smart manufacturing
- Maintenance of societal infrastructure
- Disaster prevention support
- Drone operation management
2-9 Initiatives for resiliency improvement in industry field

Value chain optimization to flexibly respond to changes in business environment

**WEF advance factory “Lighthouse”**

*Omika Works*

Advanced factories that are world leaders in the adoption and integration of the cutting-edge technologies of the 4th Industrial Revolution as Lighthouse

- High efficiency production model
- Assembly navigation system
- Work improvement support system
- Progress & operation monitoring system
- Factory simulator
- Value chain optimization in practice 50% reduction in lead time for core products
- Expansion to automobile and chemical manufacturers through customer collaboration

**Digital solution for industry**

Total optimization through planning optimization service by work site visualization and knowledge digitization

- **Digital management platform (IoT compass)**
  Integrated management and analysis of process, human, product, and equipment data

- **Supply chain optimization**
  Total simulation of procurement, production, logistics, sales

Application of solution to support the planning and execution of optimal production and sales plans for demand fluctuations in the chemical business [June, 2020]

WEF: World Economic Forum

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Safety & Security

Realize a safe and secure society raises human QoL by resolving the new challenges posed by climate change, COVID-19, aging population, progress in digital economy, etc.

- Regenerative medicine
- Biochemical immuno-assay
- Smart aging
- Digital healthcare
- Security operations
- "Empty-hand" authentication platform
2-10 Initiatives in medical/pharma for Safety & Security

Raise QoL with “Measurement × Digital” and “Bio × IT”

Clinical immuno-assay

Machine learning-based image processing tech. improves accuracy and throughput of testing

Nikkkan Kogyo Shimbun 2020 Cho Monodzukuri Award

Top share world share

Immuno-analyzer

Antibody testing capability for novel coronavirus (SARS-CoV-2)
Announcement on the quantitative measurement of antibodies to novel coronavirus and launch of a research test reagent [Roche Diagnostics K.K., Oct 2020].

Regenerative medicine

Provide regenerative medicine value chain platform

Automated cell culturing
- Expanded culturing
- Induced differentiation
- Therapeutic cells
- Patient
- Co-creation* with Sumitomo Dainippon Pharma, Kyoto Univ.

iPS cells
- Applied to cell production for physician-initiated clinical trials for treating Parkinson’s disease using iPS cell-derived dopaminergic neural progenitor cells [Announced in Jan 2021] (Cell prod.: Sumitomo Dainippon Pharma, Clinical trial: Kyoto University)
- With the support of AMED, Hitachi has developed automated cell culturing technology in collaboration with Sumitomo Dainippon Pharma and Kyoto University. “Project Focused on Developing Key Evaluation Technology: Evaluation for Industrialization in the Field of Regenerative Medicine” JP18be0104016

Traceability

Integrated management platform for value chain for regenerative medicine products

Co-creation with Alfresa, pharma companies, medical institutions

Hitachi constructs Japan’s first platform for integrated management of cell and tracing information throughout the value chain for regenerative medicine products through collaborative creation with Alfresa and others [Aug 2020]

iACE is a registered trademark of Hitachi, Ltd.

Nikkkan Kogyo Shimbun 2020 Cho Monodzukuri Award

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if iPS cells: Induced pluripotent stem cells, AMED: Japan Agency for Medical Research and Development

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2-11 Initiatives in IT for Safety & Security

Provide safety & security to people in both cyber and physical space

"Empty-handed" authentication

World's first PBI technology
eliminating the need to store biometric data, thus enabling "empty-handed" identification

Can be commonly used in various situations (e.g., empty-handed payment)

"Sarutahiko Coffee" in Yokohama office of Hitachi, Ltd.

Launch of "biometric integration platform service," a cloud service for secure biometric authentication [Oct 2020]
Aktif Bank, Hitachi and Mitsubishi Corporation form a partnership [Mitsubishi corporation, Aktif bank, Hitachi Europe, Sept 2020]

Human flow / behavior visualization

Provide safety and security in public areas such as train stations and airports using AI image analysis of people and luggage

High-speed similar vector search can find a person using over 100 entire body features in less than a second from data containing tens of thousands of people

Privacy-conscious novel coronavirus countermeasures

Began sales of "High-speed people detection and tracking solution" to support more efficient and sophisticated monitoring and security operations at stations, airports, commercial facilities, and public facilities. [Oct 2019]
Technology verification of "human flow visualization solution" for infection control in the official professional baseball game at Tokyo Dome [Nov 2020]
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3-1 Establishment of Lumada Data Science Lab.

Gathering top data scientists in Kyōsō-no-Mori

Facilitate the spiraling of R&D and business by bringing together technology and know-how in data use
Pursue Lumada business expansion using Hitachi’s unique customer co-creation system NEXPERIENCE

- Ability to solve field issues: Consultation skills
- Ability to apply OT knowledge and AI in the field
- AI technical capabilities

Team of data scientists
100 HC ('20) → 200 HC ('21)

Advancements in Lumada

Value
Resilience
Environment
Safety & Security

Business domain
Industry
Energy
Mobility
Life

Platform
5G
Edge processing
AI
Massive big data processing
Quantum computing

NEXPERIENCE

Real-time data collection / feedback

OT: Operational Technology

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3-2 Initiatives in AI

Technology development based on AI ethics, Top prize in international competition

AI ethics

“AI Ethical Principles” for progress in AI technology supporting a human-centric society (February 2020 News release)

Standards for conduct

1. We will plan the development and utilization of AI for the realization of a sustainable society
2. We will implement AI in society from a human-centered perspective
3. We will maintain and manage AI to ensure that it provides long-term value

Practices common

1. Safety
2. Privacy
3. Fairness
4. Proper dev. & use
5. Transparency and accountability
6. Security
7. Compliance

• Began operation with a checklist developed from the AI ethical principles & practices for actual LDSL projects
• Initiatives in AI ethics published in white paper

International AI competitions

Video: Top class in TRECVID 2020

TREC Video Retrieval Evaluation

Lumada related solution

Recognizing disasters with high accuracy

October 2019 Press release

NLP: 1st place in CoNLL & SemEval

CoNLL
The SIGNLL Conference on Computational Natural language Processing
Original semantic expression analysis

SemEval-2020
High-precision "meaning understanding" technology

Lumada related solution

QUICK Corp.
Improved efficiency of corporate disclosure document analysis

March 2020 Press release

LDSL: Lumada Data Science Laboratory, NLP: Natural Language Processing
3-3 Initiatives in 5G solutions

5G demonstration environment and co-creation acceleration toward real-time control use case

Telepresence remote operation support

Realistic presence, real-time comprehension of on-site situation, and remote operation support using advanced sensing and low-latency video transmission

On-site 5G

Low-latency video transmission

Remote

AR contents to support field operations

5G

360° view cockpit

Worker health

Advanced sensing

360° Camera

Small size
High visibility

AR glass

N. America: Silicon Valley

Collaborative robotics

R&D of industrial solutions utilizing 5G

Japan: Kyōsō-no-Mori

5G utilization
Real-time control

Local 5G demonstration environment to accelerate DX solution co-creation for societal infrastructure

AR: Augmented Reality

October 2020 Press release

Energy: Efficiency
Mobility: Smarter
Industry: Productivity improvement

September 2020 Press release

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3-4 Initiative in quantum computing

Promote R&D for a scalable silicon quantum computer with industry-government-academia collaboration

- CMOS annealing (2015)
- Silicon dot array (2020)
- Scaling
- Silicon quantum computer (2050~)

Collaboration

JST Moonshot Research & Development Program
R&D of large-scale integrated silicon quantum computer (Hitachi, Ltd., Kobe University, Tokyo Institute of Technology, RIKEN)

Quantum Innovation Initiative Consortium
R&D of applications for quantum computers (The University of Tokyo, Keio University, and 9 companies)

This work was partially supported by JST [Moonshot R&D][Grant Number JPMJMS2065]"
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4-1 Summary

Strengthen R&D in environmental and digital fields to become a global innovation leader driving carbon neutrality.
Cautionary Statement

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.
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