

Realizing Sustainable, Innovative Management

Hitachi's Approach

Executive Sustainability Committee Initiatives

In April 2017, Hitachi, Ltd. launched the Executive Sustainability Committee to discuss and reach decisions on the Group's sustainability strategy. The committee comprises President and CEO Toshiaki Higashihara and other members of the Senior Executive Committee, along with the CEOs of various business units (BUs).

The inaugural meeting on April 25 addressed such issues as the measures to be adopted in helping achieve the UN Sustainable Development Goals (SDGs) and the setup needed to advance those measures.

Each BU will henceforth assign sustainability strategy promotion officers in an effort to strengthen the measures and organizations needed to help achieve the SDGs and promote sustainability.

Trends in Society and Hitachi Group Identity

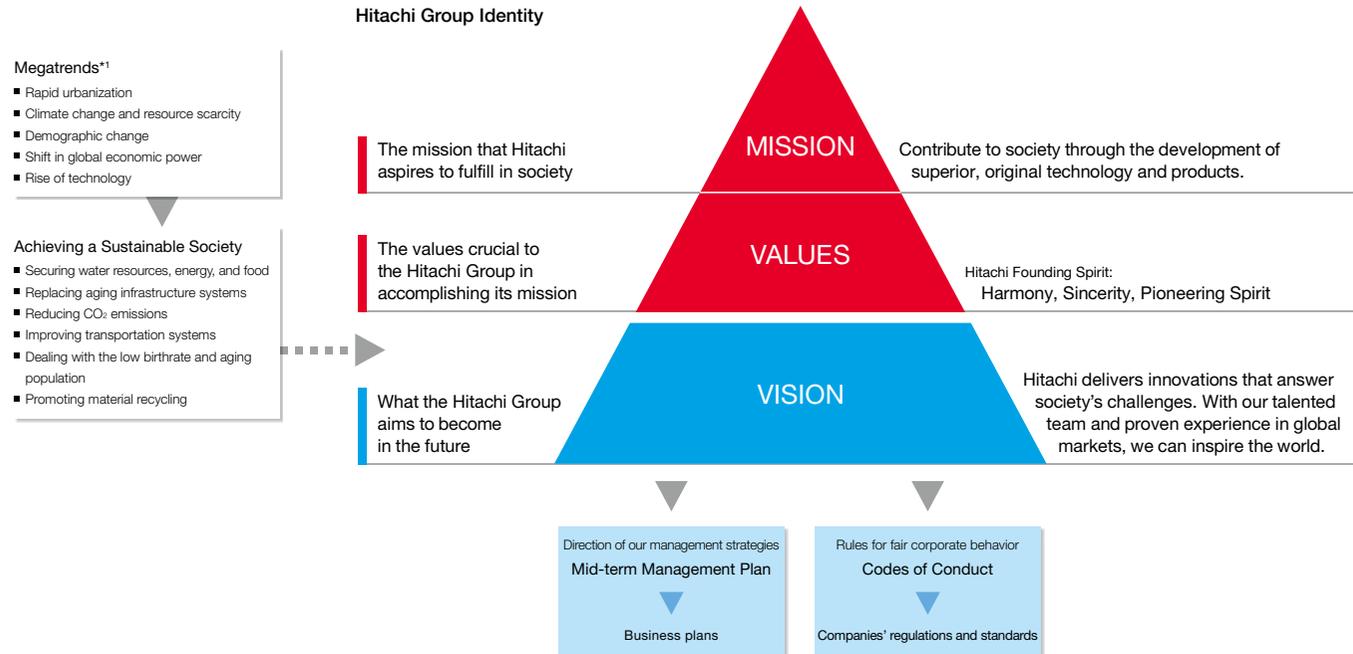
Society is today undergoing great changes and faces a range of challenges, from environmental issues and natural resource and energy constraints to poverty, inequality in education, diseases, and population concentration in cities. Hitachi's Corporate Credo is to contribute to society through the development of superior, original technology and products. We created our Group Vision in May 2013, at the start of the 2015 Mid-term Management Plan, with the aims of delivering innovations that help to answer society's challenges and of building a safe, secure, comfortable, and fair society.

The Group Vision indicates the path to the next stage of growth. We draw on the ethics and values that Hitachi has developed over the past 100 years—encapsulated in our Corporate Credo and Founding Spirit—while continuously considering the next generation. We look ahead to the longer term, while promoting corporate activities informed by sensitivity to the needs of a changing society. Our Mid-term Management Plan is the action plan we define to realize this vision; by integrating our management and CSR strategies, we seek to enhance the effectiveness of this approach.

The implementation of our plan is a way for us to fulfill our responsibilities as a good corporate citizen through robust, diverse governance; the pioneering spirit and strong ethical stance of our employees; and operations that help address environmental and other issues. We comply with the laws and regulations of all countries and regions in which we operate and pursue our activities in line with the Hitachi Group Codes of Conduct.

Recognition of Social Responsibility

Trends in Society and Hitachi Group Identity



*1 As identified in "Five Megatrends and Possible Implications," published in 2014 by PwC.

Hitachi's Social Innovation Business

We work with stakeholders to recognize issues society and our customers face, including global environment problems, and are contributing to the resolution of social issues through our Social Innovation Business, which combines advanced IT with infrastructure technologies developed over many years.

In May 2016, we formulated our 2018 Mid-term Management Plan, which will culminate in fiscal 2018. Under the plan, we aim to become an Innovation Partner for the IoT Era centered on our Social Innovation Business, seeking to expand the sales ratio of frontline operations that develop and deploy services meeting the diverse needs of global society to 40% and to increase our overseas sales ratio as a whole to 55%. We will expand our frontline operations by evolving and enhancing our Social Innovation Business through digital technology and promoting it overseas in the focus business domains of “power and energy,” “industry, distribution, and water,” “urban,” and “finance, public, and healthcare.”

We will continue to provide optimum solutions to society's issues with advanced network technologies that are capable of connecting social infrastructure, products, and people.



Social Innovation Business



2018 Mid-term Management Plan

Focus Business Domains and Key Initiatives



Power/Energy

Transition to distributed power supply utilizing IT

- Microgrid, regional energy management
- Renewable energy

Investment Focus

- Strengthening grid and engineering
- Predictive maintenance



Urban

Improvement of quality of life in communities

From rail as a service to outcome delivery

Investment Focus

- Development of urban solutions
- Expansion of the rail business area



Industry/ Distribution/Water

Use Lumada*1 IoT platform to optimize value chains for industry and distribution

Investment Focus

- Strengthening engineering
- Predictive maintenance
- Optimized factory



Finance/Public/ Healthcare

FinTech, My Number Healthcare service (platform)

Investment Focus

- Strengthening healthcare informatics

*1 Hitachi's open and highly versatile IoT solution platform using software technology to obtain new information from integrating and analyzing data and running simulations.

Innovation Management

Research and Development Direction

As an Innovation Partner for the IoT Era, Hitachi has identified “power and energy,” “industry, distribution, and water,” “urban,” and “finance, public, and healthcare” as the four focus business domains in which to advance its Social Innovation Business by accelerating collaborative creation with customers.

The role of the Research & Development Group is to respond to the challenges faced by customers through collaborative creation and technology development to lead the Social Innovation Business.

R&D will be pursued in accordance with a directive to “create business innovation in an era of uncertainty.”

Hitachi will contribute to resolving increasingly global and complex challenges in society through its Social Innovation Business.

Customer-Driven R&D and Hitachi's Business Structure

To accelerate collaborative creation with customers, the Research & Development Group was realigned into a more customer-driven research structure in April 2015. The three research laboratories in Japan—the former Central Research Laboratory, Hitachi Research Laboratory, and Yokohama Research Laboratory—were consolidated along with the Design Division and overseas research centers and regrouped into the Global Center for Social Innovation (CSI), the Center for Technology Innovation (CTI), and the Center for Exploratory Research (CER). This R&D structure supports the new market-driven business structure created in April 2016 along the lines of the “Front” (the customer interface), “Platform,” and “Products.”

Recognition of Social Responsibility

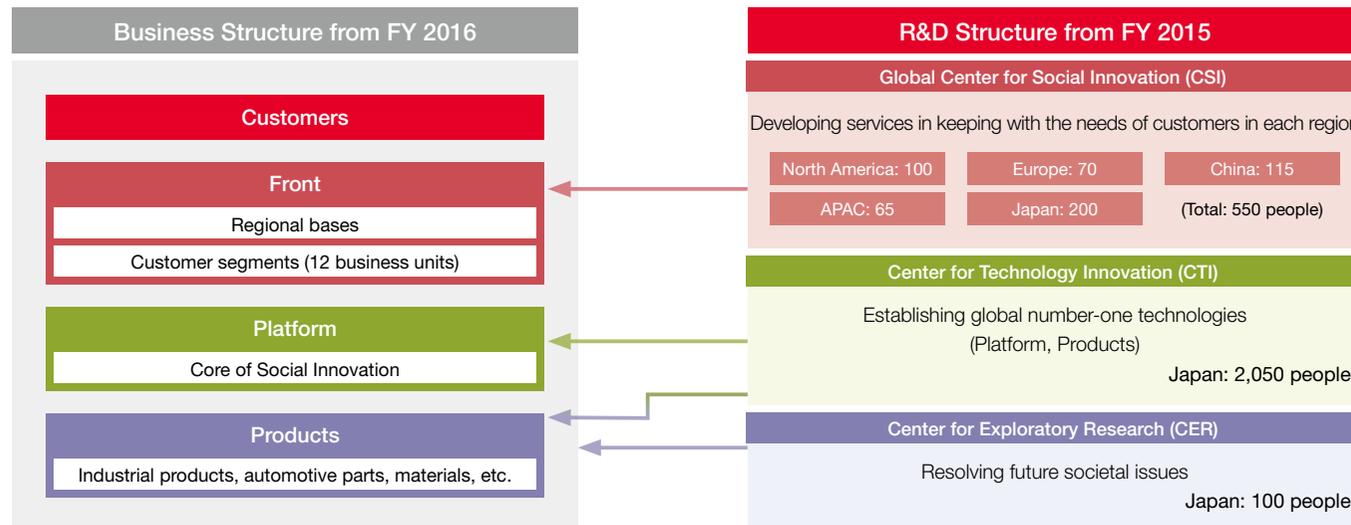
Under this new structure, the CSI is working with the 12 Front business units (BUs) as well as regional centers around the world to develop services meeting the needs of customers in each region. The CTI is working with the Platform BUs that provide the backbone of Social Innovation, as well as the Product BUs that provide the highly competitive key components that support services, to generate digital solutions combining OT (operational technology) and IT, and provide new value to customers in various fields. In December 2016, the Open Laboratory was established within the Yokohama Research Laboratory to use Hitachi's latest technologies to develop

prototypes together with customers, thereby developing applications and platforms that contribute to the creation of visionary innovations. The CER is conducting cutting-edge research toward realizing a human-centric society that pursues the fundamental human goals of "experience and well-being," by working in collaboration with various research institutions to resolve future societal challenges.

Lumada's Evolution in Support of Hitachi's Social Innovation Business

Through collaborative creation, Hitachi creates new value by designing, verifying, and simulating business models based on challenges and visions shared with the customer. To enable this, an open and secure platform that can connect the different systems of stakeholders is required. Thus in 2016, Hitachi launched the Lumada IoT platform and began offering related services. The Research & Development Group is using NEXPERIENCE, a systemized process facilitating collaborative creation with customers, to generate Lumada customer cases, as well as developing solution cores using innovative technology, such as AI and analytics, as the common platform.

Research & Development Group Structure



Accelerating Collaborative Creation with Customers Worldwide

The market for Hitachi's Social Innovation Business is expanding globally. To be able to respond to the increasing number of collaborative creation projects, CSI is located in five key regions—Japan, Asia-Pacific (APAC), North America, China, and Europe, with about 350 of the approximately 550 CSI personnel being assigned outside of Japan.

CSI-Tokyo is using methodologies developed through design and service research to pursue collaborative creation of solutions together with customers.

CSI-APAC is creating energy, transportation, and urban solutions in collaboration with customers using data science, machine learning, and software engineering. In addition to the existing centers in India and Singapore, R&D personnel have been assigned to a new center in Australia.

CSI-North America is building a big-data analytics platform to collaboratively create advanced solutions in such areas as energy, communications, finance, and healthcare. New laboratories launched in 2016 include the Financial Innovation Laboratory and the Digital Solution Platform Laboratory, which aims to strengthen IoT platform research.

CSI-China is developing such products as elevators and ATMs through collaborative creation with customers to realize solutions for “Made in China 2025,” a policy being promoted by the Chinese government to advance the manufacturing sector, and other industrial policies, such as that for a low-carbon society. In 2016, a new center was opened in Guangzhou, a major manufacturing hub in southern China, complementing existing facilities in Beijing and Shanghai.

CSI-Europe is participating in the creation of new markets through European-led standardization activities, addressing challenges facing mature society by developing solutions with key institutions. In April 2017, a new office was opened in London to accelerate the development of digital solutions.

Also launched the same month was the Insights Laboratory, a global hub for collaborative creation between regional CSIs and customers. The laboratory will work closely with the Hitachi Insight Group, established in May 2016, to accelerate the global expansion of Lumada.

Promoting Open Innovation

To realize innovative technology development that cannot be achieved by one company alone, Hitachi has created an open R&D environment, working with research institutes, universities, and customers both within and outside of Japan. From fiscal 2015, the CER has become an open innovation hub to co-create the seeds for the Social Innovation Business of the future.

In Japan, joint research laboratories were established within the University of Tokyo, Kyoto University, and Hokkaido University in June 2016 to work toward the realization of a “Super Smart Society” (Society 5.0)*1 proposed by the Japanese government. In April 2017, the Hitachi Kobe Laboratory was opened within the Kobe Biomedical Innovation Cluster as a development facility to achieve practical applications for regenerative medicine. These centers will seek insights into future societal challenges and propose visions and innovations that can both resolve those challenges and contribute to economic development.

Further, as part of efforts toward realizing Society 5.0, Hitachi announced its Vision Design project to consider the future role of technology in people's daily lives. Focusing on the four main themes of “school education,” “public safety,” “aging support,” and “meal experience,” Vision Design proposes new ways in which technology can augment human initiatives in support of people requiring assistance.

Globally, in addition to working closely with Stanford University in the field of autonomous driving technology, in 2016 Hitachi became a board member of the Hyperledger Project for blockchain technology, an area of rising interest in FinTech and other fields. Additionally, Hitachi is one of 46 groups from North America, Europe, and Asia participating in the OpenFog Consortium and plays a key role in the Japan regional committee.

In fiscal 2016, research collaboration was conducted with 65 research institutes outside of Japan and 243 within Japan. Collaboration with researchers outside of Japan is being further strengthened through such programs as the Hitachi Research Visit Programs (HIVIPS), established in 1985 to invite researchers to work for a fixed term in labs in Japan.

*1 Super Smart Society (Society 5.0): A term used in the 5th Science and Technology Basic Plan released by the Japanese government to refer to a new type of society that will be led by innovations in science and technology, following on from the hunter-gatherer, pastoral-agrarian, industrial, and information societies.

▶ **Hitachi and Hokkaido University Receive Imperial Invention Prize for Real-Time Tumor-Tracking Particle Beam Cancer Therapy System**

At the fiscal 2018 National Commendation for Invention, Hitachi and Hokkaido University were jointly awarded the Imperial Invention Prize for a real-time tumor-tracking particle beam cancer therapy system (Japanese patent no. 05896211). The award recognizes the most outstanding inventions of the year.

In particle beam cancer therapy, particles such as protons (hydrogen nuclei) and carbon ions are accelerated to create a particle beam that is focused on the tumor. Almost painless and causing relatively few side effects compared to other forms of radiotherapy, this cutting-edge technique is being introduced at an increasing number of medical institutions in Japan and worldwide. However, as tumors in the lung, liver, and other internal organs move frequently due to respiration and other factors, the need for a technology that can accurately determine the location of moving tumors has long been recognized. This new, jointly developed system combines Hitachi's spot-scanning irradiation technology with Hokkaido University's real-time tumor-tracking radiotherapy in a single, complete therapeutic device that can quickly and accurately irradiate moving tumors, reducing the burden on patients. The Hokkaido University Hospital has been treating patients using this technology since 2014.

The National Commendation for Invention was inaugurated in 1919 and is considered Japan's most prestigious award in the field of invention.

R&D Ethics Reviews

In September 2000, Hitachi established an ethical review committee to oversee the handling of information from human genome analysis. It was the first such committee to be established by a private company in Japan. The majority of the committee members are external experts, and the committee meets two or more times a year to review Hitachi's activities with reference to the in-house ethical guidelines that were prepared based on government documents, such as the "Ethical Guidelines for Human Genome/Gene Analysis Research" and the "Ethical Guidelines for Clinical Research."^{*1}

All Hitachi business divisions and Group companies whose activities require review are expected to show a high level of corporate social responsibility and to maintain high ethical standards among their researchers and staff.

^{*1} The guidelines' in-house name was changed on October 1, 2015, by the Hitachi ethical review committee to "Ethical Guidelines for Medical and Health Research Involving Human Subjects."

R&D Planning and Budget

R&D investment by the Hitachi Group is equivalent to about 4% of revenue, approximately one-fifth of which is used by the Research & Development Group. Research categories are divided into two categories: (1) Sponsored and Advanced Sponsored Research and (2) Frontier and Platform Research. The former is financed by business units and Group companies and is based mainly on business roadmaps from business unit initiatives. The latter is led by the Research & Development Group and is based on medium- to long-term technology plans. The aim of Sponsored and Advanced Sponsored Research is to expand and grow core businesses with a target

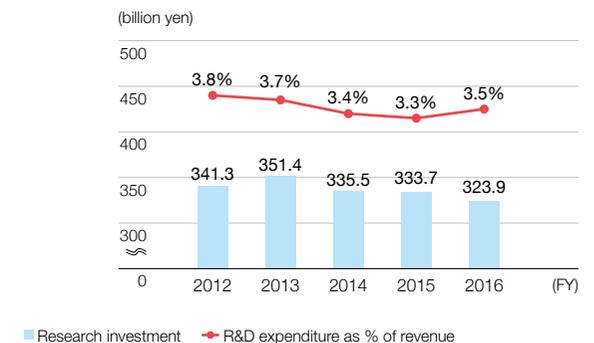
date for practical applications within three to five years. Frontier and Platform Research aims to strengthen customer collaborative creation and technical platforms and to create new businesses.

In fiscal 2017, investment in Frontier and Platform Research was concentrated on the four focus business domains identified in the 2018 Mid-term Management Plan—power and energy; industry, distribution, and water; urban; and finance, public, and healthcare—as well as digital solutions (Social Innovation Business using digital technology) that will contribute to the evolution of the Lumada IoT platform.

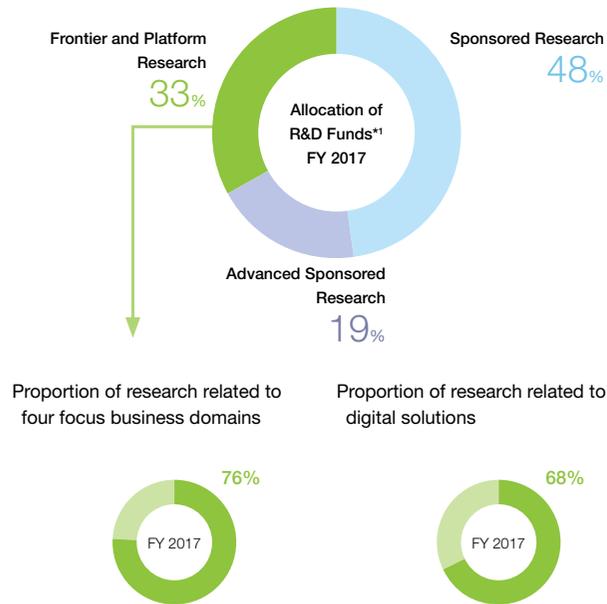
Hitachi will continue to pursue R&D aligned with its corporate strategy in order to contribute to the expansion and accelerated global deployment of its businesses.

Key Indicators

• **R&D Expenditure (Hitachi Group)**



• Allocation of Research & Development Group Funds



**1 Roughly 20% of total Hitachi Group R&D expenditure.

Intellectual Property

▶ **Actions in the Intellectual Property Field**

Intellectual property (IP) is a key element of Hitachi's business strategy. We protect the innovations emerging from our R&D, as well as the Hitachi brand, through patent, trademark, and other IP rights, along with strict management of trade secrets, while providing remuneration and incentive awards for inventors. Furthermore, as our Social Innovation Business expands and opportunities for collaborative creation with customers and partners increase, we handle IP acquired from other parties with care.

▶ **Building a Global Patent Portfolio**

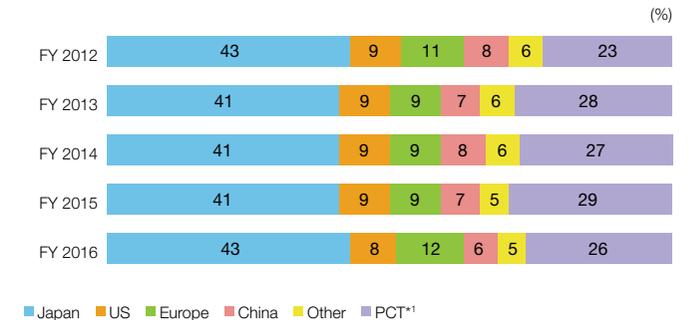
One of the IP activities supporting our global operations is the development of a global patent portfolio to ensure worldwide protection for innovations emerging from our R&D and prevent competitors from imitating the technological advantages that set us apart. The portfolio also enables us to demonstrate the advantages of those technologies to customers and provide patent licenses to other companies, spurring further collaborative creation. We increased our patent application ratio outside Japan from 47% in fiscal 2009 to 57% in fiscal 2016, and we will continue to efficiently build and maintain our global patent portfolio.

In tandem with efforts to globalize our R&D centers, we are also globalizing our IP hubs. We currently have IP offices in New York and Santa Clara, California, in the United States, Beijing and Shanghai in China, and London in the United Kingdom to protect the innovations generated through R&D activities outside Japan.

Another key issue is developing globally minded IP human resources. Since fiscal 1964, Hitachi's Intellectual Property Division has operated an international job training system, sending trainees to IP law firms and Group companies in Europe and the United States and to study abroad. In fiscal 2016, two trainees went to the United States, two to Germany, and one to Singapore, while one employee was sent to the United States to study.

Key Indicators

• **Patent Application Ratios by Country or Region**



*1 International applications filed for Patent Cooperation Treaty coverage.

▶ Respect for Intellectual Property

We respect the intellectual property rights (IPRs) of others, as we expect them to respect ours. We follow the Hitachi Group Codes of Conduct and conduct preliminary searches of others' patents when undertaking R&D on new products and technologies in order to avoid IPR infringements. For IPRs that belong to others, we obtain licenses from IPR holders before we use the IP. As our Social Innovation Business expands and opportunities for collaborative creation with customers and partners increase, we handle IP acquired from other parties with care. If any company is found to have infringed Hitachi's IPRs, we encourage the counterparty to acquire the necessary license and take legal action if necessary.



Hitachi Group Codes of Conduct, 5.3:
Management and Preservation of Company Assets

▶ Anti-Counterfeiting Activities

Protecting the Hitachi brand is crucial for supporting our global operations. We operate a rigorous regime against such infringements as making and selling counterfeit goods carrying the Hitachi brand and illegally applying for or registering trademarks similar to the Hitachi brand.

Until recently, the bulk of counterfeit goods were manufactured in China, but over the past several years manufacturing methods and sales routes have become more sophisticated and diverse, which has spurred us to take further action.

To stamp out counterfeit goods, it is also important to teach general consumers not to buy them. Hitachi conducts ongoing consumer awareness activities to eliminate counterfeit goods.

▶ Reward System for Employee Inventions

We motivate employees in the R&D field with an ample reward system for new inventions. To make this reward system as fair and transparent as possible, we set standards to evaluate inventions and disclose these standards to employees. We also have a mechanism for receiving inquiries about the rewards, as well as opinions on the reward system.

We have established a special division within the Intellectual Property Division to plan and operate this system, while an internal Invention Management Committee made up of R&D, legal affairs, personnel management, and IP experts ensures that the system operates effectively across the whole Group. The system includes an invention information channel to promote communication between inventors and the business divisions implementing the resulting patents. Inventors can ask the business divisions for information about patent implementation and check the evaluation standards used to calculate the rewards for their inventions. To ensure transparency and inventor satisfaction, we also set up an Arbitration Committee for Invention Rewards, composed similarly to the Invention Management Committee. Inventors can appeal to this committee if they disagree with the amount they have been awarded.

From fiscal 2005, we have given President's Awards to the top 100 inventors. Since fiscal 2006, we have also given awards to the top 50 young inventors (under 35 years old) based on patent application rewards received within five years of their joining Hitachi.