



Hokkaido University Sustainability Report 2022



Wisdom and Energy Connecting a Sustainable Society to the Next Generation

Thank you for taking the time to read the Hokkaido University Sustainability Report 2022. In August 2021, Hokkaido University established the Institute for the Advancement of Sustainability, headed by the President, in order to realize a sustainable world, society and university, and to also promote individual well-being. The Institute consists of two offices: the existing Sustainable Campus Management Office, which is responsible for managing the campus environment that the University has preserved and developed since its beginnings, and the newly established SDGs Initiative Office, which is responsible for a wide range of SDG-related initiatives. Since its establishment, the Institute has already launched a number of initiatives.

One of its most significant accomplishments is our being ranked 10th in the world and 1st in Japan in the Times Higher Education (THE) Impact Rankings 2022. These rankings are assessed based on a university's contributions and social impacts in terms of the 17 sustainable development goals and 169 targets adopted at the UN summit. I believe that being ranked 10th in the world in THE Impact Rankings, a first for Japan is a recognition of our research capabilities and education in field science, which the University has been particularly focusing on since its establishment in 1876. The Institute for the Advancement of Sustainability, together with the University's Research Administrator (URA) organization, played a pivotal role in extracting the great social impact that Hokkaido University has as part of its DNA and communicating it to society.

Going forward, we must develop SDG-related initiatives even more vigorously. From the standpoint of promoting campus sustainability, we must go further than just conventional environmental conservation and overcome a number of issues to achieve a carbon-neutral campus. The world's goal of reducing carbon dioxide emissions may be a mighty task, but as the "university that contributes to the resolution of global issues," we need to take the lead in tackling this global challenge. We are currently setting specific quantitative targets and preparing various, ambitious action plans to achieve this goal.

Being sustainable is very different from ceasing productive activities and being passive and quiet. It means that the global, societal, and human well-being that we hope for will not be reached unless we face the limitations of the earth and inconvenient truths head-on and then carry out development, the "D" of the SDG.

I believe that true sustainability means inheriting the wisdom of our predecessors, accumulating the collective knowledge of diverse people, and aiming for a new form of development without settling for the status quo. Sustainability is not something that can be achieved by sitting idly by; rather, it is a formidable task to which we must devote ever more of our wisdom and undivided energy.

Hokkaido University will pursue even greater social impact and make significant efforts to leave a sustainable society for the next generation. We sincerely appreciate your support and cooperation.

HOUKIN Kiyohiro President, Hokkaido University

Born in Sapporo, 1954. Doctor of Medicine. Dr. Houkin graduated from the Hokkaido University School of Medicine in 1979, and has worked as a neurosurgeon at Hokkaido University Hospital and other private hospitals. He was appointed Director of Hokkaido University Hospital in 2013, and has held his current position since October 2020.

Highlights
01

Prof. Dr. Benjamin List, the University's Second Recipient of the Nobel Prize in Chemistry

GRI 102-15



Prof. Dr. Benjamin List

University Professor, Hokkaido University;
Specially Appointed Professor, WPI-ICReDD;
Director and Professor, Max Planck Institute
for Coal Research, Germany; Honorary Professor,
University of Cologne, Germany

Prof. Dr. Benjamin List was awarded the Nobel Prize in Chemistry on October 6, 2021. The award was conferred for his development of asymmetric organocatalysis. Dr. List has been Principal Investigator at the Institute for Chemical Reaction Design and Discovery (WPI-ICReDD) since 2018, where he has been working to develop novel reactions using organocatalysts.

In 2021, WPI-ICReDD established the Akira Suzuki Awards, named after University Professor SUZUKI Akira, the University's first Nobel laureate in chemistry. This award was created to commemorate Professor Suzuki's 90th birthday and to recognize the achievements of researchers in Japan and abroad who have made outstanding contributions to the development of chemical reactions, thereby contributing to the advancement of science and technology.



Prof. Dr. List (participating online) and WPI-ICReDD members celebrate the conferment of the Nobel Prize on October 7, 2021.

Special feature

Hokkaido University Highlights 2021

Highlights
02

Launch of the Ambitious Doctoral Fellowship Program -Driving Force for Graduate School Reform-

GRI 102-2, 102-15

In FY 2021, following the approval by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) for the "University Fellowship Program for Science and Technology Innovation," the Ambitious Doctoral Fellowship Program was established to support doctoral students who will play vital roles in the future in the development of science and technology and the creation of innovations in Japan.

The program selects 40 students per year (up to 80 by FY2022) in the field of "Information and AI" and 20 students per year (up to 40 by FY2022) who engage in their research with a strong focus on "contribution to the advancement of the SDGs." In addition to a research incentive equivalent to living expenses (1.8 million yen per year) and research expenses (400,000 yen per year), support for their career path is provided after completion. The program aims to enhance the

research environment in graduate schools and attract and encourage promising young researchers.



Hokkaido University Overview and Initiatives

Organizational Profile

GRI 102-1, 102-2, 102-3, 102-4, 102-5, 102-6, 102-7

Hokkaido University is a flagship university with a strong emphasis on graduate studies, and its origins go back to Sapporo Agricultural College, established in 1876. During its long history in which the College was promoted to an Imperial University and then flourished after the creation of the new university system, the University has set forth and built upon the four core principles for education and research: Frontier Spirit, Global Perspectives, All-Round Education, and Practical

Learning.

The University will celebrate its 150th anniversary of its founding in 2026. As we approach this significant milestone, we are deeply aware of the importance of the role a university must serve in society and have been boldly and steadily advancing the university reform based on our core principles and long-term goals toward "contributing to the resolution of global issues."

Hokkaido University Facts (as of May 1, 2022)

- **Organization name:** Hokkaido University
- **Core function:** Education and research (12 undergraduate schools, 21 graduate schools, 17 faculties, 25 research institutes and centers)
- **Number of degrees conferred:** 237,532 (151,843 bachelor's degrees, 57,008 master's degrees, 1,848 professional degrees, 26,833 doctoral degrees)
- **Number of papers (2021):** 3,967 (source: Clarivate InCites Benchmarking & Analytics as of Feb. 2, 2022)
- **Number of patents held:** 1,213 (national: 697; international: 516)
- **Campus locations**
Sapporo Campus (Kita 8 Nishi 5, Kita-ku, Sapporo 060-0808)
Hakodate Campus (3-1-1, Minato-cho, Hakodate 041-8611)

Land and buildings

Category	Land (m ²)	Buildings (total floor area, m ²)
City of Sapporo (Sapporo Campus)	1,776,249	783,062
City of Sapporo (other facilities)	1,112,319	35,327
City of Hakodate	105,149	39,004
Other local facilities	657,183,747	35,744
Total	660,177,464	893,137

● **Number of faculty and staff members:** 3,917

● **Number of students:** 17,541

For details, please refer to *Hokkaido University Guidebook 2022*.

<https://www.global.hokudai.ac.jp/about/publications/hokkaido-university-guidebook/>



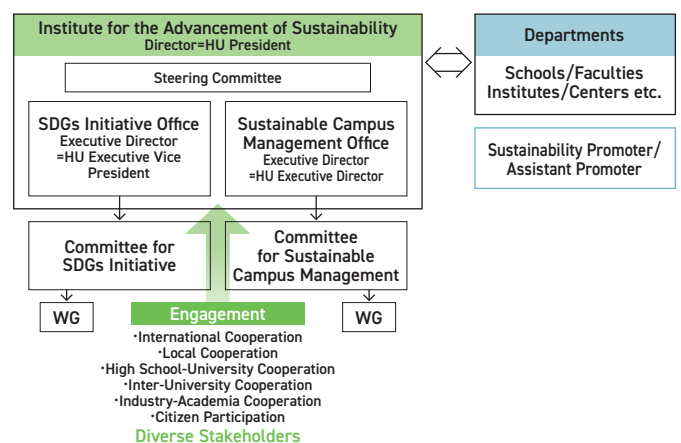
Framework for Sustainability

GRI 102-19, 102-20, 102-26

Institute for the Advancement of Sustainability

The Hokkaido University Institute for the Advancement of Sustainability is a platform for promoting education, research and social collaboration that contribute to the development of a sustainable society as well as a sustainable campus environment. It aims to realize a smart, green, sustainable campus through cooperation between the two offices: the SDGs Initiative Office and the Sustainable Campus Management Office.

Structure of the Institute for the Advancement of Sustainability



Institute for the Advancement of Sustainability
<https://www.sustainability.hokudai.ac.jp/>



Hokkaido University x SDGs
<https://sdgs.hokudai.ac.jp/en/>



Core Principles and Strategies

GRI 102-16, 102-27

4 Core Principles of Hokkaido University

- Frontier Spirit
- Global Perspectives
- All-Round Education
- Practical Learning

Future Strategy for the 150th Anniversary of Hokkaido University Formulated in March 2014

Hokkaido University will celebrate its 150th anniversary in 2026. The following goals have been set to advance the university reform and contribute to the resolution of global issues.

1. Hokkaido University will promote world-class research to resolve a variety of issues to sustain future generations.
2. Hokkaido University will develop globally minded individuals who will play a leading role in contributing to the development of a global society. As specialists in their fields, they will possess sound judgment and deep insight, along with the ability to understand and communicate with different cultures.
3. Hokkaido University will continue to transmit knowledge and promote social advancement through outside collaborations, providing assistance to local communities or societies both inside and outside the country by addressing and resolving the issues that concern them.
4. Under the leadership of the President, Hokkaido University will carry out reforms of our organizational, personnel, and budget systems, establish an infrastructure that enables members to carry out their tasks with a sense of pride and fulfillment, and implement administrative policies with a focus on sustainable development.
5. Hokkaido University will establish a global presence by actively communicating the fruits of its education and research through strategic public relations efforts.

Outline of the Fourth Period of Mid-Term Goals and Mid-Term Plan "Toward an Unparalleled University" Hokudai Vision 2022 – 2027 As of April 1, 2022

Establish a system that leads the way in solving domestic and international issues and in creating innovations by improving basic research capabilities and promoting applied research, such as the implementation of research results.

Aim to establish a next-generation higher education system that includes entrepreneurship education and recurrent education by carrying out educational reform consistent from undergraduate to graduate schools, ranging from revising the entrance examination system to nurturing cross-cultural understanding and international communication skills, and fostering globally minded individuals with the ability to implement their research results.

Serve as a key player in social change toward building a decarbonized and inclusive society by furthering social collaborations significantly and advancing entrepreneurship and community development.

Build a solid management structure that is open to dialogue and action by enhancing university-wide motivation management through quality internal controls, development of collaborative relationships between faculty and staff members (faculty-staff collaboration), and work style reform with Digital Transformation and other means.

Create expertise in the area where the University excels through reforms to promote data-driven education, research and industry-academia collaboration as well as by the fusion of academic fields and creation of new scholarly and industry-academia partnerships.

Pass on to the next generation a financial foundation for stable, independent, sustainable university operations by making the necessary selection and consolidating efforts, while bolstering the financial capacity by increasing its own revenues such as organizational business income.



Contributing to the resolution of global issues (Achievement of the SDGs)



Toward an
Unparalleled
University

Certification, Projects, and Selection

GRI 102-2, 102-15, 203-2

Certified Regional Bio-Community

The Cabinet Office promotes the formation of bio-communities based on its Bio-Strategy as a way to enter the global market. In 2021, the Hokkaido Prime Bio-community represented by Hokkaido University was certified as one of the regional bio-communities that develops distinctive regional bio-related initiatives. The Hokkaido Prime Bio Community is a group of national, public, and private universities and other various organizations in Hokkaido. It aims to make Hokkaido a destination for those who want to engage in agriculture, forestry, and fisheries.



President Houkin and Mr. Matsuo, Director General of the Science, Technology and Innovation Promotion Secretariat (at the awards ceremony on October 14, 2021)

Project to Accelerate Industry–Academia–Government Collaborative Digital Transformation (DX) for Pregnancy and Childcare Support

The University launched a new public project involving online and offline childcare support DX in June 2021, in collaboration with Morinaga Milk Industry Co., Ltd., Emi Plus Lab LLC., and ORSO Inc. The University renewed the “Family Health Handbook Application”, a community service jointly operated by Hokkaido University COI* and Iwamizawa City to support connecting the child-rearing generation and their community, and has also offered “e-learning class for expectant mothers and fathers” to its citizens.

*COI: Center of Innovation



Two Projects Selected for COI-NEXT

“The Life Design Center for Mind and Body” and “The Carbon zero and Sustainable Energy and Food community” were selected as part of the “COI-NEXT” program by the Japan Science and Technology Agency (JST) under the auspices of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). This will promote the formation of centers of excellence through industry-academia-government co-creation, as well as facilitating the transformation into a knowledge-intensive society led by universities and other institutions.



Research and Education

GRI 102-2, 102-15

Development of a Framework to Assess the Social Impact of Decarbonization Technologies



The Institute for the Advancement of Higher Education is pursuing the Decarbonization Technologies ELSI Project* to examine the ethical, legal and social issues (ELSI) posed by technologies for decarbonization. The project intends to develop a framework for assessing the social impact of the development and use of these technologies in Japan from multiple perspectives. As part of this effort, a series of dialogues on the ELSI of decarbonization technologies were held between September 2021 and February 2022 with 26 frontrunners who are driving fundamental changes toward a sustainable society in various sectors of society and experts in decarbonization technologies. The report on the ELSI of decarbonization technologies and their assessment framework was published as a result of these dialogues.



Source: Agency for Natural Resources and Energy
https://www.enecho.meti.go.jp/about/special/johoteikyo/3es_graph01.html

*Download the report on the ELSI of decarbonization technologies and their assessment framework (Hokkaido University HUSCAP).



The Report is available in Japanese only.
<http://hdl.handle.net/2115/84398>

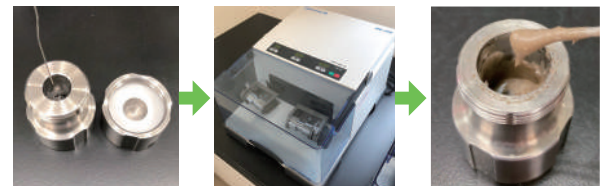
Decarbonization technologies assessment
https://citizensassembly.jp/project/ristex_elsi



Success in the Synthesis of a Paste-like Grignard Reagent



The research group led by Professor ITO Hajime and Associate Professor KUBOTA Koji at the WPI-ICReDD and the Faculty of Engineering of Hokkaido University has developed a simple method for synthesizing Grignard reagents, one of the most important reactants in organic synthesis, that uses almost no organic solvents. The group simplified the experimental operation by using a grinding machine called a ball mill and successfully synthesized a Grignard reagent in paste form with little use of organic solvents. Since this reagent can be used in various solvent-free organic reactions, it is expected to expand new material production processes.



Put the reactant in a jar

Grind it in a ball mill

The Grignard reagent in paste form
(can be used as is for the next process)

Grignard reagent synthesized efficiently without the use of organic solvents
This Grignard reagent in paste form can be used in various solvent-free organic reactions.

Establishment of the DX Doctoral Fellowship Program



The University established the Hokkaido University DX Doctoral Fellowship program in FY 2021 to provide outstanding appropriately selected doctoral students with living and research expenses, as well as career development and training content, in an integrated manner. The program aims to develop DX doctoral students who will lead Society 5.0, including those who understand digital transformation (DX) and those who can contribute to solving regional issues by using data, IT and ICT technologies to identify and solve problems.

DX doctoral students who will lead Society 5.0

Required abilities



Sustainability Activities

Ranked 10th in the World (1st in Japan) in THE Impact Rankings 2022 and 1st in the World for SDG 2. Zero Hunger

GRI 203-2

In THE Impact Rankings 2022 published by Times Higher Education (THE), a British magazine of higher education, Hokkaido University has been ranked 10th in the world (1st in Japan) out of 1,406 universities evaluated in the overall ranking, the first such achievement for a university in Japan. In the ranking by SDGs, the University ranked first in the world for SDG 2. Zero Hunger. In other SDGs, the University ranked

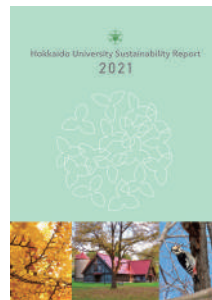
in the top 100 in the world for SDG 17. Partnerships, SDG 14. Life Below Water, SDG 15. Life on Land, SDG 9. Industry, Innovation and Infrastructure, SDG 16. Peace, Justice and Strong Institutions, and SDG 6. Clean Water and Sanitation. The University's long track record in achieving the SDGs has led to its high evaluation.



Examples of points led to high evaluations



AI robots equipped with 5G



Sustainability Report 2021



Muroan Marine Station

Hokkaido University x SDGs to Introduce our Efforts on SDGs

GRI 102-2, 102-15

The Hokkaido University x SDGs website, which introduces the University's SDG-related initiatives, features interviews with faculty members and students on their perspectives on the SDGs.

In addition, the website introduces the Fish of the Month (FoM), an educational content on marine life that was launched by the Faculty of Fisheries Science in September 2021 with the aim of helping to achieve the SDGs and to improve food resource production technologies.



Hokkaido University x SDGs
<https://sdgs.hokudai.ac.jp/en/>



Fish of the Month (FoM)
<https://edu.fish.hokudai.ac.jp/fom/>



Consulting Services to Improve Facility Quality



GRI 102-2, 102-15

The Sustainable Campus Management Office (SCM Office) provides consistent design management from project planning to conception, design and operation under the campus management system in order to improve the quality of life on campus. In designing Northern Campus Area Research Building No. 8 (the ICReDD Building), plans were made for a sustainable building that meets the ZEB Ready standard of achieving energy savings of 50% or more versus energy consumption of a standard building. For the Hokkaido Wine Education and Research Center Building, the SCM Office has planned a project to utilize the Old School of Entomology and has formulated a basic design, working together with

faculty and students from the Graduate School of Engineering. The facility concept blends the rich ecological environment and historical assets of the campus with leading research and educational spaces.



The Old School of Entomology, the oldest building on Hokkaido University Sapporo Campus (built in 1901)

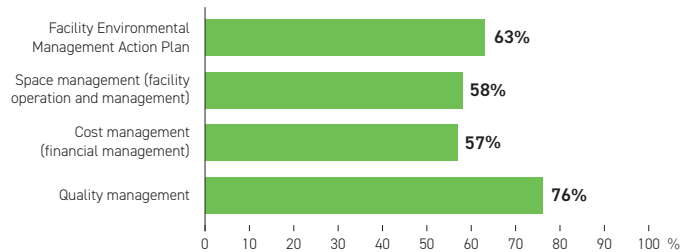
Inspection and Assessment of Facility Management Activities for the Next Plan



GRI 102-2, 102-15

In 2018, the University formulated the Facility Environmental Management Action Plan 2018, which focuses on space management, cost management, and quality management. Since this plan ended in the Third Period of Mid-Term Goals and Mid-Term Plan, then it needed to start formulating the next plan, the Facility Environmental Management WG of the SCM Office Committee conducted an inspection and assessment. Based on the results and the issues that were identified in the process of conducting the inspection and assessment, the formulation of the next plan started in FY 2022.

Level of achievement of the Facility Environmental Management Action Plan and the three activities



Collaborative Future Campus Planning between Students and the University



GRI 102-2, 102-15

As practical education utilizing the campus, the Graduate School of Engineering, the SCM Office and the Facilities Department collaborate to offer the Advanced Studio on Architectural and Urban Design I. This exercise integrates university management and education and has a positive synergistic effect for the parties involved: faculty and staff members can realize proposals based on the students' own experiences, and graduate students can have the opportunity to consider deeply about sustainability and gain direct experience

in practical operations. The results of the exercise will be used as basic data for campus planning.



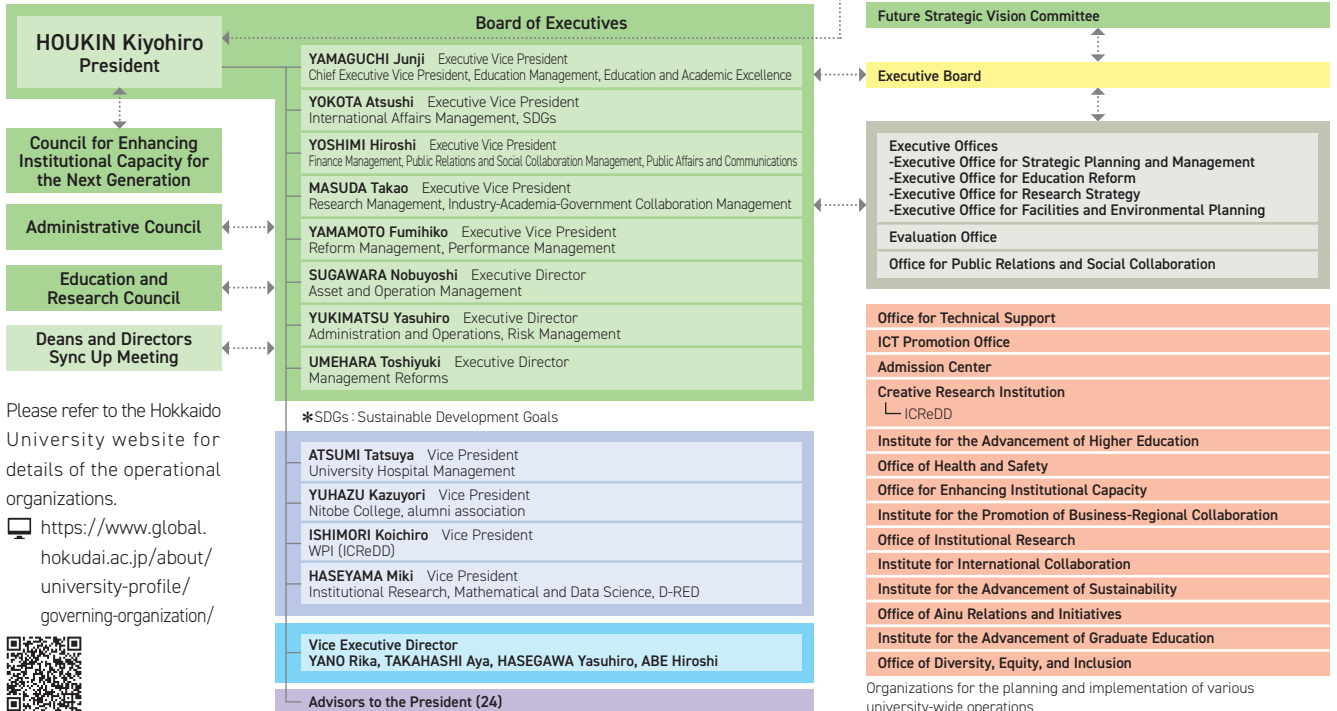
Final presentation of Advanced Studio on Architectural and Urban Design I

Strengthening Governance and Compliance

Governing Organization

GRI 102-18, 102-22, 102-23, 102-24

Data as of April 1, 2022



Audit Structure

GRI 102-17, 102-33, 205-1

1. Auditor audit

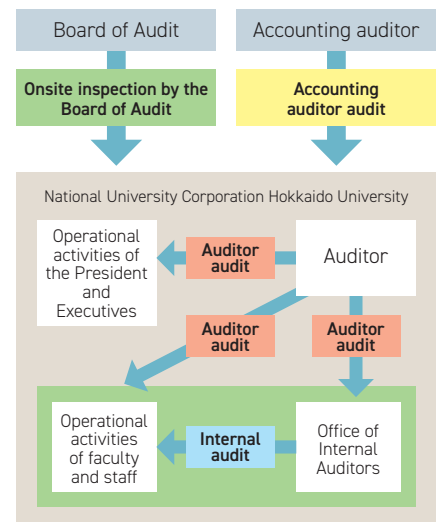
These audits are conducted by auditors for the purpose of ensuring the rational and efficient management of the operations of National University Corporation Hokkaido University as well as ensuring the appropriateness of accounting practices.

2. Internal audit

These audits are conducted by the Office of Internal Auditors for the purpose of ensuring the sound operation of the University. The Office reviews and evaluates the status of the University's administrative activities, provides information and offers advice and suggestions for the improvement and streamlining of operations.

3. Accounting auditor audit

These audits are conducted by accounting auditors appointed by the Minister of Education, Culture, Sports, Science and Technology. National university corporations, including the University, are required to have their financial statements audited under the National University Corporation Act (Article 39 of the Act on General Rules for Incorporated Administrative Agencies as applied mutatis mutandis in Article 35).



Sustainable Campus Management Methodology

Assessment System for Sustainable Campus (ASSC)

GRI 102-28, 102-29, 102-31, 103-1, 103-2, 103-3

The Assessment System for Sustainable Campus (ASSC) is a questionnaire-based assessment system that takes a general and holistic view of university activities and identifies as assessment criteria the basics necessary to achieve campus sustainability.

The ASSC was developed by Hokkaido University in 2013 and has been widely used at various universities, both domestic and foreign, since 2014. It is currently operated by the Campus Sustainability Network in Japan (CAS-Net JAPAN) (registered schools: 130 in cumulative total; schools that have submitted responses: 103 in cumulative total, as of February 2022).

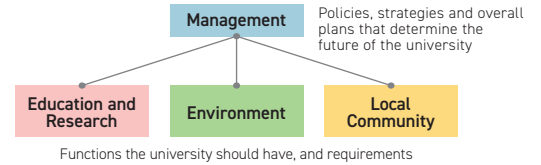
For submitters, CAS-Net JAPAN certifies them as gold or platinum according to the percentage of points scored. Not only does this serve as an indicator of the level of achievement of campus sustainability, but it also serves as a tool for disseminating the results internal and external of the university.

To continuously review and improve campus operations, Hokkaido University utilizes the ASSC for the "Check" in the PDCA (Plan→Do→Check→Act) cycle toward realizing campus sustainability.

*Goals associated with the selection of finalists at the International Green Gown Awards 2019



Features: Assessed for 4 categories



Objectives



Assessment of Hokkaido University in FY 2021 using the ASSC

GRI 203-2

In FY 2021, the scoring rate increased from the previous year in all four categories, resulting in an overall score 87.34%. This was the first time for Hokkaido University to reach this score, which was equivalent to "platinum" certification. We were awarded points for the progress made in developing a university-wide system for obtaining budgets to promote sustainability in the Management category, and for the enhancement of educational programs related to sustainability in the Education and Research category.

We were also awarded points for the continuous decreasing trend in water consumption and for the inspection and evaluation of infrastructure based on the longevity plan in the Environment category, and for the establishment of the Institute for the Advancement of Sustainability and SDGs Initiative Office, which serves as a contact and coordinator for community collaboration related to sustainability in the Local Community category.

Figure 1. Score rates for Hokkaido University in the four categories

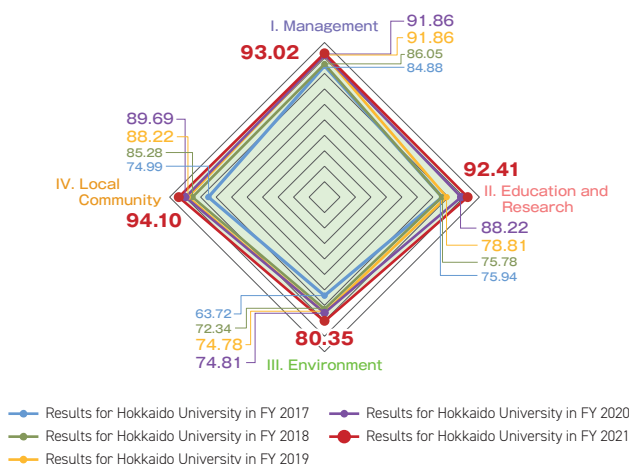
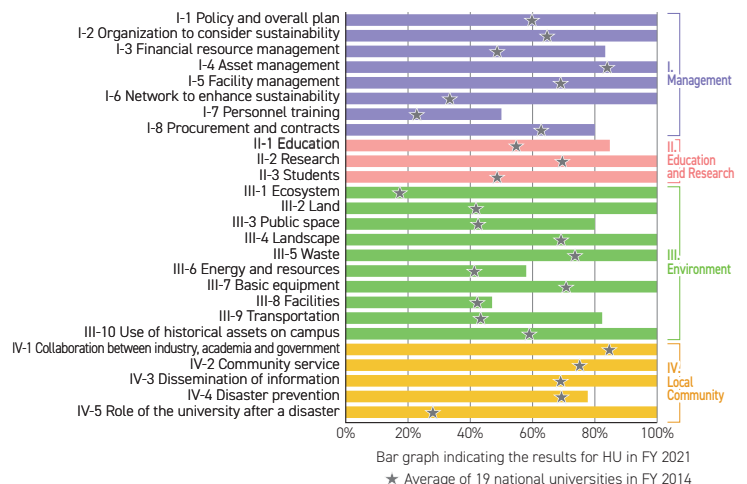


Figure 2. Score rates for Hokkaido University by assessment area



Performance Report Economy

Financial Structure in FY 2021 and Changes in Revenue and Expenditure

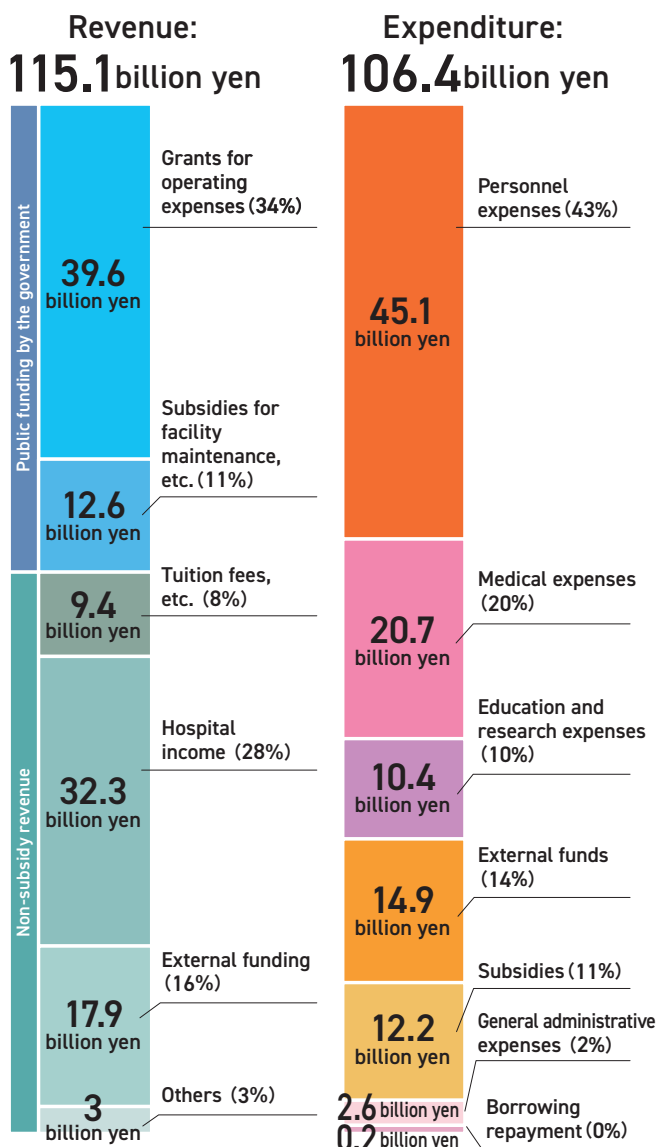
GRI 201-1, 201-4

Breakdown of Revenue and Expenditure Accounts

The financial statements of national university corporations are distinguished by the fact that half of their operating funds are financed by the government and the other half by their own revenues, and about half of their expenditures are personnel expenses.

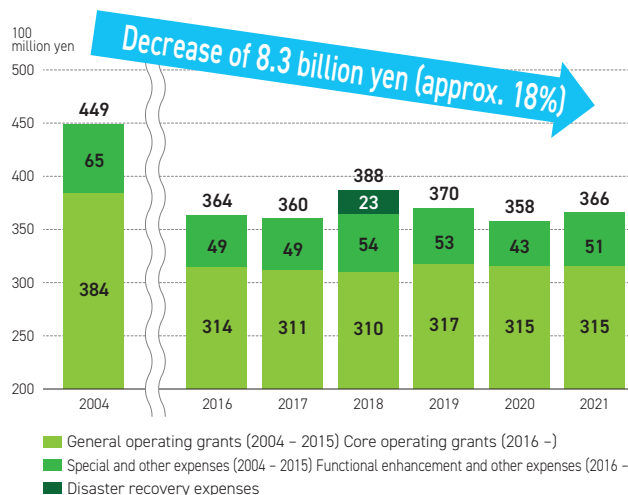
Changes in Revenue Breakdown

In addition to improving management efficiency, the University is implementing various initiatives to increase the acquisition of external funds, such as holding information sessions where researchers introduce the seeds of their research to companies and other organizations.

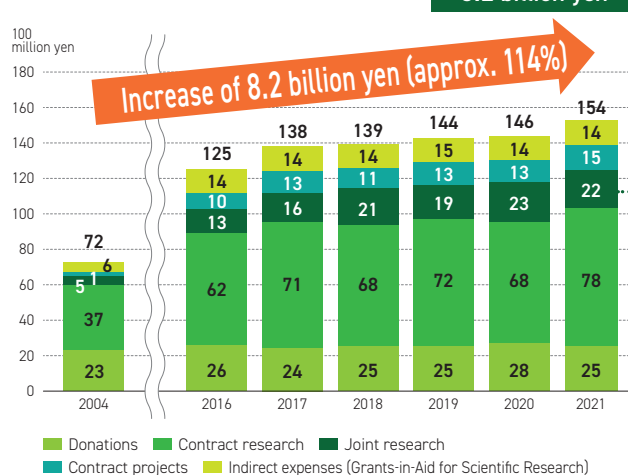


*All amounts are rounded down to the nearest unit, so totals may not add up.

Changes in revenues from grants for operating expenses



Changes in external funding income



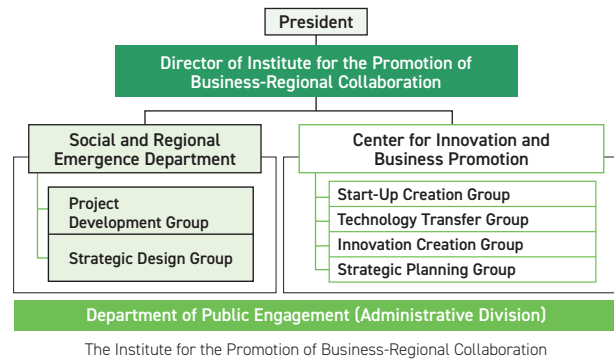
**FY 2021
Joint research
revenue target:
3.2 billion yen**

Contribution to and Collaboration with the Community

Establishment of the Society Region Emergence Department

GRI 203-1, 203-2, 413-1

In April 2022, the Social and Regional Emergence Department (S-RED) was newly established in the Institute for the Promotion of Business-Regional Collaboration. S-RED is a coordinating organization that promotes the process from the search for an ideal society to the social implementation of the university's research results as a consortium-type open innovation through industry-academia-government co-creation in order to solve all social issues from local to global scale, including low birthrate, aging society, population decrease, industrial decline, and food crisis. S-RED, as a "place" for creating new value from social issues, is the core body for



university-wide projects such as the regional bio-community, COI-NEXT, and the Regional University and Regional Industry Creation Grant Program, as well as a liaison with local governments.

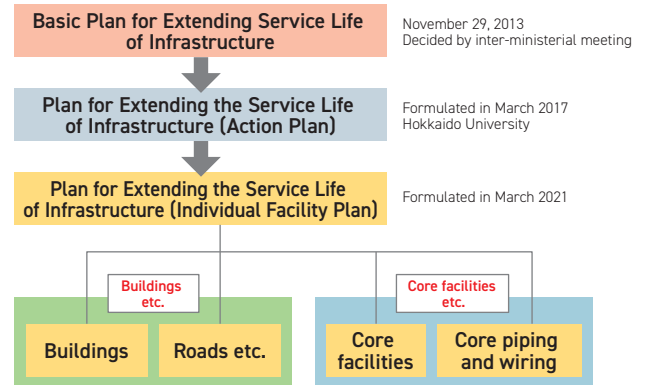
Infrastructure Investment and Procurement Initiatives

Plan for Extending the Service Life of Infrastructure

GRI 203-1

In March 2017, the Hokkaido University Plan for Extending the Service Life of Infrastructure (Action Plan) was formulated to provide direction for medium-term initiatives to steadily promote the maintenance, management, and renewal of infrastructure (e.g., buildings and core facilities) owned and managed by the University. In March 2021, the Plan for Extending the Service Life of Infrastructure (Individual Facility Plan), which serves as an action plan for the maintenance cycle for individual facilities, was formulated to ensure that infrastructure is maintained and renewed at the appropriate time based on considerations of safety and economics.

System of the Plan for Extending the Service Life of Infrastructure



Promotion of Responsible Trading and Procurement

GRI 204-1, 301-3, 308-1, 308-2, 414-1

The Hokkaido University Procurement Information website provides information on advertising for general competitive bidding and procurement results on environmental goods at our university.

Procurement results in FY 2021 (partial)

- ① Procurement of environmental goods
- ② Procurement of goods from facilities that employ people with disabilities
- ③ Contracts relating to small and medium-sized enterprises
- ④ Efforts to utilize public procurement and subsidies to promote active roles of women
- ⑤ Contract Surveillance Committee

Performance Report Environment

Energy Conservation Initiatives

GRI 302-4, 302-5, 305-5

ICReDD building achieves “ZEB Ready” level of environmental performance

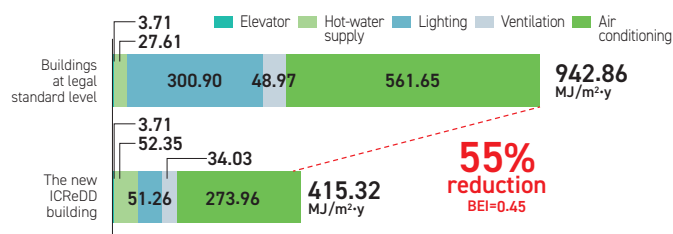


“Northern Campus Building No. 8 (ICReDD Building)” is under construction with completion scheduled for March 2023. The ICReDD Building reduces the primary energy consumption of the building by more than 50% from the

standard through the active use of natural energy and the reduction of energy loss with generic technologies. As a flagship for the promotion of SDGs, the building is planned to achieve “ZEB Ready” level of environmental performance.



Building energy graph



*According to the plan based on the Energy Conservation Act, the user-derived energy consumption (ex. by experimental equipment) is not taken into account.

Centralized Air Conditioning Controllers to be Utilized Across the University



The use of centralized air conditioning controllers, which use timer control to reduce wasteful operation (such as when we forget to turn off the air conditioner), is being steadily promoted. In FY 2021, it was newly installed in the School of

Pharmaceutical Sciences and Pharmacy, the School of Veterinary Medicine, the School of Fisheries Sciences, and the Research Faculty of Media and Communication.

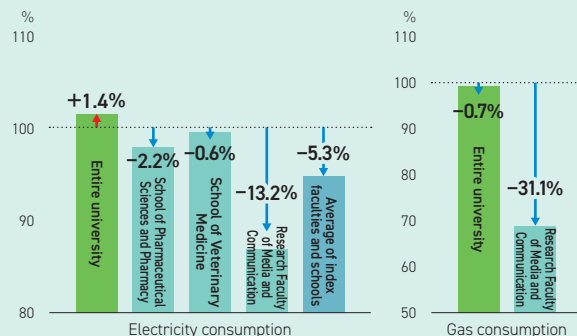
Energy savings effect by the centralized air conditioning controller

The University compared energy consumption between departments that installed controllers (have been in operation for at least 5 months since set up) in FY2021 and the University as a whole. The result showed that the fiscal year-on-year reduction in electricity consumption (EHP*) was approximately 5% (624 GJ, or approx. 1 million yen*) and in gas consumption (GHP*) was approximately 30% (395 GJ, or approx. 500,000 yen*2).

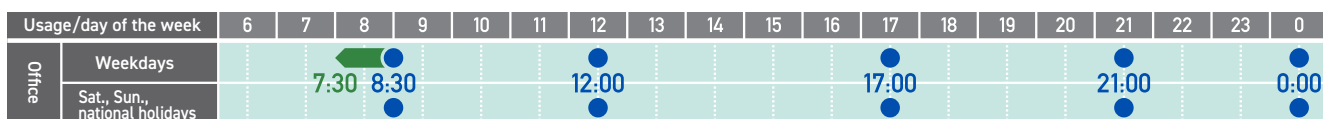
*1EHP and GHP are air conditioners that use electricity or gas, respectively, as the energy source.

*2Unit prices are based on those of April 2021.

Comparison of usage: FY 2021 versus FY 2020



Example of schedule setting



Preheating operation (winter only, set temperature of 20°C) Automatic stop (stop by timer)

Energy Consumption and Renewable Energy Generation Initiatives

GRI 302-1, 302-3, 302-4, 302-5

Primary Energy Consumption



Primary energy consumption (FY 2021)

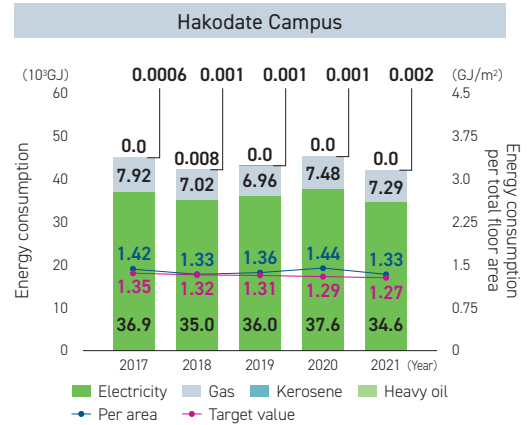
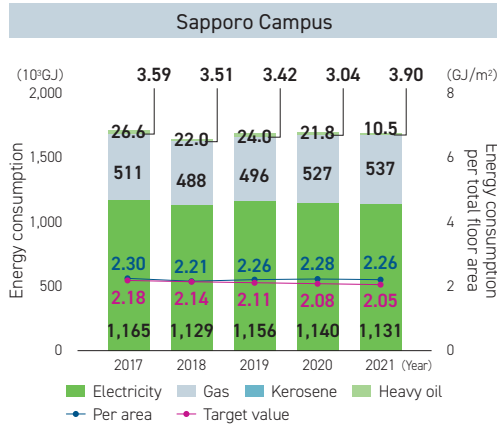
Electricity
1,165,181GJ

Gas
544,421GJ

Kerosene
3,898GJ

Heavy oil
10,464GJ

Conversion factors by energy type
Electricity 9.76MJ/kWh
Gas 45.0MJ/m³
Kerosene 36.49MJ/l
Heavy oil 38.9MJ/l



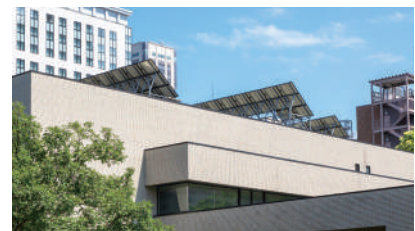
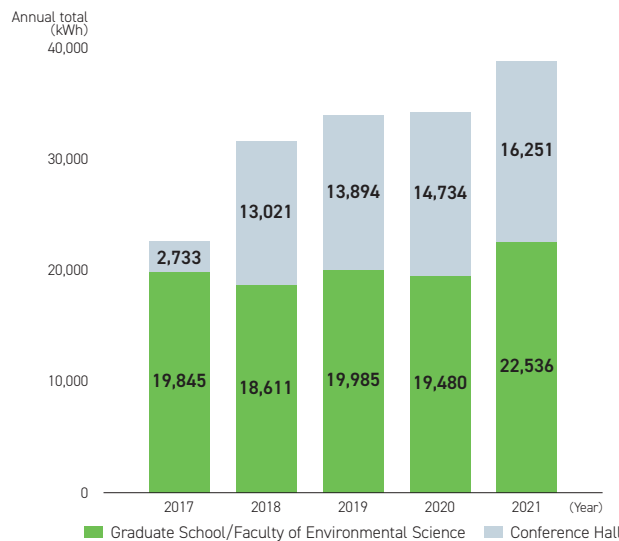
Note 1) 2018: Usage decreased due to the impact of the Hokkaido Eastern Iburi Earthquake. Note 2) 2017 – 2020: The values include private use. The energy conservation target is a 1.5% reduction per year in the basic unit for primary energy consumption on the Sapporo and Hakodate campuses (source: Action Plan for Building a Sustainable Campus 2016). That target is planned to be reset during the Fourth Period of the Mid-Term Plan.

Total energy consumption has been flat in recent years, although it has declined slightly since peaking in FY 2016. Energy consumption per total floor area (specific consumption) has similarly tended to level off in recent years, although it has been decreasing slightly from year to year. The University has set a target of a 1.5% decrease in specific consumption annually from the FY 2015 baseline, but it has not achieved this goal and needs to take drastic measures to achieve it.

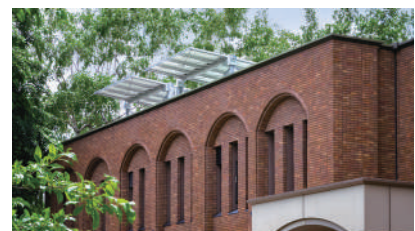
Renewable Energy (Solar) Generation

Self-generated power/solar (FY 2021)

Self-generated power/solar
38,787kWh



Conference Hall



Graduate School/Faculty of Environmental Science

Note 1) In 2018, power generation in the Conference Hall increased rapidly due to maintenance performed on the electrical room equipment. Note 2) An estimate that had to be calculated due to the failure of the management equipment terminal from FY 2020

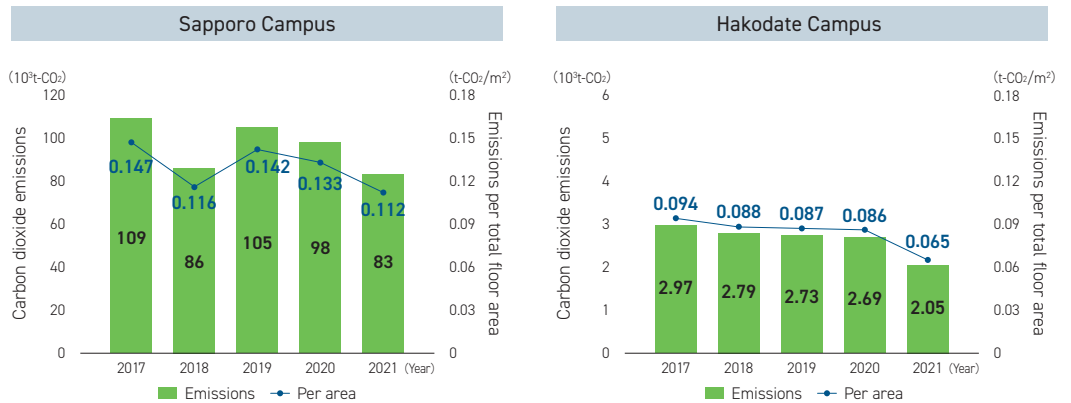
Greenhouse Gas Emissions and Initiatives to Absorb CO₂ through the Use of Experimental Forests

GRI 305-1, 305-2, 305-4, 305-5

Greenhouse Gas Emissions



Carbon dioxide
85,188t-CO₂



Note 1) The adjusted electricity-derived CO₂ emission factor [kg-CO₂/kWh] used for calculations was 0.678 in FY 2017. For FY 2018 it was 0.511 for the Sapporo Campus (new electricity supplier) and 0.678 for the Hakodate Campus. For FY 2019 it was 0.673 (April–June, new electricity supplier) and 0.656 (July–March, Hokkaido Electric Power Co.) for the Sapporo Campus and 0.656 for the Hakodate Campus. In FY 2020, it was 0.601. In FY 2021, it was 0.473.

Note 2) 2018: Emissions decreased as a result of the Hokkaido Eastern Iburi Earthquake.

Greenhouse gas emissions of the Sapporo and Hakodate Campuses in FY 2021 decreased by 16.1% from the previous year: Hokkaido University Sapporo Campus decreasing rate is 15.9%, and the Hakodate Campus is 23.9%.

The reason for the decrease may be that the electricity supply and demand contract was switched to a new power company in FY 2021, resulting in a lower emissions coefficient for electricity, which is a different trend from energy consumption.

Greenhouse Gas Absorption (Reference Value)



CO₂ absorption in experimental forests
Annual average: Approx. 116,000 t-CO₂ (estimated)

*Forest area: Approx. 65,000 ha

The above CO₂ absorption is estimated from the changes in forest stock calculated in 1995 and 2005 based on forest stock for each growth stage (m³/ha) in the long-term forest plan developed by the Field Science Center for Northern Biosphere and the forest survey register. This figure is much higher than

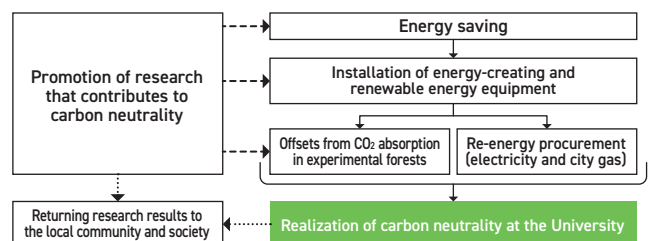
the CO₂ emissions of the entire University (Sapporo Campus + Hakodate Campus).

However, the amount of CO₂ absorbed by the University's experimental forests is not immediately offset by the amount of CO₂ emissions of the University's education and research activities, and the University will continue its efforts to reduce CO₂ emissions for a while, while promoting measures to make more effective use of the CO₂ absorbed by experimental forests through credit systems and other means.

Initiative to Achieve Carbon Neutrality



A project team will be established within the Institute for the Advancement of Sustainability to study the formulation of a university-wide policy and a roadmap for achieving carbon neutrality on campus, and numerical targets will be set and announced by FY 2025.



Priority of measures to be taken to realize carbon neutrality (visual representation)

Biodiversity / Water and Wastewater

Preservation and Management of the Ecological Environment



GRI 304-1, 304-2, 304-3, 304-4

Although Hokkaido University Sapporo Campus is located in the center of Sapporo City, the ecological environment has been well preserved over the years, with diverse flora and fauna represented, including rare species, and the campus itself is a place for academic research and education on the natural environment. The University has formulated the "Policy on Ecosystem Preservation and Management" establishing a basic policy, zoning the ecological environment,

and working on its conservation, maintenance, and utilization. In FY 2021, 53 plant species that are native to the campus (species with existing individuals that are thought to have survived since before the campus opened, or their descendants) and that are threatened with extinction from the campus or that are very rare were selected as "rare species" and were listed as such (flora version).

Zoning of the ecological environment

March 17, 2021



- Ecosystem Preservation Green Area
An area to be preserved for the future by prohibiting development activities
- Landscape Maintenance Green Area
An area where the current conditions should be maintained as much as possible with minimal impact on the current landscape
- Education/Research Green Area
Non-building site areas and unpaved areas, farms, or sports facilities, other than those in Ecosystem Preservation Green Areas and Landscape Maintenance Green Areas

Invasive Alien Species Control

GRI 304-3



As part of its efforts to preserve the remaining precious ecological environment of Hokkaido University Sapporo Campus has been engaged in activities to control invasive plants since 2009. Continuous efforts have been made to remove the cutleaf coneflower (an invasive species requiring

urgent action), which is a naturalized plant and falls under the category of invasive species requiring comprehensive action that may cause damage to the ecosystems of Japan, and poison hemlock (another invasive species requiring comprehensive action).



Associate Professor Aiko explains the purpose of the activity and control methods.



Cutleaf coneflower (foreground) and poison hemlock (background)

Water consumption

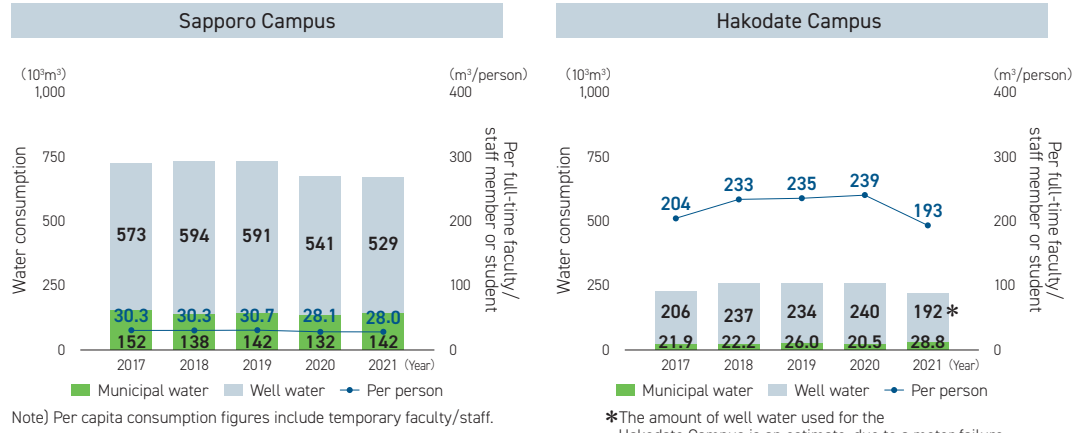
GRI 303-3, 303-4, 303-5



Water consumption (FY 2021)

Municipal water
170,601m³

Well water
720,817m³



Wastewater Management

GRI 303-2, 306-1



The University collects experimental waste liquids for final disposal by an outside contractor. Since wastewater other than experimental waste liquids is discharged into the public sewage system, water quality inspections of the campus wastewater routes are conducted twice a month, and the results are reported to the local government.

Reviving a stream: The Sakushukotoni River Restoration Project

GRI 303-1



The Sakushukotoni River used to flow through Hokkaido University Sapporo Campus, but it ran dry after the Second World War due to a decline in groundwater level caused by urbanization. The University decided to restore the Sakushukotoni River as an important backbone of the campus in the Campus Master Plan formulated in 1996 and

implemented the restoration project in cooperation with the City of Sapporo. Efforts were made to restore the water environment, such as by preserving existing riparian forests and using plants and microorganisms to improve the water quality. The project was completed in May 2004, and its ongoing maintenance and surveys are being conducted.



Central Lawn, where a stream meanders gently through Japanese elm and weeping willows



Ono Pond, where water lilies and reeds grow thick and ducks and other water birds visit

Waste / Resource Recycling

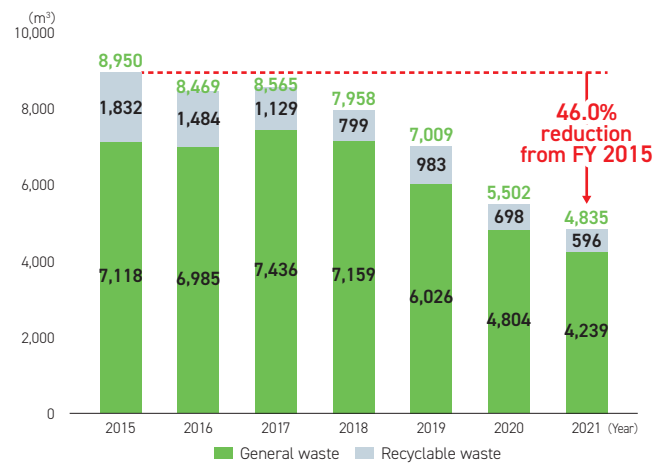
Reduction in Waste Disposal Costs and Generation by Waste Compaction

GRI 306-2

Hokkaido University Sapporo Campus has been working to reduce waste disposal costs and generation through waste compaction. In FY2016, the university started the compaction in two departments (Faculty of Agriculture and Faculty of Science). Since then, the number of compacting sites has been expanded year by year, and in FY2021, the University conducted waste compaction in 11 departments, 12 locations, and 2 sites. As a result, compared to FY2015 (before the start of the waste compaction), the total amount of waste generation was reduced by 46.0% and disposal costs were reduced by approximately 9.5 million yen.



Annual Trends in waste generation (Sapporo Campus)



Ano Onshitsu: Art Project Utilizing Campus Resources

GRI 301-2, 301-3

Ano Onshitsu is an art project that utilizes an old greenhouse (onshitsu in Japanese) built in 1973 at a nursery in the Sapporo Experimental Forest, southwest of Hokkaido University Sapporo Campus.

When the aging bridge between its forest and the campus was removed in October 2021, various artistic endeavors were pursued to make effective use out of 320 logged trees.



In a collaborative project with RITARU CÖFFEE, a café in Sapporo, this lumber is being used as smoke chips to roast coffee beans. The beans were named "Anotoki", meaning of "at that time", in the hope of preserving the memory of logged trees in our daily lives through the roasted coffee with the scent of grove. Anotoki is available at the online store RITARU CÖFFEE, Hokudai Co-op, etc.



An exhibition *Sansanto* at the activity base of Ano Onshitsu



Anotoki is also sold at "Information Center The Elm Forest"

Experimental Forest Logged Trees used for Tables and Beds

GRI 301-2, 301-3

Toward actively utilizing resources, birch logs from the Uryu Experimental Forest were used for flooring, tables, and stools at the co-working space and for beds in the accommodation rooms of the new Nayoro Education and Research Building, built in Nayoro City in March 2022.

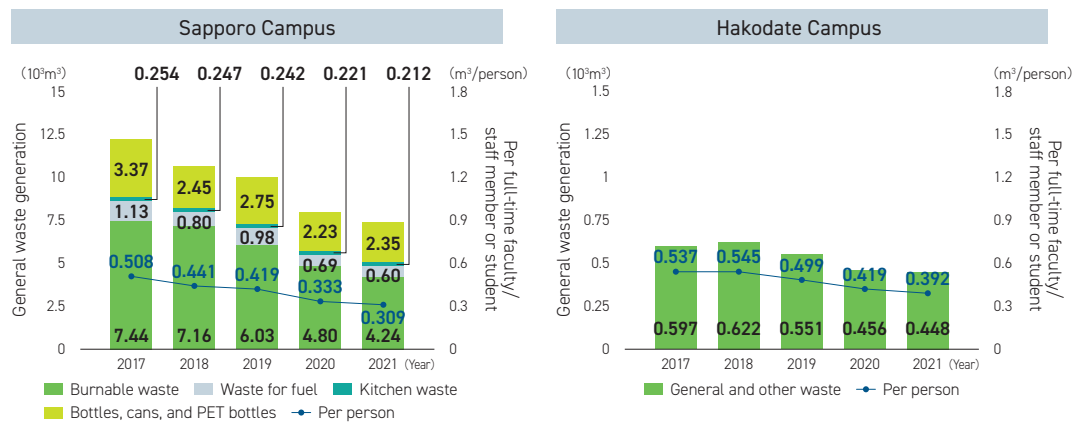


Waste Generation

GRI 306-2

General and other waste generation (FY 2021)

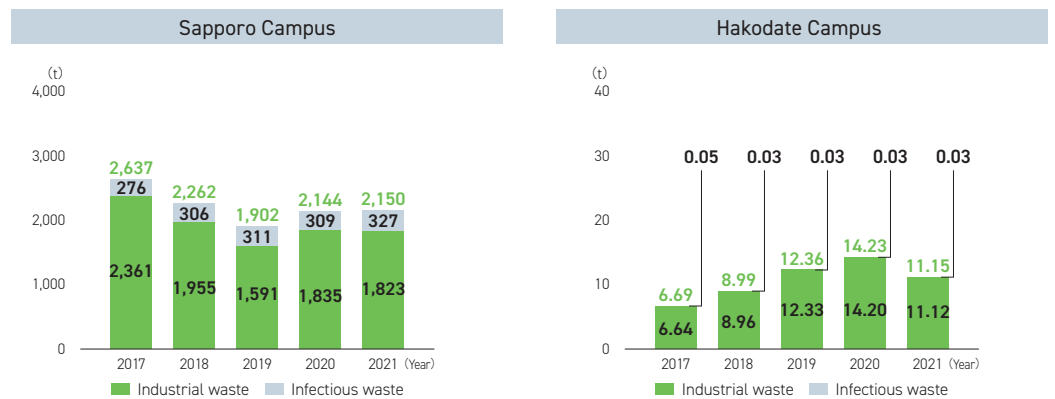
General and other waste
7,842m³



Note 1) Kitchen waste is generated at the University Hospital's food preparation facilities.
 Note 2) Per capita generation figures include temporary faculty/staff.
 Note 3) General and other waste for the Hakodate Campus includes PET bottles and other bottles.
 Note 4) The waste compaction project was phased in from FY 2016.

Industrial waste generation (FY 2021)

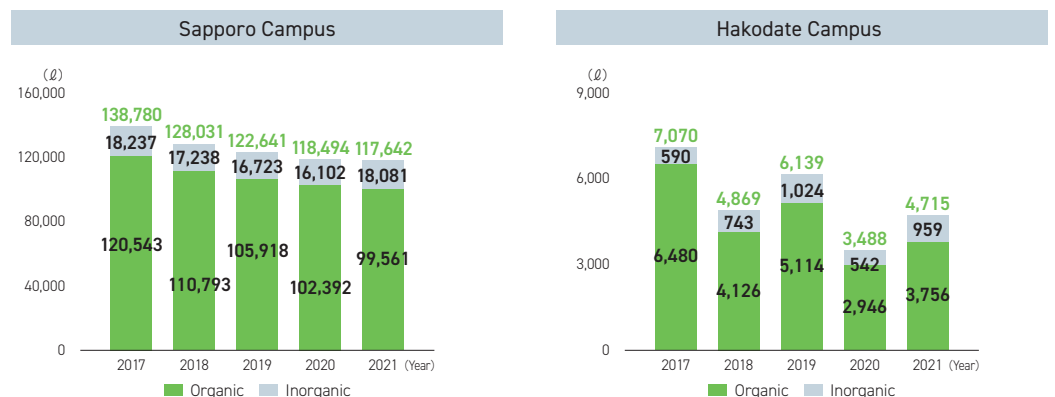
Industrial waste
1,834t
Infectious waste
327t



Note) The figures for the Sapporo Campus exclude items that fall under the Act on the Recycling of Specified Kinds of Home Appliances. The figures for the Hakodate Campus include discarded electrical appliances.

Experimental waste fluid generation (FY 2021)

Organic
103,317ℓ
Inorganic
19,040ℓ



Note) Including local facilities

Environmental Compliance

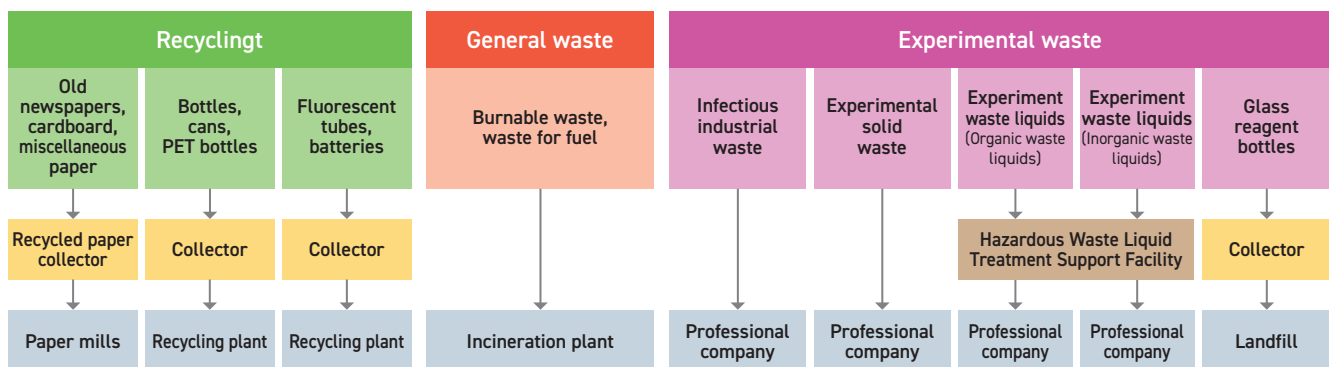
Waste Disposal Method

GRI 306-2, 306-4



Hokkaido University is implementing waste reduction, reutilization and recycling under the theme of “a resource-recycling society in which all members of the university can participate.”

Flow of recycling and waste disposal (main items)



Proper disposal of hazardous waste

The University is working to reduce emissions of chemical substances and to provide safety education based on the Hokkaido University Chemical Substance Management Regulations. Chemical substances are centrally managed under the University’s Chemical Substance Management System. The final treatment of experimental waste liquids is

outsourced, with organic waste liquids incinerated and inorganic waste liquids precipitated, and the resultant sludge is landfilled in a controlled landfill site after being baked. The Hazardous Waste Liquid Treatment Support Facility outsources this treatment and confirms proper treatment every year.

Reporting on Environment-related Laws and Regulations, and the Organizational Structure for Compliance with Laws and Regulations

GRI 307-1



In regards to environment-related laws and regulations (e.g., the Sewerage Service Act, the Air Pollution Control Act, laws and regulations concerning the proper disposal of waste, and energy conservation-related laws and regulations), we received recommendations from the regulatory authorities based on the Sewerage Service Act in FY 2021, and we have completed measures to improve wastewater quality.

Departments and divisions in charge of environment-related laws and regulations

Laws and regulations	Department/division in charge
Sewerage Service Act	Sustainable Campus Promotion Division, Facilities Department
Air Pollution Control Act	Sustainable Campus Promotion Division, Facilities Department
Laws and regulations concerning the proper disposal of waste	Sustainable Campus Promotion Division, Facilities Department
Energy Conservation Act	Sustainable Campus Promotion Division, Facilities Department
Act on Rational Use and Proper Management of Fluorocarbons	Sustainable Campus Promotion Division, Facilities Department
Home Appliance Recycling Act	Accountant of each faculty/school

Performance Report Society

Social Collaboration

Creation of General Policy on Social Collaboration

GRI 413-1



Under the ambition of “contributing to the resolution of global issues,” the University strives to contribute to solving social issues, revitalizing society, and creating new values by disseminating knowledge and advocating for social change through collaboration and cooperation with external organizations. We also aim to promote world-class research and foster globally minded individuals who will contribute to the progress of the international community. It is an essential and natural responsibility for the University to work with other members of society in order to create a sustainable social environment built on various advanced knowledge. Based on these visions, Hokkaido University’s General Policy on Social Collaboration was established on February 1, 2022.

Hokkaido University’s General Policy on Social Collaboration

- (1) Pursue organizational collaboration with local governments and other organizations
- (2) Contribute to the resolutions of social issues
- (3) Strengthen lifelong learning functions
- (4) Contribute to regional revitalization by effectively utilizing the resources

Diversity & Inclusion / Training & Education / Health & Safety / Indigenous Peoples Initiatives

Announcement of the Statement on the Promotion of Diversity & Inclusion

GRI 405-1



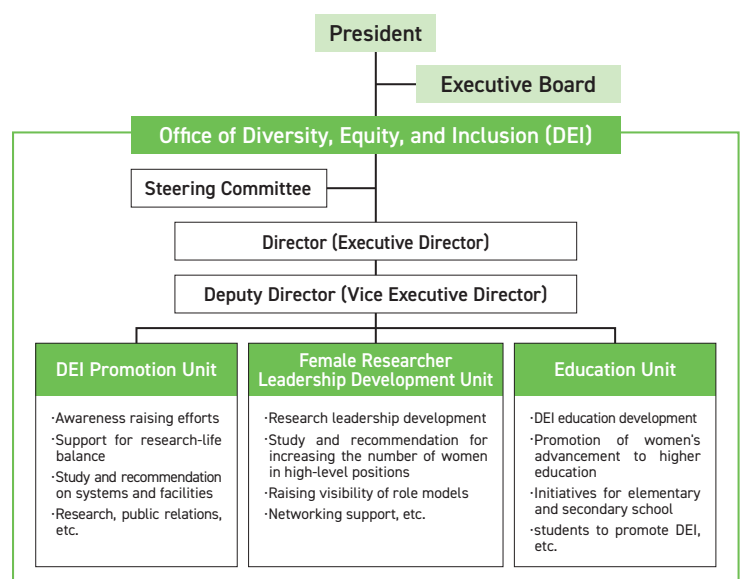
Hokkaido University announced the Statement on the Promotion of Diversity & Inclusion in December 2021 and launched the Office of Diversity, Equity, and Inclusion, a management organization under the direct control of the President, on April 1, 2022, creating a university-wide system to address issues related to Diversity, Equity, and Inclusion. Three teams have been established as the pillars of the initiative: DEI Promotion Unit to raise awareness and improve the overall environment, Female Researcher Leadership Development Unit to foster women leaders in research and provide research support, and Education Unit to provide diversity education for students and encourage the pursuit of doctoral degrees.

The full text of Hokkaido University’s Statement on the Promotion of Diversity & Inclusion is available on the University’s website below.



<https://diversity.synfoster.hokudai.ac.jp/en/>

DEI Organizational Chart



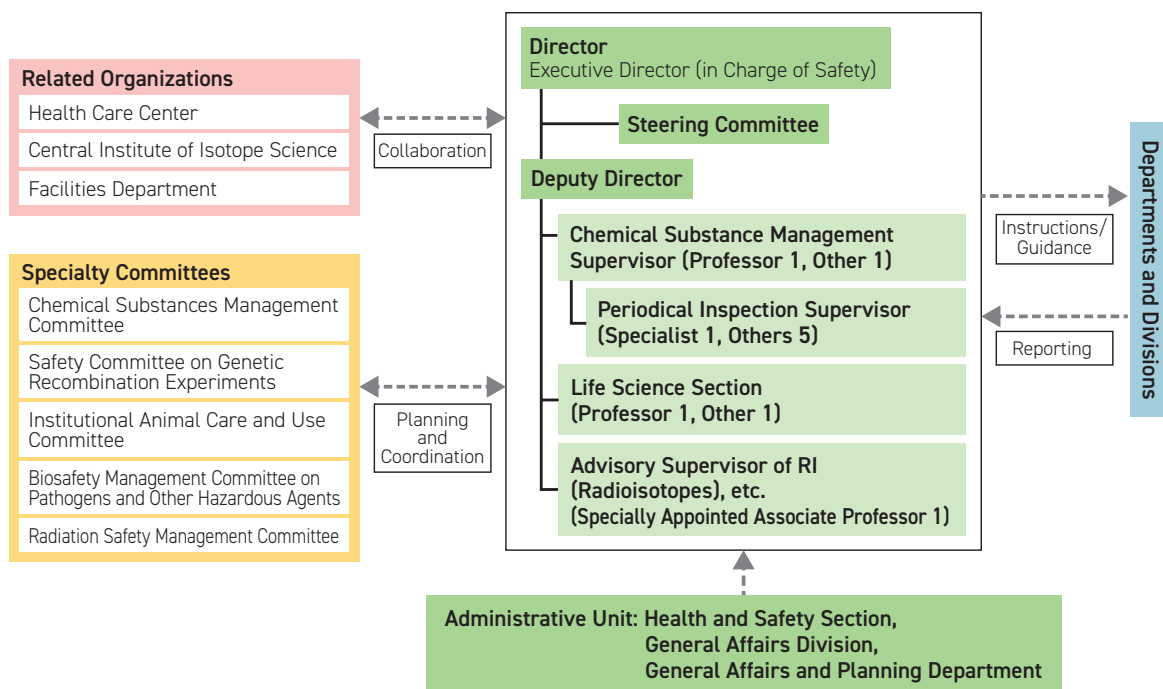
Office of Health and Safety to Guide and Supervise Safety and Health from a University-wide Perspective



GRI 403-1, 403-2, 403-3, 403-4, 403-5, 403-6, 403-7, 403-8

The Office of Health and Safety was established in March 2011 as an organization to plan, design, and supervise on-campus health and safety. The Office helps manage health and safety in cooperation with various faculties and related organizations.

Their activities include periodical inspections by health officers, investigations of the life science facilities, and providing materials for safety education and lectures.



Establishment of the Office of Ainu Relations and Initiatives



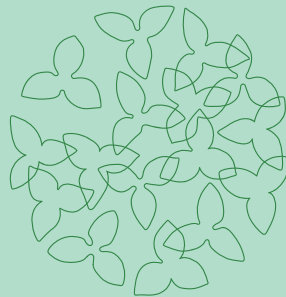
GRI 411-1

The University established the Office of Ainu Relations and Initiatives, a governing body, in April 2022.

In 2005, then-President NAKAMURA Mutsuo declared that it is the responsibility of the University to conduct nationwide and international research and education on the Ainu and other indigenous minority groups while respecting the dignity of these peoples. In 2019, then-Acting President KASAHARA Masanori said, "We will work sincerely with the Ainu people and pursue what we can do to realize a society where the Ainu people can live life with ethnic pride and that pride and ethnic identity are fully respected."

Given this background, the Office of Ainu Relations and Initiatives was established aiming to create a campus environment as well as society where the pride of the Ainu

people in their identity and ethnicity are celebrated. The Office sets out a series of important initiatives the University collectively take in order to advance our visions and create trust with the Ainu peoples. As an educational and research institution firmly rooted in Hokkaido, raising awareness and understanding of the history and culture of the Ainu people within and beyond the campus will lead to the development of an educational and research environment that help create a symbiotic society that respects indigenous peoples and celebrate their diverse values, which is also what our country strives to achieve. In addition, it is also expected to contribute to the achievement of the aims in the Statement on the Promotion of Diversity & Inclusion.



HOKKAIDO UNIVERSITY

The Trillium flower is symbolic of Hokkaido University and used as its official logo. In this design, the flower symbolizes “human” by combining intelligence, individuality, and diversity. The overlapping elegant lines of the flowers represent human relationships and knowledge. The flowers’ silhouettes reflect academic and contemporary values, suitable for Hokkaido University.

Hokkaido University Sustainability Report 2022

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The Hokkaido University Sustainability Report 2022 is available on the Institute for the Advancement of Sustainability website. To access, scan the code at right.



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