



Coaction with eXpertise for the future of Hokkaido University



Sustainability Report 2017 Toward a sustainable campus



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What does Hokkaido University mean to you?

The university must have characteristics that are talked about within your school or faculty.

When you talk with people from different departments, you may discover attractive feature of the university.

There are sure to be some bright prospects for the future.

This year's sustainability report looks at Hokkaido University's features and potential from various viewpoints.

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Message from the President

Interview with the new president

Toyoharu Nawa, President, Hokkaido University Maki Ikegami, Office for a Sustainable Campus

Why is sustainability important? The university needs to make the students understand.



President, Hokkaido University

● Toyoharu NAWA

Graduated from the Department of Architectural Engineering, School of Engineering, Hokkaido University. Completed the Master's course of the Division of Architectural Engineering, Faculty of Engineering, Hokkaido University. Doctor of Engineering (Tokyo Institute of Technology). After working for the Central Laboratory of Chichibu Cement Co., Ltd. (Taiheiyo Cement Corp.) and the Central Cement Concrete Laboratory of Chichibu Onoda Cement Corp., he was hired as an assistant professor in the Graduate School of Engineering, Hokkaido University. He was promoted to his current position in April 2017 after holding the posts of professor in the Graduate School of Engineering, member of the Educational Research Council/deputy dean of the Faculty of Engineering and dean of the Faculty of Engineering/dean of the Graduate School of Engineering/dean of the School of Engineering at Hokkaido University. He specializes in building structures and materials, in civil engineering materials, construction and construction management, and in earth and resource systems engineering.



Specially Appointed Associate Professor,
Office for a Sustainable Campus

● Maki IKEGAMI

Specially Appointed Associate Professor, Office for a Sustainable Campus. Graduated from the Department of Physics, Graduate School of Science, Tohoku University. Master of Science. Graduated from the Graduate School of Environmental Studies, Tohoku University. Doctor of Philosophy. After holding the post of assistant professor in the Graduate School of Environmental Studies at Tohoku University, she joined Hokkaido University in April 2012 to study the concept of sustainable campuses and whether it would take root in Japan and the rest of East Asia. She has conducted education and research on the establishment of a sustainable campus, a term with various meanings. The Assessment System for Sustainable Campus (ASSO), which is one of her achievements and specifies the roles of universities in society, has been used by universities in Japan and overseas for the development of strategies that seek the establishment of sustainable societies.

Professor Toyoharu Nawa was appointed as the 19th president of Hokkaido University in April 2017. In an interview, the new president of the university, where a new campus master plan is being formulated, expressed his thoughts and what he expects from faculty and students.

*This interview was conducted in June 2017. The remarks have been edited by the Office for a Sustainable Campus.

◆ Safety, security and sustainability

Ikegami: First, I'd like to hear your views on sustainability, including the ideas you've gained from your own experience.

Nawa: I first became aware of sustainability around 1995. At the time, I was involved in the development of cement for high-strength concrete and the construction of super high-rise buildings at a private com-

pany. I had the following questions about urban sustainability: No matter how durable they are, all buildings eventually deteriorate, so how can we demolish them safely? How can we dispose of large amounts of waste and conserve the environment? To conduct studies to solve these issues, I returned to the university.

Ikegami: You specialized in architecture.

Nawa: Yes. When I started research on construction

materials with low CO₂ emissions, the main focus of the construction industry was on new buildings, and not many people placed emphasis on sustainable development. Wooden buildings may last for more than 1,000 years, but concrete is superior in terms of disaster management. So I first considered the development of eco-cement, whose production process affords CO₂ emissions reductions.

Ikegami: Was there a reason for expanding your scope of research to resources?

Nawa: Construction is a resource-intensive industry. Concrete production consumes nearly 1 ton per person of sand, gravel and other aggregate resources every year. Since quality river sand and gravel had already been depleted, the



acquisition of aggregate by quarrying mountains was contributing to environmental destruction. The destruction of concrete due to the reaction between aggregates and alkalis also causes deterioration. It was therefore necessary to reconsider construction materials from the viewpoint of materials science.

Ikegami: Did you also shift to the field of resources as an instructor?

Nawa: Architecture students aren't taught the basic knowledge of physics and chemistry that's necessary for studies of environmental issues. In resource engineering, I taught physics and chemistry and addressed environmental issues comprehensively with consideration to environmental contamination and recycling. As I felt that a fusion with the academic fields of resource engineering is necessary to establish a new field of "construction sustainability," I decided to shift to the field of resources myself to inject new life into it.

Ikegami: How do you feel about buildings and the environment now that you've been continuing your studies?

Nawa: The most important things are safety and security. In large cities where populations concen-

trate, such as Tokyo and Sapporo, not enough shelters can be secured and damage can be serious at times of earthquakes if sufficient green spaces aren't secured. I was first engaged in the construction of high-rise buildings to secure green spaces. However, facing the fact at the time of the Great Hanshin Earthquake that buildings don't last forever, I decided to contribute to the creation of a safe, secure and sustainable society by considering the dangers of demolition and waste disposal.

Ikegami: "Safety" probably means there's no threat to life, but don't the conditions for "safety" differ from individual to another?

Nawa: "Safety" has the functional sense of buildings not being destroyed, and "security" refers to peace of mind. For example, good buildings don't have to be oppressive. Being able to live peacefully while safety against earthquakes and other disasters are maintained are fundamentals. Then we'll have to think about environmental issues to achieve sustainability.

Research is different from education

Ikegami: I feel that the word "sustainability" is roughly synonymous with having a society where future generations think that they can continue to live happily.

Nawa: Yes, it is. I believe that society must give its successors hopes for the future.

Ikegami: Do students in Japan have hopes for future?

Nawa: I think it's a role of education to give such hopes. At universities, it's first necessary to make students understand why sustainability is important and how it contributes to their future.

Ikegami: Education is a duty of universities, but universities must also pursue achievements in research. How do you think the improvement of a university's reputation can be connected with the promotion of students' understanding of sustainability?

Nawa: "Research" should be diverse; "education" should not. University education is about teaching knowledge that should be acquired by individual students and fostering their ability to hand down Japanese cultures and technologies. Fostering such students naturally leads to improved research results. Good research begins with good personnel develop-

ment.

Ikegami: Is there some way to be ranked in the top 100 universities in the world?

Nawa: I think that whether the university is able to rank in the top 100 depends on its ability to have purpose, to develop strategies and to define the direction in which to advance. Hokkaido University has those abilities. Instructors conducting advanced research should further promote mutual communication and should have leaders to guide those instructors.

Ikegami: Do you think research should be conducted in groups rather than by individuals?

Nawa: In architecture, for example, a good building can't be constructed by gathering proposals from individuals who are studying pillars, walls and lighting separately. Good results are produced when a designer proposes an ideal building for a certain type of resident and all those around him or her cooperate. Although academic fields are now increasingly segmented, research must take a larger perspective. It will also be important in the future to place further emphasis on fostering human resources who have comprehensive design abilities.

Ikegami: What is designing ability?

Nawa: To create something, it's necessary for one to sufficiently absorb basic knowledge and refine one's analytical ability to clearly identify a concept and one's ability to give ground to design. Design ability is the ability to comprehensively understand circumstances and solve problems. In other words, it's the ability to create solutions in one's own head instead of finding them from past data.

Ikegami: I feel that, although Japanese are brilliant in their individual studies and technologies, they're not very good at developing ideas to combine and make use of their achievements.

Nawa: Such thinking may have come from the orientation toward imitating Western countries during the rapid modernization of the Meiji era. People should create things based on their own identities. I believe Japanese have brilliant ideas that can make the most of our technologies.

Ikegami: What's the identity of the students of Hokkaido University?

Nawa: Their image is "Boys, be ambitious!" To project a strong presence on a campus where there are many different students--including 60% from outside

Hokkaido, as well as international students--you must demonstrate the language, culture and ideas of your place of origin. I think it's an advantage of Hokkaido University that students can experience and understand diverse cultures and ideas while exercising their individuality.

Go out into the field and learn

Ikegami: Lastly, could you talk about the value of involving students in campus development?



Nawa: Various instructors are involved in discussions on campus development. I hear that the lifespan of Poplar Avenue is 80 years and that seedlings for the generation after the next have already been prepared. In light of this, I believe it's highly significant for instructors not only of architecture, but also of agriculture and social sciences, to discuss the "ideal structure of a campus" and for students to participate in tree-growing, building design and other activities, in order to have first-hand experience of the process of realizing dreams.

Ikegami: I think it's ideal for a university to use the campus for both research and education.

Nawa: It's exactly what's meant by "practical learning," which is one of Hokkaido University's basic philosophies. It exemplifies Dr. Clark's remark, "Go out into the field and learn." I believe that real education and research are about providing opportunities to think and having students participate in such opportunities.

Ikegami: Thank you very much.



Harness the power of his

Hokkaido University has a wealth of historical resources that deserve to be regarded as “assets.” Based on the idea that the value of such assets may be enhanced if the facilities that store and manage them work together, staff members from three such facilities gathered for this discussion.

*The round-table discussion was held in June 2017

1 Introduction of the Archives, the Museum and the Library

First, please introduce the archives, the museum and the library.

Inoue: The Hokkaido University Archives collects materials on the university’s history. Although the



majority are documents, objects and books are also collected. There are two main categories of materials. One

is official university documents prepared or acquired for university management. When certain documents are no longer necessary as official documents, they’re stored as historical records of past management and decision-making methods. The other category is private materials provided by persons related to the university. For example, offi-

cial university records are supplemented by materials on campus life and by research procedures established by faculty members, alumni and former employees or their families. The primary purposes are to collect, sort and store such materials and present them to the public.

Ohara: The Hokkaido University Museum was established in 1999 and was renovated in 2016. It has four tasks. The first is to hand down academic specimens to the next generation by storing and sorting them. The second is to conduct interdisciplinary research using academic materials. The third is to promote the dissemination of research results by holding exhibitions and seminars. The fourth is to create and disseminate various research projects centering around the museum.

Currently, the basic task of the archives is to collect objects, and subjects of research conducted in individual schools are displayed under the theme of “Cutting-edge HU.” There’s also a café that serves alcoholic beverages now, and I’d like it to be used as a place for discussions.

Jo: The University Library provides books, magazines and electronic media to everyone at Hokkaido University as “infrastructure” for education, research and learning. The large libraries are the Main Library and the North Library. The Main Library is close to the buildings that house the liberal arts departments, and its collection consists mainly of Humanities materials. The North Library contains books for undergraduate students and serves as a place for first-year students to



● **Kyoko JO**
North Library,
Hokkaido University Library

Kyoko Jo works as a library staff at Hokkaido University. She’s been in charge of user services at the North Library since 2016. She’s learning by trial and error every day to accomplish one of the missions of the library: “to support the development of students who are eager to learn and to solve problems on their own by providing a wealth of information that’s accessible in a comfortable, stimulating, learning space.”

● **Takaaki INOUE**
Associate Professor,
Hokkaido University Archives

Takaaki Inoue has been the director of the Hokkaido University Archives since its opening in 2005. The University Archives collects a wide range of materials on the university’s history, ranging from documents from the days of the university’s predecessor, Sapporo Agricultural College, more than 140 years ago to snapshots recently taken on campus. The archives store and present these to the public. They also handle various inquiries and investigations. He hopes that, when students want to know and learn about the history of Hokkaido University, they would find out the Archives has almost everything they need.



● **Masahiro OHARA**
Professor, Hokkaido University Museum

After having worked as an assistant professor at the Hokkaido University School of Agriculture, Masahiro Ohata has worked for the University Museum since 2000. He became a professor and the deputy director in 2011. He's in charge of managing the insect specimens at the museum, including their use in research and display. He specializes in systematic entomology, especially beetles of the family Histeridae. In addition to entomology, he teaches classes on the preservation of museum collections and museum practice. He's continued activities to make the University Museum more open to the local community and its residents by introducing the Saturday seminars for citizens, the museum volunteers, the parataxonomist training course and the CISE network.

study. In addition to these, the existence of 21 departmental libraries that provide comprehensive services to individual departments distinguishes Hokkaido University. The Hokkaido University Library was designated as a United Nations Depository Library in 1963. It collects UN publications and presents them to the public, and holds events for students to discuss global issues. It also serves as an EU information center to transmit information from the EU. The library's Rare Books and Special Collections Room has valuable materials, including Northern studies materials related to the Ainu and Siberia, materials on Hokkaido's development and old maps.

What are your facility's ambitions and issues?

Inoue: In 2005, when the University Archives was first established as an organization, materials were stored in a vacant space borrowed from the university. Then, it became possible for the Archives to use its own repository in April last year, when a building that had been used as the center for international students was given to the Archives. Now that we've finally established an environment for sorting materials and creating a list of them, our first task is to create an easy-to-retrieve database system to make the materials easy to use.

Ohara: As a campus museum, the University Museum has two plans. The first is a plan to



make the museum a base in a network for disseminating research results from Hokkaido University. In fact, exhibits at the Second Farm and Fisheries Museum at School of Fisheries Sciences, which are also under the control of the Museum, are insufficient. There are also display spaces on the second floor of Clark Memorial Student Center and Centennial Hall. One main goal of the plan is to incorporate individual displays in a well-established network to make the entire campus a museum zone. Another goal is the establishment of a base to turn materials and specimens into academic resources. All research projects produce products that must be stored somewhere, and the Museum is to serve as a base for such storage. Biological and dry specimens require repositories with proper air conditioning to avoid vermiculation and mold growth. However, since the Museum is in an old building that was constructed in 1929, we still have a long way to go before solving the repository issue.

Jo: While the University Library has played a role as a base for the accumulation of knowledge, it's also required to protect and make use of its contents and function as a more stimulating place for students, faculty and people outside the university, and as a place where new innovations are created from old things. I believe it can become a place where students motivate and improve each other by mutually sharing their experiences of overseas study, international cooperation, volunteer work and other extracurricular activities. Since Hokkaido Uni-

versity has many learning support organizations other than the library, it will be good to have a portal site where information on what kind of support is provided is gathered for students to use in self-learning and study.

2 The significance of looking at history

All three facilities have been preserving historical resources and presenting them to the public. What do you think is the significance of such activities?

Ohara: The museum has four historical exhibition spaces called "History of Hokkaido University" containing materials on our predecessors, from Dr. Clark to Nobel Prize-winner Professor Akira Suzuki. New students enter the university every year, and I think it's difficult for them to develop



The paleobiology collection room of the Hokkaido University Museum

their own identity if they don't know the history of their own university. In this sense, it's the responsibility of instructors to teach the history of the university repeatedly. The education that's provided to them now wouldn't exist without intellectual property and without a campus that had been established by our predecessors. I'm studying entomology. When insect specimens are pre-

pared, pin length, pin insertion positions and the proper spread of the legs are predetermined. These are the products of knowledge accumulated by past entomologists who found the best methods through trial and error.

Jo: The Google Scholar page says "Stand on the shoulders of giants." I think that says it all. Our predecessors, who completed work and made other achievements, are likened to giants who provide a foundation for new knowledge and perspectives. That's where the significance of libraries lies, and the power of old materials and actual objects remains strong. The real feelings of an object, such as its texture, smell and appearance to the naked eye can't be transmitted electronically. That's probably why museums and archives place importance on objects.

Inoue: I think history is somewhat necessary if the present is to be seen from a skeptical viewpoint. Because there are old things, we can wonder whether something is true or can be seen from a different viewpoint. I think that seeing things with skepticism is the basic viewpoint of learning and science at universities and that old things are the foundation of that viewpoint.

3 Dream plan for cooperation among the three facilities

What's possible if the three facilities cooperate with each other?

Ohara: It would be good to share a large repository. If there were a proper repository, it would be possible to make a profit by renting

space to individuals who have valuable specimens. While the three facilities sometimes lend to, and borrow from, one-another, there's no particular system for the regular exchange of views. Although there are exhibition rooms at the research forest in Tomakomai and the Akkeshi



The Exhibition Hall of the University Archives

Marine Biological Laboratory and valuable materials in the Hokkaido University Botanical Gardens, they're not systematically linked. It's therefore desirable to establish an official committee to manage the exhibition of materials at the university.

Inoue: Hokkaido University will celebrate its 150th anniversary in 2026, and I expect there will be plans for the three facilities to do something to commemorate it. In the days of Sapporo Agricultural College, Dr. Clark suggested enhancement of the library and the collection of specimens, and established specimen rooms to improve the learning environment for students. Since its foundation, Hokkaido University has placed great emphasis on using actual materials for learning. I also think that the university deeply understands the importance of its history. It's because of our strong shared belief in "appreciating its own history." Since these three facilities are responsible for this task, there must be many ways for

us to cooperate. For example, plant specimens made by the botanist Kingo Miyabe, who was a student in the second graduating class at Sapporo Agricultural College and later became a professor, are in the Museum, the Archives has letters sent to him, and the Library has his collection of books. If the three facilities were to put them together, it would be possible to hold an exhibition to celebrate Miyabe's achievements.

Jo: I have an idea of establishing an outreach base outside of Hok-



kaido University. There is a museum of University of Tokyo in a commercial building KITTE managed by Japan Post Co., Ltd. in front of Tokyo Station, where people drop in for free when they are shopping at the building. An enormous number of skeletal and other natural history specimens are displayed, as well as the museum shop is well-stocked and fun. I think it would be good to have something to publicize Hokkaido University to the outside. If that could be realized, I'd like to start by promoting the university around Sapporo Station or Odori Park.

Is there anything else you'd like to add?

Ohara: I have a dream of delivering objects of the Museum as teaching materials through the Library's delivery system. In Sapporo, the Central Library has a system to deliver books to elementary and junior high schools, and the system is also

used to lend, for example, a brown bear specimen for classes. The University Library has a good network with each department. The Museum has objects that can be seen only by those who visit. If we were to cooperate and create a system to deliver Museum specimens to students, it would be very appealing.

Inoue: If you look at the campus in two dimensions, Furukawa Hall, the School of Agriculture, and the more than 100-year-old former Department of Entomology and Sericulture Classroom share the area with the Museum, the Archives and the Library. If you look at the campus as a tourist resource, this southern area is the most attractive part. Here, the remains of the ancestors of Ainu who once lived by the Sakushukotoni River lie, and more historical relics can be found when you dig the ground. While the campus is in such area, cutting-edge research worthy of the Nobel Prize is conducted there. It is rare for a university in Japan to have an environment where its history overlaps with the campus itself. It may be interesting to include such characteristics in the meaning of cooperation. We should make more use of these resources, which we can tell new students "This is the favorable environment we have."

Thank you very much for



Yaenkoro Ainu documents
(replica, Hokkaido University Library)

today.

Hours

- ◎ Admission is free for all three facilities.
- ◎ The facilities may be open or closed temporarily for university events or other occasions.

■ Hokkaido University Museum

- OPEN : 10:00 – 17:00
*10:00 – 21:00 June – October Fridays only
- CLOSED : Mondays, 12/28 – 1/4
*When a national holiday falls on a Monday, closed on the Tuesday after that Monday

■ Hokkaido University Archives

- OPEN : 9:30 – 16:30
- CLOSED : Saturdays, Sundays, public holidays, December 29 – January 3,

■ Hokkaido University Library

(Open-stack reading rooms of the Central Library, reading rooms on 2F – 4F of the North Library)

- OPEN : 8:00 – 22:00 on weekdays
(9:00 – for visitors)
9:00 – 19:00 on Saturdays, Sundays and national holidays

*The libraries may have shorter hours on some days.

- CLOSED : December 28 – January 3,
on Saturdays and Sundays during the University Festival (early June), on the "no-electricity day" of the university (September) and during the National Center Test for University Admissions (mid-January)

*For details, visit the Library website.

Homework for Hokkaido University

What about Hokkaido University should be improved that isn't noticed by instructors? To explore this question, three students discussed "issues that should be addressed by Hokkaido University." *The discussion was held in June 2017.

What should be changed?

What do you think should be changed at Hokkaido University?

Nishimura:

First, it's hard to move around on campus. It's good to have a large campus, but it takes about 20 minutes to walk from one end of the main street to the other. There are buses for faculty, but students can't use them. The second is the lack of communication with other schools. My only contacts with students from other schools have been those I met in first-year classes or club activities. The third is about information. For example, Hokkaido University has the Health Care Center*1, which can be used free of charge by students, but I didn't find out about it until my fourth year. More information should be provided on what facilities are available.

Yamashita: What troubles me in everyday life on campus is that there are too many puddles on the sidewalks. It's so bad in front of the School of Engineering that it's sometimes impossible to walk through. Next, grass grows neatly on the Central Lawn and in front of the School of Agriculture on the south side of the campus, but the area around the Faculty of Veterinary Medicine is like a thick forest. I'd love to see the lawn extended to the north side. Another thing is that I feel that Nitobe College*2 is not publicized

well. Not many students are taking advantage of the opportunities offered by the College to talk face to face with alumni. Some students think the program is for preparation to study abroad. It'd be good if more students could use these opportunities to improve themselves. One more thing: I've heard that the budget for labor cost has been reduced because of national fund reduction. It'd be bad if this affects our education.

Fukuyama: Talking about personnel expenses, I felt sorry for some friends when I heard them saying that there were no longer professors in their lab or that courses they'd planned to take wouldn't be offered this year. I also felt unhappy that playing sports on Central Lawn was suddenly banned to avoid damage to the grass. I eventually understood it was because of the high maintenance costs, but it was hard for students to accept such a sudden

ban without explanation. Another thing is about bicycles on campus. People on bicycle should show better etiquette, because they pose a danger by riding at high speeds and because abandoned bicycles are an eyesore. Something should be done to make the campus more pleasant for everyone.

Let's think of solutions to these issues.

How can we make it easier to get around?

Yamashita: Students are saying that it'd be nice to have an underground passage. Then we'd be able to ride bicycles even when it is rainy or snowy.

Nishimura: Even an arcade road would be enough.

Fukushima: The risk of accidents might also decrease if the underground road were made exclusively for bicycles, while cars stayed on the surface.

The problem of getting around on campus could be solved if there were a budget. Now how can we increase communication with other schools?



Kazuki NISHIMURA

A 4th year student in the School of Medicine. Born in Iwamizawa, Hokkaido. His hobbies are futsal, piano and reading.

Nagisa YAMASHITA

A 4th year student in the Faculty of Veterinary Medicine. Born in Osaka Prefecture. A member of the Japan Association of Veterinary Students. Her hobbies are making sweets and watching musicals.

Ken FUKUYAMA

A 3rd year student in the School of Engineering. Born in Kanagawa Prefecture. A member of the Hokkaido University Co-op Student Committee. His hobbies are bowling and graphic design.

Fukuyama: Although there are students from different schools in the first-year basic class, I only talked to certain students in the class. I have friends from the School of Engineering and the School of Agriculture, but I don't know anyone from the School of Dental Medicine.

Nishimura: Neither do I. This is my first time to speak to a student from the School of Veterinary Medicine.

Yamashita: It's easier to make friends at my own school, although there are opportunities to interact with students from different schools in Nitobe College, as it's a university-wide program.

For example, if a free space for students were established in a new building, would you be able to interact with a wider range of students?

Yamashita: Even if there were a space that could be used freely, I may not talk to strangers.

Fukuyama: Instructors may have contact with other schools through cross-disciplinary exchanges, but it may be difficult for students.

Let's leave the problem on the reduction of labor cost budget, as it can't be solved by students. How about the communication and information? How do you get information about the university?

Yamashita: Through the bulletin board in the school building and Twitter. But, if the Twitter account were official, I might not follow it. Information should be given by something like word of mouth, from instructors to their students.

Nishimura: I was asked by an acquaintance to take part in today's discussion. If the person had been an instructor I didn't know, it might've been a bit diffi-

cult for me to participate.

How can you contribute to Hokkaido University?

How can you contribute to making Hokkaido University more attractive?

Yamashita: I'm a student of the second class to enroll in Nitobe College who needs to pave the way for students in successive graduating classes. When I go into society, I'll have to do my best so that people around me will say "students of Nitobe College are good."

Fukuyama: As a member of the Hokudai Co-op*3, I hope to play a role in spreading information to students. Sometimes students listen to certain information only because it's provided by fellow students. For example, if new rules on bicycles are established, we can provide that information, including the circumstances and background of their establishment.



Nishimura: It is impossible for students to build the arcade I mentioned before. So we have to do what we can in our research and other activities. We've got to work hard every day to make people think that students of Hokkaido University are reliable.

What if the three of you from the School of Engineering, the Faculty of Veterinary Medicine and the School of Medicine were to conduct R&D together?

Yamashita: We might be able to make something that could be used for both animals and humans.

Nishimura: Do you study chemistry in the School of Engineering, Mr. Fukuyama?

Fukuyama: Yes, I do. I also study pharmacology and cell engineering.

Nishimura: Then we could research zoonotic diseases.

Yamashita: The Faculty of Veterinary Medicine and the School of Medicine cover fields such as public health and food hygiene. When the School of Engineering were to join, it might be possible to bring chemical apparatus in tests that currently involve only the human eye, to create indexes to present the test results as numerical values.

Nishimura: It might be possible to research the health of both humans and animals.

I'm looking forward to your success. Thank you very much for today.

Terminology

*1: [The Hokkaido University Health Care Center]

At Kita 16-jo, the Center provides initial treatments for colds and other medical conditions, first-aid for burns and injuries, consultations on mental health and health examinations. For details, visit the center's website.

*2: [Nitobe College]

Established in 2013, the college offers a special education program to foster global human resources. While taking regular undergraduate courses, students receive education to foster a rich sense of humanity and a global outlook.

*3: [The Hokkaido University Co-op Student Committee]

The Committee undertakes various activities, such as bicycle safety inspections, the promotion of mutual-aid programs and Gomi Navi (the collection and recycling of disused items), to improve campus life at Hokkaido University from the viewpoint of students, while incorporating the ideas and cooperation of Co-op members.

Making Hokkaido University more comfortable

The vast, verdant Hokkaido University campus is popular among locals and tourists for its pleasantness. But is it also comfortable for students, who spend every day on campus? The frank opinions of students were heard in the discussion.

*This round-table discussion was held in June 2017.



● Naho NISHIKAWA

A 2nd year student in the School of Fisheries Sciences. Born in Osaka Prefecture. A member of an unofficial a cappella group. Her hobby is visiting cafés.

● Taketsugu TAKAHASHI

A 3rd year student in the School of Engineering. Born in Mie Prefecture. A member of the Student Council for Sustainable Development (SCSD). His hobby is bouldering.

● Ryoto HORITA

A 2nd year student of the School of Law. Born in Ebetsu, Hokkaido. A member of the karate club (first dan level). His hobby is cycling.

Where are the places for students?

Where and how do you spend breaks between classes and after class hours?

Takahashi:

Since most of my lectures are in the same room, I stay there during breaks to finish my assignments. I'm at the library when I study or when my club members meet after school.

Nishikawa: I stay in the classroom during breaks. When I don't have a class in the next hour, I go home or I look around the shops near Sapporo Station. After classes, I work part-time or go out for dinner with friends.

Horita: I study or do my assignments at the library during my breaks. After classes, I have club activities on Mondays, Wednesdays, Fridays and Saturdays, and



I work part-time on other days. I also study often at the library after my club activities.

Please discuss what kinds of places you want there to be for students.

Horita: Since Hokkaido University has a beautiful campus, it'd be nice to have some benches.

Takahashi: Outside? Maybe on the Central Lawn?

Horita: It'd be nice to have benches on the Central Lawn.

Nishikawa: Aren't there benches there?

Horita: Not many. There are only three. I'd like to see more.

Takahashi: The library of the School of Engineering doesn't have enough seats. There are only few dozen seats.

Horita: Despite the vastness of the Hokkaido University campus, there aren't many places to hang out.

Nishikawa: I think it'd be good to be able to study while snacking in the library. I also want more

shops, even if only small ones. There are no shops near some buildings—near the Graduate School of Environmental Science, for example.

Horita: That's true.

Nishikawa: There isn't anywhere to eat, either.

Takahashi: When we get together with students of different schools, we use the library most of the time. But the libraries are only at the north and south ends of the campus. Wouldn't it be good to have space to talk at the center of campus?

Horita: I agree.

Takahashi: To be honest, are you happy about staying in your classroom?

Horita: We need permission to use another classroom. I think it's inconvenient.

Takahashi: We don't even know which classrooms are vacant.

Horita: It'd be very helpful if there were notices of vacant rooms.

Takahashi: It'd be good if we could use vacant rooms for studying.

Nishikawa: That'd be a good system. We might be able to use them for circle activities, too.

Takahashi: As it is, even when there are vacant classrooms, we don't know whether we can use them.

Nishikawa: We feel a little guilty about using them.

Where would you like there to be spaces for you to talk with friends and eat snacks? And what kind of facilities would you want?

Nishikawa: It'd be good to have several such spaces.

Takahashi: I'd want at least one at the center of campus.

Nishikawa:

I'd want more spaces similar to the "refresh spaces" [the media court, lounges and lobbies] that are currently in the libraries.



Horita: Even just having some tables and chairs would make a big difference.

Takahashi: If possible, computers and Wi-Fi would be nice, too.

Are there vacant classrooms around you of which availability you're not sure about?

Takahashi: There are lots of classrooms in the School of Engineering. If at least two rooms could be secured as study rooms, I think some students would use them.

Horita: The Faculty of Letters building also has lots of classrooms. If we get permission, we can borrow a room for a study session for a seminar, for example. But we don't know whether we can use a room to study. It'd be very convenient if classrooms that are available during certain hours were indicated on the bulletin board.

How would you spend 100 million yen?

I know it's a sudden suggestion, but if there were a budget of 100 million yen, what would you use it for on campus?

Takahashi: Underground passages. I don't know if 100 million yen is enough. Transportation is absolutely necessary, because the campus is too big.

Nishikawa: How about increasing on-campus bus service?

Horita: It'd be good if bus service were increased and became available for students, at least in

the snowy season.

Takahashi: I'd want more cafeterias.

Nishikawa: I'd want more variety on the menu.

Takahashi: All the cafeterias are crowded at lunch time. Maybe we could invite a restaurant chain to open a branch on campus.

Horita: A new restaurant wouldn't have to be operated by the Co-op.

Takahashi: If there were a family restaurant, that'd be a good place to talk with friends.

Nishikawa: A McDonald's or Starbucks would be nice, too.

If you could have 100 million yen each to spend instead of 100 million yen among the three of you, what would you use it for?

Takahashi: I'd like for the entire campus to be cleaned, as there are places that haven't been cleaned sufficiently. Something else I'd want is connecting passages between each floor of the buildings of the School of Engineering, because it's sometimes difficult to move smoothly between buildings.

Nishikawa: I'd want another hall for circle activities. Since our a cappella group is unofficial, there's no place to practice or to store speakers and microphones. I'd also want a comfortable café near Kita 18-jo, like "Elm no Mori" near the Main gate.

Horita: I'd want old library books and classroom textbooks to be updated to the latest edition. I'd want lockers, too. Students of the School of Law need to carry heavy books, including the book of six major laws. It'd be good if we could leave them on campus. I'd be happy if I could have a locker that was big enough for a suit and what I need to study.

Takahashi: Aren't there lockers?

Horita: There are, but they're very small.

Nishikawa: I don't have a locker.

Takahashi: There are no lockers in the School of Engineering, either. I know some schools have lockers. It'd be good if there were a locker for each student. Then I could leave my lab coats in it.

What score would you give the overall comfort level of Hokkaido University?

What score out of a hundred would you give the overall comfort level of Hokkaido University?

Horita: Since I'm in the Humanities course, I'm usually in the Faculty of Letters building, at the



main library or around the Central Lawn. I'd give those places 80 points, as they're very comfortable. If the north side of the campus, which seems to be in poor condition, is included, I'd give 60 points.

Nishikawa: I'd give 70 points. The Central Lawn is pleasant and there are cafés and museums, but I might give a lower score to the north area partly because it's hard to get around.

Takahashi: I'd give about 75 points now, but my rating was lower before. That's because, in my first and second years, I didn't know about the facilities at the university and which of them I could use. If someone had given me information on available facilities, my original rating would've been higher.

Some problems might be solved by communicating information properly even without expanding facilities.

Thank you for your useful opinions, everyone.

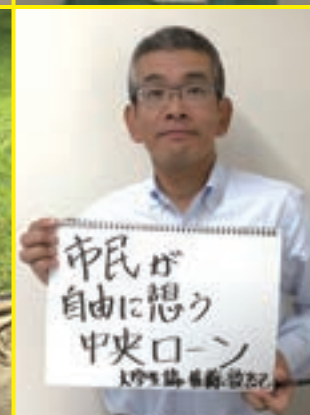
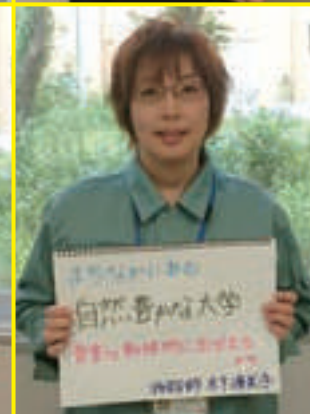
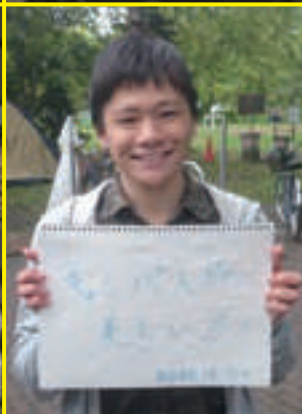
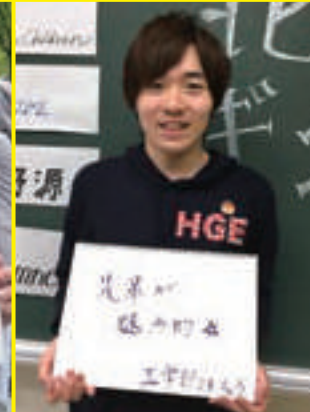
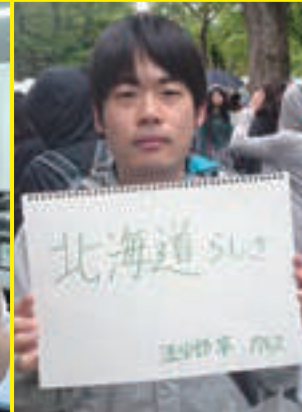
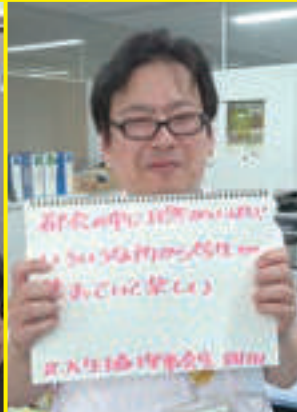
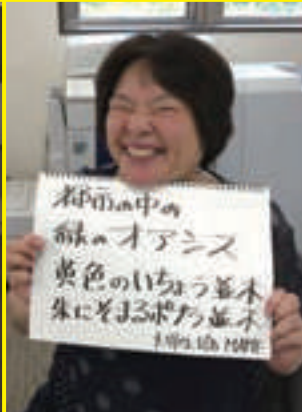
Students' editorial project

What is precious about Hokkaido University

What do you think is precious about Hokkaido University?

Places, moments, atmosphere, events, people, living things...?

This open-ended question was asked to people within and beyond Hokkaido University.



©Message from all students involved: We hope this project serves as an opportunity for everyone to rethink
©We feel that being a place where everyone can be free to speak out and cooperate is another precious



What's precious about Hokkaido University

what's precious about Hokkaido University. ©Thanks to everyone who cooperated, we were able to reconfirm the attractiveness of our campus and find new viewpoints. asset of Hokkaido University... *These photos were taken in June and July, 2017

■ The concept and evaluation of a sustainable campus

The concept of a sustainable campus

The concept of a sustainable campus has recently been broadened beyond the notion of an ecological campus with a low environmental impact. As shown in Fig. 1, the concept includes the formation of a pleasant campus space that is in harmony with the local community, the creation of opportunities for partnership between the university and external organizations, the realization of a lifestyle with low environmental impact in cooperation with the government, and the solution of regional issues through education and research.

*Reference: Maki IKEGAMI and Takao OZASA, Sustainable Campus Assessment System: results and analysis for 2014 – Research on the Sustainable Campus Assessment System Part 4, Summaries of technical papers of the Annual Meeting 2015, Architectural Institute of Japan (selected summaries), pp. 763-766, 2015.

A sustainable campus can be defined as “a platform for the university to become a driving force for the establishment of sustainable society.”



Fig. 1 The Image of Sustainable Campus (M.Ikegami, revised in 2014)

Overview of the Action Plan for Creating a Sustainable Campus

The Action Plan developed by Hokkaido University (official name: Action Plan for Creating a Sustainable Campus) is based on the university’s environmental policy (see p. 04) and presents measures to be taken for creating a sustainable society. Since it is important to assess the progress of implementation of the Action Plan, the university’s Office for a Sustainable Campus has established the Comprehensive Assessment System for Environmental Efficiency based on the PDCA (plan, do, check and act) cycle. The system operates throughout the university, with the Office for a Sustainable Campus playing a central role.

The Action Plan 2012, developed in March 2012, was revised to the Action Plan 2016

(see p. 37), and a new system for implementing the PDCA cycle was established.

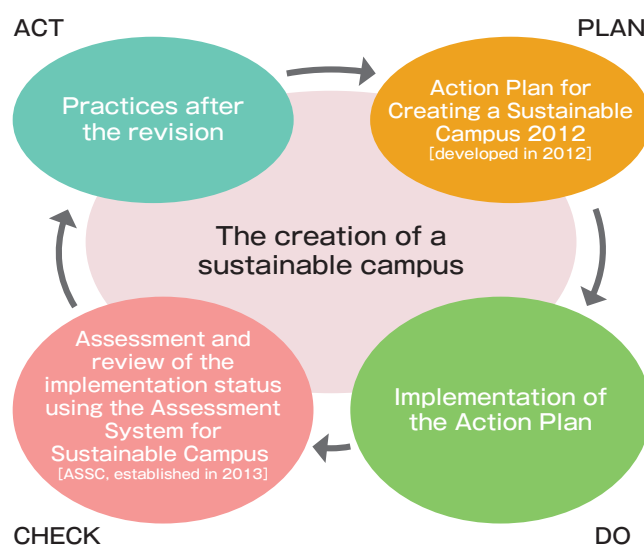


Fig. 2 Concept of the Comprehensive Assessment System for Environmental Efficiency

Assessment System for Sustainable Campus (ASSC)



As a method for assessment (“check”) in the PDCA cycle of the Action Plan, the Assessment System for Sustainable Campus was established in the university. The system covers the four fields of “management,” “education and research,” “environment” and “local community,” under which there are 170 evaluation criteria in total. Annual assessment is conducted for all of these criteria to assess the implementation status of the Action Plan every year.

The university has been assessed using the ASSC since FY 2013, which has enabled the university to effectively develop a detailed annual plan for each successive year. In addition, joint operation of the ASSC by Hokkaido University and the Campus Sustainability Network in Japan (CAS-Net JAPAN) has contributed to the development of strategies by domestic and international universities for the creation of a sustainable society.

ASSC assessment of Hokkaido University in FY 2016

Because the “Creating a Sustainable Campus” contest project was not conducted in FY 2016, the university’s score for “education and research” was slightly lower than in previous years. However, the scores for “management” and “environment” increased, as the faculty of Health Science and the Institute for International Collaboration surveyed users of their

facilities for satisfaction and a design competition for the Kita 13-jo gate was held. Future tasks are the stable promotion of sustainability-related education and research, and the implementation of measures to save energy and reduce non-industrial waste throughout the university.

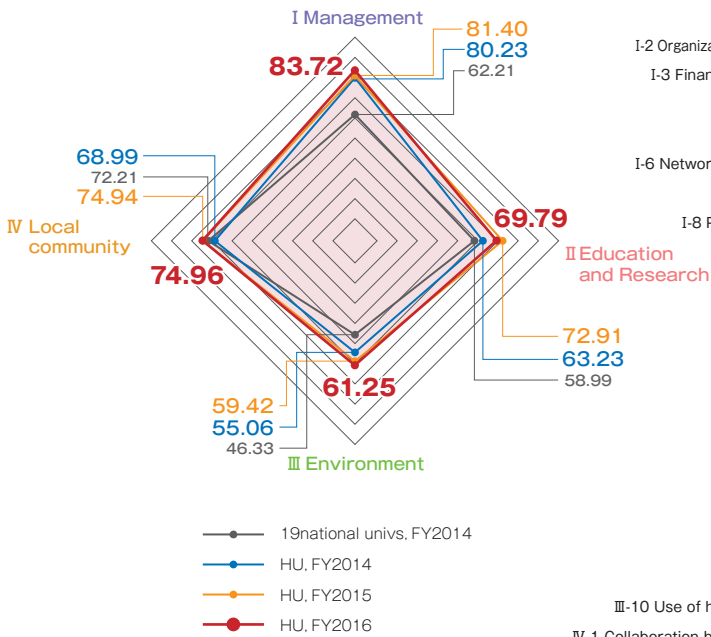


Fig. 1 Score percentages of Hokkaido University in four fields

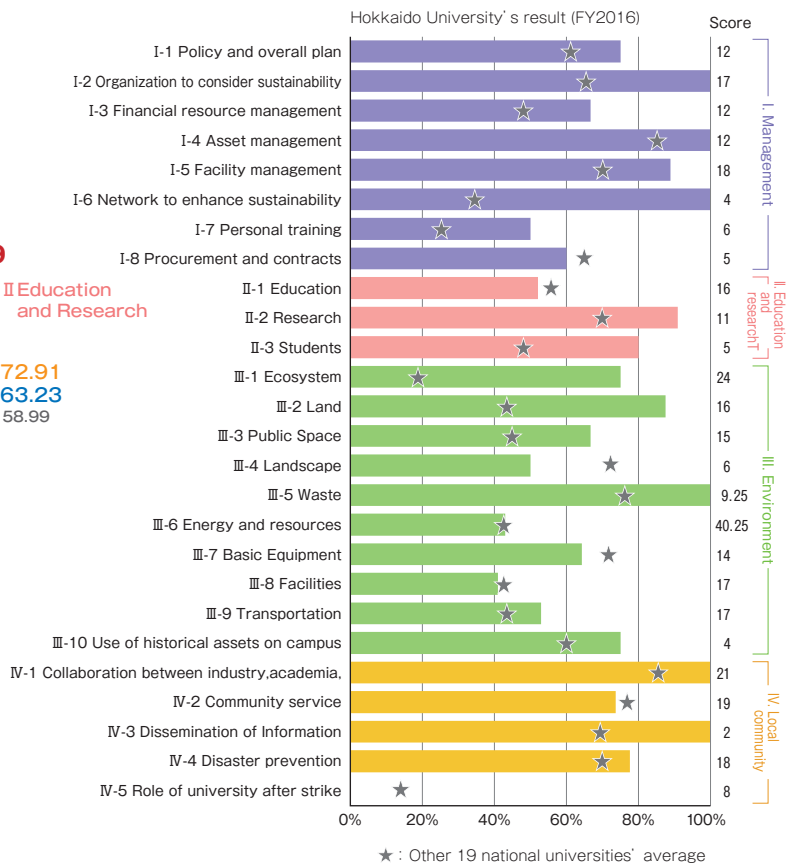


Fig. 2 Score percentages of Hokkaido University by assessment area

■ Achievements and issues of Hokkaido University revealed by ASSC

Assessment using the Assessment System for Sustainable Campus (ASSC) is based on information from different faculties. Interviews were conducted at two faculties that were active in providing information on sustainability-related education and research in FY 2016.

The aim of health sciences : QOL improvements

“Health sciences is an academic field that aims to help people maintain mental and physical health without illness or injury. I think its aim is to



improve quality of life (QOL) through health,” says Professor Harukazu Toyama of the Faculty of Health Sciences. He specializes in rehabilitation science, with particular focus on athletic rehabilitation, which is related to sports medicine, and musculoskeletal medicine for joints, the spine and other body parts. The high risk of QOL reductions from poor knee and lower back conditions is known as “locomotive syndrome.” The Faculty of Health Sciences is studying the causes of increased risk

jointly with the School of Engineering.

Focus is placed not only on the health of individuals, but also on the state of local communities. Professor Toyama says, “Removing labels from plastic drink bottles and separating waste can be a burden for senior citizens and others with physical challenges. It is desirable for local communities to create systems to support them.”

When the social implementation of projects is emphasized, cooperation with other faculties and with those in other fields is important. Therefore, the Faculty of Health Sciences is cooperating actively with the School of Medicine, the School of Engineering, the School of Veterinary Medicine, the School of Agriculture, and with

those in information science. Being in Hokkaido, the university should first focus on the development of rehabilitation and nursing devices suited to snowy regions, and then on transport systems in extensive inhabited areas. “One mission of the university is to hand down the environment and resources to the next generation. I believe that conducting research and education with sustainability in mind and cooperating with those in various fields using available knowledge are sound approaches. Since various studies are being conducted at the Faculty of Health Sciences, please also pay attention to other researchers of the faculty,” says Professor Toyama.

Harukazu TOYAMA

Deputy Dean/Professor in the Faculty of Health Sciences, Hokkaido University

Graduated from the Department of Medicine, School of Medicine, Hokkaido University, Doctor of Medical Science. He has been in his current position since 2013, after holding the posts of assistant professor in the School of Medicine, Hokkaido University, and associate professor in the Rehabilitation Division of Hokkaido University Hospital. He is a sports doctor certified by the Japan Sports Association and the Japanese Orthopedic Association, a medical specialist certified by the Japanese Association of Rehabilitation Medicine and a director of the Japanese Orthopedic Society of Knee, Arthroscopy and Sports Medicine (JOSKAS).



Faculty of Health Sciences

The Faculty of Health Sciences has 7 fields : Fundamental Nursing, Comprehensive Development Nursing, Biomedical Science and Engineering, Medical Laboratory Science, Rehabilitation Science, Functioning and Disability, and Health Sciences and Technology. For the ASSC assessment in the "Education and research" field, the Faculty presented "A survey on the relationship between senior citizens living alone and communities that support them," "A study on carbon management and water pollution in Asia" and other sustainability studies, as well as "A study on the ongoing education of public health nurses who support regional activities" and other studies on regional practices.

The Faculty of Health Sciences : devoted to diverse research projects and human resource development

Professor Kazuko Saeki, who specializes in health sciences, says, "Human resource development is important for the development of sustainable communities. I conduct research on indexes for assessing the human resource development of public health nurses. Since it's difficult to know how to develop the abilities of public health nurses, who deal with a wide range of people, from infants to senior citizens and the physically challenged, and who are involved in community development, I'm making a table of abilities that can be used for assessment by oneself and by others. I'm also a member of the Yu Yu Mashi-no-kai, which is an organization of local residents. I share ideas with other members and summarize the results in research papers.

Associate Professor Michiyo Hirano, who specializes in nursing, says, "I'm developing a way to evaluate the social activities of senior citizens, especially those certified as needing support, since there are currently no ways to measure these. Spending time with one's family, friends and other familiar people and enjoying conversations are important social activities, so I'd like to include these in the evaluation. I hope to present the research results in a year or two for use in future care services."

Professor Saeki and Associate Professor Hirano often conduct joint research. Under the premise that "nursing is part of health sciences," they say, "Nursing is a practical science that directly involves people and organizations, and health

sciences often serves as a basis or foundation for nursing. Through mutual cooperation between the two fields, it will become possible to show what's necessary for current urban development and how effective rehabilitation can be by using available data." Both of them are concerned about the expected increase in marginal communities due to the extreme demographic aging in Hokkaido. They say that they are devoted to research and education because cooperation between local residents and professionals of health, nursing and welfare is essential for community development, which is why it is important to foster professionals.

Michiyo HIRANO (left)

Associate Professor in the Faculty of Health Sciences, Hokkaido University

Graduated from the Graduate School of Human Health Sciences, Tokyo Metropolitan University. Doctoral degree in nursing. She has been working at Hokkaido University since 2007, after working as a public health nurse at a prefectural public health center in Hokkaido. She is currently promoting research on the social activities of senior citizens who are certified as needing support.

Kazuko SAEKI (right)

Professor in the Faculty of Health Sciences, Hokkaido University

Graduated from the Faculty of Social Sciences, Hosei University. Graduated from the Public Health Nurse Division of Hokkaido Prefectural School of Hygiene. Obtained a Doctoral degree in Health Sciences from the University of Tokyo. Engaged in public health nurse education at Sapporo Medical University, Kanazawa University and Hokkaido University. Her research theme is human resource development in regional health services. She became the president of the Japan Academy of Public Health Nursing at the time of its establishment. (She currently serves as an auditor-secretary.)



The Center for Advanced Tourism Studies (CATS)

The Center provides information and conducts university-community relations activities in an integrated manner, in addition to conducting surveys, research and education that are related to tourism development.

For the ASSC assessment in the “Education and Research” field, the Center presented “Tourism Development Studies” and the “World Heritage Management Seminar” in its curriculum and sustainability research projects entitled “A study on architectural heritage management in developing regions with respect to tourism development” and “A study on the individuation process of a historical urban area” as its education and research activities.

Research on tourism and exchanges for local residents

“It’s not just about increasing tourists,” says Associate Professor Hirofumi Ueda of the Center for Advanced Tourism Studies (CATS). According to Associate Professor Ueda, the Center, which specializes in studying “community-based tourism,” focuses its research on urban tourism development for local residents and supports tourism development in municipalities within and beyond Hokkaido. It also uses its expertise to assist in establishing systems to prevent local cultures and living environments from being destroyed by the tourism industries in Jordan, Ethiopia and other countries.

Associate Professor Ueda himself is helping to develop a tourism master plan for Biei Town. Tourists who visit the town to see the agricultural scenery may

interfere with farming, and he sees this as an important problem to be solved. In education, an assignment to create a tourism master plan for the Hokkaido University campus, which is also a tourist spot, is given in the Seminar on Landscape Planning, in order to make students think of solutions that benefit both tourists and the university in terms of spaces and systems. Associate Professor Ueda also teaches the concept of forest aesthetics to students. Under this concept, when the economy circulates smoothly and everything is in harmony and is favorable for humans and the ecosystem, a truly beautiful forest can be created. The concept was introduced from Germany in the Meiji era and spread to the University of Tokyo and Hokkaido University, but it has now been

almost entirely discarded. Therefore, the Center also focuses on the sustainability of learning.

Associate Professor Ueda is currently researching woodland burial. This practice started around 2000 in Germany and Japan. In Germany, it refers to human burial in forests; in Japan, it refers to the planting of trees instead of tombstones. Associate Professor Ueda believes that, if graveyards in Japan can incorporate forests, a new form of visits to graveyards that involves the gathering of descendants in forests will be created. He expressed his hope to revitalize the local community through wide-ranging tourism exchanges and to contribute to the local and global communities.



Hirofumi UEDA

Associate Professor, Hokkaido University
Center for Advanced Tourism Studies

Graduated from the Course of Forest Environment Science, Department of Life and Environmental Sciences, Faculty of Agriculture, the University of Tokyo. Graduated from the Department of Forest Science, Graduate School of Agricultural and Life Sciences, the University of Tokyo. Obtained a Doctoral degree in Political Science (Dr.rer.pol.) from the Department of Urban and Regional Sociology, School of Architecture, Urban Planning and Landscape Architecture, University of Kassel, Germany. He has held his current position since 2016, after working as a lecturer in the School of Design at Sapporo City University. He is also an associate professor in the Graduate School of International Media, Communication and Tourism Studies.



Efforts to reduce environmental burdens

Saving energy in appliances around us

Hokkaido University monitors the effectiveness of energy-saving measures for regularly used appliances through measurements conducted mainly by the Office for a Sustainable Campus, the Facilities Department and promoters to reduce environmental impacts. As shown in Fig. 5, it was confirmed that the power consumption of all electrical appliances was reduced by 50% or more by switching them to energy-saving mode. It is effective to switch copiers to sleep mode as needed, to lower the heat-retention temperature setting of electric kettles to 80° and to switch the temperature setting of heated seats and the water of bidet toilets to low. Since a great many appliances are used every day, it is important to establish the routine of switching appliances to energy-saving mode throughout the university.

In addition, an attempt to quantitatively measure the effect of power-saving efforts was made, with a laboratory of the Faculty of Advanced Life Science as a model case. When all the lights in Open Laboratory Building No. 2 on the North Campus, which houses the Faculty of Advanced Life Science, were switched off for one hour during the lunch break on July 19, 2016, power consumption was reduced by approximately 13%. However, no significant decrease in power consumption was observed when 14 of 17 draft chambers in the same

building were turned off on August 3 and 4. The reduction of the number of fluorescent lights or their replacement with LED lights and the switching off of lights when they are not necessary were found to be effective energy-saving measures.

E.g., annual power charge for heated bidet toilets in the School of Engineering/Graduate School of Engineering

$0.05 \text{ [kW/unit]} \times 24 \text{ [hours/day]} \times 365 \text{ [days/year]} \times 285 \text{ [units]} \times 17.5 \text{ [yen/kWh]} = 2,180,000 \text{ [yen/year]}$

*The number of units (285) is according to a survey conducted by the Office of Technical Support.

*The unit price of electricity (17.5 yen/kWh) was calculated based on the electric charges paid by the university in FY 2015.

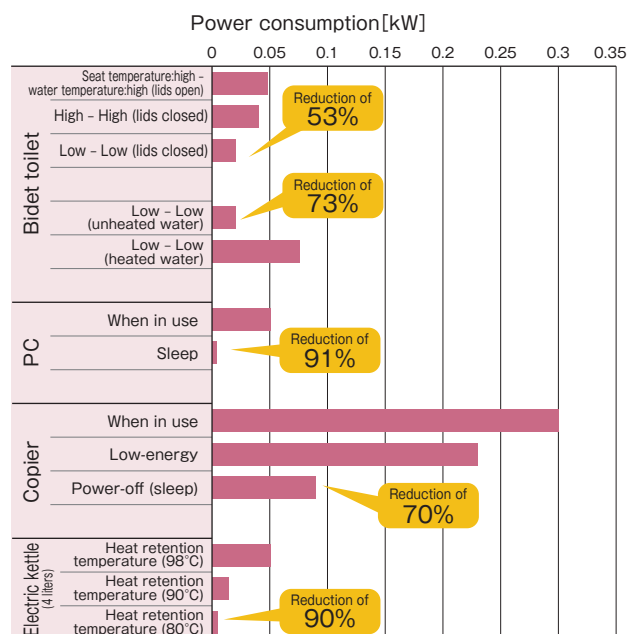


Fig. 5 Actual power consumption of regularly used appliances during their use and when they are in energy-saving mode (Measurement results of FY 2015)

The acquisition of “Gold” certification (FY 2015)

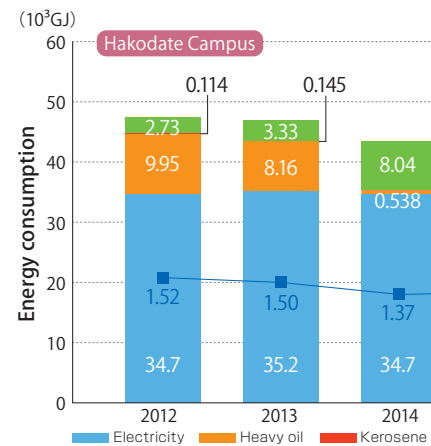
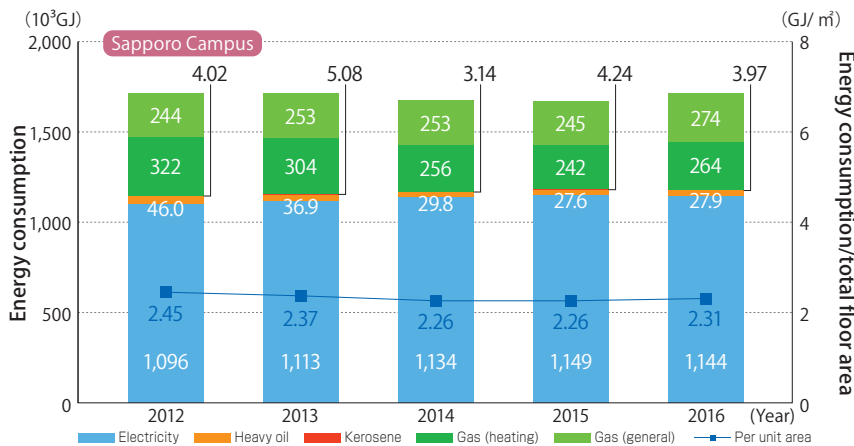
In the ASSC assessment of the Campus Sustainability Network in Japan (CAS-Net JAPAN) for FY2015, Hokkaido University acquired the certification: “Gold.” At the ASSC certification ceremony in February 2017, the Office for a Sustainable Campus gave a presentation entitled “Six years of efforts to create a sustainable campus” and presented the “Creating a Sustainable Campus” contest project, a collection of used books, “the 3 Rs” (reduce, reuse, recycle) for computers, education on a sustain-

able campus and other activities. Considering the assessment for FY 2016, the acquisition of “Gold” certification in two consecutive years is expected.



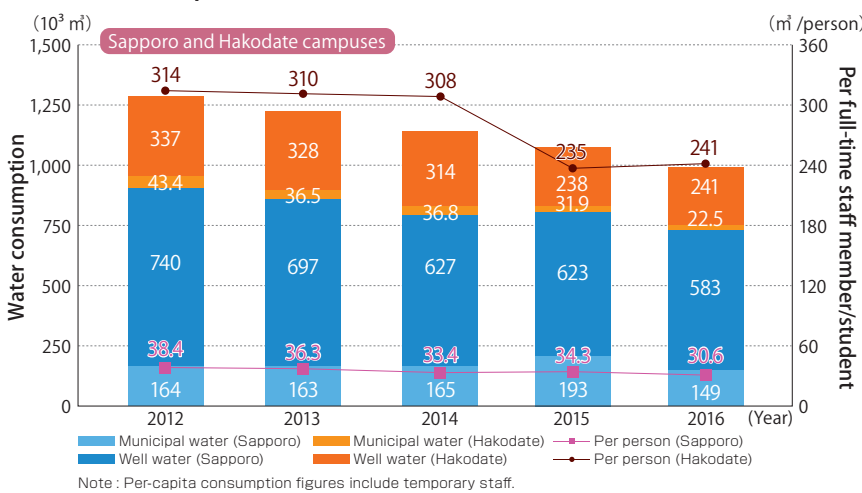
Changes in environmental data

Primary energy consumption



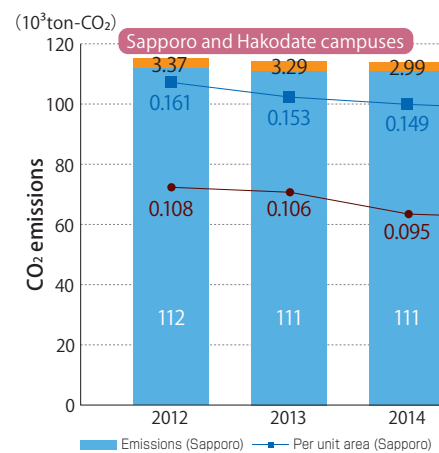
Conversion factor by type of energy Electricity (daytime) 9.97 MJ/kWh Electricity (nighttime) 9.28 MJ/kWh Heavy oil 39.1 MJ/liter Kerosene

Water Consumption



Note: Per-capita consumption figures include temporary staff.

Greenhouse Gas Emissions



Note 1: The adjusted emission factor [kg-CO₂/kWh] FY 2012, 0.678 in FY 2013, 0.683 in FY 2014. Since the value of FY 2016 has not been 2016.

Note 2: For electric power, CO₂ emissions were

Material balance *Sapporo = Sapporo Campus, Hakodate = Hakodate Campus

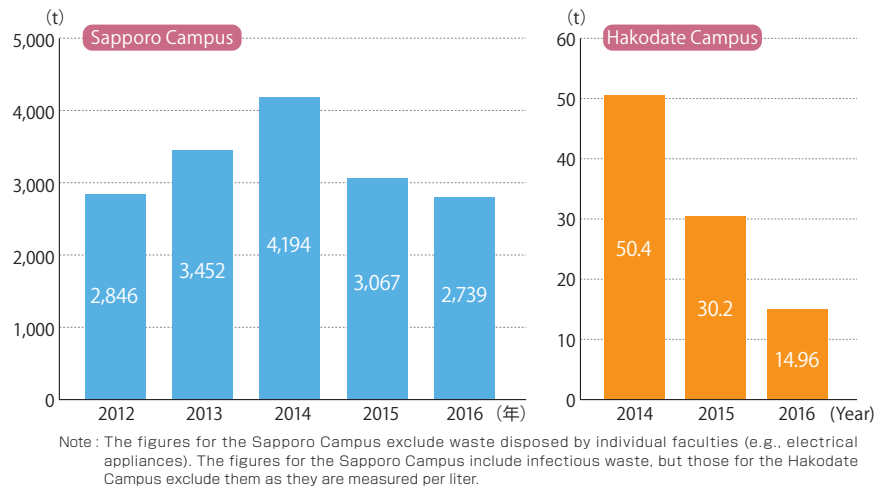
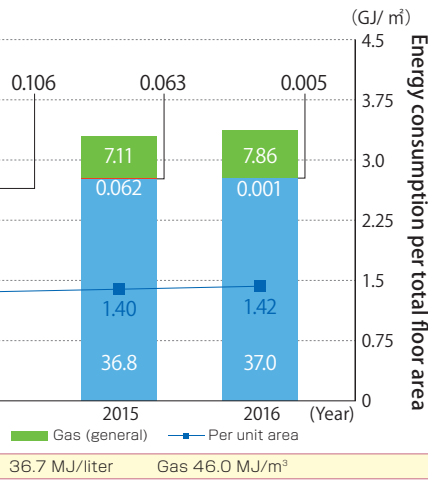
Input

Primary energy	● Electricity	1,181,135GJ ([Sapporo] 1,144,169GJ+[Hakodate] 36,966GJ)
	● Heavy oil	27,866GJ ([Sapporo] 27,865GJ+[Hakodate] 0.8GJ)
	● Kerosene	3,970GJ ([Sapporo] 3,965GJ+[Hakodate] 5.4GJ)
	● Gas	546,821GJ ([Sapporo] 538,964GJ+[Hakodate] 7,857GJ)
Office supplies	● Paper	365tons ([Sapporo]+[Hakodate])
	● "Green purchase" items	270items ([Sapporo]+[Hakodate])
Amounts of chemicals handled	Chemicals	
	● controlled under the PRTR notifications	[Sapporo] 46,698kg *none in Hakodate
Water	● Municipal water	171,671m ³ ([Sapporo] 149,161m ³ + [Hakodate] 22,510m ³)
	● Well water	823,503m ³ ([Sapporo] 582,536m ³ + [Hakodate] 240,967m ³)

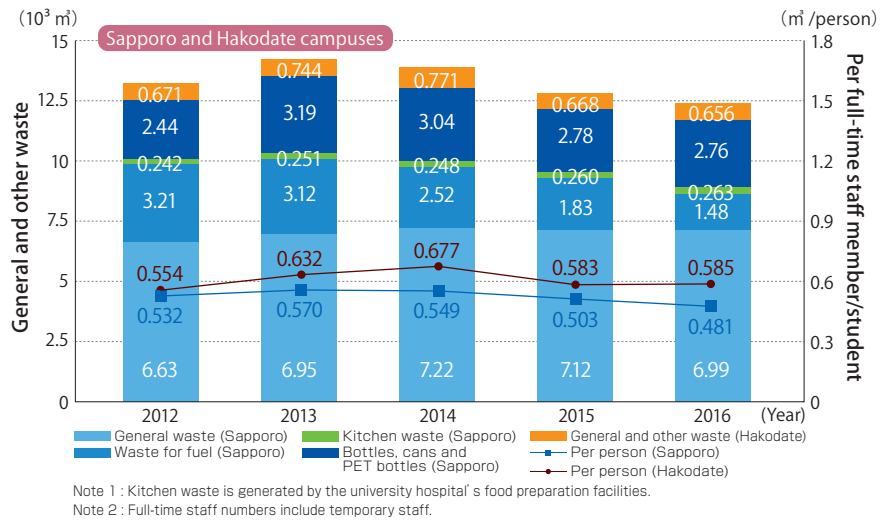
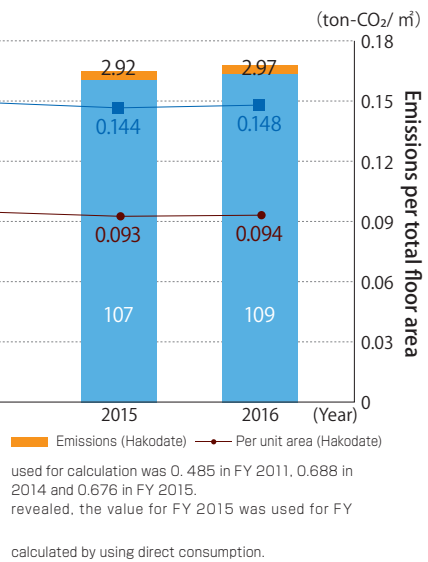
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◆ Industrial Waste Generation



◆ General and Other Waste Generation



Output

- Greenhouse gas**
 - Carbon dioxide **112,286t-CO₂** ([Sapporo] 109,316t-CO₂+ [Hakodate] 2,970t-CO₂)
*Since the carbon dioxide emission factor of electricity in FY 2016 has not been revealed, the value for FY 2015 (0.676 kg-CO₂/kWh) was used.
 - Non-industrial waste **12,151m³** ([Sapporo] 11,495m³+ [Hakodate] 656m³)
[Sapporo] general waste 6,985m³/waste to be converted to fuel 1,484m³ kitchen waste 263m³/bottles, cans and PET bottles 2,763m³
- Waste**
 - Waste paper **640.5tons** ([Sapporo] 627+ [Hakodate] 13.5tons)
 - Industrial waste **2,461tons** ([Sapporo] 2,446+ [Hakodate] 15tons) (other than infectious waste)
 - Infectious waste [Sapporo] **293** + [Hakodate] **160**liters
- Liquid waste from experimental facilities**
 - Inorganic liquid waste **22,956liters** ([Sapporo] 22,258ℓ+ [Hakodate] 698liters)
 - Organic liquid waste **128,031liters** ([Sapporo] 120,800ℓ+ [Hakodate] 7,231liters)



Kita 8, Nishi 5, Kita-ku, Sapporo 060-0808
Tel.: +81-(0)11-716-2111
URL: <http://www.hokudai.ac.jp/>

Sustainability Report Compilation

Editorial Policy

This Sustainability Report was compiled in line with the Law Concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporation, etc., by Facilitating Access to Environmental Information, and Other Measures (also known as the Environmental Consideration Act) with reference to the Japanese Ministry of the Environment's Environmental Report Guidelines 2012.

Organizations Involved

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Sapporo Campus (incl. contracted commercial operators on campus)
Hakodate Campus

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Inquiries

Office for a Sustainable Campus
Tel.: +81-(0)11-706-3660
Fax: +81-(0)11-706-4884
E-mail: osc@osc.hokudai.ac.jp

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<https://www.osc.hokudai.ac.jp/>



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