

Environmental Report 2014

Abridged Edition



KOBE UNIVERSITY

Message from the President

The U.N. report on sustainable development titled Our Common Future: Report of the World Commission on Environment and Development was released in 1987, and pointed out the necessity of solving environmental issues within the 21st century. The Report stated that the 21st century is the century for environmental conservation. Fourteen years have passed since the 21st century began and solving global environmental challenges has become a pressing issue. There exist a variety of challenges, including global warming and frequent abnormal weather, which have resulted in worldwide conflicts over resources, energy, and food.

As a means for handling these issues comprehensively, the U.N. played a key role in developing the Education for Sustainable Development (ESD) program in 2005. The Japanese government has also made efforts to implement the United Nations Decade of Education for Sustainable Development (DESD).

Ahead of ESD activities, Kobe University stated in our Charter on the Environment: We will make the utmost effort to conserve the global environment and create sustainable societies as a world-class research and education institution. Through this statement, Kobe University clearly defined itself as a university that aims to become one of the world's environmentally advanced universities, essentially 'Kobe Smart University'.

Kobe University emphasizes nurturing students as a means to proactively address these global issues and achieve sustainable development. Through the promotion of interdisciplinary research and our ESD class, held jointly by seven different faculties, the University pledges to produce graduates with the ability to find sustainable solutions and put them into practice in a global society.

Enabling World-class Research in Order to Create and Preserve a Future-oriented Global Environment

Of environmental research done at Kobe University, both the biorefinery research project and the membrane and film technology research project have received considerable attention in recent years. The membrane and film technology research project aims to develop separation membranes that have the world's best functions, membranes that can contribute to the treatment of radioactive substances. In support of this research, Kobe University has built facilities to advance membrane and film technology research.

In other fields, the University has begun working on power electronics research that would have a tremendous effect on energy saving efforts, and in marine science, the University has developed the world's most sophisticated aerial wind power generator using wind power simulation technology and precise control machine technology. Further, we are accelerating a variety of other research for preserving the global environment by extensively integrating world-class research including research into organic semiconductor electronics using atoms and molecules, Green Fluorescent Protein (GFP) signal biotech research, research on highly efficient engines and robotics, and research on the origins of the solar system, and the Kuiper Belt.

The Development and Support of Ecologically and Globally Minded People

A wide variety of knowledge and viewpoints are necessary in order to address global environmental issues. We encourage our students to become well informed and to possess a common understanding of rapid changes in the



movement of the European Parliament's Environment committee, which sets environmental restrictions and enacts laws, and the development of Eco Design, which is closely connected to ISO standards. Kobe University offers both numerous programs on campus, including the global education program, through collaboration between multiple graduate schools, as well as programs where students are dispatched to overseas partner universities. Through these programs, as well as environmental classes such as Introduction to Environmental Studies, which is provided as a liberal arts course, ESD, and others, Kobe University is encouraging students to be more globally knowledgeable and to become world leaders in the environmental field. In 2020, the Olympic Year, the University will host an international environmental conference in Kobe, where we will present our cutting-edge environmental research to the world and at the same time demonstrate that our ecologically-minded students have developed the traits necessary to be global citizens.

Encouraging Individual Participation in Environmental Preservation and Conservation Activities That Set an Example for Others to Follow

The Center for Environmental Management has been taking an active role in the University's environmental conservation activities. In April 2014, the Center enhanced its responsibility to better serve the university, and aims for further advancement. This will, I believe, help to accelerate the University's environmental conservation activities, including energy and resource preservation. Two year ago, students who participated in the Third Workshop to Read the Environmental Report, which is one of the activities of the Environmental Report Working Group, formed the Kobe University Students' Environmental Research Team. The team is now an official university-certified organization. With a variety of viewpoints among them, the students have been providing honest proposals about ideal environmental activities. I have high expectations that cooperation between the Center for Environmental Management and the Kobe University Students' Environmental Research Team will generate an eco-wave within the University, and that that wave will spread throughout the community as well.

FUKUDA Hideki
President
Kobe University

Kobe University Charter on the Environment

Environmental Philosophy

As a world-class research and educational institution, Kobe University pledges, through all of the University's activities, to preserve the global environment and to create a sustainable society; the two most important challenges the world faces today.

Sandwiched between the Rokko Mountains to the north and the Seto Inland Sea to the south, Kobe University enjoys a rare natural diversity in its surroundings which it uses to increase the number of ecologically-minded students and to disseminate knowledge gained from academic research from the international city of Kobe to the world. Kobe University pledges to pave a path towards a sustainable global society which must be a common goal of humanity, through these efforts and by setting an example in the preservation and conservation of the environment.

Environmental Principles

1. To educate and support ecologically-minded students.
2. To promote research on sustainability of the global environment.
3. To promote environmental preservation and conservation activities that set an example for others to follow.

Enacted on September 26, 2006

Third-party Review

Reading through the Kobe University Environmental Report 2014, I came to realize that the University has been taking steady steps toward becoming Kobe Smart University and one of the more environmentally-advanced universities in the world. In addition to the accelerated world-class environmental research being done there, my attention was drawn especially to the University's efforts to develop global citizens.

To begin with the development of global citizens, classes offered in related subjects often result in students who have simply gone through the motions, the effect of classes not always immediately visible. However, Kobe University holds meetings to read the Environmental Report, and taking it a step further, the students who attended these meetings got together to form the Kobe University Students' Environmental Research Team, a launching pad for their activities. As learning about environmental issues can be achieved through practical experience, movements such as these are incredibly important. The energy and momentum that pushed them to participate or act voluntarily should be esteemed. The University's ability to create a place where such energy and momentum is generated toward environmental conservation activities is, I believe, its true value.

As mentioned in the Message from the President, the University is aiming to integrate students' voluntary activities with the University's official activities, mainly implemented by the Center for Environmental Management, in hopes that it will lead to an eco-wave inside the University, a movement that could perhaps even spill over into the surrounding community. Though that wave seems to have already done so in, for instance, the handling of waste issues, etc., I have high expectations that

it will further evolve in the form of a relationship between the University and the surrounding community.

One of the methods of measuring concrete achievement in environmental preservation activities is to keep records of changes that have been brought about as a result of those activities. I wanted to know if there has been an increase in participation in environmental conservation activities.

In terms of specific numbers, reports say that carbon dioxide emissions in FY2013 increased by 8.1% over FY2012, and that the amount per total area rose by 10.1% from base year FY2004. The report indicates that the major cause for this rise was elevated electric CO₂ emission due to the rapid increase in the weight of fossil fuels in the composition of electric sources after the 2011 Fukushima Nuclear Accident. I imagine that this value will not be returning to the previous levels any time soon. Nevertheless, they set a goal of reducing CO₂ emissions by 15% in basic units during the second midterm (FY2010-FY2015). I would suggest that additional efforts are necessary in order to attain that goal.

I hope that the process of preparing and utilizing the Environmental Report will help expand environmental preservation activities in a creative manner.



UETA Kazuhiro

Professor, Graduate School of Economics, Kyoto University

Profile

Environmental Economist. Currently researching the prevention of global warming and environmental economic and energy policies toward a sustainable society in Japan. Graduated from Kyoto University Faculty of Engineering and then graduated from the Osaka University Graduate School of Engineering. He holds both a PhD in Economics and a PhD in Engineering.

He has held the positions such as the President of the East Asian Association of Environmental and Resource Economics (2010-2012), and Chairman of the Society for Environmental Economics and Policy Studies (2006-2010). He jointly edited and published books such as Green Energy Principles (Iwanami Shoten, 2013) and Energy Principles for the People (Nikkei Publishing Inc., 2011). Currently, he serves as a Chair on the Procurement Price Calculation Committee and is a member of the Basic Policy Subcommittee of the Comprehensive Resources and Energy Research Committee.

Environmental Education and Research, and Related Topics

Through the Activities of the Kobe University Students' Environmental Research Team

IMAHASHI Ryo
Senior, School of Business Administration

In order to improve the situation facing Kobe University, namely the fact that student involvement in the University's environmental activities is not at sufficient levels, three Kobe University students formed the Kobe University Students' Environmental Research Team in the fall of 2012. The team's intention was to conduct research on the situation at other universities and to make proposals accordingly from the student body's standpoint. In 2013, three new members, including myself, joined the team and together we are working on environmental activities. Although our team is small in number, we have worked on a variety of activities this academic year in cooperation with the Center for Environmental Management, the faculty, and administrative staff members.

Our main activities include hosting a school event called Eco Festa, which was held in June 2013 in association with ECORO, an environmental circle, and NPO Gomi Japan, for the purpose of raising student interest in environmental issues. The students and administrative staff members in attendance had a lively exchange of ideas about environmental issues, most of which we believe would be useful in promoting activities to improve the environment. It was a very fruitful event.

We interviewed President Fukuda in August to ask for his views about the University's environmental preservation activities and to propose student ideas. Such a discussion with a top decision-maker was a valuable experience, allowing us to set our policies for future activities.

In November, we made a research visit to Hokkaido University and had an exchange of opinions with SCSD*. We found the experience very meaningful, especially in that we learned a great deal from their ideas about how to encourage other students to get involved in environmental preservation activities.

*SCSD: The Students Council for Sustainable Development



Interview with the President



With Hokkaido University SCSD members

In December, we held the Eco-idea Presentation Competition based on the proposal we made to the President. Providing an opportunity for students to present their ideas for activities to improve the environment could, we believe, contribute to improved awareness of the University's environment among students. In 2014, we solicited designs for a thermometer-equipped magnet that was to be distributed to the University's freshmen and we also decided on a boar girl named Tamaki-chan as our official mascot.



'TAMAKI-chan', design for a thermometer-equipped magnet

Through a whole year's worth of activities, we have realized just how difficult it can be to provide proper incentives for students to participate in environmental preservation. We, as well as other student environmental teams such as ECOLO and NPO Gomi Japan, are facing common challenges: low levels of recognition and a limited number of participants. Both the University and the student environmental teams recognize these schoolwide challenges, that is, that there are few ecologically-minded students. To address this issue, we started to look into the establishment of the Kobe University Environment Student Committee (provisional name) through the integration of all the environmental teams. Through such a committee, we believe that we could strengthen collaboration across teams, supporting each other's activities and alleviating member shortages.

Looking forward, we are planning to host events like a Talk Cafe where any student, not limited to environmentally-conscious students, may casually drop in. Through the frequent hosting of such events, we would like to examine how we could further raise student awareness and incentivize participation. We will also make efforts to implement the strategies presented at the Eco-idea Presentation Competition.

I must admit that I was not leading an eco-friendly lifestyle before joining this team. However, my consciousness has improved gradually since proactively engaging in environmental activities and I feel that my current lifestyle is based upon the preservation of the environment. Our team will make further efforts toward our goal that students, who account for the majority of University members, be more proactive in participating in environmental preservation activities and leading eco-friendly lives.

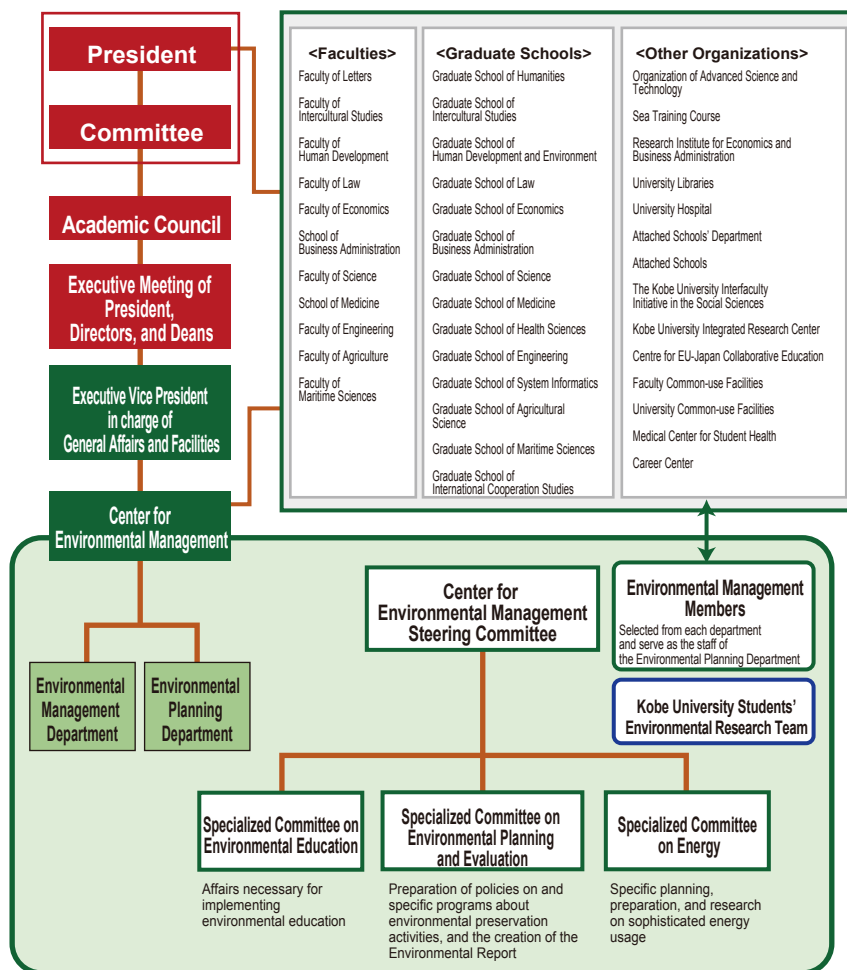
Organization for Environmental Management

Promoting Environmental Preservation and Conservation Activities That Set an Example for Others to Follow

Our Organization

The Kobe University Center for Environmental Management enhanced its responsibility in FY2014 in an effort to promote the University's environmental conservation activities. The Steering Committee for the Center was established to discuss significant items on the Center's administrative agenda, as well as to promote specific efforts in collaboration with undergraduate and graduate schools. The Center has two departments: the Environmental Planning Department and the Environmental Management Department. The former is in charge of preparing basic plans for the promotion of environmental management activities, evaluating said activities, and doing work on the rationalization of energy usage. The latter is in charge of the environmental education of University members. Under the Steering Committee there are three specialized committees in charge of planning and preparing specific programs to achieve their own goals.

Additionally, the Kobe University Students' Environmental Research Team, which was officially approved by the University in AY2013, has been promoting environmental preservation activities.



Educational Research on Environment and Related Topics

Meetings to Read the Environmental Report

In order to raise awareness of the university's Environmental Report within the university and to have the benefit of student opinion for use in future productions of the Environmental Report and environmental preservation activities, meetings to read the Environmental Report have been held annually since AY2011.

First Meeting to Read the Environmental Report

27 students and 18 faculty and administrative staff members had a lively exchange of opinions on Jun. 2, 2011. It was proposed that the Environmental Report should include more student opinions.

Second Meeting to Read the Environmental Report

11 students and 15 faculty and administrative staff members had a lively exchange of opinions on Jun. 6, 2012. It was proposed that the Environmental Report should include an account of how the University is handling the opinions expressed at Meetings to Read the Environmental Report.

Third Meeting to Read the Environmental Report

7 students and 14 faculty and administrative staff members had a lively exchange of opinions on Jun. 26, 2013. It was proposed that the Environmental Report should be prepared with students in mind as the primary reader target group.

Fourth Meeting to Read the Environmental Report

At the Third Meeting to Read the Environmental Report, it was suggested that we devise ways of inviting more participants. Accordingly, the Meeting to Read the Environmental Report will be conducted as part of a liberal arts course called Introduction to Environment from AY2014. This approach will allow more students to read the Environmental Report and allow us to better hear their opinions on the report as well as environmental preservation activities.

Related URL

<http://www.kobe-u.ac.jp/info/public-info/environment/environmental.html>



Environmental Performance at Kobe University

Saving Energy and Preventing Global Warming

1. Environmental Goal

During the current term (fiscal year 2010 to 2015), Kobe University aims to reduce CO₂ emissions by 15%, setting FY2004 as the base for measurement.

2. Energy Flow

Our efforts to save energy have concentrated on educational activities involving faculties, administration and students, as well as on replacement of outdated equipment with more efficient models. In addition in the Kusunoki area, a change was made from heating boilers that use fuel oil to those using city gas, which produce lower CO₂ emissions. This was followed by a change of the cooling and heating boilers in the Fukae area from fuel oil to electricity.

The total amount of CO₂ emitted in FY2013 increased by 8.1% (3,102 CO₂ tons) from FY2012.

The amount of CO₂ emissions by gross floor area increased by 10.1% (8.3 CO₂ tons/1000m²) from the base fiscal year (FY2004). This is mainly due to the restart of nuclear power stations, which led to a sharp increase in the emission coefficient used for calculating the CO₂ in electricity. Kobe University will continue its energy conservation activities and make efforts to achieve its goal, which is, to reduce CO₂ emissions by 15% in basic units during the current term (FY2010 to FY2015).

Note: The increase in the amount of CO₂ emitted reflects the CO₂ conversion coefficient (an officially published figure) of electricity purchased. The coefficient was changed from 0.414 (CO₂ tons/1000 kWh) to 0.475 (CO₂ tons/1000 kWh) for the Tsurukabuto 2 campus, Kusunoki Area, Myodani Area and Fukae Area as they have contracts with Kansai Electric Power Co., Inc. which relies on nuclear power generation for much of its operation.

Table 1 CO₂ emissions (CO₂ tons)

	FY2004	FY2011	FY2012	FY2013
Rokkodai 1 campus	2,029	1,826	1,765	1,763
Rokkodai 2 campus	12,318	10,857	10,743	11,264
Tsurukabuto 1 campus	1,426	1,169	1,143	1,232
Tsurukabuto 2 campus	482	517	775	876
Kusunoki area	18,494	17,518	21,626	23,731
Myodani area	479	472	580	685
Fukae area	1,004	994	1,258	1,441
Total	36,232	33,353	37,890	40,992

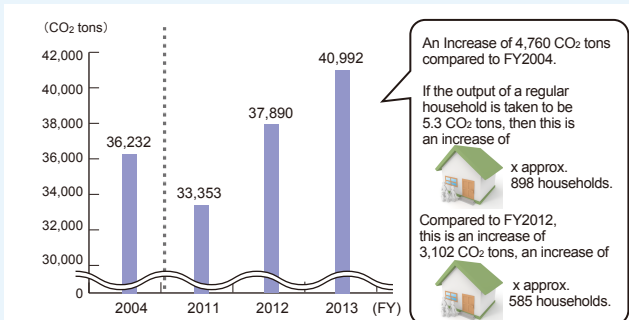


Chart 1 CO₂ Emissions

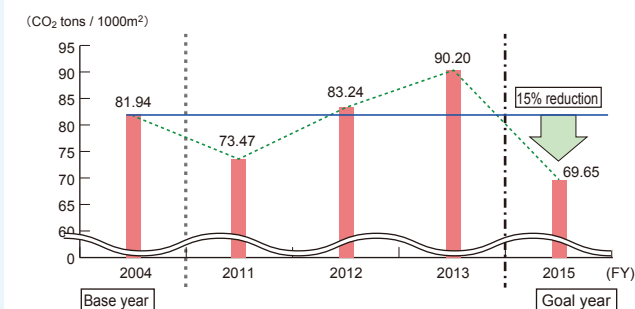


Chart 2 CO₂ Emissions by Total Floor Area

3. Electricity Usage

The total amount of electricity used in FY2013 increased by 263,000 kWh (0.4%) from the previous fiscal year.

This was mainly due to the FY2013 opening of The Life Science Laboratory, a building housing experiments, which uses massive amounts of electricity. The lab is located on the Rokkodai 2 campus. Nevertheless, overall electricity usage on this campus decreased.

All departments will make a concerted effort to save energy and promote conservation activities. Future building renovations will continue to include the introduction of more efficient equipment, with the goal of further reducing energy consumption.

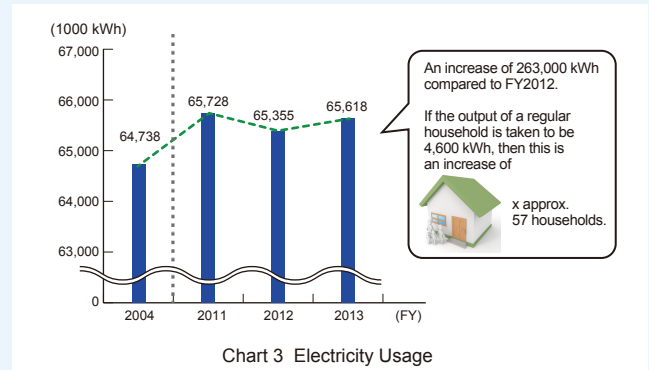


Chart 3 Electricity Usage

4. City Gas Usage

Total gas usage in FY2013 increased by 28,000 m³ (0.6%) from the previous fiscal year.

All departments will make a concerted effort to save energy and promote conservation activities. Future building renovations will continue to include the introduction of more efficient equipment, with the goal of further reducing energy consumption.

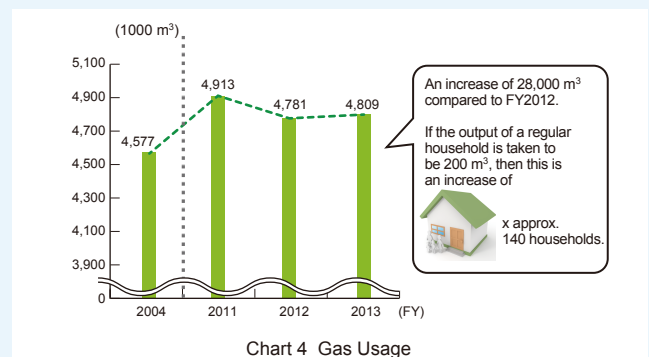


Chart 4 Gas Usage

5. Fuel Oil Usage

Total fuel oil usage in FY2013 increased by 23.2kl (58.3%) from the previous fiscal year.

This was mainly due to a decrease in usage in FY2012 related to building renovation in the Fukae area, returning to normal levels in FY2013.

The Rokkodai 1 and Tsurukabuto 1 campuses, and Kusunoki area stopped using the heating boilers, so the amount used dropped to zero in recent years. The Rokkodai 2 campus uses a negligible amount of fuel oil for emergency generators. Fuel oil is not used on the Tsurukabuto 2 campus.

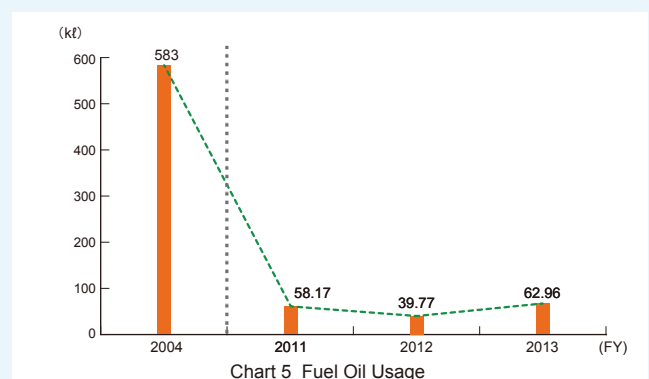


Chart 5 Fuel Oil Usage

Conserving Resources and Recycling

Water (City Water/General Service Water) Usage

Total water usage in FY2013 decreased by 24,000 m³ (5%) from the previous fiscal year.

In the Rokkodai area, water resources have been conserved by using Rokko Mountain river water as reclaimed wastewater for flushing toilets, in laboratories, and elsewhere. In addition, the Kusunoki area started using well water in February 2012.

Efforts toward the efficient use of water resources will continue.

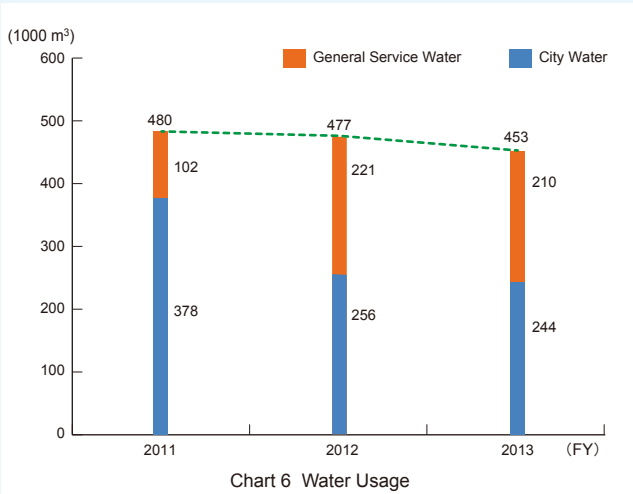


Table 2 Water Usage(m³)

Area	Water Type	FY2011		FY2012		FY2013	
		Volume	Total	Volume	Total	Volume	Total
Rokkodai 1 campus	City water	14,431	29,563	13,429	28,614	10,971	26,621
	General service water	15,132		15,185		15,650	
Rokkodai 2 campus	City water	46,231	93,009	43,458	93,766	45,937	93,595
	General service water	46,778		50,308		47,658	
Trukabuto 1 campus	City water	10,455	22,348	11,651	21,813	10,338	20,194
	General service water	11,893		10,162		9,856	
Tsurukabuto 2 campus	City water	7,168	15,320	6,523	15,333	5,928	14,709
	General service water	8,152		8,810		8,781	
Kusunoki area	City water	270,972	290,753	152,921	289,517	143,131	270,920
	General service water	19,781		136,596		127,789	
Myodani area	City water	6,705	6,705	6,796	6,796	7,112	7,112
	General service water	0		0		0	
Fukae area	City water	22,424	22,424	21,157	21,157	20,093	20,093
	General service water	0		0		0	
Total	City water	378,386	480,122	255,935	476,996	243,510	453,244
	General service water	101,736		221,061		209,734	

Non-Industrial Waste

Chart 7 shows the amount of non-industrial waste produced from FY2010 to FY2013. The volume recycled indicates the volume of waste converted back into resources, and the numbers in the chart itself show exact values for FY2013. Bulk waste and office paper account for a significant proportion of non-industrial waste. Bulk waste had slightly decreased up until FY2011, but increased by roughly 15% in FY2012 due to building renovations and the relocation of laboratories within the University. In FY2013 it decreased again as the renovations and the relocation were nearly completed. The amount of office paper waste, which makes up the largest portion of paper waste, was increasing until FY2012 but was successfully reduced in FY2013. Office paper is used for various purposes, not just for education and research. Efforts toward the efficient use of paper seem to be gradually taking hold at the University. Other paper waste, including wrappings and advertisements, decreased slightly from FY2012, but for the most part was still being discarded. Emphasizing that such paper products should be recycled will bring more success.

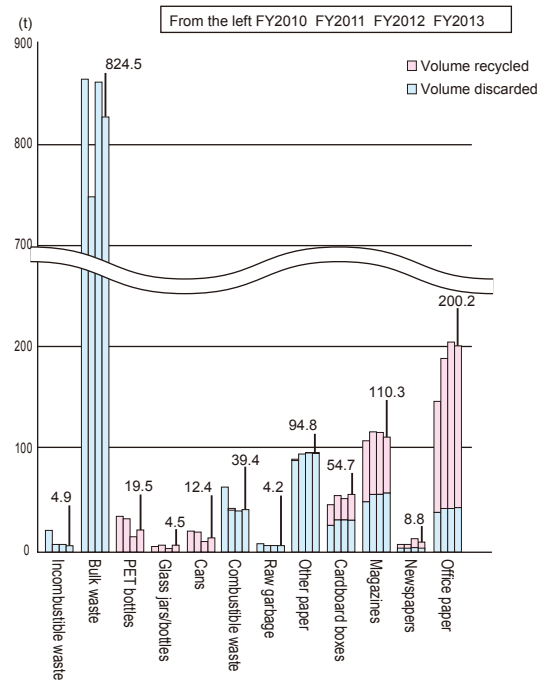


Chart 7 Non-industrial Waste Production by Waste - FY2010 - FY2013

The total amount of non-industrial waste produced in FY2013 decreased by about 2% from FY2012. This can be attributed mainly to the decrease in the amount of bulk waste produced. The recycling rate saw an increase of 0.8% to 20.3% over the previous fiscal year (Chart 8).

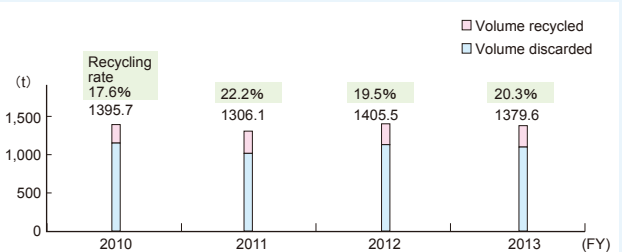


Chart 8 Changes in the Total Non-industrial Waste Produced from FY2010 Through FY2013

Trends of Paper Usage Across the University

Chart 9 shows trends in the amount of office paper used from FY2011 to FY2013. The volume of office paper used decreased by 11.9% (approx. 27 tons) from the volume of FY2013.

We need to continue our efforts to reduce office paper usage by making it common practice to have paperless meetings and lectures, to make copies using both sides of the paper, to make consolidated printings, and to use the blank side of paper that has been used on only one side.

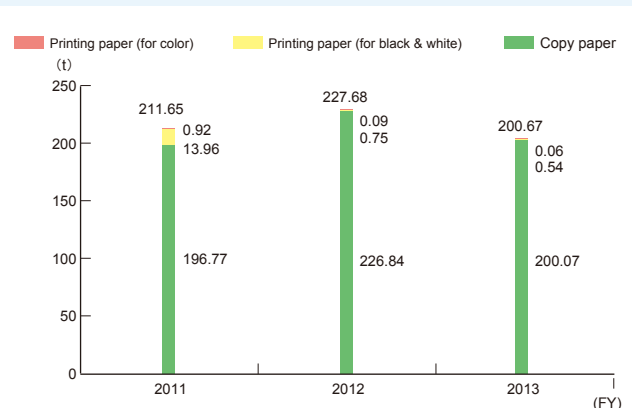


Chart 9 Volume of Office Paper Used

How this Environmental Report was compiled

This environmental report summarizes the work accomplished by our environmental activities over the past year (April, 2013 to March, 2014) on the main campuses of our university. It is published under the title Kobe University Environmental Report 2014. While the intended readers of this report are the members of our university, including students, faculty and administrative staff members, the report also serves as a tool for stimulating discussion regarding the environment both on and off campus. In addition to introducing readers to the related environmental topics, education and research conducted throughout the university, the report also features our efforts in promoting an environmental management system to further enhance environmental performance. In order to create interest in environmental issues among students, who make up the majority of the university's population, the cover page of this report, as well as articles related to student groups, were prepared in cooperation with the Kobe University Students' Environmental Research Team*.

*See inside for details on the Kobe University Students' Environmental Research Team.

Reference guidelines	<ul style="list-style-type: none"> ● Environmental Reporting Guidelines, Fiscal Year 2012 Version (Ministry of the Environment, April 2012) ● Guidelines for Items to be Mentioned in Environmental Reports, Second Edition (Ministry of the Environment, November 2007)
Survey locations	<ul style="list-style-type: none"> ● Rokkodai area: <ul style="list-style-type: none"> Rokkodai 1 campus main departments: Faculty of Law, Faculty of Economics, School of Business Administration, Graduate School of Law, Graduate School of Economics, Graduate School of Business Administration, Graduate School of International Cooperation Studies, Research Institute for Economics and Business Administration Rokkodai 2 campus main departments : Administrative offices, Faculty of Letters, Faculty of Science, Faculty of Engineering, Faculty of Agriculture, Graduate School of Humanities, Graduate School of Science, Graduate School of Engineering, Graduate School of System Informatics, Graduate School of Agricultural Science, Organization of Advanced Science and Technology Tsurukabuto 1 campus main departments: Faculty of Intercultural Studies, Graduate School of Intercultural Studies, and Institute for Promotion of Higher Education Tsurukabuto 2 campus main departments: Faculty of Human Development, Graduate School of Human Development and Environment Kusunoki area main departments: School of Medicine, Graduate School of Medicine, and University Hospital Myodani area main departments: Faculty of Health Sciences, and Graduate School of Health Sciences Fukae area main departments: Faculty of Maritime Sciences, and Graduate School of Maritime Sciences
Fiscal year of operation	● Fiscal 2013 (April, 2013 to March, 2014)
Date of issue	● September 30, 2014
Planned date of next issue	● September 30, 2015
Department in charge of publication	● Center for Environmental Management
Contact	● Environmental Management Group, Safety and Health/Environmental Management Division, Facilities Department, Kobe University 1-1 Rokkodai-cho, Nada-ku, Kobe, Hyogo 657-8501 TEL: 078-803-6654 E-mail : shis-kankyo@office.kobe-u.ac.jp
URL	● http://www.kobe-u.ac.jp/report/environmental/2014/

Cover

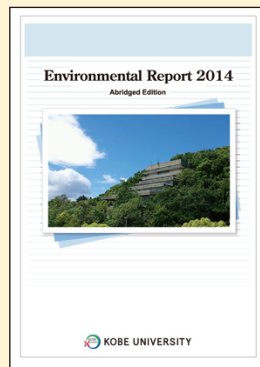
The Kobe University Students' Environmental Research Team has been contributing to the preparation of the 2014 Environmental Report since last year. They requested that students at Kobe University and its attached schools submit cover images in an effort to spread awareness of the report; 9 images were collected during the one-month application period.

The Kobe University Students' Environmental Research Team reviewed the entries and selected the best one, which was then used for the report's cover page.

During deliberation, the best image received comments such as, "The contrast between the sky and the abundant green is brilliant" or "The subject, the student hall, seems to imply that students will take more initiative in carrying out future environmental activities at the University."

Thank you to all who made submissions.

Best Photo Award

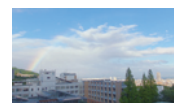


KUBOTA Ryo
Freshman, Faculty of Law,
Kobe University
Location: Student Hall

Other Distinctive Photos



KOBAYASHI Fumiaki
Sophomore, Department of Physics,
Faculty of Science
Location: Tsurukabuto 1 campus



YAMANE Tomomi
Senior, Department of Earth and
Planetary Sciences, Faculty of Science
Location: Faculty of Engineering campus

*The Student Hall houses the Kobe University co-op store on the 1st floor, meeting rooms, community rooms, halls, club activity rooms, etc. on the 2nd-6th floors, and is utilized for various purposes by students, faculty and administration.