

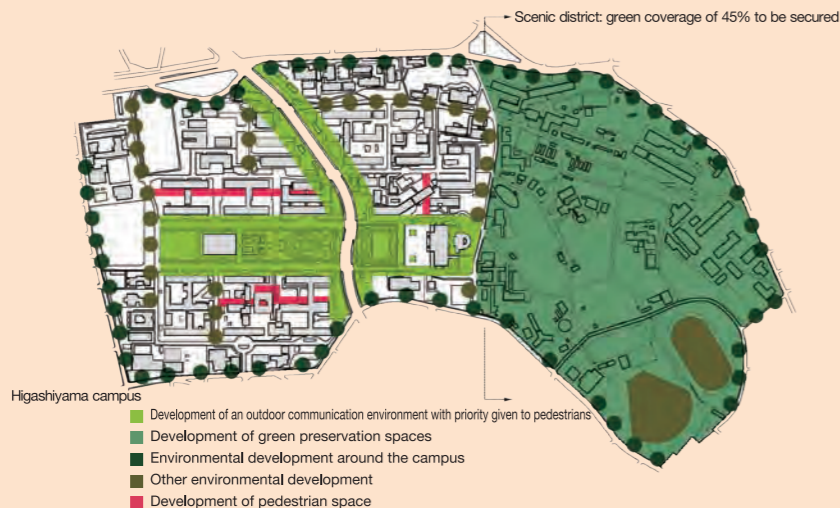
◆ Ongoing Efforts for Environment

— Green Environment Conservation and Planning —

“Nagoya University Campus Master Plan 2001 (March 2002)” presents a future image of a green and outdoor environment as its mid-term plan for its 3 major campuses in order to fulfill “The Outline of Nagoya University Campus Master Plan” which states our facility development principles.

Specifically, there are three basic goals for conservation and development of an outdoor environment focused on green areas: 1) To take an approach from the two aspects of conserving/maintaining the natural environment and improving the quality of the man-made environment; 2) To create a campus environment in which its members and citizens can be connected with nature; and 3) To contribute to the assurance of safety for the university members and citizens, and to the creation of an attractive community environment with a harmonious and beautiful landscape. Each campus area has its own plans for environmental conservation under these goals.

Higashiyama campus has a plan to prepare community and on-campus green areas for pedestrians, including the areas adjacent to the green belt designated as the Yotusya/Yamanote Avenue urbanscape conservation area. In this plan, Japanese zelcova trees and camphor trees will be conserved and maintained, and the shrubs on the west side of the green belt will be trimmed for safety and landscape conservation. For the Eastern Green Area, designated as a city’s scenic district, while maintaining the minimum green coverage of 45% as stated in the city ordinance, we aim to conserve the natural environment of the area by removing dead trees and preventing trespassing to improve the safety of the university members and community people, by removing illegally dumped wastes, and by taking preventative measures against illegal dumping.



Development Plan for a Green Outdoor Environment
(From Nagoya University Campus Master Plan 2001)

— Recycling of used paper and paper waste —

The amount of annual paper waste from the university exceeds 300 tons. About 70% of this is recycled and used to produce 173 thousand rolls of toilet paper and used paper collection bags. This amount is equal to the annual consumption at the university (including the Graduate School of Medicine and the University Hospital).

We started recycling various types of paper waste at the intermediate used paper processing plant. This included “confidential documents” which had been difficult to dispose, “shredded paper” whose recycling route had not been established, and “scrap paper” and “paper containers for sweets and cigarettes” which had been discarded into garbage cans.

All-campus recycling route	Newspaper, advertisement (flyer), computer paper, cardboard, file, magazine, book
● Recycling is promoted, taking advantage of all-campus recycling route. Collected paper waste is recycled as materials for “cardboard”, “newspaper”, and “magazine.”	
Circulating route (intermediate used paper processing plant)	Photocopy paper, confidential documents (exam paper, account paper, payment slip, name lists), paper waste, shredded paper
The intermediate used paper processing plant collects, separates, and shreds paper waste before transporting it to paper milling plants. The plant will	
<ul style="list-style-type: none"> ● Deliver “used paper collection bags” (recycle products) ● Regularly collect paper waste at the designated collection sites ● Separate the collected paper waste ● Shred paper waste including confidential documents ● Deliver recycled “toilet paper rolls with the university emblem” 	
Recycled “toilet paper rolls” and “used paper collection bags” are used in the university.	

◆ Efforts by the Students and the University Organizations

— Recycling Station at Nagoya University Festival —

Nagoya University Festival put an emphasis on environmental countermeasures. The 47th Nagoya University Festival (1-4 June, 2006) implemented the following (mainly separate waste collection, waste reduction, and recycling).

During the festival, the regular garbage boxes used daily on campus were closed and special garbage collection sites (garbage stations) were established on campus. In addition to 8 stations on campus, one station was set up at the Nagoya University subway station. We classified garbage into 7 groups; trays with detachable film, combustible, non-combustible, plastic, PET bottle, can, and food waste. All types of garbage other than combustible and non-combustible are recycled. Separate collection is very important for garbage recycling. The Executive Committee members of the festival stayed at garbage stations to help visitors with garbage separation.



At a garbage station

Environmental Policy

1. Basic Philosophy

- Recognizing the impact that our modern lives and activities have on the environment and future generations to come, Nagoya University intends to actively work towards and to protect a sustainable environment.
- As the university continues to acknowledge the intellectual accomplishments of humankind, it also intends to reconsider priorities in academics as it broadens its perspective on the relationship between humans and earth to adequately consider our long future together.
- Each member of the Nagoya University community, in their respective positions and through all the areas of their activities, including education, research, university management, and social contribution, strives to realize a better earth environment.

2. Basic Policy

- (1) In order to respond to environmental problems in the most appropriate manner, Nagoya University dedicates itself to the consideration of environmental problems from a comprehensive, systematic perspective, including that of humanities, society, natural sciences, and all other relevant fields.
- (2) Students will be encouraged to develop the ability to understand and to analyze environmental problems as Nagoya University nurtures future pioneers in the field.
- (3) Through the cooperation of both students and staff, Nagoya University will continue to create university policy best suited to address environmental issues.
- (4) Nagoya University will pursue a comprehensive and systematic policy set in order to reduce the university’s negative impact on the environment and to objectively realize its proper role and influence regarding the environment.
- (5) Nagoya University is dedicated to addressing both regional and worldwide environmental issues in an assertive manner. As these policies take root from a local level, it is intended that they will also connect to larger international level responses to environmental problems.

Conclusion

Nagoya University Environmental Report 2007 is the summary of efforts to achieve a better environment at Nagoya University during the fiscal year of 2006. Looking back at past activities, the outcome may still be insufficient even after many diligent attempts and much effort. In particular, visible reductions in energy consumption and in other environmental burdens are extremely difficult, and the outcome tells us that there is a long, hard way ahead.

Fortunately, compared to the previous year, the total energy consumption rate and the greenhouse gas intensity in the three campus areas of the university were reduced. However, we still need to introduce new countermeasures to continue further reductions, and I feel that depending upon any single measure would not be sufficient to have direct effects.

Three years have passed since the incorporation of the national universities. We should be proud of this Environmental Report of Nagoya University that contains its unique research and development for environment, educational efforts, and by the efforts undertaken by students and university organizations along with the self-evaluations that have been done. As the responsible trustee, I am very grateful to the working group members who contributed to the publication of the Environmental Report.

However, as we improve educational and research programs, energy consumption increases. Additionally, total energy consumption rate per floor unit continues to increase as we more fully utilize our facilities. These are the conflicting situations continuing from the last year yet to be solved. It is clear that reducing energy consumption and environmental burdens while facilitating educational and research activities cannot be achieved without cooperative efforts among all university staff and students.

As the responsible trustee, I will encourage the university members to implement the basic policy under the basic philosophy of the Environmental Policy. I expect further efforts by the staff and the students in many of the university divisions.

Trustee/Vice-President for Hospital, Facilities Management and Environmental Safety
Yasuo Sugiura

The main volume of the Environmental Report is on the Nagoya University website.
URL <http://web-honbu.jimu.nagoya-u.ac.jp/fmd/rpt.html>

Period of Report: the fiscal year of 2006 (1 April, 2006-31 March, 2007)
Areas of Report: Nagoya University Higashiyama, Tsurumai, and Daiko Campus

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Nagoya University participates in the national campaign of Team Minus 6%.

Stop Global Warming
Team Minus 6%

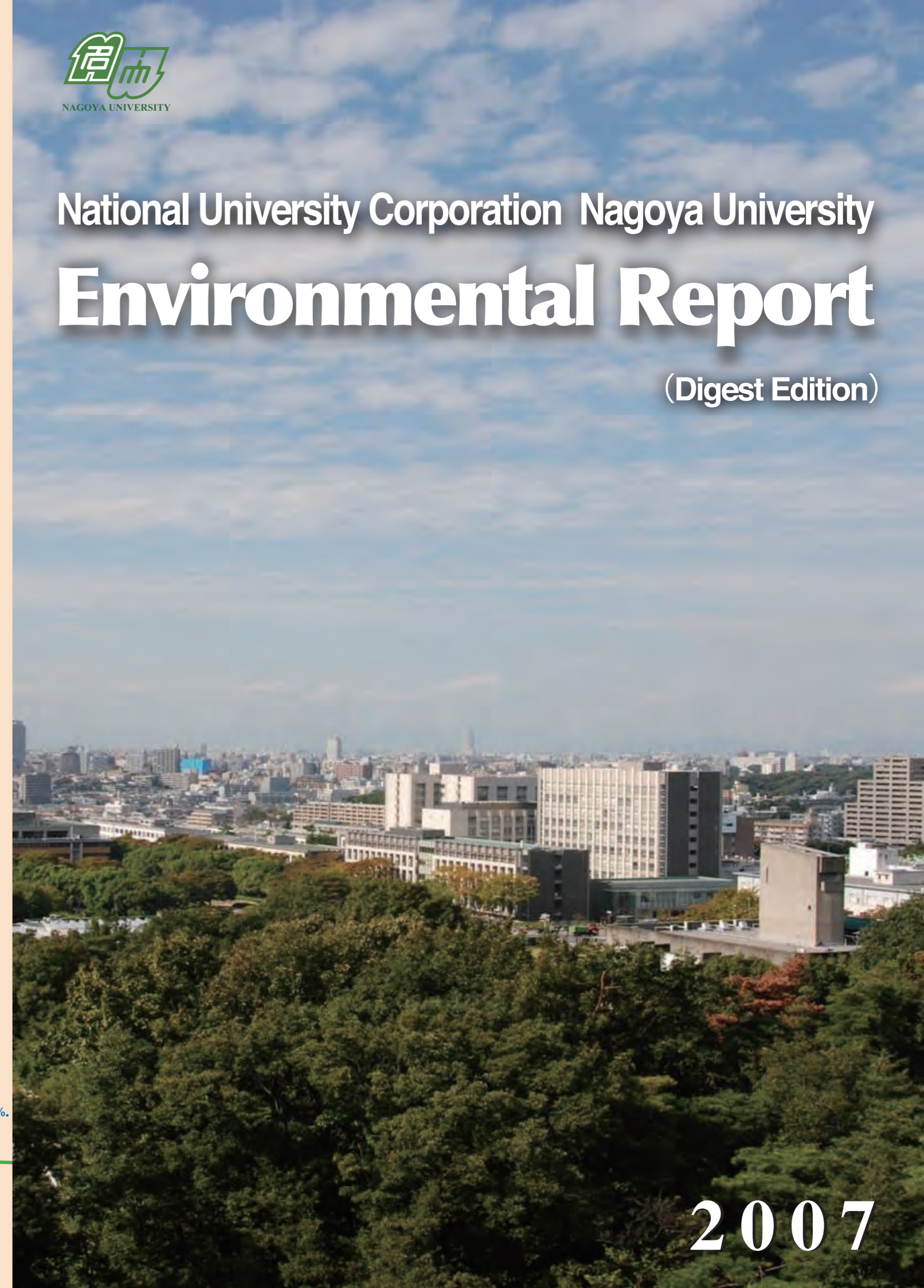
Eco-business establishment authorized by Nagoya City



National University Corporation Nagoya University

Environmental Report

(Digest Edition)



2007

From the President — On Publication of the Environmental Report —



The President, Nagoya University
Shinichi Hirano

Nagoya University Academic Charter states “its mission as the contribution to the happiness of the people through research and education on humanity, society and nature.” And the basic philosophy of the Environmental Policy says, “Each member of the Nagoya University community, in their respective position and through all the areas of their activities, including education, research, university management, and social contribution, strives to realize a better earth environment.” These statements indicate the university’s attitude that its true mission is to make further progress in academic activities maintaining a harmony between science and the environment beyond merely providing educational services and conducting research.

In the educational field, we aim at cultivating courageous intellectuals who tackle environmental issues through education and research under the leadership of the Graduate School of Environmental Studies for environmental research in a humanities-science combined fashion and the Ecotopia Science Institute for the realization of an environmentally harmonized sustainable society.

As a member of society, we also have made various efforts to reduce environmental burdens through reducing energy, electricity, gas, and water consumption as well as efforts at sustaining and increasing greenery. This report includes a representative sampling of the efforts made during fiscal year of 2006. I hope the direction of Nagoya University’s activities for better environment will be presented further through publications of our Environmental Reports.

◆ Plans for Better Environment

Category	Activities	Target	Achievement in fiscal 2006	Self-evaluation
Reduction of energy consumption	<ul style="list-style-type: none"> Temperature setting for air conditioner: 28 °C, heater: 19 °C Lights turned off during lunch time Installation of energy-saving equipment 	1 % year-to-year reduction of annual energy consumption rate (per 1 m2 floor area)	Higashiyama Area: 4.3 % reduction Tsurumai Area: 4.7 % reduction Daiko Area: 10.0 % reduction	○
Global warming mitigation	<ul style="list-style-type: none"> In addition to the above; Introduction of low emission vehicle Use of public transport instead of automobiles 	Target in fiscal 2006 3 % reduction of greenhouse gas intensity (CO2 equivalent, per 1 m2 floor area) compared to fiscal 2003	Higashiyama Area: 7.4 % reduction compared to fiscal 2003 Tsurumai Area: 6.0 % reduction compared to fiscal 2003 Daiko Area: 21.8 % reduction compared to fiscal 2003	○
Reduction of wastes	<ul style="list-style-type: none"> Improvement of recycling rate Reduction of paper consumption by double-sided copying or using intact side of used paper Separation of used paper from offices for recycling 	Thorough waste separation and collection for recycling	Higashiyama Area: 12.2 % increase of combustibles /non-combustibles compared to the previous fiscal year Tsurumai Area: 0.4 % decrease of combustibles /non-combustibles compared to the previous fiscal year Daiko Area: 7.1 % increase of combustibles/non-combustibles compared to the previous fiscal year	△
Management of chemical substances	<ul style="list-style-type: none"> Centralized all-campus control by chemical substance management system 	Establishment of chemical substance management information system	System registration rate: about 88 %	○
Promotion of green purchase	<ul style="list-style-type: none"> Environmental consideration on all procurement 	Green purchase rate of 100 %	Green purchase rate of major items: 100 %	○
Environmental education	<ul style="list-style-type: none"> Implementation of environmental education for students and staff 	Various types of guidance, implementation of awareness-raising activities	Orientation for freshmen, environmental education programs at attached schools	○

[Self-evaluation] ○ : Target achieved, △ : Target not achieved

◆ Social Contribution to Environment

— “Nagoya Eco Campus” and Nagoya University —

“Nagoya Eco Campus” (President: Minoru Matsuo, the former president of Nagoya University) is an environmental education program which offers various lectures and symposiums for the public through cooperation among the public, companies, universities, and administrative bodies to share knowledge, experience, and awareness of environmental issues. It started in March 2005 with the aim of “developing human resources and a network of people” in order to support “Environmental City of Nagoya” and “Sustainable Global Society” and letting everyone “grow together (reciprocal learning)” as cooperating citizens in action. “Nagoya Eco Campus” is not a newly established university. It is a concept through which environmental learning is offered in a wide range of places in the city such as classrooms of universities/schools, company facilities/factories, unoccupied shop spaces, and familiar natural locations from forests to rivers. The courses are planned and implemented by citizens’ groups, companies, universities, and administrative bodies.

Teaching members and students of Nagoya University have been actively involved in “Nagoya Eco Campus” since its planning phase, and attended the symposiums and the workshops. We continue to contribute to “Nagoya Eco Campus” in many ways. For example, the Executive Committee of “Nagoya Eco Campus” currently includes teaching staff members from our Graduate School of Environmental Studies. We also send our teaching staff and graduate students as lecturers for many courses for reciprocal learning. In 2007, “Eco Nex Nagoya” was established for students to get together and support “Nagoya Eco Campus.” The students of Nagoya University are involved and actively promote various activities from their unique point of view as students. Further contribution by Nagoya University is greatly expected.



◆ Environmentally Conscious Research and Development and Efforts for Environmental Education

— Seminar on Greenhouse Gas Emission Trading —

One of the missions of the School of Informatics and Sciences is to develop human resources that can handle and solve problems from a broad point of view in the new integrated humanities-science field. Therefore, we established a collaboration agreement with Nagoya Carbon and Technology Exchange (NCTX), a limited liability intermediate company (Chief Director: Kiyooki Fujii) on 11 October, 2005. The objective of the agreement is to contribute to education, research, and local community development and apply the outcomes of university education and research to corporate activities through this collaboration. The collaboration agreement includes (1) provision of lecturers to the School of Informatics and Science, and public participation in relevant courses; (2) collaborative research; and (3) collaborative contribution to the local community as well as to various research activities including (a) conducting an awareness survey for large emitters on climate changes and its analysis, (b) planning a technology transfer mechanism for energy conservation and its information system, (c) developing information search engines for energy conservation technology, and (d) developing simulations for greenhouse gas emission trading and its economic effects.

Based on this agreement, we held two seminars in fiscal year 2006 (8 September, 2006 and 22 February, 2007), in which Informatics and Science students teamed with business people to practice inter-corporate energy conservation technology trading and emission trading in our on-campus computer facility.



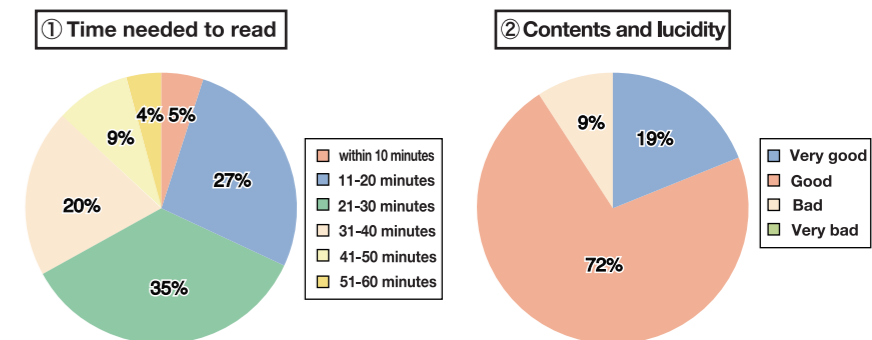
Teaming up with business people in the emission trading seminar

◆ A Questionnaire to the Students on the Environmental Report 2006

We conducted a questionnaire survey on the Environmental Report 2006 (last year’s version) with our students (responders: 133 students in Chemical and Biological Engineering, School of Engineering) after explaining the outline of the Environmental Report. The questions were regarding (1) Time needed to read, (2) Contents and lucidity, (3) Information further desired, (4) Items of interest, and (5) Other comments.

In question (1) Time needed to read, 67% answered 30 minutes or less as indicated in the pie chart, which shows the amount of information is adequate. In question (2) Contents and lucidity, 91% answered either “Very good” or “Good”, but some students asked for explanations on technical terms (Notes are added to the 2007 version). For question (3) Information further desired, the answers included “Description of environmental research”, “Natural environment within Nagoya University”, and “Treatment methods of wastes and chemical substances.” For question (4) Interested items, the answers included countermeasures for energy consumption and wastes because the issue is familiar for the students’ campus life. Safe management of chemical substances also generated high interest as the respondents were students in the chemical field. In addition, efforts by students and various organizations are of interest.

Based on these questionnaire results, the 2007 version includes more articles on “Environmentally conscious research and development”, “Efforts for environmental education”, and “Current efforts for environment.” We are also planning to use the report as a material for environmental education and public relations.



— Environmental Purification by Plants —

Heavy metal contamination of the soil is an important environmental issue to be solved as it causes ground water pollution as well as other human health concerns through its direct and indirect intake through plants. While the major conventional purification methods of treating contaminated soil, such as the removal or the addition of soil, are energy and cost consumptive, phytoremediation (phyto = plant, remediation = purification) using plants has recently garnered attention as an environmentally friendly method. In this method, “hyperaccumulator” plants which specifically absorb and accumulate certain heavy metals are grown on contaminated soil, and then harvested for collection after absorbing heavy metals.

The Laboratory of Forest Environment and Resources, Graduate School of Bioagricultural Sciences searches for plants applicable to phytoremediation and conducts research on their heavy metal accumulation abilities and mechanisms. To date, we have found a wild crucifer *Arabis gemmifera* (the plant with small white flowers in the photo) and a woody plant *Evodiopanax innovans* that act as hyperaccumulators of cadmium and zinc. As *Arabis gemmifera* can accumulate over 1000mg/kg of cadmium, our joint research partner, Fujita Corporation is now working on its practical application to the purification of cadmium contaminated soil. Although the concentration ability of *Evodiopanax innovans* is less than that of *Arabis gemmifera*, it also has a potential for eliminating heavy metals efficiently because of its large size. Further research for its field application is ongoing.



A colony of *Arabis gemmifera*

— “Challenges for Environment” -Sponsored Lectures by Mitsubishi UFJ Lease & Finance Co. Ltd. —

Since April 2006, the Graduate School of Environmental Studies started the lecture series of “Challenges for Environment” sponsored by Mitsubishi UFJ Lease & Finance Co. Ltd. In the first year, under the unifying theme of “How we reconstruct the balance between human society and nature”, we focused on not only the current situation of environmental issues but also the underlying problems of energy and population as well as a view of nature and ethics based on human activities. Leading experts of environmental issues were invited as lecturers to talk about intriguing subjects such as “Sustainable Food Consumption and Agriculture”, “Urban Environmental Design and Landscape”, “Sustainable Civilization”, and “The Rights of Nature.”

As a new attempt to improve citizen awareness, the university opened the lectures to the public. The program was able to accommodate up to 40 people, and became full immediately. Participants were very willing to ask questions in every lecture. Because this program invites not only our students but also those from other universities through the credit-exchange program, it provides a synergic effect in learning for both students and citizens.

Another feature is that we plan field studies and call for participation in addition to classroom lectures. This time, the participants visited Kawagoe Thermal Electric Power Plant, Chubu Electric Power Co. Ltd. under the theme of energy issues. This is one of the world’s largest LNG thermal power plants and participating students and citizens were very interested in the state-of-the-art technology of the combined cycle power generation.

On the questionnaires completed after the lectures, we had many comments such as “It was a good opportunity to think comprehensively about environmental issues”, “Much of my knowledge on environmental issues used be disparate but I could take a comprehensive approach through these lectures”, “It was beneficial for me to learn about various attempts for the environment from different points of views”, and “I could hear about current environmental situations firsthand from the experts, which would not be fully covered by mass media.” We hope to further contribute to the local community by providing opportunities for systematic understanding of globally expanding environmental issues.



Participants during the field study