

AIST REPORT

2012 Social and Environmental Report



CHARTER

Full Research in Society, for Society

National Institute of Advanced Industrial Science and Technology (AIST),
An Independent Administrative Institution

The common goal of humankind is to realize a society in which every person can enjoy a comfortable life. Science and technology can lead the way to such a society. The mission entrusted to AIST and its staff, as members of the scientific community, is to develop science and technology that complements society and the environment.

We, the staff members of AIST, recognize our mission and responsibility to society. We work towards the realization of such a society through research and development in industrial science and technology.

||Accurate Assessment of Social Trends

We endeavor to ascertain social trends and needs at every level of society from local communities to the international stage, to identify key issues promptly, and to propose scientific and technological solutions in collaboration with other organizations.

||Creation of Knowledge and Technology

We value each person's autonomy and creativity and display our collective strength through collaboration and synergy, creating new knowledge and innovative technology based on advanced research efforts.

||Application of Research Findings

We contribute to Japan's industrial development by applying our research findings to academic pursuits, intellectual infrastructure development, technology transfer, and policy proposals. We endeavor to enhance and disseminate science and technology through human resources development and the open sharing of information.

||Responsible Conduct

We are actively involved in improving our own abilities and our working environment in order to perform our duties more effectively. We respect both the letter and the spirit of the law and maintain a strict sense of ethics in all our affairs.

Charter of the Environmental Safety

- We strive to promote research activities that contribute to the global environmental protection and the security of mankind and pursue our work to realize a safe and reliable society of high quality of life harmonious with the environment.
- In compliance with the applicable laws and regulations related to environmental protection, we establish the autonomous standards of the Institute such as Safety Guideline, etc. and with this in mind, we shall endeavor to conserve environment and promote health and safety at all times.
- We promote the dissemination of information related to the environmental protection and make every effort to be in harmony with and coexist with the local community. Naturally, in case of disasters or emergencies, we take prompt and proper measures to deal with the situation.

Furthermore, in conformity with the 'principles of disclosure,' we shall endeavor to return the knowledge acquired and accumulated to the society.



Editorial Policy

The National Institute of Advanced Industrial Science and Technology (AIST) has issued yearly environmental reports since 2004, and since 2010 has issued AIST Reports, which incorporates social responsibility (SR) into an environmental report. The AIST Report 2012: A Social and Environmental Report was edited with the aim of gaining an understanding of AIST's social responsibility activities as well as open innovation activities, one of AIST's missions, from various stakeholders with a reader-friendly explanation and thereby develop the relationship of trust between AIST and society. This report describes AIST's activities in society with a focus on collaboration with local communities and industry and international collaboration.

http://www.aist.go.jp/index_en.html

(Translation from AIST Report published Sept. 2012)

◆ Scope of this report

This report covers activities conducted in all AIST research bases.

◆ Period covered by this report

April 2011 to March 2012

◆ Areas covered in this report

This report covers primarily organizational

governance, human rights, labor practice, fair operating practices, community involvement, environmental activities, occupational safety and health activities, and open innovation activities at AIST.

◆ Treatment of fractions

Numbers are rounded to the specified number of display digits.

◆ Referenced guidelines

- Environmental Reporting Guidelines (FY2007 Version), Ministry of the Environment
- Law Concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures
- Guidance on Issues to be Covered in an Environmental Report (Second Edition), Ministry of the Environment
- Japanese Version of ISO 26000:2010 Guidance on Social Responsibility, Japanese Standards Association

◆ Next issue date

September 2013 (in Japanese)

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President
National Institute of Advanced Industrial
Science and Technology (AIST)

野間口 有

Nomakuchi Tamotsu

Toward a Sustainable Society



Open innovation

One and a half years have passed since the Great East Japan Earthquake. AIST has regained its vitality through everyone's efforts. Although the affected areas still have many issues to be addressed, we have undertaken various forms of activities that can lead to the recovery of and support to the region.

In 2012, the construction of the renewable energy research and development hub facility is well underway. The facility is located in the City of Koriyama, Fukushima Prefecture, and will be a self-contained, highly energy-efficient facility with solar power, geothermal air-conditioning, natural

lighting, and novel sensor-based control systems. Areas of research to be conducted in the facility include solar power, wind power, geothermal energy, and energy management, and the world's most advanced research and development of renewable energy technology and demonstration of the technology will be performed. We will make the facility a place where researchers and engineers from various fields from domestic and overseas research institutions, universities and businesses gather to take on the challenge for scientific and technological innovation in renewable energy.



Evolving collaboration

The world has entered an era of global issues, such as global warming, and industrial competition by innovation. The industrial competition is not a competition among businesses but a competition among nations that reflects national strategies. Companies cannot win the competition if they try to conduct research and development using their own technology only. Therefore, large and small businesses, research institutions and universities are required to work together to promote open innovation on a global scale beyond any one nation's and region's borders.

With the mission to reinforce its functions as an open innovation hub, AIST has enhanced its functions to promote industry-academia-government collaboration, utilizing its human

resources and research facilities, and has been working not only on research and development, but also on technology evaluation and standardization. I think that we are in the era of industry-academia-government collaboration, that is, the era of open innovation to achieve a variety of goals through collaboration where diverse players work together in a synergistic and complementary manner.

Using all available resources, we will promote international collaboration, revitalize local industry and provide more effective support to industry, which is in the midst of global competition.



In society and for society: Bring technology to society

Since its establishment, AIST has undertaken research activities with the slogan "Bring technology to society" based on the philosophy "In Society and For Society" and has undertaken activities to make use of research results for society and with society to achieve a sustainable

society. AIST Report 2012: Social and Environmental Report describes AIST's role and efforts as a public institution and its social responsibility and environmental activities in an easy-to-understand manner.

Interview with Masahiro Seto [AIST Vice-President and Director-General, Research and Innovation Promotion Headquarters]

AIST: Making Things, Making Ideas, Making People

~The Open Innovation Strategy~

If Japan's industry is to recover its vitality, industry, academia and government must cooperate to improve our industrial competitiveness. To this end, AIST has established a mission called "Reinforcing the Functions of an Open Innovation Hub" and is accelerating this mission. We asked Vice-President Masahiro Seto about the concept of the mission and its practical developments.

AIST's commitment to hub functions linking industry, academia and government

AIST is promoting *Full Research*, integrating all stages from basic research to research for commercial application.

Vice-President Masahiro Seto describes the context: "Initially the number of research projects we were cooperating with businesses on was only a few dozen a year, but over the past ten years that number has risen to 1,800 projects a year. To further develop our partnerships with industry and academia, we will continue to establish bases for the promotion of open innovation, increasing our activities in areas including exchange projects, personnel development and information propagation."

As a part of this, the "Vitalization Council for Industrial Technology of Japan", was launched in October 2011 in cooperation with Nikkei Inc. to provide a forum for discussions between industry, academia and government on bringing about technological innovation.

"What we mean by 'vitalizing Japan' is producing innovations that will increase the public's happiness. To this end, AIST is committed to implementing hub functions to link businesses with universities. In our role as a government-affiliated public research institution, we will send out messages about the directions of innovation in Japan and we will make proposals relating to specific projects."

Surviving in the global society

The May 2012 interim report of the Vitalization Council for Industrial Technology of Japan contained five proposals. What kind of messages did AIST intend to send out with these proposals?

"When targeting new economic areas such as the developing markets of China, India and Brazil, we need to identify topics for R&D considering outcomes, rather than the old bottom-up style of R&D being driven by basic research.



This means understanding what is required in each society or region, making proposals as to what kind of society should be created there and how lifestyles should be altered, and creating values (making ideas) to realize those proposals with technology.

With the progress of information technology and new possibilities of instantaneous communication, our activities must be fast-paced and strategically oriented to business.

When living standards in new economic areas improve in the future, values will be more consistent across the world. On issues that affect the whole world such as the environment and energy problems, large numbers of institutions will be working in partnership at a national project level. For the various reasons I have given, open innovation will be very important."

Masahiro Seto adds that, in the context of globalization, personnel development with a view to the long term is a big issue.

"We need Japanese researchers to seek out opportunities to go abroad and we need to invite foreign researchers to come to Japan. In particular, if young researchers from new economic areas come and experience the attractions of Japan's research environment and living environment, personnel development will work in both directions and personal networks will be built up, which will lead to future partnerships in economic markets."

TIA-nano, a base for global collaboration in Tsukuba

“Competition to create the structures of innovation platforms is now spreading through the world. This is not limited to collaboration between research institutions. Factors such as support from towns and cities in terms of favorable taxation and living conditions for overseas researchers are already spanning whole regions and countries. In Japan, the ideal is for universities and research organizations to create bases for open innovation in the fields they are strongest in and for these activities to spread through the whole country. AIST is playing a leadership role in this, and it is crucial for AIST to be a source of innovation.”

AIST’s creation of bases for open innovation includes the formation of the Tsukuba Innovation Arena (TIA), participation in technological research associations, and the establishment of a hub at regional research bases aimed at bringing about regional innovations.

TIA is a global nanotechnology research complex (TIA-nano) in the city of Tsukuba. Its core institutions are AIST, the University of Tsukuba, the National Institute for Materials Science (NIMS), and the High Energy Accelerator Research Organization (KEK). The advantages of TIA-nano include the involvement of AIST and NIMS, world class in the nanotech field with world leading research facilities, the involvement of educational institutions capable of educating personnel, and the presence of over 500 guest researchers from industry.

A vitalized Japan that can lead the world again

AIST is also taking practical measures, such as public research facilities in which leading edge experimental equipment and facilities are made widely available (IBEC* Centers), the “Renkeisensha no Kai” or AIST Innovation Partners association with around 520 member businesses, the AIST Innovation School which develops young doctoral graduates through on-site training by AIST and industry, the AIST Open Lab which provides open laboratories and lectures, and *Full Research Workshops* held at seven regional research bases around Japan.

“The past ten years have been what you might call a foundation laying period. We have created a seedstock of resources through steady basic research, changed attitudes to commercial application, and cultivated an array of individual initiatives such as the Open Lab and the *Full Research Workshops*. In the coming ten years, we hope to bring these seeds into full bloom.

I am proud of the effects that AIST’s open innovation

strategy has had on science and technology R&D systems throughout Japan. It is currently said that Japan is in the doldrums but if Japanese people, with their talents and ability to cooperate, collectively move to open innovation, I believe that a vitalized Japan can lead the world again.”

*IBEC: ICT, Biotechnology, Energy & Environment Tech., Converging Tech.

The Five Proposals

(Vitalization Council for Industrial Technology of Japan, Interim Report, May 2012)

- 1) To win global growth markets by promoting responsive open innovation
- 2) To take the lead in addressing global problems and create the new values that the world will need
- 3) To promote a change of perspective in industry, from just making things to making values (making ideas)
- 4) To set up innovation bases in Japan and find a road to growth in which global development of industry contributes to the employment of high-quality personnel in Japan
- 5) To develop idea production-oriented talents and accelerate the internationalization of personnel



Establishment of the Fukushima Research Base for Renewable Energy

To support reconstruction after the Great East Japan Earthquake, the Fukushima Research Base for Renewable Energy is under way to contribute to the clustering of related industries and the creation of employment in Fukushima Prefecture using AIST's potential. This research base will be constructed in the Koriyama West Second Industrial Park (Machiikedai 2-chome, Koriyama, Fukushima Prefecture), and is scheduled to be opened in April 2014. It will consist of a four-story main building, a one-story annex building and a field to demonstrate the integration of renewable energies.

In establishing the research base, we have set the following goals; and are selecting research topics and are collaborating with external parties :

- (1) Promote renewable energy research and development open to the world.
 - (2) Contribute to industry clustering in Fukushima Prefecture, and restoration after the earthquake.
 - (3) Promote the application of renewable energy and energy saving.
 - (4) Develop human resources for associated renewable energy.
- The research base will undertake a wide range of research and

development topics, such as the verification of a renewable energy network, the configuration of a development platform for next-generation solar photovoltaic modules, the development of geothermal energy application technology, and the development of hydrogen energy carriers and their advanced utilization technology etc. While collaborating with Fukushima Technology Center, the four universities in Fukushima Prefecture (Fukushima University, Nihon University, the University of Aizu, and Iwaki Meisei University) and local businesses, the research base is expected to be the place where a huge variety of researchers and engineers from domestic and overseas research institutions, universities and companies come together for the world's most advanced research and development of renewable energy and its demonstration.



Conceptual drawing of the new building

Vitalization Council for Industrial Technology of Japan

On October 1, 2011, AIST and Nikkei Inc. set up the Vitalization Council for Industrial Technology of Japan thinking that Japan may lose the largest thrust for future growth if we do not strengthen the base for innovation in the midst of the intense global competition in technology. Both shared the awareness that re-creation of industry supported by competitive industrial technology is essential for Japan to revive its economy after the Great East Japan Earthquake.

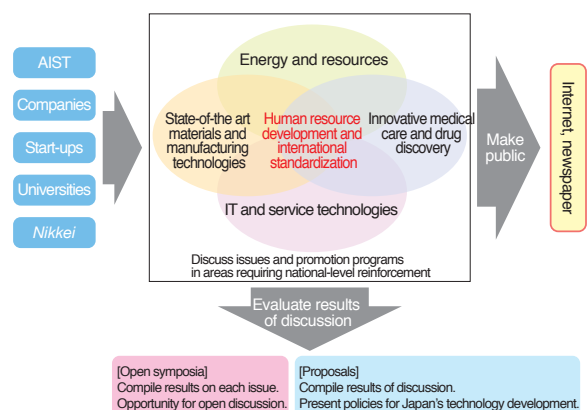
With the participation, cooperation and support of major Japanese companies and universities, the Vitalization Council for Industrial Technology of Japan has discussed the direction of technology development and issues to be solved in four areas: 1) energy and resources, 2) innovative medical care and drug discovery, 3) IT and service technologies, and 4) state-of-the-art materials and manufacturing technologies, and cross-disciplinary issues, such as human resource



Panel discussion in a symposium hosted by the Council

development and international standardization in symposia and lectures. The Council will release an Innovation Roadmap (Action Plan) required for Japan to continue to be the world's frontrunner in key industrial technologies in the mid- to long-term by the end of 2012 and make proposals to industry, academia, and government across the country. We believe that the Council will contribute to society by using the innovation infrastructure to solve not only individual technological issues but also issues common to a variety of industries.

Framework of the Vitalization Council for Industrial Technology of Japan



AIST Open Lab (AIST Tsukuba)

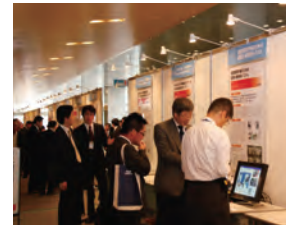
The fourth AIST Open Lab was held on October 13 and 14, 2011 at AIST Tsukuba and was attended by 4,224 people over two days. The purpose of this event is to give corporate management, researchers and engineers and people from universities and public research institutions the opportunity to learn about AIST's research results and resources, such as experimental equipment and shared facilities, and to expand and enhance collaboration with AIST. The venues, where panels about research topics gathered from AIST's research bases across the country were displayed and explained, and laboratories in Tsukuba were open to the visitors. AIST's researchers explained and discussed their research results as well as research equipment, to promote industry-academia-government collaboration.

Afternoon café talks were held in which the researchers explained to the participants face-to-face

the background and details of their research in an easy-to-understand manner.



Lecture



Panel displays



Laboratory tour



Afternoon café talks

Full Research Workshops Held throughout Japan

Since FY 2009, open workshops have been held by seven regional research bases throughout Japan to discuss AIST's *Full Research* (research in a seamless manner from basic research to research for commercialization) in public. AIST has conducted advanced and basic researches, and also has focused on translational researches such as integration and systematization technology, mass-production technology, and safety assessment technology etc. required to transform results of basic researches into corporate product developments. In FY 2011, seven workshops were held with 1,580 participants. Not only technology seeds of regional research bases but also examples of *Full Research* that match regional needs, conducted in all AIST research bases including AIST Tsukuba, were presented.

The main programs include the following:

- Seminar: Presentation of research topics that match regional needs including collaboration cases with regional companies
- Exhibit: Poster presentations to show research activities conducted in each regional research base to give the opportunity to meet with AIST researchers

- Technology consultation: Consultations on collaborative research with AIST

Full Research workshops held in FY2011

Research base	Topic	Date	Location
Hokkaido	Biomass use in Hokkaido ~Proposal from AIST~	2011.11.15	Sapporo
Tohoku	Aiming at recovery from the earthquake and industrial development in the Tohoku region	2012.3.7	Sendai
Chubu	AIST's challenge to next-generation vehicles	2012.1.31	Nagoya
Kansai	A scenario for a sustainable low-carbon society ~To keep Japan as an affluent society in 2050 for the young generation~	2012.3.12	Osaka
Chugoku	Issues and efforts for the full-scale introduction of renewable energy	2011.12.12	Higashi Hiroshima
Shikoku	Creating new industries to live a healthy life to 100 years	2011.11.28	Takamatsu
Kyushu	Current status and outlook of AIST's support for regional companies	2012.2.9	Kagoshima



Seminars of *Full Research* workshops in Sendai and Takamatsu

AIST's Mission

AIST aims to solve 21st century issues and reinforce its functions as an open innovation hub based on the basic philosophy "Achieve a sustainable society." In the 3rd Term

(FY2010 to 2014), we have been working on the following four research promotion strategies to contribute to the achievement of the strategic goals set forth in the New Growth Strategy.

1 Strategy to promote green innovation

We will conduct R&D to contribute to the solution of three issues that are becoming more apparent with the increasing population: the environment, energy and natural resources. We also aim to create new markets and reduce greenhouse gas emissions significantly.

2 Strategy to promote life innovation

We will conduct R&D to contribute to the realization of advanced medical services and the reduction of the burden of nursing care, aiming to create new industries appropriate for an aging society with a declining birthrate, and to achieve a more affluent and healthier life for the people.

3 Strategy to promote the development of cutting-edge technologies

We will conduct R&D for innovative materials and devices, productivity improvement, and creation of new services, aiming to improve people's lives and enhance global competitiveness of industry through the IT-based development of Japan.

4 Strategy to develop and promote a knowledge base

We will develop measurement standards that are the common basis of science and technology, improve adaptability evaluation technology that ensures safety and security, and perform geological survey that is indispensable for securing energy and natural resources, and for disaster mitigation.

Research Fields of AIST

At AIST, we are promoting research in the 6 fields of Environmental and Energy, Life Science and Biotechnology, Information Technology and Electronics, Nanotechnology, Materials and Manufacturing, Metrology and Measurement

Science, and Geological Survey and Applied Geosciences. We are also promoting interdisciplinary research which crosses over boundaries of research fields.



Environment and Energy

Toward green innovation

For the purpose of green innovation, AIST is promoting the development of technologies for increased use of renewable energy and energy saving to reduce greenhouse gas emissions, the securing and effective use of natural resources, reduction of environmental loads of industry, and evaluation and risk management of various new technologies.



Life Science and Biotechnology

Toward a sustainable society in which people live a long life with health and vigor

It is necessary to build a healthy longevity society where people can live their lives in a state of well-being and security, as well as a sustainable society with less burden on the environment. We are contributing to life innovation by developing new technologies to evaluate health and assisting in the creation of new medicines as well as in the maintenance, improvement, and recovery of health according to the individual's condition. We are also contributing to green innovation by developing technologies to reduce environmental loads using bioprocesses.



Information Technology and Electronics

Toward improved social vitality and safety through green-IT

Rapid growth and spread of IT have increased energy consumption and imposed threats on information security and reliability issues. AIST is contributing to the development of energy-efficient IT devices and IT services to reduce energy consumption, which are supported by safe and reliable software technologies.



Nanotechnology, Materials and Manufacturing

Toward the development of revolutionary materials and manufacturing technologies that contribute to green innovation

AIST is contributing to green innovation, the aim of which is to achieve enhanced Japanese competitiveness and a sustainable society by creating materials and devices that play a core role in green innovation with nanotechnology as the key technology, and by revolutionizing manufacturing processes in the fields of nanotechnology, materials, and manufacturing.



Metrology and Measurement Science

Setting measurement standards and developing intellectual techno-infrastructures for measurement, testing, and certification to support technological innovation and a fair and secure society

Measurement is necessary for designing and developing products as well as for testing and certifying their qualities. It serves as a driving force to maintain Japan's industrial competitiveness, and as an intellectual techno-infrastructure for sharing technical policies to maintain the security of society and the lives of individuals, preserve the environment, and maintain energy and resources. AIST develops and maintains national measurement standards in order to ensure global acceptability of consistency, of relevant technologies, and is systematically developing measurement technologies from the standpoint of intellectual infrastructure.



Geological Survey and Applied Geoscience

Understanding the Earth well, and harmonizing our life with this planet

AIST gathers geological information essential for realizing a safe and secure society in Japan. It also develops technologies to solve such problems as alleviating natural disasters, protecting the global environment, developing resources and energy sources, and so on. The Geological Survey of Japan (GSJ), an arm of AIST, disseminates information gathered and organized for international cooperation on behalf of the country.

Formulation of a Business Continuity Plan (BCP)

Based on the lessons learned from the damaged infrastructure such as the power cut and halted economic activities due to the Great East Japan Earthquake, the importance of the formulation of business restoration plans and the implementation of disaster prevention measures to prepare for large-scale natural disasters is increasingly recognized. In October 2011, AIST formulated the “National Institute of Advanced Industrial Science and Technology Business Continuity Plan: Focused on Preparedness for Major Earthquakes (AIST BCP).”

The AIST BCP gives priority to AIST’s statutory duties, duties that, if interrupted, may significantly affect the continuation of industrial and economic activities, duties to provide information on an accident at AIST and recovery from the accident, and basic duties to repair and maintain infrastructure at AIST to support these duties. To ensure the continuation and early resumption of priority duties in the event of a disaster, such as a major earthquake, the BCP defines preliminary measures, measures to ensure the supply and allocation of resources required for the continuation of duties, and the command structure. The Great East Japan Earthquake hit just before the finalization of the BCP, which had been under consideration since June 2010. However, with information shared by the staff involved, the BCP helped us focus on the maintenance of the information system, electricity and other infrastructure required to continue priority duties and thus contributed

to the recovery from the damage caused by the earthquake. Also, the lessons learned from the Great East Japan Earthquake were reflected in the BCP.

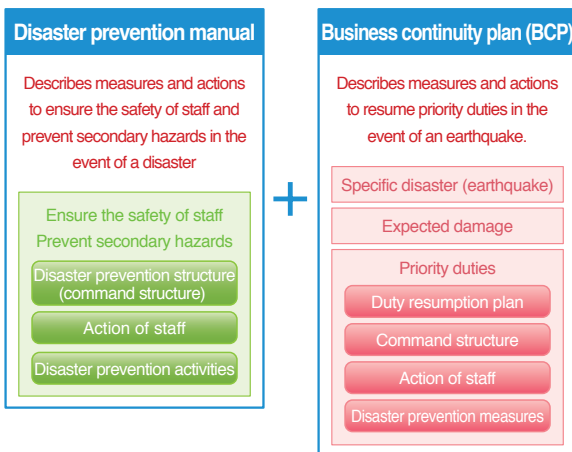
The AIST BCP will be reviewed on a regular basis, updated and implemented in a practical manner. In May 2012, we made the first revision of the BCP: we reviewed priority duties as a result of the transfer of duties to another organization, renewed the recovery goals and actions and updated the improvement schedule.

AIST will endeavor to fulfill its social responsibility in the event of a large-scale disaster.

◆AIST BCP (summary in Japanese)

http://www.aist.go.jp/aist_j/outline/bcp/aist-bcp.pdf

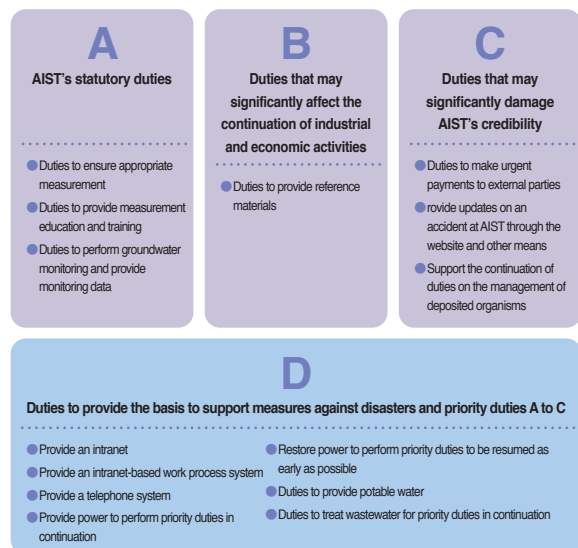
Necessary duties to be performed in the event of a large-scale disaster



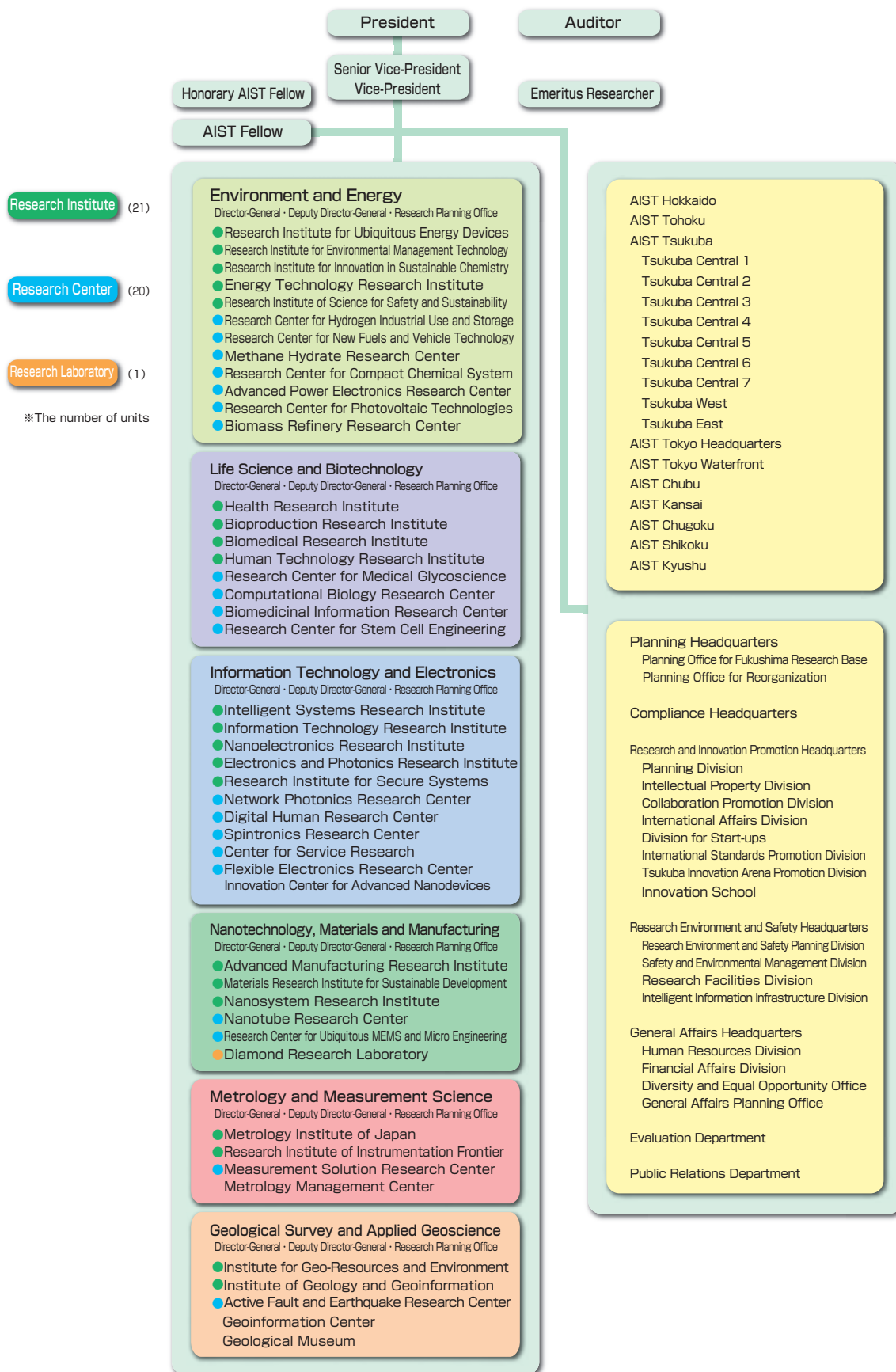
●About the AIST BCP

The AIST Business Continuity Plan (BCP) identifies activities required to prevent secondary hazards in the event of major earthquakes and other natural disasters and ensure the safety of the employees and residents in the neighborhood and the continuation and early resumption of priority duties.

AIST’s priority duties



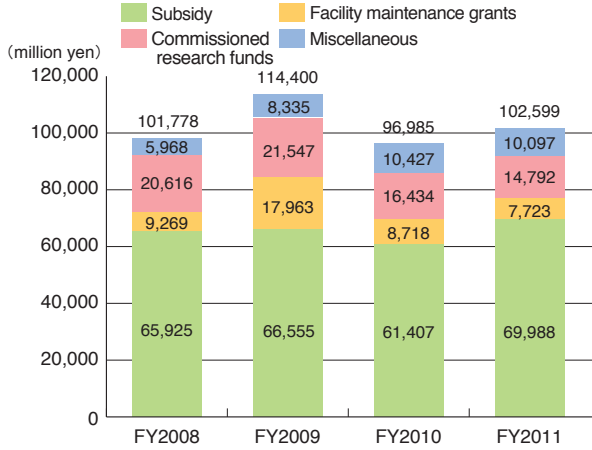
Organization Chart (April 1, 2012)



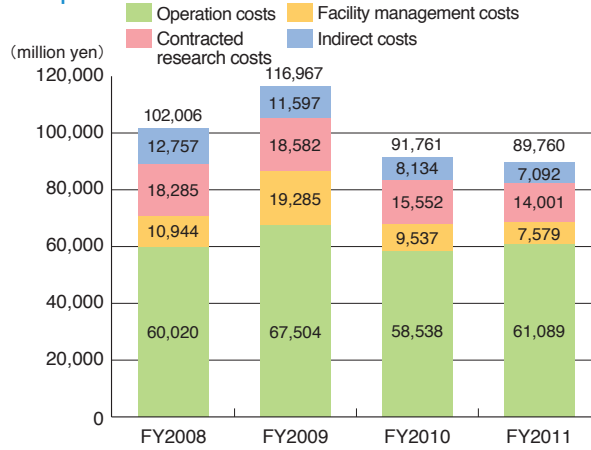


Revenue and Expenditure

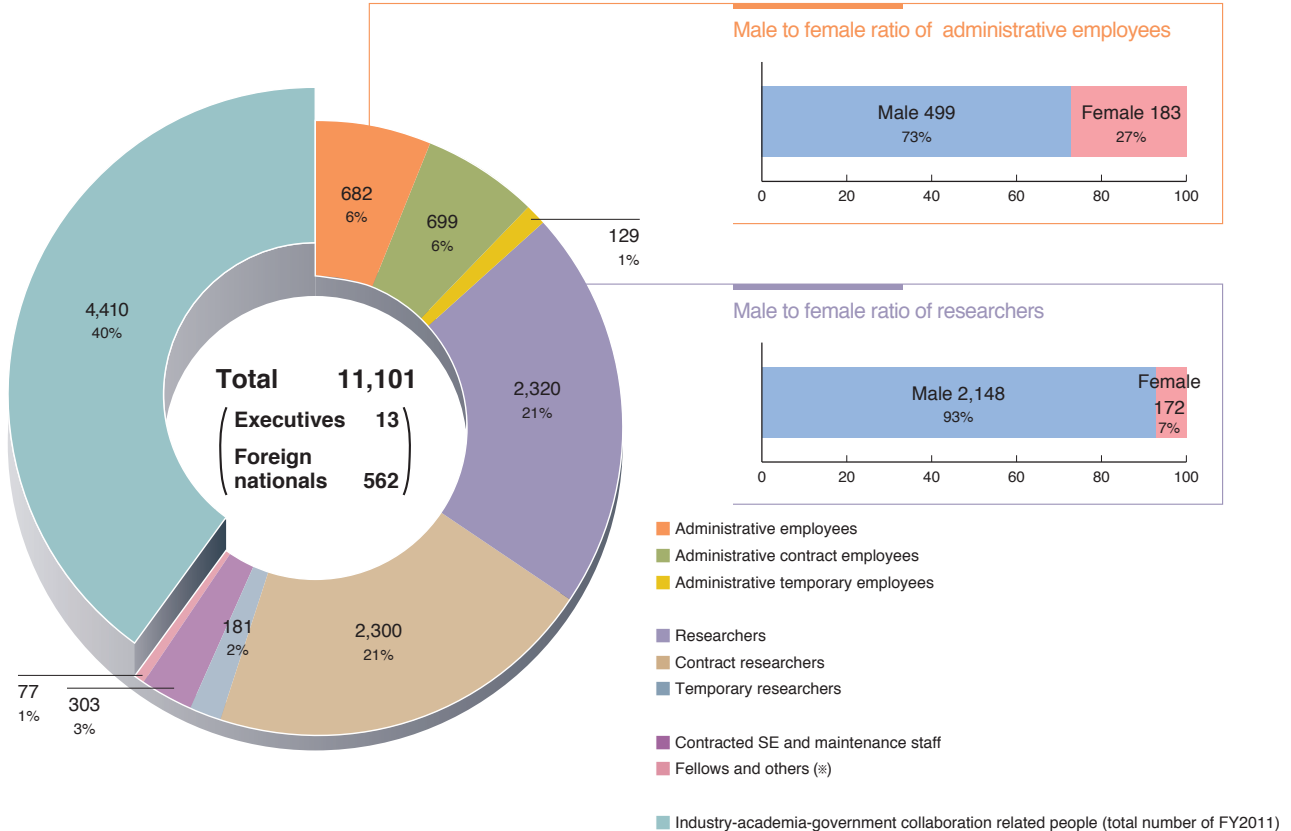
Revenue



Expenditure



Staff (as of March 1, 2012)



* Honorary AIST Fellow, Special AIST Fellow, Grand Emeritus Advisor, Special Emeritus Advisor, Research Emeritus Advisor, Research Emeritus Counselor

Promotion of Compliance

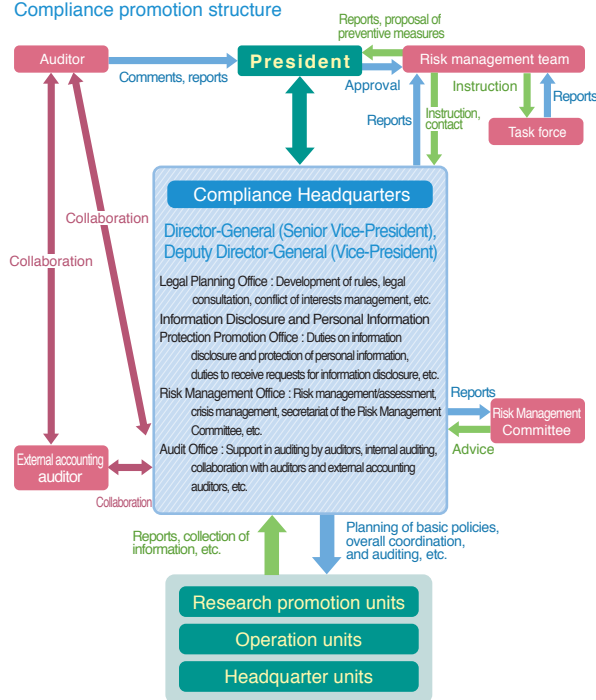
We undertake compliance activities with the awareness of “participatory” compliance where we support the compliance activities of units and individuals and do not impose on them to follow the activities of the Compliance Headquarters, with the understanding of the importance of increasing the compliance awareness of individuals.

In FY2011, “compliance training” was provided to educate new and contract employees on the basics of compliance. To increase the compliance awareness of individuals, a “compliance self-check” was conducted on all the staff once a year (total number of

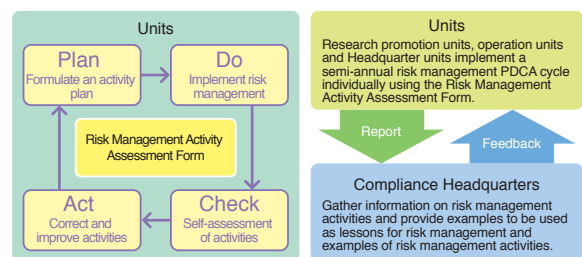
participants: 5,360) to remind them of the basics of compliance. In addition, as part of the compliance activities at AIST, the Compliance Newsletter was created based on familiar examples and distributed across AIST to deepen the understanding of compliance.

In risk management activities, each unit formulates a risk management activity plan and conducts a self-assessment of the plan semi-annually to steadily implement a risk management PDCA cycle. In addition, examples of risk management activities and examples to be used as lessons for risk management that can be referenced by units are produced as “notices” on the intranet to promote information sharing to raise awareness of risk management.

Compliance promotion structure



PDCA cycle of Risk management



Disclosure of Information and Protection of Personal Information

Disclosure of information

To ensure accountability for its activities, AIST proactively discloses information through the website and other means according to the Act on Access to Information Held by Incorporated Administrative Agencies, Etc. (put into effect on October 1, 2002)

In FY2011, we made a list of about 3,160 research papers and reports available for viewing in the archives of the information disclosure desk at AIST

Tsukuba. The list is updated regularly to improve information services.

Protection of personal information

AIST has formulated “Privacy Policies” and “AIST Rules for the Protection of Personal Information” according to the Act on the Protection of Personal Information Held by Incorporated Administrative Agencies, Etc. (put into effect on April 1, 2005), to

protect individual rights and interests while performing its duties properly and smoothly. In FY2011, a “Self-Check on the Protection of Personal Information and Information Security” was performed to further increase the awareness of each of the staff on appropriate management of personal and other information and information security measures. (Fair operating practices: see page 35 “Information security”)

Information disclosure desk and personal information protection desk

A request for information under the Act of Access to Information and the Act on the Protection of Personal Information can be made to the information disclosure or personal information protection desk at AIST Tsukuba and other regional research bases or on the website (request to the website is for disclosure purposes only). The desk also provides consultation on information disclosure requests and personal information protection.

Personnel Training Activities

AIST offers training to its staff who, as members of the organization, can achieve self-development and self-education with ability development and career development in mind. The training programs include rank-specific training with a focus on topics, such as task-performance skills, management and leadership required for the level of work, and professional training with a focus on the enhancement of expertise in respective professional capacities and areas.

In FY2011, we provided 14 rank-specific training programs, such as unit leader training and administrative manager training, and 9 professional training programs, such as training of staff for the utilization of research results and public relations training. In addition, we provided unit-specific education and training required for the employees to perform their work and learn basic knowledge. To develop and increase a shared awareness of problems among people who work at AIST, we also provide basic employee training to learn basic knowledge, such as AIST’s mission, required to perform their work. This training includes 5 lectures: AIST’s Mission and Topics, Compliance, Service and Discipline, Safety Management, and Code of Conduct for Researchers.

To promote e-learning-based basic training, in FY2011, we explained to the e-learning participants the advantages of the e-learning system developed in the previous year, such as allowing them to learn at any time and any place and in any order according to their work schedule. To provide basic training to foreign employees, we have developed an English version of the e-learning system to allow them to learn at their convenience. The English version of the e-learning system will start in FY2012.

We ask participants to evaluate the key items of these training programs, such as the content of lectures and lecturers’ presentations, on a 5-point scale to further improve the planning and implementation of subsequent training sessions, and conduct questionnaires and interview surveys to learn of their comments and requests to reflect employees’ voice.



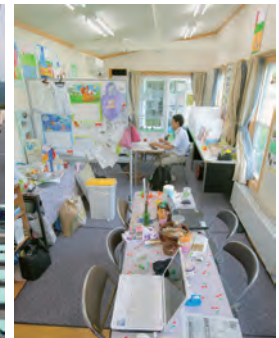
Scene from the public relations training program

Number of participants in the training programs

Number of Participants (Number of Sessions)		
Training Program	FY 2010	FY 2011
Rank-Specific Training	364 (11)	905 (28)
Professional Training	674 (57)	890 (72)
Basic Employee Training (e-Learning)	150 (1)	466 (2)
Total	1,188 (69)	2,261 (102)

The Challenges of the Kesennuma Kizuna Project

Last year, AIST launched a cross-discipline partnership project in the disaster zone of the Great East Japan Earthquake. We started new activities for implementing smart communities and studying connections between people. This research started with the question of how we could build the relationships of trust that would be the basis of partnerships.



Temporary housing built on a baseball field (left). A multi-purpose support trailer under the management of a local NPO (right). It was used for a wide range of interactions, such as social events and various classes.

The process of investigating in a disaster zone as a research subject

After the Great East Japan Earthquake of March 2011, deputy research director Kohtaro Ohba, a native of Sendai city, made numerous visits to cities in the disaster area including Sendai, Ishinomaki and Rikuzentakata. He witnessed the harsh reality of lines of coffins waiting as the fire service and self-defence forces searched for the missing. Day after day, he asked himself what he as a scientist could possibly do. In August 2011 he proposed the “Kesennuma Kizuna Project”. Along with ten or so volunteers from AIST, he commenced activities in October. The project studied the connections between people and applied the findings to lifestyle support technologies in the disaster area.

The project investigated how to strengthen interactions with disaster victims and what they needed in the places where they were located. However, the process of investigation itself became an important subject of research. Along with politicians and the media, researchers are the least popular kind of people in a disaster zone. The feeling of disaster victims is that they are not guinea pigs and that research is a nuisance.

Given this situation, what is effective for interaction in the field is conversation of a very old-fashioned kind, with people talking face-to-face while drinking at social gatherings. Senior researcher Kazuhiro Kojima went to live in the disaster zone and got involved in the gradually changing community. This immersive approach is called community-based participatory research (CBPR). It is a new approach which has not previously been put into practice by engineers in a disaster zone.

What is important is the ability to respond to change

In January 2012, we installed three mobile homes at the Goemongahara temporary housing site. AIST set them up in partnership with the NPO Lake Kawaguchi Nature House, Cumberland Japan Co. Ltd., Teijin Ltd., Honda Motor Co. Ltd., Itochu Techno-solutions Corporation, Itochu Corporation, Accenture Japan Ltd., and others. We used one mobile home as a support base for AIST and a living space for Kazuhiro Kojima, and used the other two for various kinds of interaction and the sale of foods and household supplies.

Our partner companies voluntarily provided a variety of technologies and resources including a power management system with solar power generation and storage batteries, combined heat and power generation, a water purification system, an electric car and a walking assistant robot. Our objective was to implement smart life care, providing comprehensive support for energy, information, transport, and daily living.

The mobile homes attracted a lot of attention and were widely reported on as a means of support utilizing leading edge technologies. However, according to Kazuhiro Kojima, this was not the main point of the research.

“Our main interest was in substantiating what form a smart community in which people are connected together should take and how technology should be employed in such a community. For example, in supporting mobility, both mobility for daily activities in the recovery period and mobility to enable a vibrant community in the rebuilding period must be considered. It is then important to carefully examine the technologies that are needed and progressively adapt them to the situation in the field. When we technologists are in the field, we can flexibly respond to changes. I think that is the main issue.”

The highway to solutions is out in the field

This project came about through wide-ranging collaboration with disaster victims, local government bodies, NPOs and volunteer groups active in the field, businesses, and others. According to Kohtaro Ohba, there have been very few studies that have succeeded in penetrating so deeply in a disaster zone.

“My ultimate objective is for us to continue our support and not leave the disaster zone until the people of the area are back on their feet. My first contact with the disaster victims was not in the role of a researcher but as a helper, and this may be what enabled us to build up an unusual level of trust. There were very many people in the disaster zone who could not be reached by telephone, so spending 30 minutes in the area had to be more useful than 30 hours of discussions in Tsukuba. Being in the field, we could confront the new problems, and solve the problems that kept coming up, and we could build strong connections with the people.”

Concerning the importance of these relationships and networks, research center deputy director Yoichi Motomura gives the following explanation: “When creating technologies that can be introduced into society, the amount of social capital a research institution has is an important matter for that institution. We cannot just develop technologies without understanding people’s daily lives and surroundings. The ideal has to be a co-creative approach in which we create values together with the people who will use the technologies.”

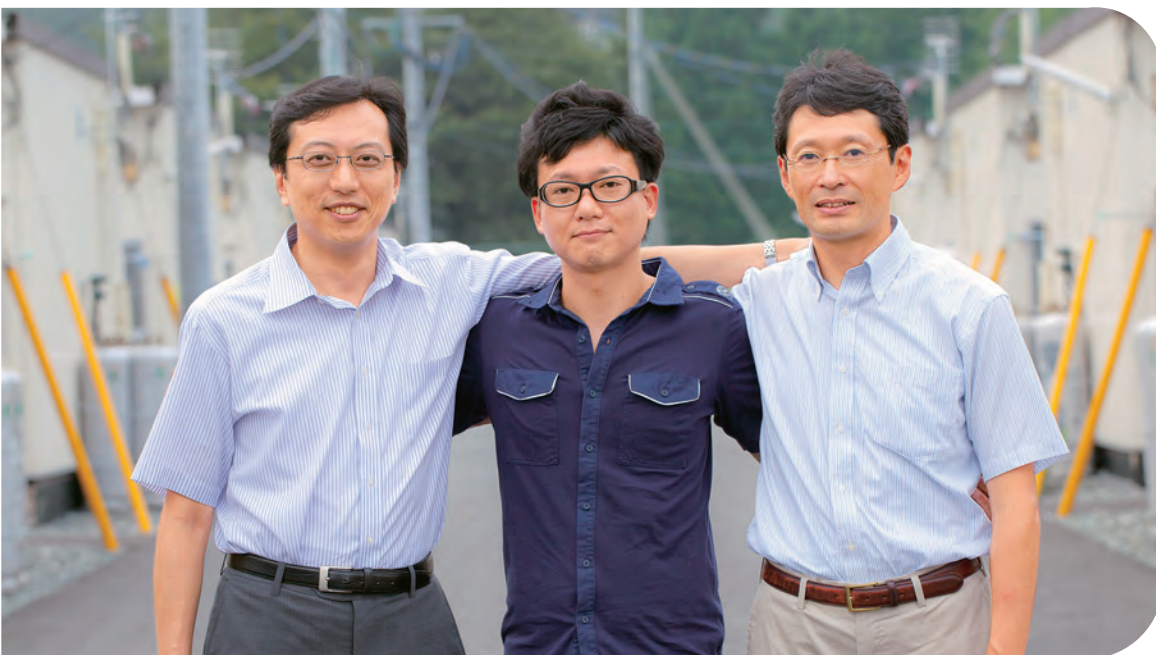
Research at the leading edge of innovation

Kohtaro Ohba argues that this project is new research at the leading edge of innovation: “There is an overwhelming number of lessons to be learned in the field, and it would not be possible to respond without researchers changing to address these lessons. Adapting is only natural for researchers, while doing things that have no precedent is research and is surely the ultimate in innovation. I would really like to live in a society that appreciates such research.”

The research will not be concluded in the disaster zone. For example, it is likely that the technologies and methods cultivated here will be deployed in the aging society of 20 to 30 years hence. Even where technologies are feasible, it may not be possible to use exactly the same processes, and new high-level methodologies will be needed so that appropriate methods for embedding technologies in new situations can be identified.

Yoichi Motomura expresses his hope for the future: “Another objective is for other researchers in other situations to be able to create the structures that Kazuhiro Kojima created in this case. Lifestyles and daily living practices are themselves living things and are constantly changing. Research into people will never come to an end as long as there are people.”

These researchers set down roots in the disaster zone and took the challenge of creating a completely new concept by their own efforts. Through this work, they have raised questions about the fundamental nature of innovation.



From left (position and name):

Deputy Director,
Center for Service Research, AIST

Yoichi Motomura

Senior Researcher,
RT-Synthesis Research Group,
Intelligent Systems Research Institute, AIST

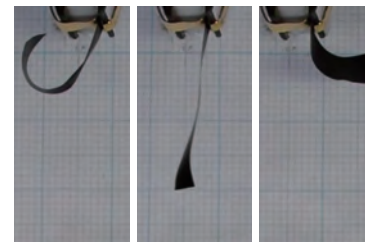
Kazuhiro Kojima

Deputy Director,
Intelligent Systems Research Institute, AIST

Kohtaro Ohba

Japanese–German Partnership Grows from Polymer Actuators

AIST and the Fraunhofer-Gesellschaft are research institutions respectively representing Japan and Germany. We have conducted research exchanges over many years, and have recently made great progress in strengthening our partnership. The trigger for this was polymer actuators developed at our AIST Kansai.



Actuator
Photograph of a three—layer film actuator formed by carbon nanotube and ionic liquid electrodes and an ionic liquid gel deforming when 3 V from two batteries is switched

A positive climate for partnership and the results of partnership

AIST’s mission is to transfer developed technologies to private business and deliver the technologies to society. AIST Kansai was initially founded as the Government Industrial Research Institute, Osaka after the First World War, to establish manufacturing technology in Japan, and was thoroughly grounded in a culture of cooperation with private business. From this background, numerous technologies developed at AIST Kansai have blossomed greatly in society.

According to the general director, Takahisa Taguchi, “Three major inventions from AIST Kansai are the carbon fibers that are used in everything from fishing rods to aircraft, the transparent conducting film that are used in liquid crystal displays, and the nickel metal hydride batteries that hybrid cars are equipped with. We are now working on practical applications of a fourth major invention: polymer actuator technology.”

Polymer actuators using carbon nanotubes in electrodes, which were developed by research group leader Kinji Asaka, attracted global attention as a highly original technology. Subsequently, international conferences were held organized by AIST Kansai in 2001, 2004, 2006 and 2009, bringing top-level scientists from around the world. Exchanges with the Fraunhofer-Gesellschaft, which oversees more than 80 research units including 60 laboratories in Germany, have helped to drive the research forward.

Low-voltage driven, high-performance actuators

Polymer actuators are essentially a technology made in Japan. Ion conduction polymer actuators were successfully developed at AIST Kansai in 1991. In

2005, the group led by Kinji Asaka developed a bucky gel actuator with a three-layer structure that can be driven in air. This actuator has a structure in which a gel electrolyte constituted of an ionic liquid and a polymer is sandwiched by two electrodes constituted of carbon nanotubes, ionic liquid and a polymer binder. Kinji Asaka describes the characteristics and application potential of bucky gel actuators: “The main characteristic is that the actuator is greatly deformed by low voltages, 3 Volts or less. Polymer materials have excellent workability, which is an advantage for easy fabrication of high-performance actuators. We have made progress in applying the actuators to devices that provide tactile information, such as the development of light, thin Braille displays. Beyond healthcare and welfare, there are potential applications in a wide range of fields, from liquid crystal panels on domestic electronic goods and touch panels on mobile telephones to the robotics industry and the automobile industry.”

Huge improvements in performance have been achieved since the actuators were first developed, with generative forces increasing more than tenfold, displacement speeds increasing more than tenfold, and displacement amounts more than doubling. The actuators we have created are known as the fastest driving low-voltage actuators in the world.

A rapidly developing and growing Japanese–German partnership

The Fraunhofer Institute for Manufacturing Engineering and Automation (Fraunhofer IPA) is counted among the highest-level laboratories in the Fraunhofer-Gesellschaft. Fraunhofer IPA encountered the polymer actuators developed by Kinji Asaka at an international nanotechnology exhibition in Tokyo in

2007. Head of the department “Functional Materials” at Fraunhofer IPA and one of the European CNT actuator pioneers, Ivica Kolaric, was wandering around the exhibition when he happened upon the AIST booth and saw the capabilities of the polymer actuators. Fascinated by the supreme performance of the AIST actuators, he wished to learn more about the world-class research and to collaborate with Dr. Asaka. Since that day, exchanges have been expanded. The Fraunhofer Office for Process Engineering of Functional Materials and Robotics (Fraunhofer OPER) was opened in Osaka in March 2011, and in November 2011 they held a symposium in collaboration with AIST Kansai. In July 2012, the partnership was strengthened by concluding a memorandum of understanding on comprehensive research cooperation (MOU) with the Fraunhofer-Gesellschaft.

Fraunhofer OPER marketing manager Nao Tomita, who supports this collaboration as a liaison person, explains: “We have a common mission with AIST of returning technology to society through research development and technology development, so this partnership is very beneficial. In particular, if one had to choose, the researchers at Fraunhofer IPA are probably closer to being engineers. They feel strongly that their job is to create products in collaboration with industry rather than writing papers.”

Moving from commercial application to providing innovation

We asked our three interviewees to tell us about their expectations for the Japanese–German partnership.



Director-General,
AIST Kansai

Takahisa Taguchi



Leader,
Artificial Cell Research Group,
Health Research Institute, AIST Kansai

Kinji Asaka



Manager,
Marketing and PR, Fraunhofer OPER

Nao Tomita

Takahisa Taguchi: “AIST is good at developing high-performance materials, and Fraunhofer IPA has strengths in its experience and know-how of turning materials into products. Therefore, I expect the partnership to be vertical in nature rather than horizontal.”

Kinji Asaka: “Cooperative research can achieve things that I could not achieve by myself, and is very efficient in that something that would take five or ten years can be done in one year. I sense great expectations from business that the partnership may speed up the commercial application of our technologies.”

Nao Tomita: “Each country’s awareness of the other will be improved by this partnership, and networks will be expanded. We would like to grow in scale from this foothold and have a stronger presence in Japan.”

Concerning future forms of cooperation, Takahisa Taguchi envisages three stages. The collaborative research between AIST Kansai and Fraunhofer IPA is stage 1, stage 2 will also involve businesses, and stage 3 will be consortiums involving numerous businesses from Japan and Germany. As these develop, the appearance of a fourth stage is envisaged, broadening to partnerships between Japan and Germany or between Asia and Europe. A great wave of international cooperation to create and support innovation while aiming for practical results in the commercial application of technology will spread around the world from Osaka.

Shaping the Future of the Rubber Industry with Molecular Breeding Technology in Rubber Trees

We have embarked on international collaborative research with the aim of improving the productivity of natural rubber (*Hevea brasiliensis*). This collaboration will link three parties in a Win-Win relationship that is beneficial for all, with AIST realizing the commercial application of leading edge plant biotechnologies, the Bridgestone Corporation being assured of supplies of natural rubber, and Indonesia by promoting a key industry.

A partnership enabling the commercial application of plant biotechnology

AIST and Indonesia’s Agency for the Assessment and Application of Technology (BPPT) are both large public research institutions representing their countries. To further strengthen our cooperation, we concluded a memorandum of understanding on comprehensive research cooperation (MOU) on February 24, 2011. At the same time, AIST, BPPT and the Bridgestone Corporation, a leading global manufacturer of rubber and tires, agreed to start collaborative research into natural rubber.

Bridgestone owns large rubber plantations in Indonesia, which are managed with high-level technologies. Bridgestone has had a cooperative relationship with BPPT for some time. They embarked on biotechnology research together at the start of this century, and they come with great hopes for AIST’s fundamental technologies.

For AIST, this partnership offers an excellent chance to put our leading edge knowledge and technologies in the plant biotechnology field into practice. Plant biotechnology is generally a difficult field in which to link leading edge research findings to commercial applications in Japan. In this partnership, however, we can perform large-scale empirical testing in the plantations of Indonesia and the research outcomes will be very clear, so this is a definite route to commercial application.

In this light, participants on all sides agreed that they had found excellent partners and had formed an ideal partnership, and the project has started smoothly.

The importance of natural rubber and the global market

Of the three partners, it was Bridgestone who devised the overall scenario for achieving practical application on the basis of AIST’s leading edge plant biotechnology. AIST is principally responsible for the basic technologies, while BPPT and Bridgestone share



Collecting latex (rubber)



A rubber tree nursery

responsibility for the development of applied technologies and practical testing in the plantations.

So why is improving the productivity of natural rubber a matter of urgency? For the background, Bridgestone’s central laboratory director Koichi Morita describes a pressing situation: “There is no synthetic rubber that exceeds the strength of natural rubber, so reliable supplies of natural rubber are very important for the automobile industry and the tire industry. However, cultivation of the source, the Pará rubber tree, is limited to tropical regions, and about 90% of the natural rubber that is used in the world is produced in Southeast Asia. With the spread of motorization in the BRICS countries (Brazil, Russia, India, China and South Africa), the consumption of natural rubber is rapidly increasing. However, there are not large areas of arable land to spare in Southeast Asia. With the situation progressively getting more difficult, it is important for us to introduce leading edge biotechnology and reliably improve productivity if we are to maintain the balance of supply and demand.”

In Bridgestone’s scenario, the fruits of the research will not be limited to application in its own plantations but will be widely deployed on rubber plantations in Indonesia, with BPPT acting as a base.

Molecular breeding technology as the key to improving productivity

Rubber trees can be harvested from about five years after planting, and growing trials of around 20 years are needed to really see whether productivity is good or bad. Therefore, to achieve an improvement in productivity by classical breeding with cross-fertilisation takes very many months and years. The key to reducing this

timeframe is molecular breeding technology.

In July 2012, in collaboration with the National Institute of Genetics and Illumina, Inc., Bridgestone succeeded in decoding the Pará rubber tree's genome. Using this genome information, AIST aims to make progress in establishing genetic analysis and modification technologies, to establish cultivar selection technologies, and to develop superior cultivars.

Leader Kaoru Suzuki describes the technologies to be used: "Our greatest competence is in research into transcription factors that promote and suppress gene expression, that is to say, controlling acceleration and braking. Our research previously was focused on promotion but AIST has turned its attention to suppression technology and independently developed the CRES-T process. With this process, we can suppress similar transcription factors in a single plant all at once, and we can obtain very clear results in a short time. Using this technology, we will first work on developing and regulating useful genes. Then, to utilize the useful genes we will need genetic modification technologies for Pará rubber trees. I think this research will require perseverance but it will play a very important role. By using genetic modification technologies, we hope to increase productivity rapidly." From genetic analysis to empirical demonstration, the research will take long periods, so nurturing the young researchers who will carry this project on into the next generation is an important part of the mission. If we can get good results in terms of commercial application, we hope that young people will be motivated and that there will be a great wave of new enthusiasm for the field of botanical science.

Commercial application is what earns scientists recognition

We asked unit leader Norie Watanabe what the key to success in international partnerships is.



Director,
Biomedical Research Institute, AIST

Yoshihiro Ohmiya



Leader,
Plant Gene Regulation Research Group,
Bioproduction Research Institute, AIST

Kaoru Suzuki



Director,
Central Laboratory, Bridgestone Corporation

Koichi Morita



Unit Leader,
NR R&D Unit 2, NR R&D Division,
Central Laboratory, Bridgestone Corporation

Norie Watanabe

"I have worked on a number of partnerships. In international partnerships, the most important thing is to build relationships of trust between individuals. When partners share the same goals and visions, they feel secure and they can exchange detailed information. Over the past 12 years, I have visited Indonesia every year for collaborative research with BPPT. Many researchers have studied in Japan, are very enthusiastic about Japan and frequently communicate in Japanese in meetings, telephone conversations, e-mails, etc. We have been able to achieve successes in research on the basis of friendly relationships. Trust will be further strengthened by this three-way partnership, and I am hopeful that this will contribute to development in both Japan and Indonesia."

The project also contains the possibility of future application in different kinds of research relating to botanical resources.

Director Yoshihiro Ohmiya emphasizes that the project is important for the future of AIST: "How well we play our role in this marvellous scenario and whether this partnership can return the benefits of research to humanity are critical questions. This is really the science that will make the future, and it can be said that work that produces results is work that scientists will be recognized for. I think we should cultivate this research for the long term and make it one of AIST's assets. I think that AIST will be a major base for botanical research and lay the foundations for plant biotechnology that is relevant to industry."

Through achieving minor goals one by one over a long period, this partnership is on its way to major successes.

Open Innovation

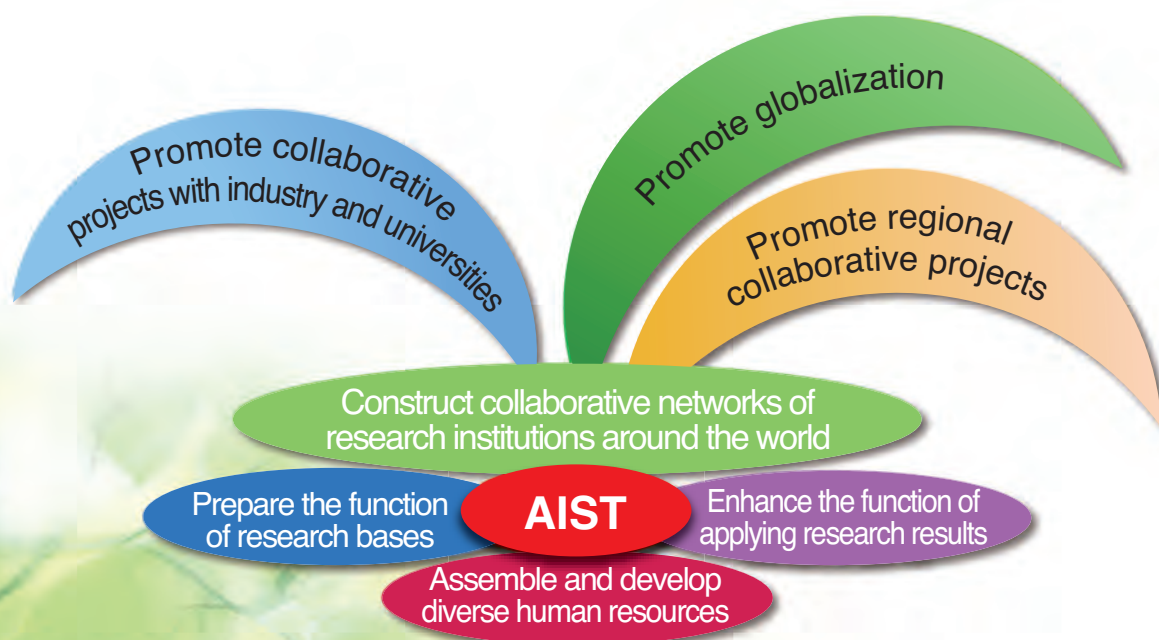
Promotion of Open Innovation

To achieve a sustainable society, it is essential to solve 21st century issues, such as energy, environmental and aging issues. To this end, innovation to create new social and economic values which is driven by promoting research and development through collaboration among diverse and various players, domestic and overseas, that is, open innovation, is indispensable.

With this background, to serve as a hub for open innovation, we will assemble diverse human resources and organizations at AIST and carry out research and development effectively using a collaborative network of research institutions around the world. We will continue to accumulate research results, prepare advanced infrastructure and develop human resources, and will reinforce the research support system for industrialization from a mid- to long-term perspective.

AIST is actively working on the following seven priority issues to fully serve as the open innovation hub:

1. Promote collaborative projects with industry and universities.
2. Prepare the function of research bases.
3. Enhance the function of applying research results.
4. Assemble and develop diverse human resources.
5. Promote globalization.
6. Promote regional collaborative projects.
7. Construct collaborative networks of research institutions around the world.

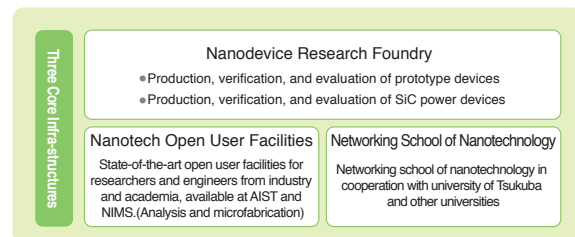
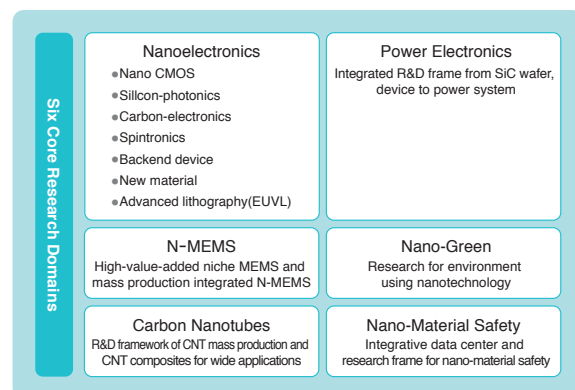


Tsukuba Innovation Arena

Creation of a world-class nanotechnology research and education base

The Tsukuba Innovation Arena for Nanotechnology (TIA-nano) is working to create a world-class nanotechnology research and education complex in Tsukuba where world-class nanotechnology research facilities and human resources are gathered. The National Institute for Materials Science, the University of Tsukuba, and AIST play central roles, with the participation of industry and with support from the Ministry of Economy, Trade and Industry, the Cabinet Office and the Ministry of Education, Culture, Sports, Science and Technology. In FY2011, a full-scale operation of TIA-nano supported by the organizations involved began, with the development of the Nano-Green Research Platform at the National Institute for Materials Science and the establishment of the TIA Graduate School Consortium by the University of Tsukuba and the organizations involved.

We have accelerated collaboration with industry. For example, we have started international collaborative research with the EUVL Infrastructure Development Center, have loaned equipment to companies involved in collaborative research in the power electronics complex to start small volume production, and provided CNT samples produced in the test production plant to companies that develop CNT applications.



Robot Safety Center (AIST Tsukuba)

In Japan, with the rapidly aging population and the rapidly declining birth rate, there is a concern that we may not be able to provide adequate support to elderly people. Robotics technology has made its way into not only the industrial sector but also aspects of our living, such as nursing care, welfare work and household chores, in the form of service robots, and is highly expected to be a technology to support the aging society with a declining birth rate. Service robots are required to work for many and unspecified people in environments with changing conditions and situations.

However, until now, there have been no standards for the safety against people and no established test methods for evaluating compliance with standards. There have been no certification authorities, either.

In the “Project for practical application of service robots” (NEDO), the Robot Safety Center serves as the center for international standardization for the safety of service robots and development of test and certification methods.



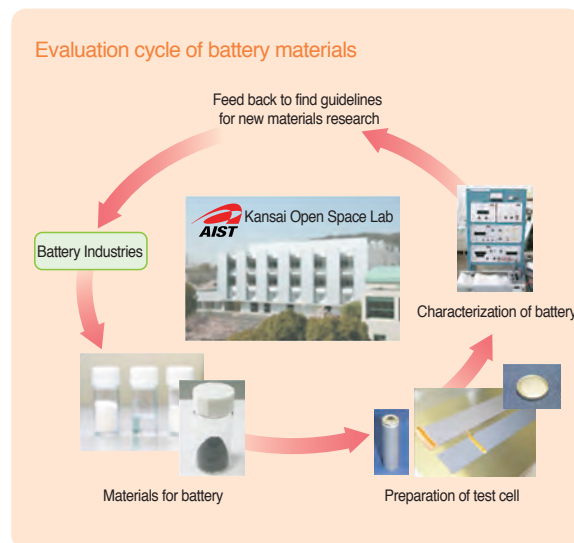
Exterior view of the Robot Safety Center

Battery Research Center (AIST Kansai)

AIST Kansai is developing technology for common evaluation and analysis of new materials for secondary battery components. By establishing common evaluation methods, we will reduce the time for coordination between battery manufacturers and material suppliers and the development time of high-performance secondary batteries.

● Achievements

- Developed research infrastructure in the Lithium Ion Battery Technology and Evaluation Center (LIBTEC), such as equipment for the test fabrication and evaluation of batteries
- Enhanced industry-academia-government collaboration and collaboration with different fields, such as nanotechnology, through the Li-ion and Excellent Advanced Battery Development project and the Research and Development Initiative for Scientific Innovation of New Generation Batteries project



Photovoltaic Device Research Center (AIST Tsukuba and AIST Kyushu)

We have undertaken activities to promote the widespread dissemination of highly efficient and low-cost next-generation photovoltaic systems toward strengthening the base of Japanese photovoltaic industry. For example, we have started the Phase II of the “Consortium Study on Fabrication and Characterization of Solar Cell Modules with Long Life and High Reliability” with 78 participating organizations in FY2011 as a three year project.

● AIST Tsukuba

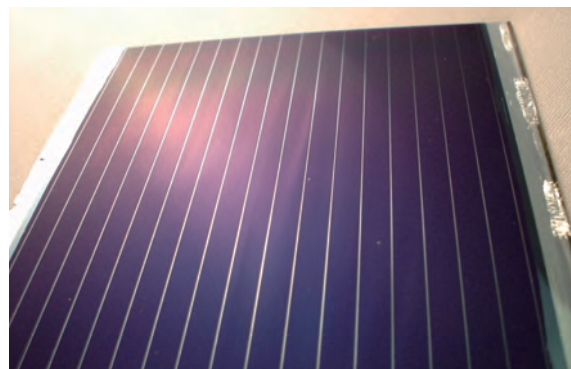
- Research and development of various photovoltaic materials, solar cell devices, and calibration methods toward significant improvement of their photovoltaic efficiency

● AIST Kyushu

- Development of new photovoltaic module components and reliability test methods to ensure the quality, reliability and extended lifetime of photovoltaic systems



Field evaluation facilities of solar cells at AIST Kyushu



Highly efficient CIGS photovoltaic sub-module

Participation in Technology Research Associations

In technology research associations each member provides researchers, research funds and equipment in order to jointly research and develop technologies used in individual activities. As a member, AIST leads in some associations through planning and implementation of research projects or utilization of their results. AIST will contribute to the promotion of open innovation, particularly by making its people and organization available for association activities and thereby serving as a center for innovation and creation where different organizations and individuals interact with each other and their knowledge is shared through association activities.

People from AIST have participated in association activities as researchers, project leaders and directors. AIST defines itself as a place where researchers from the member industries and universities conduct research intensively, and makes its facilities and equipment available to them.

● Association participation (FY2011)

- AIST joined 17 associations
(Total number of members: 248 companies, 35 organizations, 9 universities)
- 12 associations conducted intensive research at AIST
- AIST researchers played the role of project leaders for 6 associations and took on the responsibility for

AIST participating Technology Research Associations (March 31, 2012)

Technology Research Association	
1	Stereo Fabric Research Association (SFRA)
2	Photovoltaic Power Generation Technology Research Association (PVTEC)
3	Bio Electro-mechanical Autonomous Nano Systems Laboratory Technology Research Association (BEANS)
4	Lithium Ion Battery Technology and Evaluation Center (LIBTEC)
5	Fuel Cell Cutting-Edge Center Technology Research Association (FC-Cubic)
6	Advanced Laser and Process Technology Research Association (ALPROT)
7	R&D Partnership for Future Power Electronics Technology (FUPET)
8	Technology Research Association for Single Wall Carbon Nanotubes (TASC)
9	Epigenomics Technology Research Association
10	International Standard Innovation Technology Research Association (IS-INOTEK)
11	Stem Cell Evaluation Technology Research Association
12	Photonics Electronics Technology Research Association (PETRA)
13	Chemical Materials Evaluation and Research Base (CEREBA)
14	Advanced Printed Electronics Technology Research Association (JAPEREA)
15	Technology Research Association for Next-generation Natural Products Chemistry
16	NMEMS Technology Research Organization Technology Research Association (NMEMS)
17	Control System Security Center (CSSC)

general project management

- AIST's staff worked as directors or executive directors for 13 associations
- AIST provided technical guidance and support and know-how on the use of equipment to loaned researchers from member companies

● An example of a technology research association AIST Tokyo Waterfront

Research Association for **Next-generation Natural Products Chemistry** (established on April 21, 2011)

Number of members: 8 companies and 2 organizations
(Astellas Pharma Inc., OP BIO Factory Co., Godo Shusei Ltd., Shionogi & Co., Ltd., Daiichi Sankyo RD Novare Co., Ltd., Nippon Boehringer Ingelheim Co., Ltd., MicroBiopharm Japan Co., Ltd., Meiji Seika Pharma Co., Ltd., Japan Biological Informatics Consortium, AIST)

The purpose of this association is to implement projects to improve the technological level of the members and achieve commercialization by conducting the NEDO project "Development of Technology for Stable Production of Useful Natural Compounds" and research on the commercialization of a natural compound library through its shared use. An AIST researcher plays the role of the project leader. AIST has developed a natural product library to gather the natural products of the members at AIST Tokyo Waterfront and contributed to the shared use of the library by the members.



Development of technology for stable production of useful natural compounds



Application of the natural product library to the screening



Utilization of Research Platforms and Promotion of Personnel Interchanges for Industry-Academia-Government Partnerships

AIST is active in accepting visiting researchers through implementation of joint researches, participation in technology research associations and so on. In addition, AIST implements commissioned researches; provides technology training and technical consultations; performs commissioned tests; provides research samples; and thereby contributes to the research and development of private business corporations.

Active in the acceptance of visiting researchers

● Acceptance of visiting researchers in joint researches

Number of researchers accepted in FY2011: 1,699
AIST is active in accepting researchers from joint research partners to effectively perform joint research projects using its state-of-the-art equipment and facilities.

● Implementation of researcher transfer-type joint researches

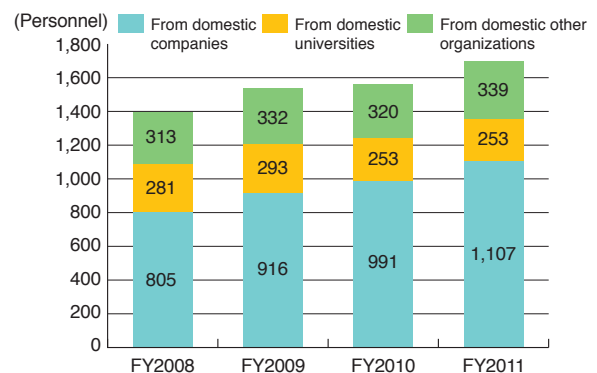
Number of projects implemented in FY2011: 15 (32 researchers were temporarily transferred to AIST)
Joint research partners temporarily transfer their researchers to AIST (the partners pay personnel costs as research funds) to accelerate both their and our R&D by extensively using platforms and human resources of AIST.

● Examples of activities of visiting researchers

AIST and visiting researchers work together on a variety of research topics.

- Production of genetically modified strawberries that produce dog interferon α for drugs for animals using a completely sealed plant factory
- Research for a low-carbon society to commercialize ultra-high-voltage SiC power semiconductors

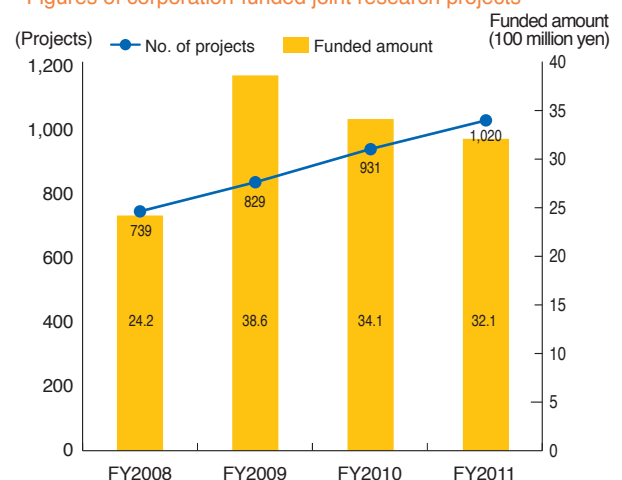
Acceptance of visiting researchers in joint researches



Number of joint research projects

Joint research is a program in which AIST performs research and development in collaboration with companies, universities and/or public testing and research organizations with common objectives and goals that cannot be achieved by each party alone. In implementing joint researches, AIST is active in providing its platforms and accepting people from industry, academia and government to enhance collaboration.

Figures of corporation-funded joint research projects



Promotion of International Standardization

AIST, being a public research institution as well as the national metrology institute, is committed to the standardization as its research outcome.

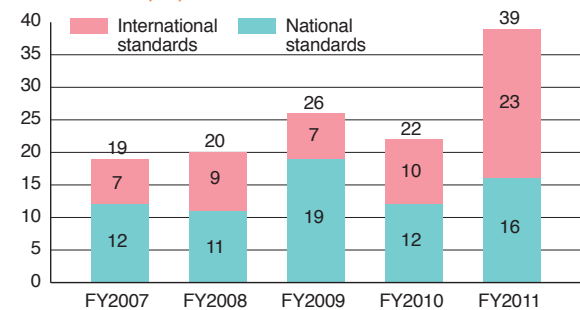
Standards under development are, for example, for the measurement method of biomass ratio in bio-plastic products, test method for the performance of photocatalysts, and location and positioning information for robots. We proposed 39 national and international standards in total in FY2011, including JIS for the determination of thermal diffusivity of fine ceramic thin films.

We also encourage participation in the international meetings to promote standardization. 47 researchers are cooperating with the standardization process as chairperson, convenor or secretary in the ISO/IEC or the international forum. We held the Symposium of International Standards Promotion Strategy twice, in August 2011 and in August 2012, to disseminate the importance of standardization and certification among industry, academia, and government.



Symposium of International Standards Promotion Strategy in August 2012

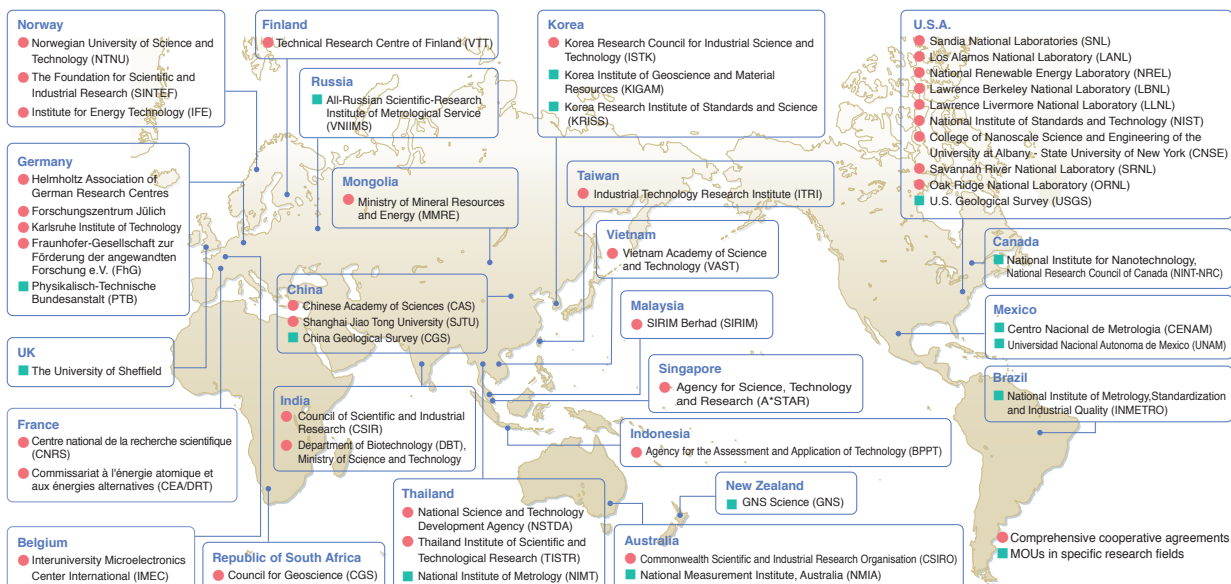
The number of proposed standards



Collaboration with Overseas Research Institutions

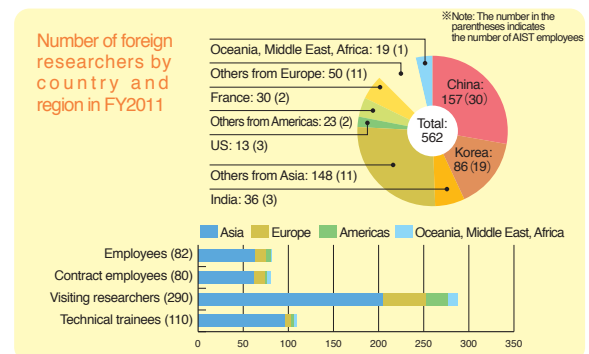
We will promote research and development of environmental and energy technologies, nanotechnology, etc. internationally to achieve a low-carbon society, which is a global issue. We have in particular been promoting international collaborations with emerging Asian countries; these include personnel exchanges both in Japan and abroad, such as at the Commonwealth Scientific and

Industrial Research Organisation-AIST Workshop, the Biomass-Asia Workshop with the Vietnamese Academy of Science and Technology, and the Japan-India Science and Technology Symposium. In FY2011, we concluded memoranda of understanding on comprehensive research cooperation with seven organizations.



Acceptance of Foreign Researchers

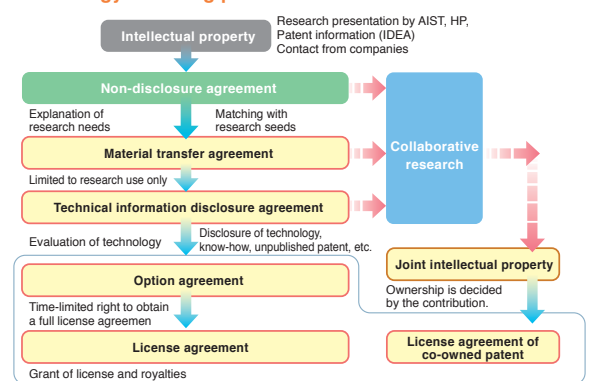
Talented foreign researchers with a global perspective are essential in promoting AIST's researches, and are of vital importance in expanding our research strategies internationally. In FY2011, we accepted a total of 562 foreign researchers, of which around 3/4 of whom were from Asian countries. We play a leadership role in Asia, and collaborate closely with Asian countries. We aim to make AIST a hub for researchers from around the world to meet and share information.



Technology Transfer Activities

It is our key mission to disseminate our research results in society and contribute to economic and industrial development. To achieve the mission, we acquire intellectual property rights, and maintain and manage them in an appropriate manner to achieve technology transfer, and strongly promote technology transfer based on intellectual property.

Technology licensing process at AIST



Technical Consultation

Technical consultation is a program in which AIST provides consultation to companies, universities and public testing and research organizations based on AIST's technological potential developed over the years. When we are consulted on a technological issue, technological advisors, innovation coordinators and research scientists work together to provide an appropriate answer.

● Example of consultation

Topic of consultation ▶ Consultation on technical points to ensure reproducibility in the development of a highly integrated sensor device based on a geometric method

Action ▶ Advice was provided on the importance of the surface condition of the substrate used to fabricate the device as well as on a method to clean it. Discussion was held with researchers and led to the decision to perform joint research on a substrate that allows easy control of the fabrication parameters.

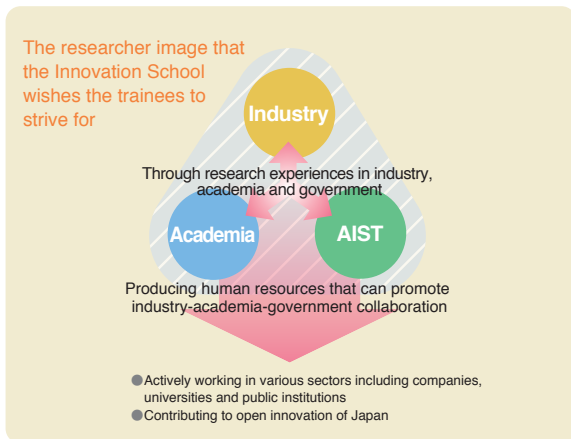
Number of technical consultations



Innovation School

Activities of AIST Innovation School

In FY2008, AIST opened the Innovation School and since then has been training postdoctoral researchers and PhD students for their carrier development and the promotion of industry-academia-government collaboration by giving them various lectures and On-the-Job Training (OJT) in private companies (industry) and AIST (public institution). In FY2011, we accepted 22 postdoctoral researchers and 10 PhD students, and strove to broaden their horizons and reform their way of thinking through a unique curriculum.



Curriculum of the Innovation School

We provide the trainees lectures by research directors and corporate managers from industry, and by specialists from academia and government including AIST. The curriculum contains subjects essential to promote researchers' carrier development, such as research methods, research management, communication-presentation skills, intellectual property, and global problems (energy, environment, standards, geo-hazards, etc.). We also provide OJT under the direction of research supervisors at AIST and a few month-long OJT at private companies.



A graduate of the Innovation School presenting in a poster session at a symposium

Effects of the Innovation School

Trainees' voices after the completion of the school curriculum

Trainees learned that there were a variety of job opportunities for PhD graduates, and had changed their way of thinking and significantly broadened their horizons, such as:

"My research approach works in a corporate environment better than expected."

"I successfully completed corporate OJT, and this gave me great confidence."

"The most important is to be aware that we work in an organization."

"It is necessary to have mutual understanding and establish communication with people who have their specific, different fields of specialty and expertise."

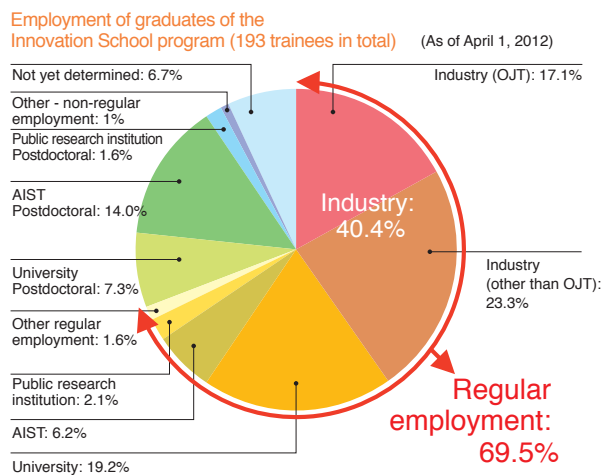
Opinions of private companies which provided OJT

The companies highly rated the research capability and work attitude of the trainees, such as:

"We have gained technical knowledge from them"

"They inspired our employees of their generation."

Since the opening of the School, 193 trainees have completed the school curriculum. They have found their new potential and now work in various sectors, such as industry, academia, and public institution.



Bioinformatics Training Programs

Bioinformatics is a multidisciplinary field integrating life and computer sciences, which provides indispensable techniques for molecular biology including drug discovery. We have launched programs for bioinformatics training, to activate the life sciences by fostering human resources in bioinformatics.

- Bioinformatics Training Consortium (membership system with dues)
 - Two courses, “bioinformatics” and “pharmacoinformatics,” were set up
 - Both e-learning and hands-on training of 6 – 8 days were arranged
 - Number of participants: total number of regular and associate members was 180
 - In FY2011, victims of the Great East Japan Earthquake could take the courses free of charge
- High Performance Computing Infrastructure (HPCI) Training Program
 - This is a human resource training program for

practical use of the next-generation super computers, which consists of a series of seminars of graduate school level (a total of 401 participants in 12 seminars), workshops for the general public (125 participants), and lectures with hands-on training for NGS data analysis (33 participants).

Screenshot of an e-learning system



A high performance and convenient system has been introduced to support the training; for example, the slides on the right are switched, synchronized with the progress of the lecture video in the left corner.

Kumikomi Tekijuku A training program for system architects

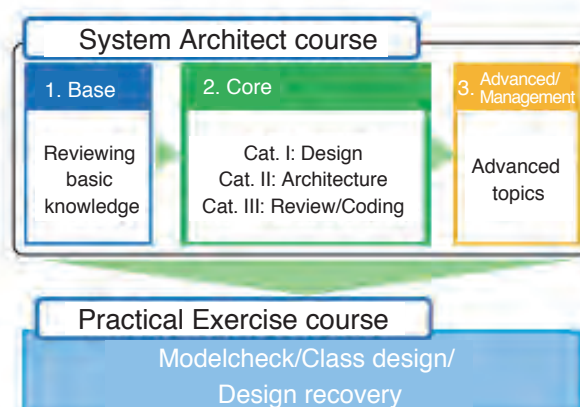
Nowadays softwares embedded into cars, appliances, and other products have become huge and complex. It indicates that the people who develop embedded softwares are required to have sophisticated skills. Based on this situation, AIST established the Collaborative Research Team for Verification and Specification (CVS). Since then, CVS has been holding a training program, Kumikomi Tekijuku, aiming to foster system architects who lead embedded software development from technical aspects on site. This program is organized in collaboration with the Embedded System Industry Promotion Organization (ESIP).

【Activity】

- Designing a systematic and practical curriculum for Kumikomi Tekijuku. This task is done through collaboration among industry, academia, and AIST. Subjects in the curriculum are structured based on software engineering. Focuses of the curriculum are on architectures and design specific to embedded softwares, and on knowledge to tackle actual problems in embedded software development.

- Offering quality lectures by excellent lecturers from industry, academia, and public institutes, Kumikomi Tekijuku also offers a place of friendly competition. It is cosponsored by AIST Kansai and ESIP for effective operation.

Around 100 engineers have finished Kumikomi Tekijuku in the last 5 years. Now, many of them are taking active parts in the field of embedded software development and are giving positive contributions to form a community of embedded system engineers in the Kansai area.



Technology Training

Technology training is a program in which AIST accepts researchers, engineers and students from companies, universities and public testing and research institutions for a given period of time and provides them opportunity to learn about technologies of their interest under the guidance of AIST researchers. In FY2011, 1,325 people participated in this program.

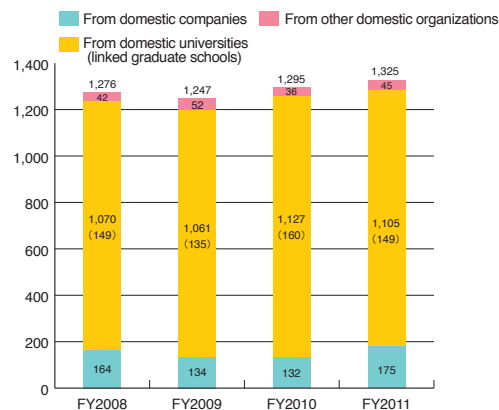
● Training program in conjunction with the system of linked graduate school

AIST researchers are appointed as visiting professors or visiting associate professors of linked graduate schools and guide graduate students in research at AIST. They also provide lectures at graduate schools.

● Intern program

AIST provides short-term technology training primarily to university students.

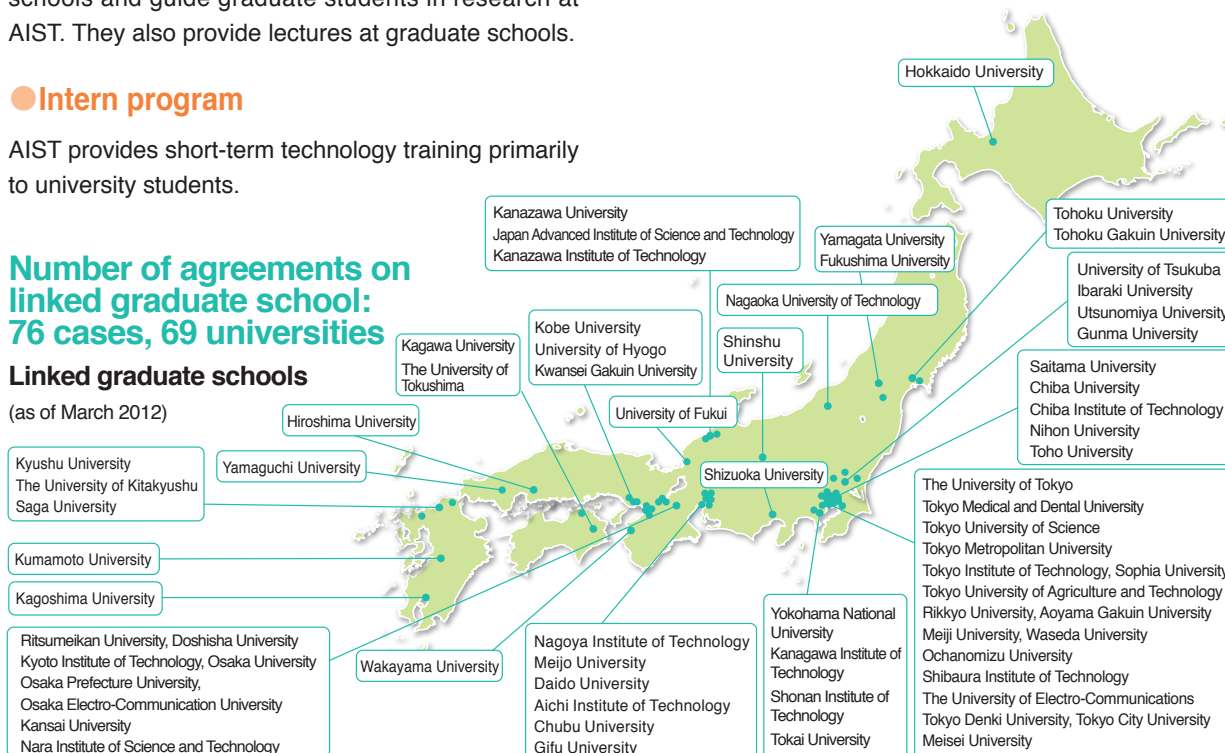
Number of acceptance of technology training



Number of agreements on linked graduate school: 76 cases, 69 universities

Linked graduate schools

(as of March 2012)



● Comments of trainees

● “I had learned fabrication and evaluation methods from literature and patents and had a certain understanding of the procedure. But when I did an exercise, I learned that there were important points I had not known throughout the methods. I would like to take another technology training to learn about required technologies when I work on a new topic in my company.”
(Company)

● “I was satisfied that I was able to conduct research using a particular technique of electron microscopy.”
(Public testing and research institution)

● “I was able to participate in cutting-edge research. I felt that guidance from many AIST’s researchers had significantly broadened my insights.”
(University)

Labor Practices

Occupational Safety and Health Activities Employee safety and health is our top priority

Under the Environmental Safety Charter “Improvement of Occupational Safety and Health,” we have been working to create a work environment where everyone at AIST can work safely and in good health, with the top priority given to the improvement of occupational safety and health.

Occupational Safety and Health Meeting and Site Meeting

The Occupational Safety and Health Meetings are held at each site every month with the participation of management and labor representatives to discuss occupational safety and health issues. The Site Meeting, which is composed of representatives from the units of the site, is held every month to discuss the results of the discussion at the Occupational Safety and Health Meeting and other occupational safety and health issues. The results of the meetings are communicated to all employees through meetings of units.

Safety guidelines

AIST has safety guidelines in place that set forth the code of conduct on safe handling of hazardous chemicals and high-pressure gases under the Environmental Safety Charter. These guidelines provide the basis for safety education for employees and experimental activities, and are reviewed and revised annually. Paragraphs on the handling of substances subject to the guideline for the carcinogenicity and designated drugs were added to the codes on hazardous chemicals of the safety guidelines in the FY2011 revision.

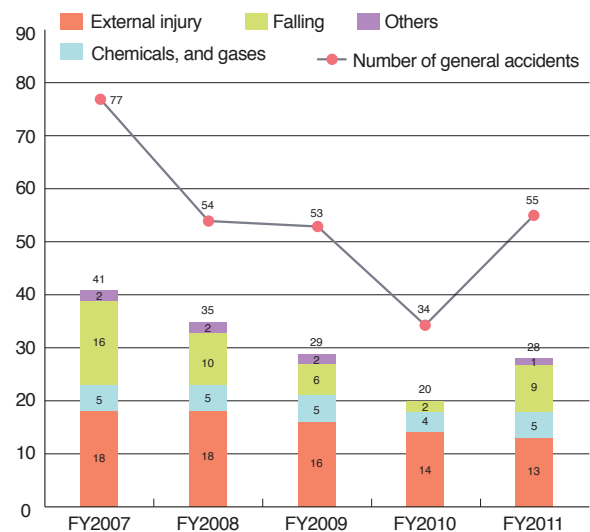
Prevention of occurrence and recurrence of accidents

If an occupational accident occurs, we will investigate and analyze the cause of the accident; stop the work until corrective action to prevent recurrence is taken; and communicate information on the accident to all employees to prevent similar accidents. Every morning, we hold the Safety Management Report Meeting by connecting the AIST research bases across the country with the video conference system. The research bases and units report on accidents, “hiyari-hatto” (near-accidents), health issues, etc. that have occurred during 24 hours from morning to morning and exchange information with each other to horizontally deploy

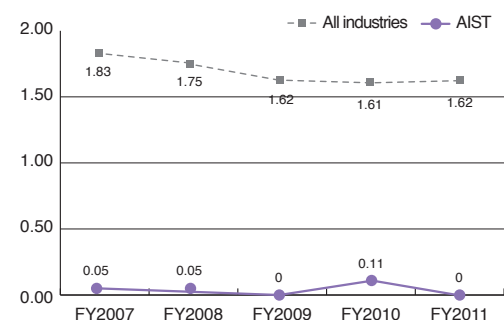
measures to prevent recurrence of similar accidents and improve occupational safety and health.

The number of accidents at AIST increased in FY2011 from the previous year. However, the number of human injury accidents caused by experiments was as low as in the previous year. No serious accidents occurred. External injuries, such as those during handling of glass equipment, and chemical exposures due to improper use of personal protective equipment accounted for most of the human injury accidents caused by experiments.

Number of general accidents and human injury accidents



Disabling injury frequency rate



Emergency response

We conduct emergency response drills to ensure prompt action in the event of an accident or other emergencies to prevent extended and serious damages of the accident. To provide means of communication with the regional bases in the event of an accident, we have a wireless telephone system in place in each research base across the country and conduct emergency reporting training using the system. We have reviewed and built emergency stock, including food, to respond to disasters such as earthquakes.



Firefighting training

Safety education and support to the acquisition of qualifications

To prevent accidents, we provide safety education programs and workshops to all levels of employees, including new employees and newly accepted researchers. Safety education after recruitment and a change in duties is managed by the intranet-based “Safety Education Management System,” allowing viewing of the record and description of programs taken. In FY2010, we introduced an e-learning system to provide part of the safety education on life science experiment to expand the learning opportunity. We hold courses for health officer’s license on industrial hygiene engineering and for operation chiefs of the work handling organic solvents, and thus are active in providing support to the acquisition of qualifications.

Main education and training programs and workshops provided in FY2011

Program	No. of Sessions	No. of Participants
Course for the health officer’s license on industrial hygiene engineering	2	56
Course for operation chiefs of the work handling organic solvents	1	32
Course for operation chiefs of the work handling specified chemical substances	1	31
Education and training on recombinant DNA experiment (e-learning participants)	1	260(426)
Education and training on animal experiment (e-learning participants)	1	123(185)
Education and training on life science experiment involving human ethics	1	116
Safe driving course	4	1,114
Joint radiation education and training [for personnel engaged in radiation work]	4	528
X-ray education and training [for personnel using X-rays]	101	331
Explanation of compliance with laws and regulations on radioactive materials [for managers and personnel using nuclear fuel material]	1	83

The number in the parentheses indicates the number of e-learning participants.

Support for Child Care and Nursing Care

AIST provides support programs for child care and nursing care in order to help the work life balance of employees. At AIST, flexible working styles are available such as a flex-time system, a discretionary work system, and a short-time work system for pre-school child care. Also, various leave and absence programs are available for child and nursing care. On the intranet, we have “Child and Nursing Care Plaza” to provide such information, and operate a bulletin board for exchange of information and opinion. As a result of our efforts to improve the work environment, there are no women researchers who have left AIST for reasons of birthing or child-raising since the establishment of AIST in 2001.

Number of users: leave and absence programs (FY2011)

	Male	Female
Parental leave for child sickness	97	159
Special parental leave	29	13
Parental absence	2	59
Nursing care leave	36	23
Nursing care absence	0	2

At three research bases of AIST, there are day care facilities for children where parents can temporarily leave their children. At other bases without such facilities, AIST provides private child day care or babysitting services for the employees.

Number of users: short-term child day care facilities (FY2011)

	Staff	Contract Staff
Petit Cherry (AIST Tsukuba)	819	762
Little Oak (AIST Chubu)	25	22
Petit Cherry (AIST Kansai)	178	81
Private child day care and babysitting services	15	0

● Users' comments

- My child often gets sick on the day when I have important work to do. Petit Cherry helped me a number of times in such emergencies. He has a nice time there, so he often says, 'I want to go to Petit Cherry today, too!' and makes me smile.
- “The child care services always provides a cozy and homelike atmosphere to all ages from one-year-old infants up to upper elementary school children. My child is cared for on the premises of my workplace, a very familiar environment for me, so I do not have to worry about my child while working.”

With the aging population, nursing care becomes increasingly important to both the institute and its employees. Since 2007, AIST has organized nursing care seminars to support the balance of career and nursing care. In order to make the seminars useful, we conducted a questionnaire survey on the employees' current situation and concerns on nursing care, and reflected the results in the discussions at the seminars. In FY2011, the focus was placed on long-distance nursing care and the nursing care insurance.

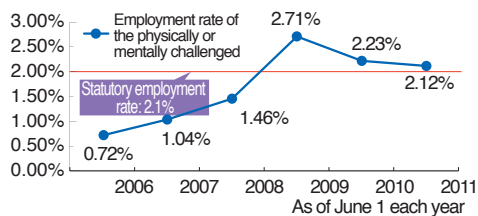


Scene from the nursing care seminar

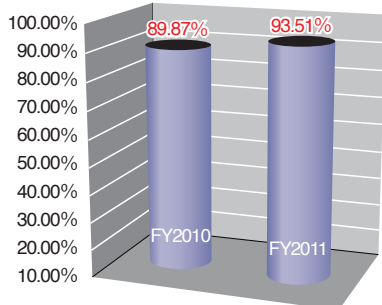
Activities to Promote Employment of the Physically or Mentally Challenged

AIST promotes employment of the physically or mentally challenged. The employment rate of the physically or mentally challenged exceeded the statutory employment rate of 2.1% in January 2009 and has since been above it (actual employment rate: 2.12% as of June 1, 2011). We have created a comfortable workspace for physically or mentally challenged employees and increased the employee retention rate (93.51% in FY2011).

Change in employment rate of the physically or mentally challenged



Employee retention rate of the physically or mentally challenged



We accept trainees for practical job training provided by special support schools and help them get a job by providing the opportunity to gain actual work experience and skills and develop a work attitude. We will continue to work together toward a harmonious society in which everyone can participate through their professions.



Practical job training of special support school students

Challenged Team activities

Mentally challenged people and people with learning difficulties work in the Challenged Team: 10 at AIST Tsukuba, 2 at AIST Chubu and 2 at AIST Kansai. They perform administrative assisting tasks, such as reusing office supplies, collecting used paper, shredding documents, producing business cards, and making copies of documents for distribution and putting them into an envelope; the tasks of changing the layout of and cleaning meeting rooms and sports facilities upon request; and environment improvement tasks, such as weeding the premises. Thus, they contribute to the creation of a pleasant workplace.

As part of AIST's project "Work Process Improvement by the Reuse of Office Supplies," they perform tasks, such as collecting and repairing tube files, producing and repairing envelopes for internal communication, and thus cooperate in the promotion of the reuse of office supplies.

In the annual open house events, the activities of the Challenged Team are presented. We hand out newspaper eco-bags and flower seedlings, demonstrate the eco-woodwork class using cut trees and display panels.



Newspaper eco-bag production (AIST Tsukuba)



Bike maintenance (AIST Tsukuba)



At the eco-woodwork class (production of a chair piece) in the open house event (AIST Kansai)



Venue set-up work (AIST Chubu)

Creation of a workplace environment friendly for the mentally and physically challenged

AIST strives to create an environment where mentally or physically challenged can work comfortably. We have a consultation desk in the Barrier-Free Promotion Office to provide consultation to mentally or physically challenged employees, as well as strive to have a Work and Life Counselor for the Mentally and Physically Challenged in each regional research bases. To support their long-term employment, we provide guidance on the improvement of work procedures and on how to improve the procedures, in collaboration with external organizations to support the employment of mentally or physically challenged.

After the Great East Japan Earthquake, we placed equal number of EVAC+CHAIRS (evacuation chairs to move downstairs) as the number of physically challenged employees for use in an emergency.



EVAC+CHAIR (an evacuation chair to move downstairs)



Emergency drill using EVAC+CHAIR (an evacuation chair to move downstairs)

Health Care Services

We provide mental and physical support to help individual employees fully display their ability and live a healthy professional life. We strive to detect and treat illness at an early stage through counseling with occupational health staff (health care guidance) based on the results of general medical examinations, special medical examinations and health screening, as well as medical questionnaires at medical examinations.

We also have activities to promote health and prevent illness by providing counseling to help quit smoking, hosting health support seminars and providing health information on the intranet. We have launched the website “Basics of Mental Health” to provide health information on the intranet.

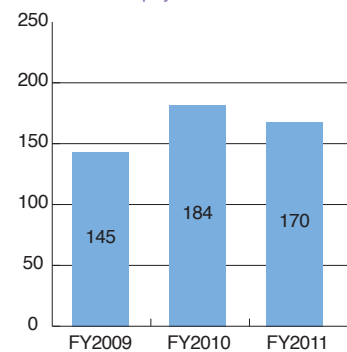
We have set our own criteria for the prevention of health disorders caused by overwork. We promote work-life balance by reducing overtime and holiday work, changing work hours, and encouraging employees to take annual leave, based on the Board of Directors’ decision of June 10, 2010, “promotion of

reduction of work hours and cost through the fundamental improvement of work processes: toward a research institution that enables employees to achieve work-life balance and work comfortably to create innovation.”

Note: Eligibility criteria for those who seek counseling

- Research work
Those who have worked overtime for more than 80 hours per month in a row for three months
- Research-related and administrative work
Those who have worked overtime for more than 45 hours per month in a row for three months
- Those who have worked overtime for more than 100 hours in a month

Number of interview sessions with industrial physician



Mental Health Care

With a focus on primary (prevention of mental health disorders), secondary (early detection and treatment) and tertiary (support to return to work and recurrence prevention) prevention, we provide four mental health care programs in an integrated manner in accordance with the Guidelines for Mental Health Care in the Workplace for Workers (2006 Ministry of Health, Labour and Welfare guidelines): Self-Care, Line-Based Care, Internal Industrial Health Care Staff-Based Care, and External Resource-Based Care. With a focus on Self-Care among the four care programs, we held the health support seminar “Self-Management: Deepen Self-Understanding from Egogram to Help Interpersonal Relationships.”

To help manage stress caused by anxiety and fear of an earthquake and radiation resulting from the Great East Japan Earthquake, we held the health support seminar “Individual Stress Management and Risk Management in the Workplace: How to Continue to Manage Anxiety of an Earthquake and Radiation and Stress Caused by the Anxiety.”

Mental health care activities in FY2011

Major Activity	No. of Sessions	No. of Participants
Interview by industrial physician	All year round	797
Counseling	All year round	188
Over-the-phone counseling	All year round	11
EAP (counseling with external specialized institutions: telephone, email, interview)	All year round	61
Health support seminar: “How to continue to manage anxiety of an earthquake and radiation and stress caused by the anxiety”	1	82
Health support seminar: “Self-management”	1	242
Workshop (hosted by Human Resource Development Planning Office) : New employee training: “Mental health”	1	80
Training for the evaluator of individuals (hosted by Human Affairs Office): Management of stress on staff required for the evaluator	14	481

Fair Operating Practices

Implementation of Conflict of Interest Management

If, in performing their duties, staff members of AIST are deemed to give precedence to their personal interests or external activities, regardless of whether or not it is true, people may doubt the integrity of researchers or suspect that there is a bias in research results, and research and industry-academia-government collaboration activities at AIST will be compromised. We have formulated regulations for the implementation of conflict of interest management and implemented the management in cases where staff had personal interests in companies participating in industry-academia-government collaboration activities. In FY2011, we implemented self-reporting of conflict of

interest twice (the first half; August, the second half: February) on the staff. Reports were received from 3,168 staff members in the first half and from 3,150 staff members in the second half, and eight staff members who might have a conflict of interest were interviewed by an external conflict of interest counselor. The results of the interviews identified no conflict of interest issues. However, we called attention to conflict of interest from those with personal interests in the companies involved to prevent them from getting involved in a conflict of interest.

Information Security

Information security training is provided on an ongoing basis for all AIST network users to deepen their understanding of the information security policy and follow the policy properly with awareness and responsibility.

Information security training

To maintain and increase awareness of information security, we have made it mandatory for all AIST network users as well as new staff members to take information security training more than once a year. In FY2011, we worked to increase the percentage of those who take web-based training.

Number of participants in information security training

	FY2008	FY2009	FY2010	FY2011
Group training	1,033 (22 sessions)	1,178 (22 sessions)	1,857 (22 sessions)	329 (3 sessions)
Web-based training	248	344	4,432	5,745
CD-ROM-based training	15	37	(Abolished in FY 2010)	—
Face-to-face training in units	51	50	112	85
Total no. of participants	1,347	1,609	6,401	6,159

Implementation of self-checks

Both training and self-checks are important to ensure AIST's information security. Self-checks of information security measures and personal information protection are implemented in an integrated manner. In FY2011, we set a self-check period and requested, via the information managers, all network users to conduct a self-check. As a result, the self-check rate dramatically increased from slightly less than 10% in the previous fiscal year to 93%. Thus, the self-check further increased awareness of information security, including handling of personal information.

Implementation of an information security audit

An information security audit of research units is performed to determine whether the information system is properly operated and maintained in accordance with the information security policy. In FY2011, we performed a security audit of 31 units and an audit of three units on improvements in the issues identified in the previous fiscal year, and strengthened information security at AIST as a whole based on a PDCA cycle. We will perform a security audit and a security check audit systematically from the coming fiscal year onward.

Support of the Development of an Export Control System at Universities

Export control is a very important scheme to maintain the peace and safety of the international community. More specifically, to prevent proliferation of weapons of mass destruction and excessive stockpiling of conventional weapons, export control is put on arms exports, as well as on export and provision of goods and technologies that could be used for the development and production of weapons. Because of this, strict export control is required for companies and organizations that may have a relationship with overseas counterparts.

Since its establishment in 2001, AIST has developed a strict security export control program ahead of other research institutions and universities. We have provided export control training to AIST researchers, performed internal audits, and have reviewed goods and technologies as well as transactions to determine their subjectivity to export control.

Universities too are required to have such an export control system in place, but programs which are suitably sufficient have yet to be created. Appropriate export control at universities is a concern to AIST with a growing number of collaborative research projects and personal exchanges being conducted with universities. We held presentation meetings at AIST regional research bases and visited local universities to give an explanation of our export control activities, and to learn about and provide advice on their own activities in this area.

In FY2011, we were requested by the Ministry of Economy, Trade and Industry to report on the experiences of AIST as an organization which has implemented export control, at a presentation for universities, in addition to the usual explanation concerning the export control law. We explained examples of our export control activities at presentation meetings hosted by the Ministry at seven locations across the country, including AIST regional research bases. More than 250 people from a total of 130 universities and research institutions participated in the meetings. We received positive response from the participants. It is expected that the export control activities of universities will be improved.



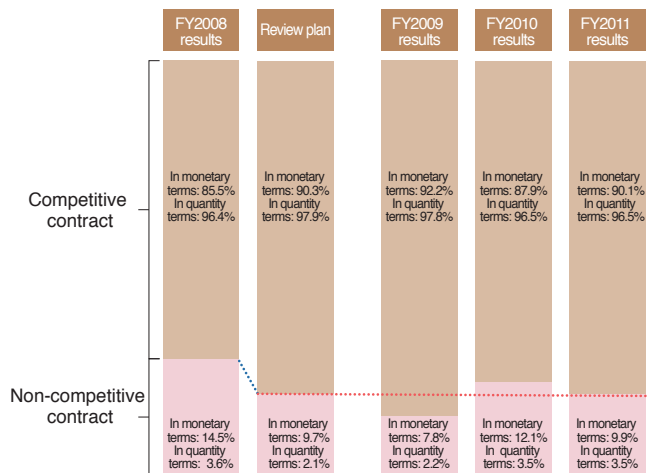
Presentation meeting at AIST Kansai

● Comments from participants (excerpt)

- “Specific examples made it easier to understand export control in relation to the law explained at the beginning. The presentation was very informative.”
- “AIST’s examples were informative. The questions and answers were more specific and instructive.”
- “I want to review the administrative practice at our university.”
- “I hadn’t had much chance to learn about export control, and found the detailed explanations highly informative.”

Appropriate Procurement

We award contracts based on general competitive bidding or open competition for planning, except for truly unavoidable negotiated contracts. In April 2008, in a review of negotiated contracts based on the Consolidation and Rationalization Plan for Incorporated Administrative Agencies, we changed the maximum base amount for negotiated contracts to that of the government and formulated the Negotiated-Contract Review Plan. As a result, in FY2011, the share of non-competitive negotiated contracts in contracts exceeding the base amount was 9.9% in monetary terms and 3.5% in quantity terms. These figures are slightly higher than the targets set in the Negotiated-Contract Review Plan. One of the possible reasons for this is that multiple emergency procurement contracts (repair projects, etc.) occurred due to the Great East Japan Earthquake.



Note: The contracts in FY2008 were examined and reviewed, and the Negotiated-Contract Review Plan was made public in April 2010.

Introduction of Competitive Bid-based Procurement

According to the Cabinet Office's decision of July 15, 2011 on the "Basic Policy for Public Service Reform, Etc.," we considered a three-year comprehensive contract for eight facility maintenance and related services for AIST Tsukuba (maintenance work for the Geological Museum, guide services and maintenance work for Science Square Tsukuba, plant maintenance work, comprehensive building operation work (accommodation facility management) for the Research Cooperation Center, facility maintenance work,

automobile maintenance work, security services, cleaning work for buildings, and additional general management services.

Consequently, we set procedures for competitive bidding for private sector contracts and presented them to the Bidding Management Committee for review. A government procurement procedure was implemented and the AIST Tsukuba Facility Management Services Consortium was selected for the contract based on a comprehensive evaluation method.

Community Involvement

Creation of Regional Innovation

Economic growth based on regional innovation is required to stop the shrinking and to achieve sustainable growth of the local economy. AIST is a public research institution that conducts research and development in a wide variety of fields and has research and collaborative bases in different regions. Using these regional research bases, we can contribute to various regional innovations in places near businesses.

● Development of collaboration for open innovation

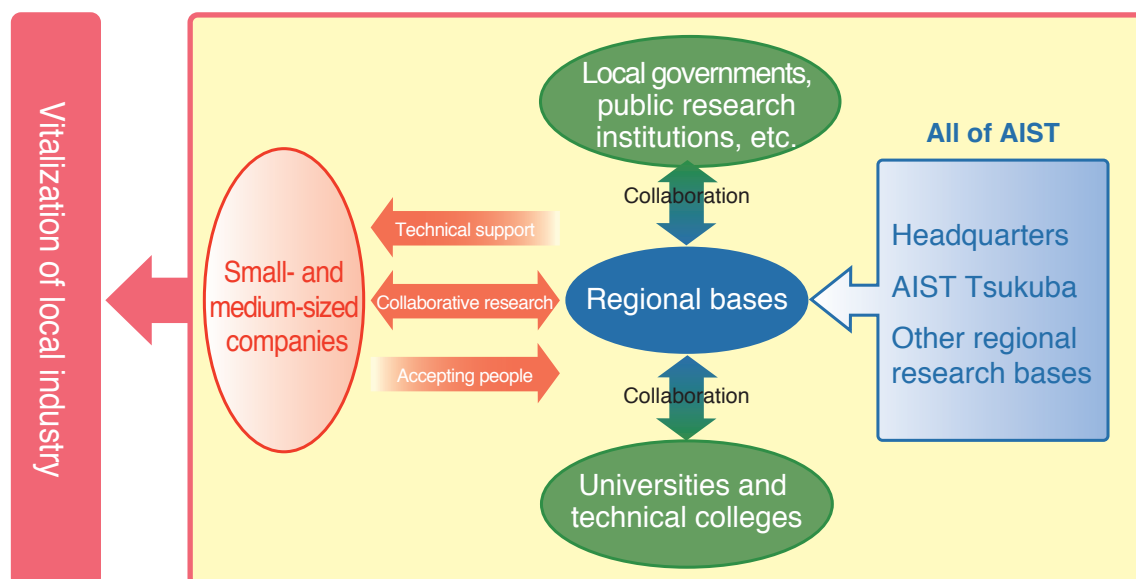
In FY2011, we concluded a comprehensive collaboration and cooperation agreement with a local financial institution, The Iyo Bank in Matsuyama City; four education and research institutions, namely Yokohama City University, Kyushu Institute of Technology, Fukushima University, and the Institute of National Colleges of Technology; and two municipalities of Maniwa City and Kitakyushu City. We will create synergy effects of cutting-edge technology

development capability of AIST and, strengths of the organizations; conduct community-based collaborative research; foster human resources; provide technical support to solve technical issues of local businesses; and thus strongly promote innovation in regions.

● Promotion of the vitalization of local industry using all available resources of AIST

The regional research bases of AIST serve as local contact points for each region; and provide technical support to conduct collaborative research with and accept people from small- and medium-sized businesses in collaboration with local governments and public research institutions, universities and technical colleges. In this way, the bases promote the vitalization of small- and medium-sized businesses. For issues that a regional research base alone cannot address, we support the base using all of our available resources. We contribute to the vitalization of local industry through these activities.

Promotion of the vitalization of local industry using all available resources of AIST



Open House

We have open houses every year to give the public the opportunity to learn about our research activities and about how we strive to make them useful to society. In FY2011, we had an open house in nine AIST research bases across the country. The events held include hands-on exhibits representing the characteristics of each regional research base and facility tours. The children were wowed by the therapeutic robot “Paro” and the mini-humanoid HRP-2m “Choromet”. Both the children and adults were enthusiastically making bead

straps that change color with ultraviolet light and kaleidoscopes using polarizing films. The open house attracted about 15,000 people in total for all venues, exceeding the last year’s figure.



AIST Chubu Research Presentation Meeting and Open Lab

AIST Chubu held its third research presentation meeting and the Open Lab on June 28 and 29, 2011. The latest research results of AIST Chubu were presented over two days with a focus on five areas: next-generation automotive technology, aircraft technology, measurement and standard technology, basic materials and process technology, and medical equipment technology. The meeting attracted 356 participants. In the afternoon of both days, 166 people participated in the Open Lab, which provided people

primarily from companies, universities and public organizations with the opportunity to meet researchers. Through this event, we were able to draw their attention to our research activities.



Research presentation meeting and Open Lab at AIST Chubu

Kyushu, Okinawa Industrial Technology Open Day

**Grab technology!
Create networks!**

On November 17, 2011 at AIST Kyushu and the Tosu Cultural Center, this event was held as an opportunity to introduce the latest technology and information on the latest research activities to the individuals and organizations involved, such as local enterprises and business support organizations. The event was hosted by AIST Kyushu, Kyushu Bureau of Economy, Trade and Industry, prefectural research institutes in the Kyushu and Okinawa areas, and Kyushu Innovation Creative Collaboration. The event was composed of lectures, exhibits, consultations, and lab tours, and attracted 400 participants in a wide variety of fields from prefectures in the Kyushu area (184 from companies; 91 from prefectural research institutes; 53 from government-affiliated organizations; 60 from prefecture-affiliated organizations; 12 from universities).



Lecture at a research presentation meeting jointly held by prefectural research institutes in the Kyushu and Okinawa area and AIST



Exhibit

Science in Town (AIST Tohoku)

AIST Tohoku has a satellite office in the central area of Sendai City, which serves as a place for businesses and citizens to meet with AIST. In June 2011, the event “Science in Town” was started to provide the opportunity for the citizens to familiarize themselves with science and has since been held once a month (10 times in FY2011).

Models and panels to explain examples of research activities at AIST Tohoku and the therapeutic robot, “Paro” are displayed to help the citizens learn about AIST. Hands-on experiences in science and experiments using familiar objects help develop interest in science.

Science Talk presents a wide variety of scientific topics with help from various organizations and individuals. This event covers diverse topics, including familiar topics, such as radiation, topics on trains and the local area, and experience-based talks about overseas affairs.



Hands-on experience in science



Science Talk

Science Square Tsukuba and Geological Museum

At Science Square Tsukuba, various industrial technologies are displayed in an easy-to-understand manner. These include the results of cutting edge research conducted at AIST and AIST’s contribution to society, as well as hands-on exhibits based on research results and basic scientific exhibits. In FY2011, 21,133 people visited Science Square Tsukuba.

The Geological Museum is a globally unique earth science museum. Many geological specimens, as well as explanations of earth science as a whole, and the history and mechanism of the Earth and its relationship with the human beings are displayed here. Special exhibits of the latest geological research and participatory events are held. In FY2011, 33,452 people visited the Museum.

● Group activities at AIST

Ensemble Grand Jeu

This is a recorder-based early music ensemble with more than 30-year history. Before the establishment of AIST, it was called Agency of Industrial Science and Technology Recorder Ensemble. Currently, the ensemble consists of five AIST members and four external members. They perform mainly Renaissance music using recorders of eight different sizes, from kleine sopranino to contrabass recorder, crumhorn, and viola da gamba.

They participate in the joint concert “Tsukuriko” held annually in Tsukuba and perform several lecture recorder concerts every year at elementary schools in Tsukuba and its outlying towns. They perform easy listening programs consisting of

famous tunes from Hayao Miyazaki's animations and Disney movies with recorders of different sizes so that 3rd grade students who take up the recorder for the first time will become interested in and be familiarized with the recorder. Thank you letters sent from the students after the concert are filled with wonder and joy, and this encourages the ensemble members to practice more.



Human Rights

Respect for Fundamental Human Rights

Besides directors, employees and contract employees, many other people work at AIST including temporary employees, visiting researchers, technical trainees, contractors, visitors from industry, academia and government, and visitors of international programs. We perform duties with the awareness of the importance of respecting each other and helping each other, regardless of the difference in position and stance.

From the Compliance Guideline

Item 1: Respect for human rights

— We respect human rights and never say or do things that denigrate others. —

1. We respect basic human rights and never discriminate against any race, nationality, age, gender, religion, belief, and social status.
2. We never say or do things that denigrate others including harassment.

Respect for Human Rights in Research Activities

At AIST, we conduct research activities on humankind, such as measuring human characteristics. We set up the Human Engineering Experiment Committee, which includes five external members. The Committee reviews and approves experimental plans of human engineering experiments to ensure human rights, dignity and

safety of the subjects, as well as scientific validity. After this process, the experiments are performed in an appropriate manner. 51 new and 150 ongoing research projects were performed in FY2011.

From Gender Equality to Diversity

As stated in the “Declaration of AIST Gender Equality” (February 2006), we have been working to create an environment where, regardless of gender, individuals can fully utilize their skills and capabilities, based on the firm belief that diversity of employees will truly enrich research and make it beneficial to society. In the “Measures for the Promotion of Gender Equality during the Third Mid-Term Plan” (September 2010), we determined the measures to be taken, on the concepts that 1) we should further expand gender

equality activities and promote the use of the diversity of values and ideas achieved by diverse qualities (gender, age, nationality, etc.), and 2) diversity is a driving force to perform world-leading research, to strengthen AIST’s competitiveness, and to contribute to society.” To efficiently implement the Action Plan set forth in the Measures, in October 2011, we reorganized the Gender Equality Office into the Diversity and Equal Opportunity Office to promote diversity throughout AIST.

Action Plan for the Support of Raising the Next Generation

Considering the rapidly declining birth rate in Japan, it is necessary to create social environment where children, who will play key roles in shaping the future society, are born and brought up healthily, and the Act for Measures to Support the Development of the Next Generation was enacted in April 2005. At AIST, the First Action Plan had been implemented for six years since FY2005 in accordance with this Act, and many programs were introduced and revised based on this Act. As a result, AIST's activities to support to raise next-generation children were significantly improved.

In April 2011, the Second Action Plan for the Support of Raising the Next Generation was established.

In FY2011, we made a portal site on the intranet to list and describe counseling programs and other useful information in an easy to understand way; provided information on infertility treatment to prevent loss of the opportunity for pregnancy; organized training programs and seminars on diversity; and launched a campaign to encourage employees to take paid leave.

[Period]

Two years from April 1, 2011, to March 31, 2013

[Action Plan]

1. Improvement of working environment

(1) For the employees in child raising generation: balancing the career and home life

■ Goal 1

Provide information concerning the support for birthing and child raising, and improve the counseling programs

■ Goal 2

Develop an environment to prevent loss of the opportunity for pregnancy

(2) To provide diverse working conditions that contribute to a change in the way of working.

■ Goal 3

Raise awareness of diversity

■ Goal 4

Encourage employees to take annual paid leave

2. Support for raising the next generation

■ Goal 5

Support children's activities to experience natural science

独立行政法人産業技術総合研究所
次世代育成支援行動計画

独立行政法人産業技術総合研究所（以下「産総研」という）では、これまで仕事と育児の両立支援として、多様な勤務形態や休業等の制度を整備してきた。具体的には、典型的勤務形態としてフレックスタイム制や微量労働制の導入、休業・休暇等制度として育児休業、産前特別休暇、産後就業制限、育児特別休暇、子の看護特別休暇、配偶者出産および育児参加のための特別休暇、育児短時間勤務等の整備、所内施設一時預かり保育所の運営など積極的に取り組んでいる。また仕事と健康増進の両立に向けて「労働時間管理実施要綱（平成23年3月改訂）」に基づく適切な労働時間管理の中で時間外労働の抑制に取り組んでおり、その具体策として、1）所内各種研修等を避けての適切な労働時間の管理の説明、2）就業時刻等での帰宅を促す館内放送、3）「ノー残業デー」の設定を行っている。

本計画は、両立支援のために導入した制度を維持・発展しながら今更に取り組みを行う事項について次のように策定する。

【計画期間】 平成23年4月1日～平成25年3月31日までの2年間

【計画内容】

1. 雇用環境の整備に関する事項

(1) 子育てを行う雇員の職業生活と家庭生活との両立を支援するための雇用環境の整備

【目標1】 出産及び育児の支援に関する制度の情報提供および相談体制の充実

<対策>イントラネット等で提供している出産及び育児の支援に関する制度の情報を拡充する。また各種相談窓口は、利用者の利便性を向上するために利用者の観点から相談窓口の運用改善を行う。（目標達成：平成24年度）

【目標2】 出産機会喪失防止のための環境整備

<対策>不妊治療のために各種休暇制度の取得しやすい環境を整備するため不妊治療に関する各種情報の提供を行う。（目標達成：平成23年度）

(2)働き方の見直しに資する多様な労働条件の整備

【目標3】 多様な活用（ダイバーシティ）に関する啓発活動

<対策>性別、国籍等による固定的な役割分担にとらわれない意識を啓発・浸透するために、多様な活用（ダイバーシティ）をテーマとしたセミナー・研修等を開催する。（目標達成：平成23年度）

【目標4】 年次有給休暇の取得促進

<対策>年次有給休暇の取得しやすい環境を整備するため啓発活動等を行う。（目標達成：平成23年度）

2. その他次世代育成支援対策に関する事項

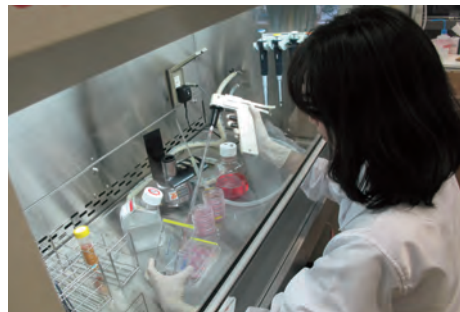
【目標5】 子どもの自然科学体験活動等の支援

<対策>毎年実施している産総研一般公開を雇員の子どもへも広く周知し、産総研雇員等の子どもによる職場参観を促進する。（目標達成：平成24年度）

平成23年4月1日 総務本部

Activities to Raise Awareness of Diversity

- To raise awareness of diversity and provide motivation for career development, we organized a seminar, “Diversity as a Management Strategy,” based on the understanding that the concept of diversity and work-life balance benefits both the organization and employees. We also held lectures on diversity in the training programs for new employees and managers in order to share the concept of diversity among all AIST employees.
- To achieve the Third Mid-Term Plan of increasing the employment rate of women researchers to more than 15% by the end of the third period, we presented recruiting personnel of each research field with the results of the survey of the ratio of women research candidates in the recruitment process of each field. We conducted recruiting and advertising activities through university job information magazines, science and engineering journals, and joint recruit meetings for women students of science and engineering fields. In FY2011, the percentage of women among successful applicants was 18.4% and exceeded the previous year. However, at two years in the third period, the cumulative percentage of women employed is 14.9% and slightly below the target.
- We provide information to foreign employees on intellectual property and external research funds through internal seminars. We also provide necessary information on the intranet in English, such as on the attendance record, vehicle pass, ID card, and key card. To improve the user convenience, we created a portal site on the intranet to list and explain counseling programs in Japanese and English in an easy-to-understand manner.
- We actively promote gender equality and diversity using the inter-organization network of the Diversity Support Office (DSO), a consortium established by AIST. With the participation anew of six organizations in FY2011, DSO now consists of 19 organizations and the collaboration has been expanded and enhanced.



Female researcher working at AIST

AIST International Center (AIST Tsukuba)

The purpose of the AIST International Center (AIC) is to support the living of foreign nationals who stay at AIST and their families. In FY2011, we were significantly affected by the Great East Japan Earthquake. Due to the decrease in the number of foreign nationals at AIST, the annual total number of consultations halved (319) compared to the usual years (600 to 800). Many of the inquires in FY2011 were about immigration procedures, and we strove to provide accurate information. Six months after the earthquake, we resumed our service of filing applications to the immigration office on behalf of foreign residents. Although there was also a delay in resuming the Japanese language program, six courses

by qualified instructors were offered as planned and were highly rated by the class participants. They commented that the courses were useful for them to work and live in Japan.



Japanese class

Prevention of Harassment

Harassment violates the dignity of the harassed person and causes emotional distress and disadvantage to the person. An offender who has harassed without intention may fall mentally ill. The presence of harassment in the workplace can deteriorate the work environment, damage worker's morale, and eventually may adversely affect the results of research. We have formulated internal rules and provided training to ensure a harassment-free workplace.

harassment and propose necessary measures, and appropriate actions will be taken.

In addition, to create an environment that facilitate counseling and to protect privacy, counseling by an industrial physician or an external organization is provided via email or telephone.

Preventive measures against harassment

- We have formulated internal rules for harassment (excluding sexual harassment) and sexual harassment and defined procedures for the prevention.
- We provide harassment training to employees, managers and counselors in sites to educate them on harassment prevention and counseling.

Counseling programs

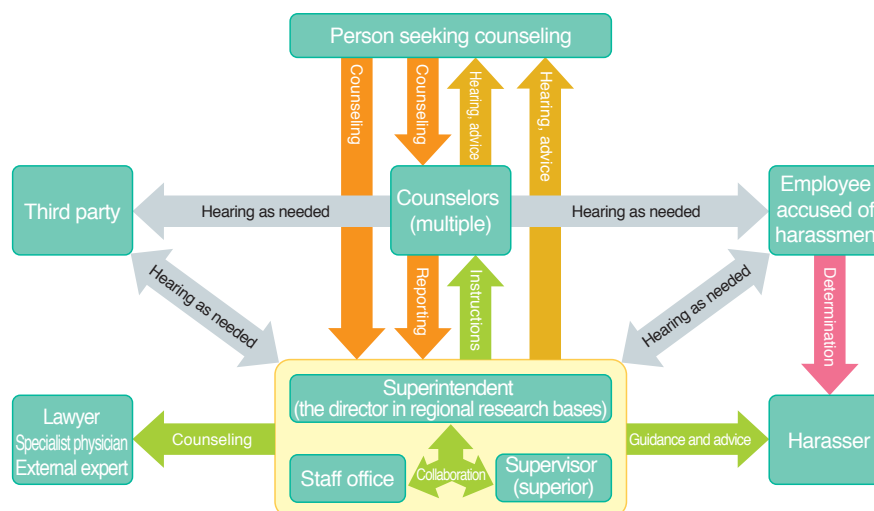
We have harassment and sexual harassment counselors (half of them are women) in each site so that harassment victims do not suffer alone. The counselors perform activities such as counseling, investigation and mediation. If harassment cannot be solved by the line of duty or counselors, the upper committee will review the

Harassment training programs conducted in FY2011

Training Program	Target Participant	Purpose
New employee training	New AIST employees	To learn about the basics and preventive measures of harassment as part of training on principles, basic knowledge and skills required to perform duties.
Contract employee basic training	Contract employees (New employees and those who were employed the previous fiscal year and did not take the training)	To learn about the basics and preventive measures of harassment as part of acquiring basic knowledge of AIST, including mission and compliance, required to perform duties.
Basic training for foreign employees and others	Foreign employees with no Japanese skills	Contract employee basic training is provided in English.
Evaluator training	Primary and secondary evaluators	To learn about the basics and preventive measures of harassment and acquire knowledge required to take action in the event of harassment, to enable evaluators as leaders to help improve the work environment and develop an organization with integrity.
Harassment and sexual harassment counselor training	Harassment and sexual harassment counselors	To acquire knowledge of harassment prevention and counseling skills of a counselor, based on lectures and role plays.

Flow of counseling

- People seeking counseling also include others than those who have been harassed or have harassed.
- Counseling can be provided by means of interview, telephone, email, document (letter) or facsimile.
- Seeking counseling causes no disadvantage to those seeking counseling.
- Due consideration will be given to ensure privacy protection, and any confidential information obtained in the course of counseling will not be disclosed.



Environmental Policy



Environment-Friendly Policy

AIST promotes environment-friendly activities with the Charter of the Environmental Safety

AIST has stipulated the Charter of the Environmental Safety to promote environment-friendly activities in the research and development process, in addition to the production of research and development results toward a sustainable society. Under the principles of the Charter

of the Environmental Safety, we have set an environmental and safety policy to take positive actions with a strong awareness that “protecting the global and local environment” and “ensuring the safety and health of all people working at AIST” are important issues.



Charter of the Environmental Safety

- We strive to promote research activities that contribute to the global environmental protection and the security of mankind and pursue our work to realize a safe and reliable society of high quality of life harmonious with the environment.
- In compliance with the applicable laws and regulations related to environmental protection, we establish the autonomous standards of the Institute such as Safety Guideline, etc. and with this in mind, we shall endeavor to conserve environment and promote health and safety at all times.
- We promote the dissemination of information related to the environmental protection and make every effort to be in harmony with and coexist with the local community. Naturally, in case of disasters or emergencies, we take prompt and proper measures to deal with the situation.
Furthermore, in conformity with the ‘principles of disclosure,’ we shall endeavor to return the knowledge acquired and accumulated to society.



Environmental and Safety Policy

1. We will actively conduct research that contributes to the protection of the environment and the realization of a healthy and safe society.
2. We will comply with laws, regulations, ordinances, and agreements on the environment and occupational safety and health, and set self-imposed management standards to further improve environmental protection and occupational safety and health.
3. We will save energy and resources and reduce waste to decrease environmental load.
4. We will take actions to prevent environmental pollution and occupational accidents and take prompt and appropriate actions in the event of an emergency to prevent aggravation of damage.
5. We will establish a management system to effectively and efficiently promote environmental protection activities and occupational safety and health activities, perform the activities with the participation of all staff, and make continuous improvements.
6. We will actively disclose information on environment, safety and health through publication of environmental reports and information disclosure to promote communication with society.

Integration and Mapping of Spatial Distribution Data of Radiation Dose at Various Locations

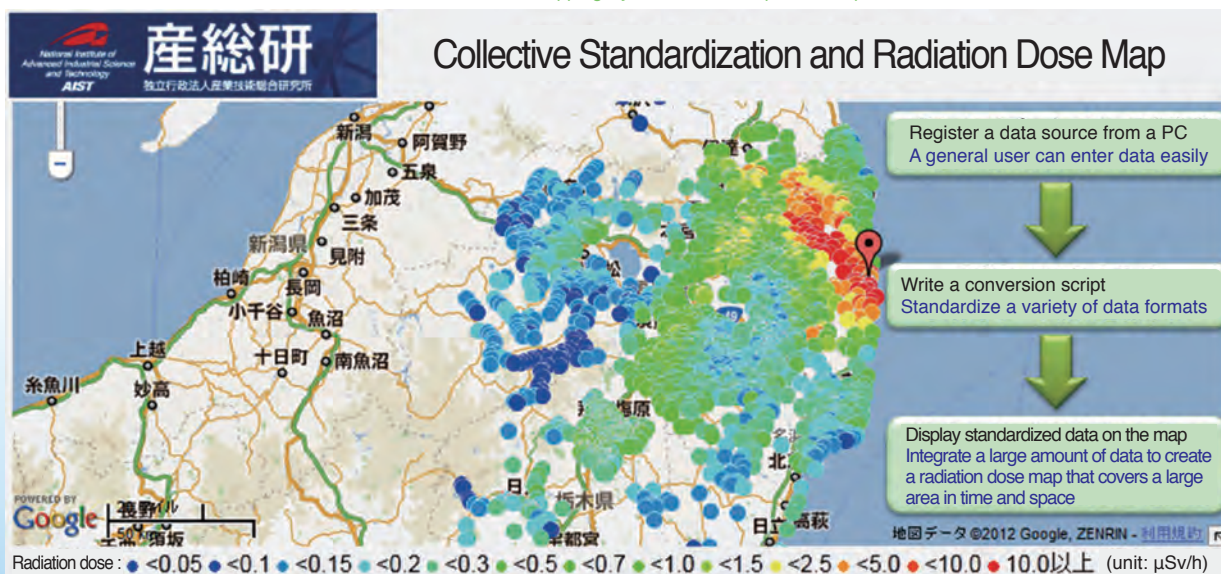
Conversion of data in different formats into a standard format with ease

Since the accident at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Company caused by the Great East Japan Earthquake, there has been a growing demand for information on radiation doses in the living environment. We have developed and made available on the Internet a radiation dose mapping system that requires no expert knowledge of programming, and allows the user to integrate spatial radiation dose distribution data of radiation dose in different formats published separately by municipalities and others, and to plot them on a displayed map by performing simple operations on the PC. To process radiation dose data, this system uses AIST's technology called collective standardization for

converting individual data sets into a standard format by integrating operations performed by many users. The results of this research were presented in the AIST press release on March 5, 2012. The release was accessed 3,750 times in three days and covered by seven newspapers.

To expand the area covered by the radiation dose map and augment the map in a long term basis, we would like the municipalities involved and the public to volunteer to enter a variety data into this system continuously. We will contribute to the reduction of radiation exposure risk by sharing the integrated data throughout society.

Screenshot of the website and workflow of the Radiation Dose Mapping System, which is open to the public



<http://i-content.carc.jp/ustore/manual/radiation/>

(in Japanese)

Radiation Measurement at AIST Tsukuba

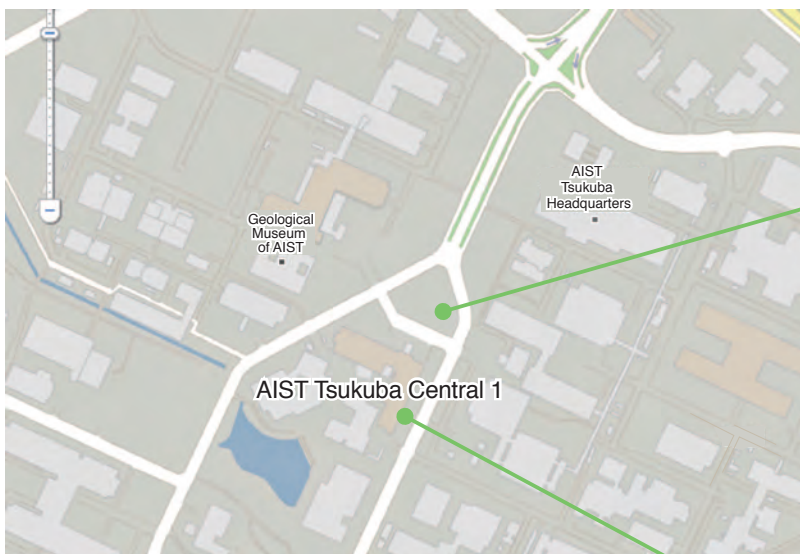
Environmental radiation doses rose following the accident at the Fukushima Daiichi Nuclear Power Plant caused by the Great East Japan Earthquake. The radiation doses in the air at AIST Tsukuba have been published on AIST's website since March 15, 2011. Since the data at the parking lot of AIST Tsukuba Central 1 decreased and became stable, the measurement was stopped on March 16, 2012. The continuous hourly measurements with an NaI scintillation survey meter at the balcony on the third floor of the main building of AIST Tsukuba Central 1 are continued. The survey meter was calibrated in January 2012.

AIST's published data only show the increase due to the nuclear power plant accident obtained by subtracting the previously measured value of 0.06 $\mu\text{Sv/h}$ * of background radiation from the measured value. The graph shown below is also available on the website so that the change in radiation dose in the air

can be easily recognized. The radiation dose shown in the graph gradually decreases and remains constant at a low level, indicating that no additional radioactive materials are transported from the Fukushima Daiichi Nuclear Power Plant in quantities that affect the radiation dose. The current radiation dose (of July 2012) attributable to the accident is 0.05 to 0.07 $\mu\text{Sv/h}$, which is as low as the natural background level.

※ This figure is reasonable compared to the average external exposure to natural background radiation in Japan [the average exposure to cosmic rays and telluric radiation = 0.076 $\mu\text{Sv/h}$].

Continuous radiation measurement points



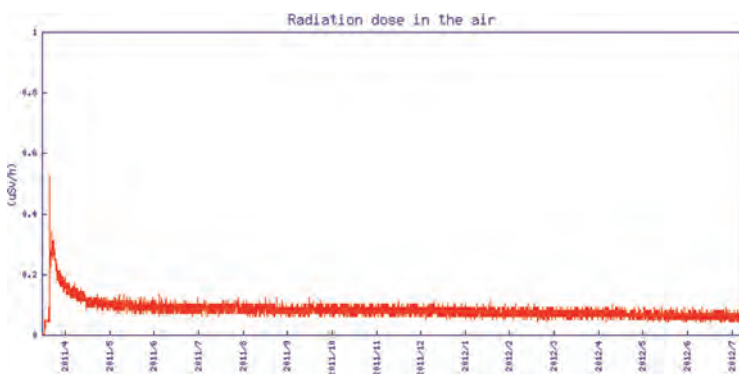
Parking lot



3rd floor balcony



Graph of the results of radiation measurements at the 3rd floor balcony



Targets for Environment-Friendly Activities and Results

Targets are set for environment-friendly activities. The activities are reviewed for evaluation and the results are reflected in activities in the next fiscal year.

Activity	FY2010 Result	Environmental Management FY2011			FY2012 Target	Page
		Target	Result	Self-evaluation		
CO ₂ emissions reduction	15% reduction over FY2004	1% reduction over FY2010*	17.2% reduction	○	Average 4% reduction over FY2009 over 3 years from FY2012 to FY2014	52
Asbestos removal	Removed 3,873 m ³ .	Remove remaining asbestos by FY2013	Removed 17,818 m ³	○	Complete the removal of remaining asbestos by FY2013	55
Effective use of resources	439 cases	Reuse of property no longer in use: more than 600 cases (Third Mid-Term Plan period)	Reuse cases: 532	◎	Reuse of waste resources: more than 600 cases (Third Mid-Term Plan period)	57
Promotion of green procurement	100%	Procurement rate for special procurement items: 100%	A 100% procurement rate was achieved for 230 of 231 procurable items	○	A 100% procurement rate for special procurement items	50-51
Expansion of green contracts	Introduced environmental thresholds into power supply contract at AIST Tsukuba, AIST Tokyo Waterfront, AIST Chubu, AIST Kansai	Introduce environmental thresholds into power supply contract at AIST Tohoku, AIST Chugoku, AIST Kyushu	Introduced environmental thresholds into power supply contract at AIST Chugoku. Introduced it in 2 more cases	△	Environmental thresholds in power supply contract will be introduced at AIST Tohoku and AIST Kyushu after FY2013	51
Operation of environmental safety management system	Provided environment and safety management training (35 people)	Provide internal audit training (20 people or more)	Provided environment and safety management system level-up training (35 people)	○	Provide internal audit training (20 people or more)	50

[Self-evaluation] ◎: target exceeded, ○: target achieved, △: target nearly achieved, ×: target not achieved

※ AIST's CO₂ emissions reduction target is 18% over FY2004 for the FY2007-2010 period and 4% over FY2009 for the FY2012-2014 period. Due to the Great East Japan Earthquake, the CO₂ emissions reduction target for FY2011 was set to the reduction rate (1%) specified in the Energy Conservation Policies and Laws.



Over View of Environmental Load

To perform environment-friendly activities with consideration for the entire environment and reduction of environmental load, it is important to evaluate the environmental load of the activities performed at AIST.

The table below shows the amount of energy, chemical substances and water used and released for AIST's activities.

Overall picture of environmental load

Energy	Unit	FY2009	FY2010	FY2011
	TJ	2,794	2,668	2,172
Purchased electricity	1000kWh	243,021	233,146	195,868
Utility gas	1000m ³	9,460	7,841	5,611
Propane gas	kg	6,443	10,166	5,091
Liquid fuel	kL	1,047	968	639
Purchased energy	TJ	15	17	18
Solar power	1000kWh	1,062	1,233	1,220

Substance	Unit	FY2009	FY2010	FY2011
Chemical substance (PRTR substance)	t	21	112	104
Research & development equipment (e.g. experimental equipment, paper)	-	-	-	-

Water	Unit	FY2009	FY2010	FY2011
	1000m ³	3,124	3,093	2,249
Water received	1000m ³	1,312	1,223	1,094
• Potable water	1000m ³	1,272	1,185	1,059
• Groundwater	1000m ³	37	36	33
• Industrial water	1000m ³	3	3	2
Recycled water	1000m ³	1,811	1,870	1,155



Atmospheric Emissions	Unit	FY2009	FY2010	FY2011
Greenhouse gas emissions	1000tCO ₂	157	150	92
• Purchased electricity	1000tCO ₂	135	129	77
• Fossil fuel	1000tCO ₂	21	20	14
• Purchased energy	1000tCO ₂	1	1	1
NOx emissions	kg	9,044	9,007	5,283
SOx emissions	kg	1,205	1,310	1,318
Soot & dust emissions	kg	188	295	346

Waste	Unit	FY2009	FY2010	FY2011
Waste generated	t	2,253	2,253	2,320
• General waste	t	639	583	567
• Industrial waste	t	1,613	1,670	1,753
Landfilled waste	t	350	238	180
Recycled paper	t	276	274	250

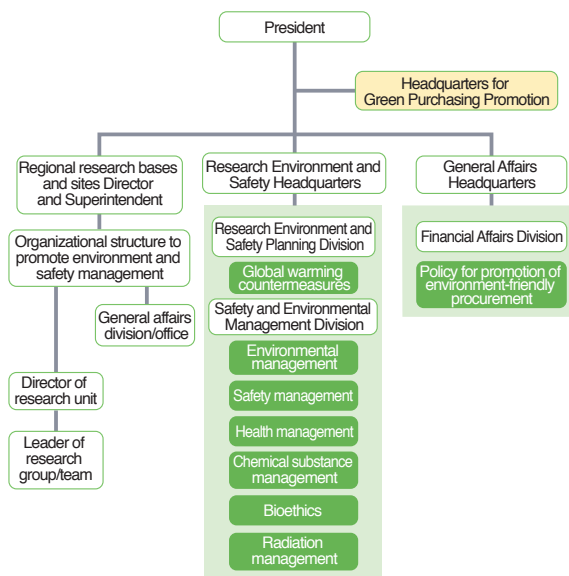
Effluent	Unit	FY2009	FY2010	FY2011
Discharged water	1000m ³	1,048	760	981
• Sewer	1000m ³	1,041	758	979
• Public water bodies	1000m ³	7	2	2
Contaminants discharged	kg	2,073	1,605	1,114
• BOD	kg	1,012	905	470
• Nitrogen	kg	629	128	118
• Phosphorus	kg	13	9	10
• Suspended matter	kg	418	563	516

Organizational Structure

Organizational structure is constructed to ensure the implementation of measures according to the environmental policy

For environment-friendly activities of the entire AIST, we promote environmental measures through close collaboration between headquarters (Research Environment and Safety Headquarters, General Affairs Headquarters, etc.) and operation units (regional research bases). The Research Environment and Safety Headquarters determine the policy for the reduction of greenhouse gas emissions, which is an ongoing issue. We have established Headquarters for Green Purchasing Promotion to formulate the AIST's policy for the promotion of environment-friendly procurement and to oversee its implementation. A specific program to implement these policies is set up and implemented under the supervision of the director or superintendent of each regional research base and site.

Organizational structure for environment and safety



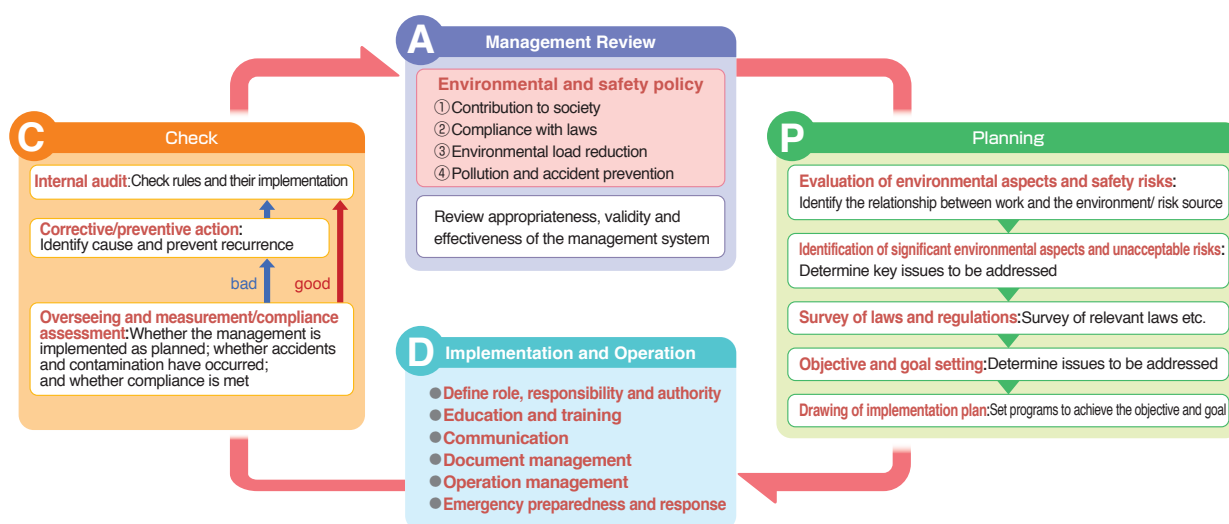
Note: In July 2012, Headquarters for Global Warming Prevention was closed and its duties were transferred to the Research Environment and Safety Headquarters.

Environmental Management System

AIST has created and operated its own environmental and safety management system (ESMS) combining an environmental management system to reduce environmental impact due to research activities and protect the natural environment, and an occupational safety and health management system to reduce potential risk in the workplace and improve occupational safety and health. In FY2011, we conducted an internal audit (internal environmental and safety audit) of each site, inspected the

implementation status of the management program and reviewed the program to improve it. As part of internal auditor training, we conducted Management System Level-Up Training by an external instructor to improve the skills of occupational safety and health management personnel who are responsible for administrative tasks in the operation of the ESMS in each site and regional research base.

Structure of AIST's environment and safety management system



Environmental Education We will enhance environmental education

We provide pre-work training on issues that have a significant environmental load, such as treatment of research wastewater and exhaust gas and sorting and discharging of waste, to new employees, and

those who have come to work with us based on academia-industry-government and international exchange programs. We will enhance environmental education and training.

Green Purchasing and Green Contract

Green purchasing activities

We practice green purchasing, which requires us to preferentially select goods and services with less environmental load, based not only on prices and qualities but also on environmental considerations, when purchasing products, components and materials required for research and development, and using external contractors for processing and test fabrication

services. To promote green purchasing, every year, we make public our procurement policy with a procurement goal for environment-friendly goods and services, according to the Law Concerning the Promotion of Procurement of Eco-friendly Goods and Services by the State and Other Entities (Green Purchasing Law) and the Basic Policy for the Promotion of Procurement of Eco-Friendly Goods and Services.

● Procurement status of environment-friendly goods and services

In FY2011, AIST purchased 231 items in 17 categories out of 261 items in 19 categories, specified in the Green Purchasing Law (types of environment-friendly goods and services to be preferentially purchased by the government and other organizations). For all items except for one (a media case[※]) that failed to meet the criteria because of performance and functional requirements, we achieved the annual goal of a 100% procurement rate of specified procurement goods (those that meet the criteria for goods contributing to environmental load reduction specified by the government). We give consideration to environmental load when purchasing environment-friendly goods (trash bags), a non-specified procurement item.

※Media case: An album-type case made primarily of non-plastic materials that can contain multiple units. It did not meet either of the green criteria: For the case, "recycled or plant-based plastics must be used." It must be a "slim-type case with a thickness of 5 mm or less."

● Number of hybrid vehicles owned by AIST

As of June 2012, of the total of 90 vehicles (including those for research purposes) owned by AIST, 8 vehicles are hybrid. We preferentially select hybrid and low-emission vehicles when replacing vehicles for operations.

● Green contract activities

When awarding contracts, we promote those (green contracts) with consideration to greenhouse gas emissions reduction based on the Law concerning the Promotion of Contracts Considering Reduction of Emissions of Greenhouse Gases and Others by the State and Other Entities (Green Contract Law). In FY2011, we made three green contracts, including the change of the type of power supply contract.

Number of green contracts

Type of Green Contract	No. of Green Contracts
Purchase of vehicles	1
Building design	1
Power supply contract	1

● Green contract

With vehicles, we purchased two vehicles and leased one vehicle. We comprehensively reviewed vehicles for price and performance (fuel efficiency) and made a green contract for one of them. For the other two vehicles, we selected models that fulfill research purposes and made contracts based on general competitive bidding.

In building design, with the Fukushima Renewable Energy Research Center (tentative name), we aimed to design a research facility with low energy consumption and environmental load that can serve as a model for buildings using energy saving renewable energy technologies, and to reduce facility operation costs.

In power supply contracts, we introduced environmental thresholds[※] into a power supply contract at AIST Chugoku. For AIST Kyushu, we will introduce environmental thresholds after an accurate evaluation of the summer peak energy demand in the summer of 2012. For AIST Tohoku, we will not introduce environmental thresholds in the immediate future due to the effect of the 2011 earthquake.

※ System with environmental thresholds
Bidders are reviewed by rating, on a point scale, for carbon dioxide emissions, the use of unused energy, the use of new energy sources, and planned amount of the green power certificate to be transferred to the purchaser. The bidder with the lowest price among those whose total score exceeds the threshold is selected.

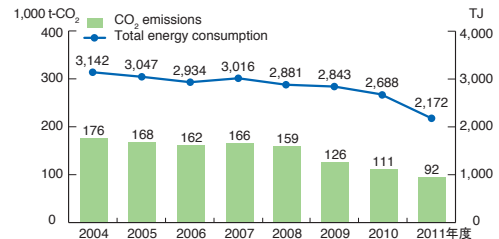
Reduction of Greenhouse Gas Emissions

As part of efforts to reduce environmental load materials generated from activities at AIST, in June 2007, AIST established an implementation plan to reduce greenhouse gas emissions, promoted activities to reduce greenhouse gas emissions over five years from FY2004 to 2009, and in FY2010 reduced greenhouse gas emissions by 15% over FY2004.

Its operations in FY2011 were affected by the earthquake, with damage to facilities. In restoration of the damaged facilities, instead of restoring them to the previous state, we concentrated some research facilities, improved space utilization, and made changes to improve the efficiency of the research infrastructure. These efforts, in addition to power-saving efforts in the summer, resulted in a greenhouse gas emissions reduction of 17.2% over FY2010. With the anticipation that factors such as establishment of a new research base and research enhancement by promoting open innovation will contribute to an increase in greenhouse gas emissions, AIST will continue activities to reduce greenhouse gas emissions to live up to the expectations of the government and society. The goal of the next phase is to reduce greenhouse gas

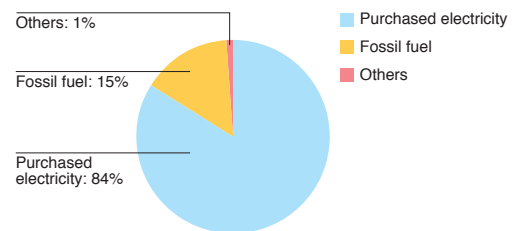
emissions by an average of 4% over FY2004 in three years between FY2012 and 2014.

Change in CO₂ emissions and total energy consumption



Note: The CO₂ emission factors have been changed since FY2009.

Breakdown of CO₂ emission sources



Power-Saving Efforts in Summer

To comply with the restrictions on the use of electricity in the service area of Tokyo Electric Power Co. Ltd. imposed in the summer of 2011, in accordance with Article 27 of the Electricity Business Act, we took general energy saving measures not to exceed the specified limit on power consumption, as well as the following measures to minimize the impact of the energy-saving measures on research activities.

● Energy-saving measures

- (1) Shutdown or operation in turn of some of the large facilities (clean rooms, constant temperature and humidity rooms, large computers, etc.)
- (2) Concentration of animal raising facilities, refrigerators and freezers for research purposes, etc.
- (3) Introduction of a total power consumption monitoring system to monitor power consumption
- (4) Implementation of a shared-use restriction scheme[※] at AIST Tsukuba and AIST Tokyo Waterfront
- (5) Introduction of rotating scheduled shutdowns in summer in which sites shutdown in turn

※ Share-use restriction scheme

Reduction of peak power consumption in accordance with Article 27 of the Electricity Business Act is performed on each power-requiring facility. However, as an exception, if it is possible to reduce the peak power consumption of multiple power-requiring facilities as a whole, it can be done through collaboration among them.

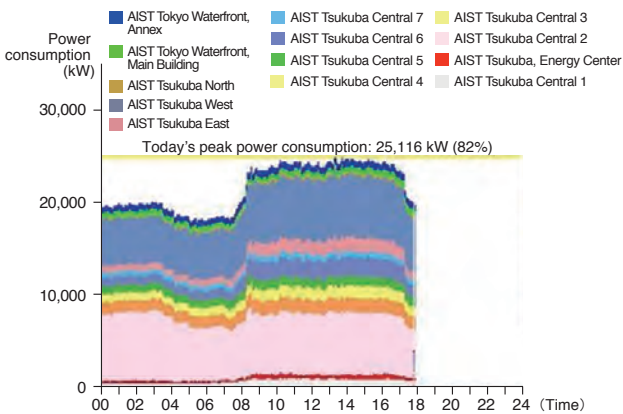
● Measures taken to reduce peak power consumption

- (1) Reviewed experimental plans to conduct most of the experiments using large facilities before and after the summer
- (2) Generated about 600 kW of power on sunny days with the solar power system in AIST Tsukuba alone
- (3) Reduced peak power consumption by 1,200 kW between 9 a.m. to 6 p.m. by charging an NAS battery system overnight and discharging it during the day
- (4) Successfully reduced peak power consumption by about 800 kW between 8 a.m. and 3 p.m. over the previous summer, by operating large power-intensive research facilities, such as the research wastewater treatment plant and the helium liquefaction facility, in turns, on holidays, and at nights

● **Implementation of the shared-use restriction scheme and introduction of a total power consumption monitoring system**

We reduced the total power consumption of main research facilities in the service area of Tokyo Electric Power Co. Ltd. (13 power-receiving facilities in Tokyo and Tsukuba) (implementation of the shared-power use restriction scheme). To help achieve these goals, we have introduced a total power consumption monitoring system that allows real-time monitoring of the power consumption of each site as well as the total power consumption of all facilities.

Screenshot of the intranet (August 12, 2011)

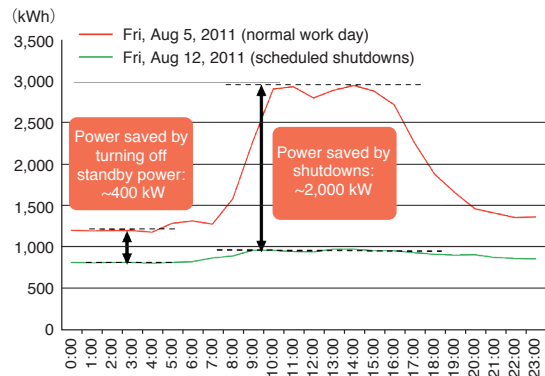


● **Introduction of scheduled shutdowns in which sites are shutdown in turns**

We estimated the effect of shutdowns on the reduction of power consumption from the difference between the day-time and night-time power consumption of each site in the summer of 2010, grouped multiple sites, and implemented the scheduled shutdowns for six weeks

from July 25 to September 2, 2011. The power consumption decreased by 600 to 3,500 kW, depending on the week (sites). The rotating scheduled shutdowns have been found to have an additional effect of eliminating standby power by the complete shutdown of equipment due to long holidays.

Change in power consumption before and after the scheduled shutdowns were implemented



As a result of these measures, in the service area of Tokyo Electric Power Co. Ltd., the power consumption of AIST Tsukuba and AIST Tokyo Waterfront Center was 82% of the power consumption limit of 34,239 kW in July and 76% in August. To reduce power consumption in the summer of 2012, we changed the grouping of the sites at AIST Tsukuba, where the rotating scheduled shutdowns were implemented in FY2011, took more effective measures to reduce peak power consumption, and introduced scheduled shutdowns into other research bases across the country.

Introduction of New Energy Sources

We have introduced new energy sources to reduce CO₂ emissions

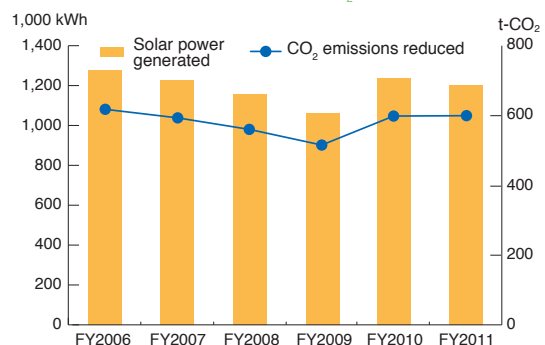
We installed a solar power system at AIST Tsukuba, AIST Tohoku, AIST Tokyo Waterfront, AIST Chubu, AIST Chugoku, AIST Shikoku, and AIST Kyushu. The amount of



Mega Solar Town (Sun Hills, AIST Tsukuba)

solar power generated in FY2011 was 1,220,000 kWh, which is equivalent to powering 339 homes per year, resulting in CO₂ emissions reduction of 592 t per year.

Change in solar power generation and CO₂ emissions



Appropriate Chemical Substance Management

We perform appropriate chemical substance management to reduce environmental risk and to ensure safety

As AIST conducts research in a wide variety of fields, it uses a variety of chemical substances in small quantities. Care is taken to properly use and store chemical substances to prevent accidents and spills or leaks, as well as to properly treat them before disposal.

Information on what chemical substances must be handled in a fume hood and detoxified is provided to researchers using the Integrated Chemical Substance Management System described below.

Treatment of liquid waste and exhaust gas

Liquid waste: At AIST Tsukuba, liquid waste is detoxified in the treatment plant on the premises and discharged into the public sewer. In other regional research bases, the treatment of liquid waste is contracted out to an industrial waste treatment service provider.

Exhaust gas: Chemical substances generating harmful vapors are handled in a fume hood and the vapors are discharged through an exhaust detoxification

Integrated Chemical Substance Management System

We have created and operated the Integrated Chemical Substance Management System to allow researchers to manage a variety of chemical substances used in research activities according to their properties and regulations.

Regulatory codes applicable to chemical substances are incorporated in the system. In FY2011, as a result of the amendment of the Water Pollution Control Act, regulated chemical substances specified in the Act were added to the codes. Information on the rooms where regulated chemical substances are stored can be obtained using the codes.

Information on Released Chemical Substances

We report the release and transfer of relevant chemical substances to municipalities in accordance with the PRTR Law* and municipal ordinances. Chemical substances subject to reporting are mainly organic solvents used to dissolve and extract a variety of organic

compounds. Other chemical substances subject to reporting are hydrogen fluoride used to wash semiconductors and dioxins from spray incinerators for organic liquid waste.

Amount reported under the Chemical Substance Management Program

Release and transfer of PRTR chemical substances (handled amount exceeds 1ton)

Location	Chemical Substance	Handled	Released	Transferred	
			Air	Sewer	Waste
Tsukuba Central 1	Dioxins (mg-TEQ)		0.052		
Tsukuba Central 5	Chloroform (kg)	1,328	670		100
	n-hexane(kg)	1,125	140		50
Tsukuba West	Hydrogen fluoride and its water soluble salts (kg)	4,107		160	
	Ferric chloride(kg)	90,530			

【Tokyo】

Release and transfer of chemical substances subject to the Tokyo Metropolitan Environmental Ordinance to Ensure the Health and Safety of the People of Tokyo (used amount exceeds 100 kg)

Location	Chemical Substance	Handled	Released	Transferred	
			Air	Sewer	Waste
AIST Tokyo Waterfront	Acetone (kg)	130	34		98
	Chloroform (kg)	200	9		190
	Methanol (kg)	1,200	350		890

【Osaka】

Osaka Prefectural Ordinance on the Preservation of Living Environment (handled amount exceeds 1ton)

Location	Chemical Substance	Handled	Released	Transferred	
			Air	Sewer	Waste
AIST Kansai	V O C (kg)	2,600	430		2,200

※PRTR Law

Officially, the law is called "Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management." Business establishments that handle any of the 462 PRTR chemical substances in quantities of 1 ton or more per year (0.5 ton or more for some chemical substances) must report its release into the environment and its transfer to another business establishment (sold or transferred for treatment or disposal).



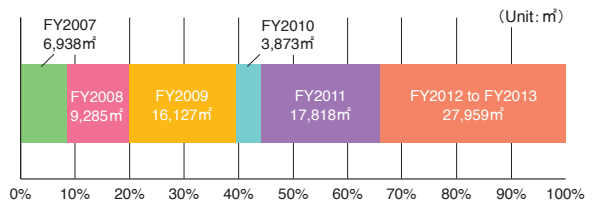
Asbestos Removal

Removal of asbestos-containing spray-on materials

We have been removing asbestos-containing spray-on materials systematically. Since FY2007, we have been removing about 82,000 m² of asbestos-containing spray-on materials at AIST according to plan under the Basic Policy for Planning the Removal of Asbestos-Containing Spray-On Materials formulated in FY2006, while conducting a survey to evaluate the degradation of the materials and environmental measurements on a regular basis. In FY2011, we removed 17,818 m² of asbestos-containing spray-on materials from buildings. So far we have removed a total of 54,041m². We will remove the remaining asbestos successively by FY2013, except for that in buildings where refurbishment is planned. We also take environmental measurements

once a year to check for airborne asbestos fibers from the remaining asbestos-containing spray-on materials.

Change in the area of removed asbestos-containing spray-on materials



Storage of PCB Waste

We store and monitor PCB waste continually

PCB-containing transformers and capacitors are stored in each research base and site PCB waste is stored as specially-controlled industrial waste in a designated storage area in each research base and site, and checked for stored conditions once a month by the Specially Controlled Industrial Waste Managers. In FY2011, 2 capacitors stored at AIST Tohoku and 34 capacitors stored at AIST Tsukuba were transported to Japan Environmental Safety

Corporation (JESCO) for treatment and disposal.

Stored PCB waste

Type	Quantity
Capacitors	557
Transformers	50
Stabilizer	5,272



Loading of PCB waste for treatment



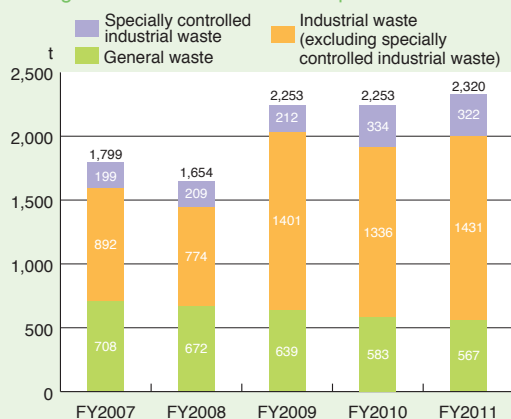
Reduction of Waste Generation We strive to reduce environmental load through waste reduction

AIST strives to reduce environmental load through 3Rs (Reduce, Reuse, and Recycle) activities. Particularly, the reuse of research equipment helps reduce expenditures, and therefore is the focus of our waste reduction efforts (see Effective Use of Resources). As a responsibility of a waste generator, we voluntarily inspect waste disposal sites every year. In

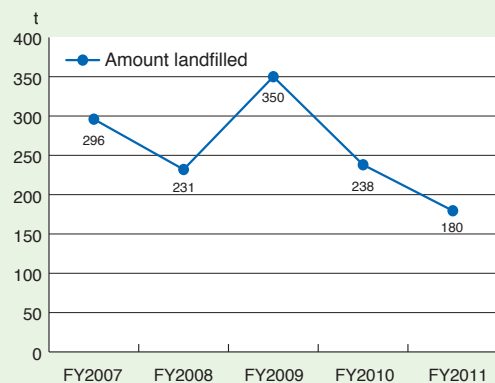
FY2011, we inspected a total of 14 intermediate waste treatment facilities and final landfill sites and confirmed that waste was properly treated.

In FY2011, when drain pipes at AIST Tsukuba damaged by the Great East Japan Earthquake were repaired, a large amount of sludge in the pipes was released, and twice as much sludge was disposed as the previous fiscal year. We promoted the reduction of the use of chemical substances from the perspective of safety management. As a result, the amount of disposed flammable waste oil (hazardous material) increased about three times as much as the previous fiscal year.

Change in the amount of waste disposed



Amount landfilled



Breakdown of Waste disposed (FY2011)

Type	Disposed (t)	Landfilled (t)	Landfill Ratio (%)
General waste	567	86	15
Industrial waste	1,431	86	6
Plastic waste	473	33	7
Scrap metal	642	0	0
Sludge	134	27	20
Scrap wood	24	10	42
Scrap glass, concrete, ceramics	43	5	11
Mixed waste	15	2	10
Waste oil	11	1	5
Composite material	21	4	20
Slag	50	0	0
Others	18	3	19
Specially controlled industrial waste	322	7	2
Flammable waste oil	60	1	2
Strong acid	235	2	1
Infectious waste	17	3	18
Waste oil (hazardous)	6	0	0
Sludge (hazardous)	2	0	7
Waste acid (hazardous)	1	0	6
Others	1	0	19
Total	2,320	180	8

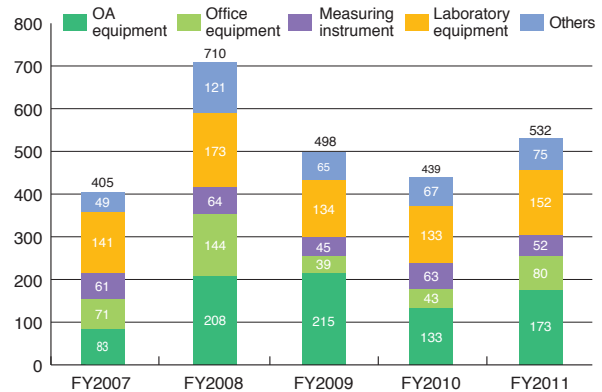


Effective Use of Resources

We promote the reuse of equipment not in use

Since 2005, the Goods Recycling System has been operated to exchange information on necessary and unnecessary research equipment, OA equipment, furniture, consumables etc. using the intranet promoting recycling within AIST. Items that cannot be recycled within AIST are transferred to external parties for free or for a fee. Through these activities, we promote waste reduction and reuse.

Number of recycled items

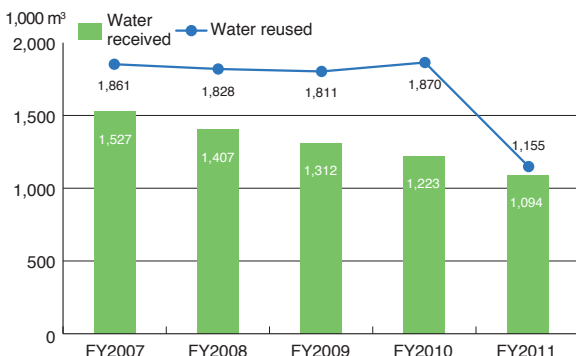


Conservation of Water Resources

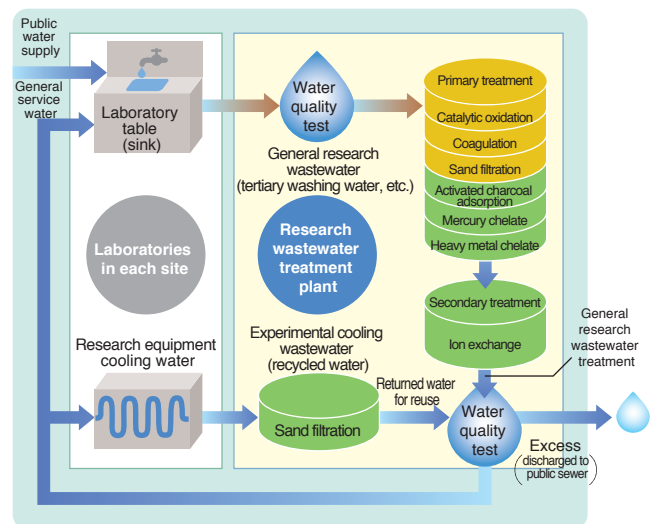
We strive to use water resources effectively through reuse of wastewater

At AIST Tsukuba and AIST Chubu, for the effective use of water resources, research wastewater is reused through neutralization and reduction treatments. The amount of water received in FY2011 was 10.5% less than in the previous fiscal year. The amount of water reused at AIST Tsukuba decreased by about 38% over the previous fiscal year due to the decreased level of research activities as a result of the Great East Japan Earthquake.

Change in the amount of water received and water reused



Water recycling for reuse at AIST Tsukuba



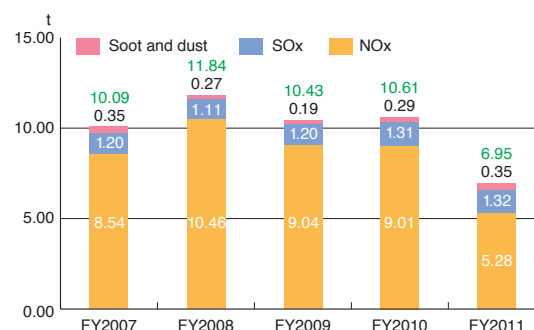
We observe laws, regulations, social norms, code of conduct for researchers, and rules, and thus promote compliance to put the AIST Charter “*Full Research in Society, for Society*” into practice. In the area of environmental protection, we promote the following actions to contribute to the protection of the global environment and the achievement of a sustainable society.

1. We observe international environmental regulations, government and municipal environmental regulations to prevent pollution and preserve the natural environment.
2. We promote research that can contribute to the protection of the global environment and the safety of humanity, and actively work to improve energy efficiency, save resources and recycle resources.

Air Pollution Prevention

The main source of air pollutants are boilers for cold energy source of air conditioning. Primarily, utility gas and kerosene are used as boiler fuel to reduce SOx emissions. In FY2011, NOx emissions were reduced due to the decrease in boiler operating hours at AIST Tsukuba resulting from the 2011 great earthquake.

Change in airborne environmental load



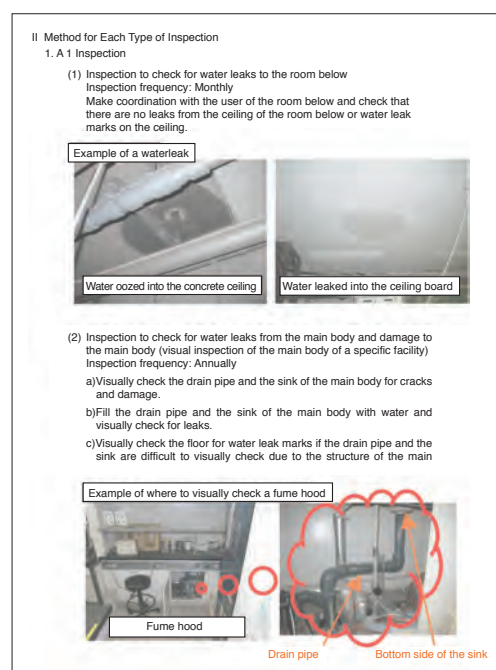
Water Pollution Prevention

Research wastewater discharged from AIST, for the most part, undergoes treatment at the wastewater treatment plant located in each base to meet the effluent standards of the municipalities, including processes of pH adjustment, coagulating sedimentation, filtration, and activated charcoal adsorption, and is discharged into the public sewer.

● Voluntary inspection of drain pipes following the amendment of the Water Pollution Control Law (prevention of groundwater contamination)

Prior to the amendment of the Water Pollution Control Law, which went into effect on June 1, 2012, in all research bases, we voluntarily inspected outdoor buried drain pipes through which research wastewater flows. The outdoor buried drain pipes were difficult to inspect and therefore were inspected with a fiberscope camera or by filling the pipes with water and checking for leaks. At AIST Hokkaido, AIST Kansai, AIST Chubu, AIST Chugoku, and AIST Kyushu, pipe damage was found and repaired. After the amendment

went into effect on June 1, 2012, an inspection manual and a record form were prepared for specific facilities requiring inspection. The facilities are inspected on a regular basis and results are recorded.



Any damage will be reported to the municipalities, and water analysis of the leaked wastewater, groundwater analysis and, as needed, soil analysis will be performed to prevent adverse effects on the surrounding environment.

At AIST Tohoku and AIST Tsukuba, many buried pipes

were damaged by the Great East Japan Earthquake. However, since wastewater was not being drained at the time, the damage had no adverse effect on the environment. The damaged pipes were repaired within FY2011.

As a result of the inspection of drain pipes, damage was found as follows:

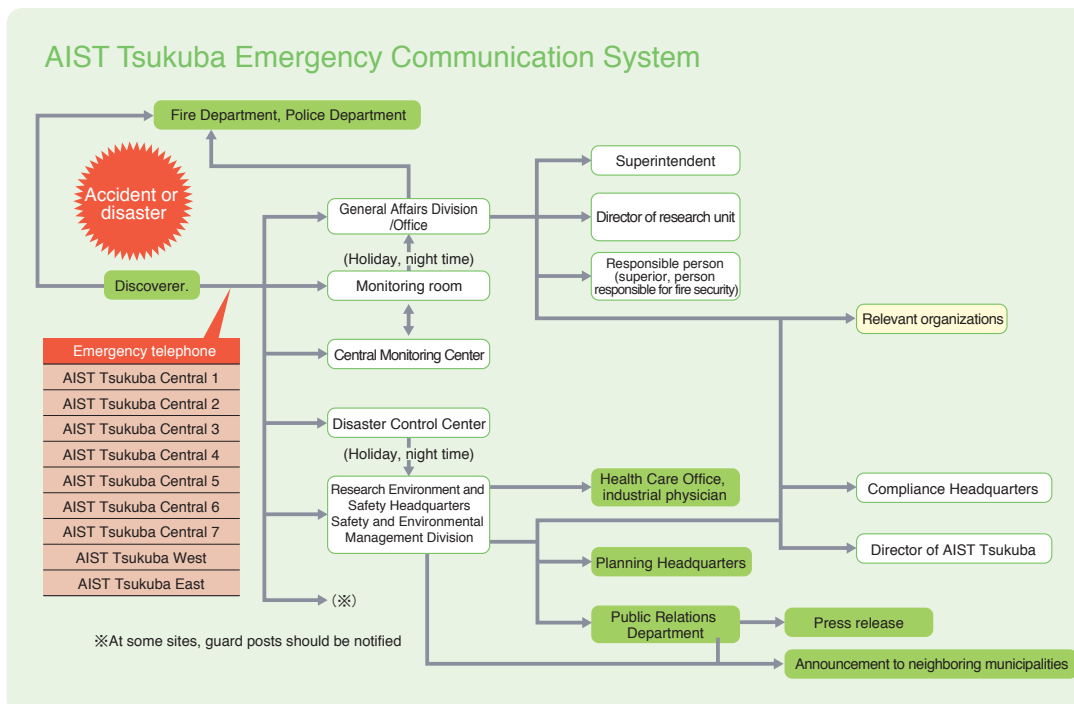
Research base	Abnormality	Action Taken
AIST Hokkaido	One leak due to pipe damage	<ul style="list-style-type: none"> •Soil analysis results were satisfactory •The damage was repaired
AIST Chubu	Two leaks due to pipe damage	<ul style="list-style-type: none"> •Soil analysis showed fluorine concentration exceeding the criteria in one location •Groundwater quality is being monitored •The damage was repaired
AIST Kansai (Ikeda Site)	300 damaged parts, 66 leaks from these parts	<ul style="list-style-type: none"> •Soil analysis showed arsenic and lead concentrations exceeding the criteria •Groundwater analysis* showed arsenic concentration exceeding the criteria •Groundwater quality continues to be monitored •All damaged parts were repaired
AIST Chugoku	One damaged part, no water leaks	<ul style="list-style-type: none"> •No leaks into the ground •The damage was repaired
AIST Kyushu	Three leaks due to pipe damage	<ul style="list-style-type: none"> •Soil analysis results were satisfactory •The damage was repaired

※Since there were many damaged parts, groundwater samples were taken in nine locations on the premises. The arsenic concentration in two locations exceeded the criteria.

Accidents Related to the Environment

At AIST, a PDCA cycle is implemented based on the environmental management system to check for compliance with environmental laws and regulations.

We have a system to minimize damage in the event of an accident.



● Briefing session for employees

In recent years, the public awareness of environmental issues has increased as demonstrated by the amendment of the Water Pollution Control Law. Since a variety of chemical substances are used at AIST, we gave employees who use chemical substances a briefing session, with a focus on the amended Water Pollution Control Law, on safety precautions when handling chemical substances, and the importance of inspecting equipment to prevent environmental accidents, such as leaks of pollutants into public water areas and groundwater (8 sessions with 286 participants in total).



At the briefing

● Implementation of a drill to prepare for an environmental accident

We conduct a communication, reporting and emergency-measure drill to minimize damage in the event of an environmental accident, such as an oil and chemical substance leak or spill. In FY2011, we conducted a drill to prepare for a leak of a hazardous substance from the exhaust gas cleaning system located on the roof of an AIST Tsukuba building. If there is a leak of a hazardous substance on the roof, the substance will flow through the rain gutters into public water areas. In the drill, we practiced locating the rainwater drain line and stopping the flow at the rain water pit, and confirmed emergency contact and reporting procedures.

We will conduct similar drills on a regular basis and revise the emergency procedures as needed.



The drill



The drill

Reporting of accidents in FY2011

● Fire at AIST Tsukuba West

On May 24, 2011, a fire occurred in the propylene rectification system in the research facility for producing propylene from bioethanol, which is located outdoors at AIST Tsukuba West. This accident caused no personal injury and no impact on the surrounding environment. However, we extend our apologies to those in the neighborhood for causing anxiety.

Immediately after the accident, we set up an accident investigation committee to investigate the cause of the accident and to draw up recurrence prevention measures. The committee indicated that the accident was caused by a problem with the construction of the facility and the inadequate operating manual. Also, the committee suggested that for recurrence prevention, facility modifications should be made; the design of a research facility should be reviewed by safety management specialists; and operating manuals and an operation and safety management system should be improved. We confirmed that these measures and a safety management system had been put in place, and approved the resumption of the facility.

● Detection of a nuclear fuel material without registration at AIST Tsukuba Central 3

On October 10, 2011, uranium oxide (about 54 g) was found at AIST Tsukuba Central 3. Immediately, this was reported to the Ministry of Education, Culture, Sports, Science and Technology and to Tsukuba City. The nuclear fuel material found was immediately stored in a lockable safe and is under strict control. We took the incident seriously and performed a thorough inspection of all AIST Tsukuba sites to check if there were similar incidents in other sites. No nuclear fuel materials without registration were found. We will make efforts to prevent recurrence by providing thorough safety training.

In addition, in FY2011, we had two complaints about noise and vibration from residents in the neighborhood. We limited construction work on holidays and stopped the operation of the exhaust fan, which were the cause of the noise and vibration.

Third Party Views

An Outsider's View of the AIST Report 2012 Social and Environmental Report

Tamio Yamaguchi,
Director, Workers Club for Eco-harmonic Renewable Society (NPO)

I am presenting my opinion here in the light of two exchanges of opinions during the preparation of the report. The authors were kind enough to sincerely seek and respond to my comments on early drafts of the report.

Social responsibility (SR) reports have been included in the AIST Report since 2010. With growth in the size of the report (from 49 pages to 55 pages and then 63 pages), there has been steady improvement, such as in the breadth of content in the report, including new disclosures, and writing that gives consideration to ease of understanding.

This year's report leaves a strong impression that the keyword is partnerships. Along with an editorial policy of introducing AIST's activities in society with a focus on collaborative activities, the introductory message by the President strongly emphasizes the importance of collaboration, saying that it is not sufficient for individual businesses to only work on R&D for their own technologies. Taking the lead-off articles and the research reports together, they report on specific forms of collaboration between regional communities and the business world, universities, and research institutions both inside and outside Japan. In particular, the article on the challenges of the Kesennuma Kizuna Project provides a glimpse of a new kind of partnership that has not previously been apparent in the activities of AIST, and the report is rich in pointers to the fundamental nature of innovation.

In the reports issued in previous years, there were frequent signs of a lack of appeal. In contrast, I feel that establishing a clear editorial policy and organizing the introductory message, lead-off articles and other articles more organically has been very effective for the appeal of the report.

Our organization views SR 3.0 as the current level of SR. In SR 3.0, the social issues are shared with other actors (SR sharing), and common values between society and these actors are created in order to solve problems. The collaborative activities referred to in the report are a good example of SR 3.0, and have made for very interesting reading.

It is apparent that efforts in SR have steadily produced results in a number of areas. There are two points that particularly strike me: that

female researchers have not left work due to pregnancy and child-rearing since AIST was founded in 2001; and that an environment suitable for people with disabilities to work in has been created, leading to high retention rates (93.5% in 2011). In regard to the former, it has been reported that generally 60–70% of women give up work at the birth of their first child. In regard to the latter, companies with a retention rate of 90% for people working five years or more have been awarded business commendations from the Ministry of Health, Labour and Welfare. Considering all this, the background to these two points in the report is that AIST seems to have worked hard on creating an unusually supportive environment.

The compliance promotion systems and environment and safety systems of AIST are well established and have steadily produced results. For further development of SR, systems and management to promote the integration of social responsibility into the whole organization (ISO 26000) will be necessary. I hope that this will be considered for the future.

I have two hopes of an SR report. The first is that, because it is an SR report, I would like clear descriptions with a constant awareness of the social context. Such descriptions can be seen everywhere in this report. However, the social significance of the work would be more clearly shown if more quantitative information was included. My second hope is quantitative discussions of issues such as mental health and harassment. Some ingenuity is needed for quantitative indicators of these issues but it is an important matter for AIST, because interest in and concern about improvements in this area are getting stronger. There are a number of cases where disclosure has resulted in evaluation of the effectiveness of policies and progress in improvements.

Workers Club for Eco-harmonic Renewable Society (Junkan Workers Club): A citizens group that investigates, with a global perspective, the form of a society in harmony with the natural ecosystems that will be passed on to the next generation. The goal of the club is to study, support and put into practice measures leading to a sustainable mode of society for regional citizens, businesses and governments. In its CSR workshops, the group runs activities studying and proposing appropriate forms for CSR.
<http://www.nord-ise.com/junkan/>

Afterword

On the publication of the AIST Report 2012

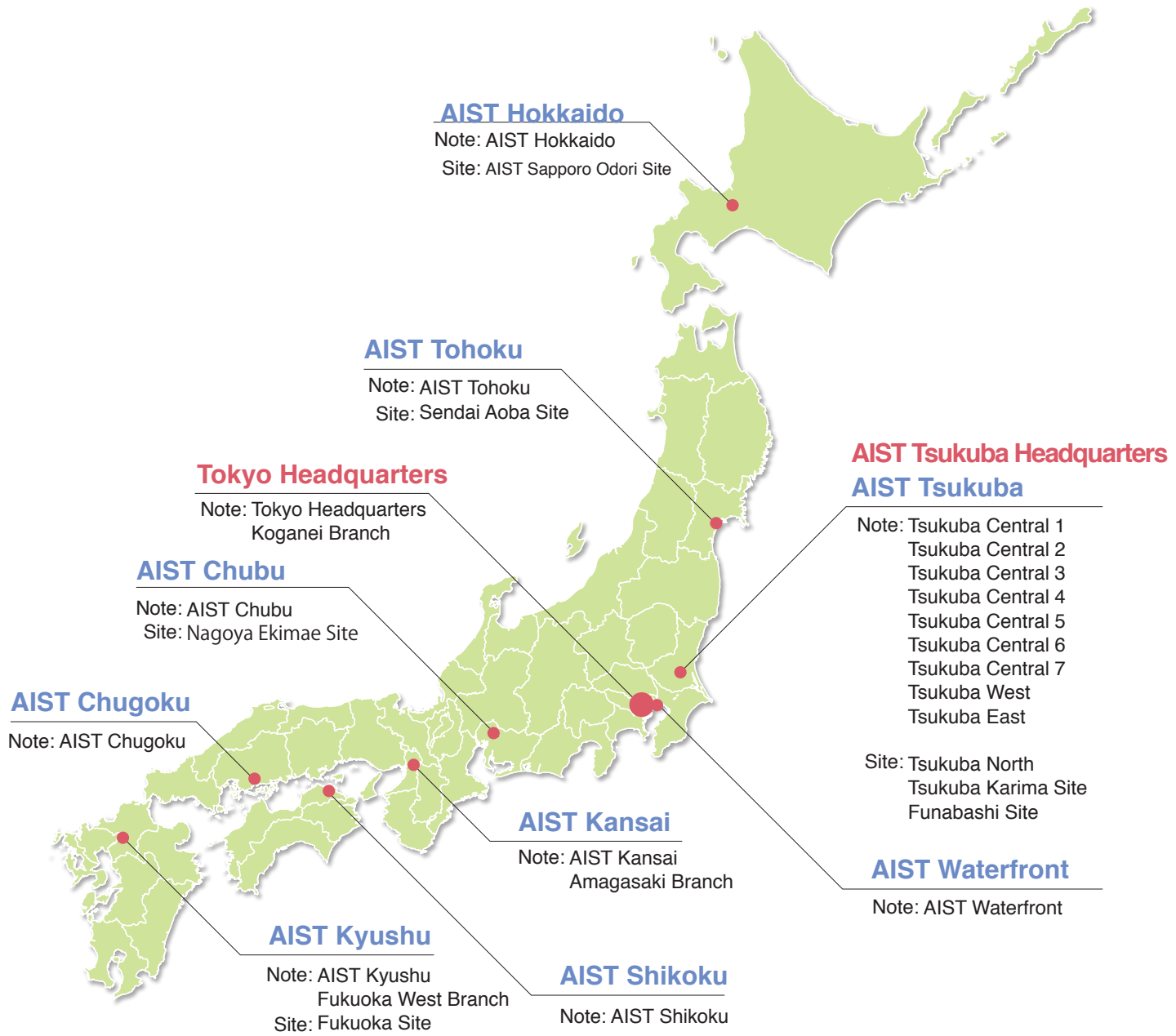
AIST began publishing environmental reports in 2004, and has been publishing the AIST Report—Social and Environmental Report that covers its efforts in social responsibility as well since 2010. AIST considers partnerships with society to be important, and has taken them as the main theme for this year's report. In the lead-off articles, we present our open innovation strategy and related activities. In the research articles, we present our work on new research activities in the region that suffered the Great East Japan Earthquake, and our research activities based on partnerships with overseas research organizations and the business world. We have worked hard to go from simply

introducing our systems and activities to presenting our efforts at evaluation and improvement.

Also, in the Environment Report we present our activities in radiation monitoring and our efforts at saving electricity in the summer, and the reductions in electricity use and in greenhouse gas emissions that were achieved as a result. As a part of society, AIST intends to carry out activities aimed at realizing a sustainable society. We would like to continue to develop in this way, with this report serving as an improved communication tool for presenting the mission and activities of AIST in a way that is easy to understand.

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