

JEOL Group Environmental Activities 2015 Report

Cover micrograph

The moss that often grows between the patches of pavement in the city can be observed as-is with the table-top scanning electron microscope NeoScope[™] using the low vacuum mode. Here, the view of the same area as seen with the optical microscope is overlapped with the electron microscopic image. In addition to the detailed surface information provided by the electron microscope image, the natural coloration from the optical microscope image can also been seen.

100 µm

JEOL Group Environmental Activities

Greeting

The JEOL Group management philosophy is "On the basis of "Creativity" and "Research and Development", JEOL positively challenges the world's highest technology, thus forever contributing to the progress in both Science and Human Society through its products." That is, there can be no progress of society without advances in science. This expresses the passionate belief held at the time of JEOL foundation in 1949 to produce and sell electron microscopes. Under this philosophy, the JEOL Group has continued to develop and provide scientific metrological instruments throughout the years which contribute to the cutting-edge research, like Electron Microscopes and Nuclear Magnetic Resonnance ; Medical Equipment such as Clinical Chemistry Analyzer that supports the preservation of human health; and high-efficiency, energy-conserving industrial equipment.

As part of the philosophy of "sustainable society", there is a world-wide focus on the issues of energy resource depletion and the destruction of the natural environment. The R&D of science technology holds the important role in the events of more efficient solar power generation, high-efficiency power transmission technology, and technologies for utilizing biomass. Meanwhile, the power of science has become very crutial in finding solutions against the environmental pollution issues and nuclear decommissioning issues as a part of our generation responsibility for preserving and passing on a beautiful environment to future mankind,. We are confident that the scientific/ metrology instruments that we develop can make a large contribution to addressing these issues. At the same time, the increasing speed of semiconductors, development of industrial technology, as well as the remarkable progress in medical technology are all contributing to the further enrichment of society. In keeping with the JEOL corporate message of "Solutions for Innovation", we will continue to work hard to provide the optimal solutions.

In order to implement the JEOL Group philosophy, and to promote the development of science technology in Japan, we believe it is important to foster the development of the personnel able to accomplish this task. As part of the effort to achive this, we support young researchers through the operation of the Kazato Research Foundation, as well as working to support science through activities like special classes at elementary and junior high schools by utilizing electron microscopes, to help reversing

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- 2015 Report

the trend of children moving away from interest in science.

We also regard contribution to our local community as being very important. We continue to actively participate in the Akishima-shi Evironment Consideration Enterprise Network assigned as a viceexecutive role. Through this network, in collaboration with the city of Akishima and local enterprises, we contribute to the improvement of the local environment.

Since starting as a company that developed electron microscopes shortly after the end of the war in May 1949, the JEOL Group has received warm local support, and has grown into a company that is expected to meet the needs of the world. Making use of our world- leading technologies, the JEOL Group will continue to provide products quickly and flexibly to meet the ever-changing needs from around the world.

栗原 植右衛門

President & Representative Director

Gon-emon Kurihara



Company Outline

Company name: JEOL Ltd.			
Establishment:	May 30, 1949		
Main office:	3-1-2 Musashino, Akishima, Tokyo		
	196-8558 JAPAN		
Employees:	2,963 (As of end March 2016)		

Report scope

Subject organization: JEOL Ltd.			
	JEOL Technics Co. Ltd.		
	Yamagata Creative Co. Ltd.		
Target period:	April 1, 2014 to March 31, 2015		
Field:	Matters related to		
	environmental protection		
Target audience:	Everyone		

Outline of IMS (Integrated Management System)

JEOL Group IMS Objectives

By providing products and services, such as analytic equipment and instruments for cutting-edge research & development, as well as test equipment, based on our management philosophy, the JEOL Group aims to offer the total solutions demanded by customers and the marketplace.

In addition to satisfying the customer needs, we believe that providing total solutions is an activity that helps to achieve our company philosophy of making contributions to realizing a recycling society that can support sustainable development.

We continue to manage our operations using a internationally-certified management system that integrates product quality and environmental concerns (hereafter "IMS", (integrated management system)). By using this IMS as a tool for business improvement, we are working toward achieving business growth and realizing the goals of our business plan.

- 1. Further promote the YOKOGUSHI strategy to successfully achieve the business plan and meet the high expectations of the market.
- 2. Deliver highly-reliable products and results as a solution provider in order to further improve customer satisfaction.
- 3. Continue to promote environmental protection through product development and process management that considers the product life-cycle throughout
- Proactively engage in company internal and external communication activities to promote contributions to local society and to the development of science and technology.
- Continue to comply with applicable laws, ordinances, and regulations in order to fulfill our corporate social responsibilities as a company that operates globally.
- 6. Continue to make use of IMS in order to successfully achieve the business plan.

Efforts to review and revise the international standards have been started. As we also proceed with revisions to the JEOL Group IMS, we will pay attention to maintaining a consistency with the existing measures.

As the chief executive of the IMS, the continuing improvements to the system will be reviewed, including the proper definition of continuing adminsitration and assignment of responsibilities, and the appropriate implementation and achievement of the IMS policies, goals and targets.

While keeping in mind about the relations betwenn actual business activities and IMS itself, IMS policies shall be annouced within the businee plan and informed to all operation levels among our organization. These IMS policies will be publicized both inside and outside the company, via the web and other appropriate means.

JEOL Group IMS Goals

- 1. Successful achievement of the business plan.
- 2. Further activity to improve quality in order to increase customer satisfaction.
- 3. Promote environmental improvement activities designed to reduce the burden on the environment and prevent pollution.
- 4. Promote activities to make a contribution to the society, making use of JEOL Group personnel and knowledge.
- 5. Strict compliance with the applicable laws and regulations related to our business activities, both inside and outside Japan
- 6.Continue the activities to make effective use of IMS as a business improvement tool

JEOL Group Environmental Management / Promotion System

The JEOL Group Environment Management System associated with several JEOL Group companies is working under the basis of this single unique IMS. The instructions from the IMS Management Committee are implemented through the IMS Managers assigned at each company and department. The management system is illustrated below.

Audits

External Audits

The activities of the JEOL Group are regularly audited by an external audit company, and the audit company provides us an evaluation of the effectiveness of the IMS and the on-going improvement activities. The issues that are pointed out in the audits are regarded as opportunities for improvement, and we make a full use of them as a tool for improving business operations.

The follow-up audit in July 2015 revealed three "minor nonconformity", and we implemented corrective actions.

Internal Audits

Internal auditors, chosen from within the JEOL Group itself, perform regular audits for both quality and environment throughout the entire JEOL Group. These audits are regarded as a tool for business operation improvements, and a priority is placed on making effective use of the internal audits.

The areas of improvement identified in the internal audits are not applied only to specific departments and groups; the entire JEOL Group uses the information to improve the quality of operations.

Second party Audits

A mutual trust relationship with our business partners is essential in order to meet our customers' expectations regarding JEOL Brand prosperity and growth.

Second-party auditors perform audits of our vendor companies. This creates a Win-Win situation between the JEOL Group and our vendor partners, as we work together, with a common goal of creating the best possible products.

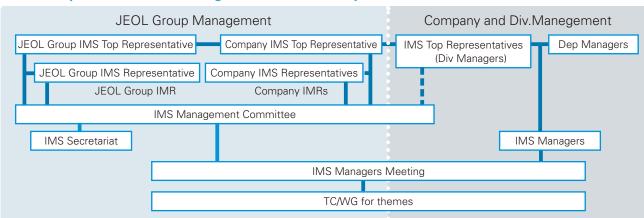
Certification

Not only the JEOL headquarters in Japan, but the entire JEOL Group received ISO14001 certification for the Environmental Management System in December 2002. The quality management system received ISO9001 certification in December 1995, and we were quick to comply with the additional supplemental amendment ISO9001-2008.

Currently, an Integrated Management System that includes both product quality and environment is being operated as the IMS.

In July 2007, JEOL also received certification for ISO 13485 for the Quality Management System for Medical Equipment.

Certification authority: Bureau Veritas Japan Co. Ltd. / DNV Certification authority: UKAS (United Kingdom), RvA (Netherlands) Registration numbers: ISO14001: 3253536 ISO9001: 3253537 ISO13485 : 6254-2007-AQ-JPN-NA



JEOL Group Environmental Management /Promotion System

Compliance Measures

CSR Committee

Recently corporations are being required to comply with regulations concerning "Pollution Control, Chemical Reduction, Quality/ Environmental Control" as part of their Corporate Social Responsibility (CSR).

JEOL organized a committee to address this issue in 2006. The CSR Committee, headed by the president and advised by JEOL's attorney, meets quarterly. The committee's purpose is to promote JEOL's activities to continuously improve and reinforce compliance, quality control, social contribution, corporate ethics, and risk management.

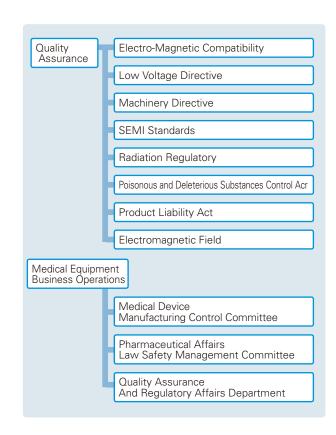
Technical Regulation Committees

In the 1980s, our Engineering Division organized a number of committees to study and comply with regulations and directives worldwide. In 1996 when the Quality Control Office was established, a committee dedicated to technical regulations was organized, and a series of sub committees have emerged over time.

The committee members are responsible for issuing annual activity plans and activity reports, and for reviewing the latest trends in regulations that concern our products.

Laws and regulations change over time. Any provisions affecting the JEOL Group are discussed in the committee specializing in that area, and a review is quickly distributed among all concerned through the Quality Control Office.

For medical equipment, RA (Regulatory Affairs), along with QA (Quality Assurance) is responsible for the ME quality assurance within the Medical Equipment Division, and ensuring complance with the various rules and regulations throughout the world.



Environment Protection through Products

Measures to decrease the burden on the environment

The JEOL Group contributes to improving the global climate by developing and marketing environmentally-friendly and environmentally-contributing products in accordance with the company mission statement "Contribute to the advancement in science and society through our products".

Development & Distribution of Environmentally-Friendly Products

We have performed product assessment by considering energy / resources / space savings since 2002 to develop Environmentally Friendly Products.

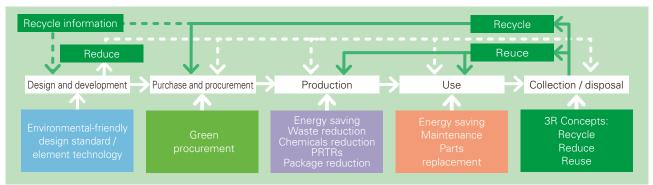
Environmentally Friendly products:

Products designed to reduce the burden on the environment at each step of the product cycle, from materials purchase, production, distribution, through operation, disposal and recycling.

EnvironmentallyContributing products:

Products used by customers that are useful for the analysis and evaluation in areas of environmental protection and pollution control.

Scope of JEOL product assessment Image diagram



Recently, significant reductions have been achieved in the energy required for operation (compared to existing products) of the field emission scanning electron microscope JSM-7800F incorporating the super-hybrid lens, one of the our high-end models.

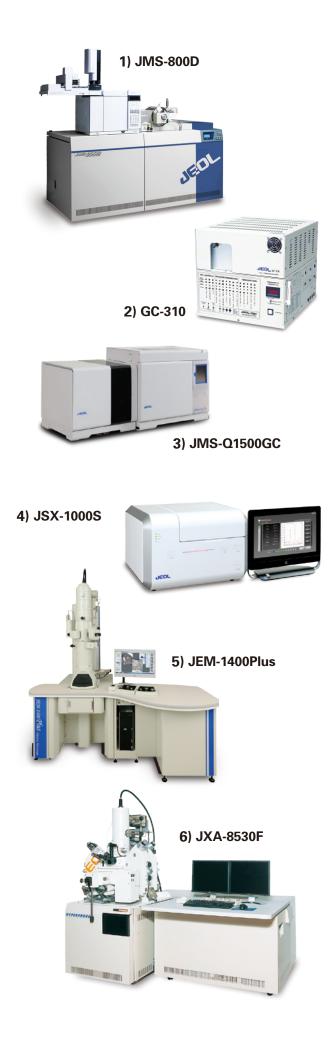
For the production energy, a reduction of 38% was achieved (CO_2 conversion); the energy during use by the customer is reduced by about 30% during normal operation, and up to 40% during standby when the energy-saving mode is used. The usage energy has been reduced by about 35% (CO_2 conversion).

In addition, the installation footprint of the auto biochemical analyzer, JCA-BM6070, has been decreased by about 23%. This system features a minimum reagent volume of 60 μ L for blood analysis, contributing to human wellness and environmental protection.



Environmentally-contributing product

JEOL is a supplier of research tools such as electron microscopes and NMR systems that are essential for research and development of green devices such as LED, solar battery, organic EL, etc. We also provide components needed for green device manufacturing equipment, including electron guns for LED electrode fabrication. In addition to the products supporting the green device industry, we manufacture and distribute various instruments directly contributing to environmental improvement including 1) Dioxin Analysis Mass Spectrometer, JMS-800D, a total solution for dioxin analysis; 2) Portable Gas Chromatography, GC-310, capable of on-site sampling and highly-reliable, real time data acquisition; 3) Quadrupole Mass Spectrometer (QMS), JMS-Q1500GC, capable of qualitative and quantitative analysis with high accuracy and sensitivity for various isomers, such as brominated flame retardants like PBB and PBDE, 4) X-ray Fluorescence Spectrometer, JSX-1000S, which can be used to easily measure harmful substances that are subject to regulation, such as for soil contamination measures, 5) Transmission Electron Microscope JEM-1400Plus, which is widely used for asbestos testing in Europe, and 6) Electron Probe Microanalyzer JXA-8530F, used in studies for the decommissioning of nuclear reactors, as well as PM2.5 component analysis surveys and environmental surveys, such as of soil pollution.



Green Procurement measure

The JEOL Group communicates our environmental policies to our clients and business partners and asks for their cooperation in complying with environmentally preferable (green) purchasing requirements.

JEOL Group companies promote the development and design of products that do not contain certain chemical substances. Our suppliers, provide services without adding specified chemicals, and deliver goods that do not contain the specified chemical substances, in accordance with the terms of their contracts with us.

JEOL Group companies provide information related to chemical regulations to their business partner companies, and make efforts to assist in achieving the targets, by working with their partners, and helping with analysis of the chemical substance content.

RoHS Compliant Products

To provide products compliant with the RoHS directive, many projects have been implemented, including chemical property analysis of materials used, systems to manage chemical properties of our products, and lead free soldering.

We have been working on a RoHs compliant production cycle, from purchasing to distribution. Manufacturing and supply that conforms to RoHS is being expanded.

Regulations on chemical composition, like the RoHS directive in Europe, are becoming increasingly common worldwide.

We are committed to the development, production, and distribution of environmentallycontributing products and environmentallyconscious products to comply with these standards throughout the entire product lifecycle, from procurement to final disposal.

Visit the JEOL site for more details on our environmental projects

(http://www.jeol.com/corporate/envi/report).

JEOL Group

Green Purchasing Requirements [excerpts] Version 5 (June 2010)

The JEOL Group is committed to activities to encourage environmental protection throughout the business cycle from material purchasing, product delivery, service, maintenance, and disposal.

We form an alliance with our clients, vendors, and partners to establish environmentally preferable purchasing worldwide. To insure green purchasing from our supply chain, we have defined a set of rules as the JEOL Group Green Purchasing Requirements.

Visit the JEOL site for the entire document (http://www.jeol.co.jp/envi/activity/activity002.htm).

Protection the environment through business activities

Reducing Greenhouse Effect Gases

We, in compliance with the Global Warming Policy promoted by the Tokyo Metropolitan Government, implemented various measures through the Energy Saving Committee to reduce the amount of CO_2 emissions.

Enhancing Energy Efficiency

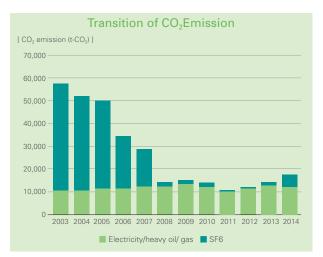
We are proactively working to improve energy efficiency of electricity, fossil fuels, and other resources. Specific measures include phased conversion of the lighting to LED, the introduction of ice thermal-storage air conditioning to make effective use of electricity during the night, the installation of shading sheets and thermal barrier coatings on buildings to reduce the cooling load during the summer.

Furthermore, as a company-wide activity, efforts are being made to reduce energy consumption, including the promotion of the Cool Biz and Warm Biz initiatives, and the control of electricity consumption for each building.

Storage and Disposal of PCB Waste

We store the PCB waste used in high voltage capacitors, transformers, and stabilizers. We have continued the storage for over 40 years since 1972. In some older buildings, PCB is still used as a lighting equipment stabilizer. However, it is being replaced according to a systematic plan.

In 2001, two acts concerning PCB became effective: Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes and Tokyo Metropolitan Government's Guidelines for Proper Management of PCB. We comply with these regulations, filing various documentation including the annual Storage/Disposal of PCB Wastes report for the Tokyo Metropolitan Government.



Management of Chemical Substancesa

Materials used in the manufacturing processes that are handled as toxic substances are subject to special measures, including limiting the handling to specified personnel only, management of the storage locations and amounts, as well as training for the management personnel. These measures are taken to protect employees and to prevent inappropriate circulation or leakage of the toxic substances.

Records of the amounts of toxic substances received and the amounts used are maintained at each storage site for the toxic substances, and all these records are maintained in a company-wide database.

 PRTR Law (Pollutant Release and Transfer Register) and Tokyo Metropolitan Environmental Preservation Code

The reporting on the specified chemical substances that are subject to reporting is made by 2 companies within the JEOL Group, which have received environmental certification. These materials are carefully managed, even at JEOL Group companies that do not handle reportable quantities, so that the quantities at each business location can be continuously monitored.

Waste materials

For waste materials, the issue is to improve the rate of recycling, and efforts continue to achieve this goal. Through measures such as completely separating waste products by the type of material, improving the rate of recycling of waste plastics, and adopting reusable packing crates and materials, we are currently recycling more than 88% of all the materials being used (main office, Akishima factory) In addition, at the Tendo Facotry of Yamagata Creative Co., a recycling rate of 84% has been achieved.

Enhancing Energy Efficiency

For the disposal of waste materials, we make the effort to monitor the final disposal method, even for those items that are handled outside the company grounds. We do not rely solely on the control manifests for industrial waste. Waste materials

Reporting to the national government

Reporting business locations of the certified company: 2 companies (1 substance) Substance name: Dichloropentafluoropropane

Fiscal Year Output destination		FY 2012	FY 2013	FY 2014
Emissions amount	To the atmosphere	1.6/1.1	1.4/1.2	1.4/1.2
	To public waterways	0/0	0/0	0/0
	Into the ground	0/0	0/0	0/0
	Reclamation processing	0/0	0/0	0/0
Transferred amount	Into the sewer system	0/0	0/0	0/0
	Transferred externally	0/0.37	0/0.97	0/1.0

Reporting to the City of Tokyo

Reporting business locations of the certified company: 1 companies (4 substances) unit: kg/vear

Year (amount used) Substance	FY 2012	FY 2013	FY 2014
1) Isopropyl alcohol	—	—	—
2) Methanol	173.0	186.0	160.0
3) Acetone	106.0	106.0	110.0
4) Sulfuric acid	_	_	_

disposal managers ensure compliance with the stipulations of Japan's Wastes Disposal and Public Cleansing Act, as well as those of local regulations. We also perform on-site checks to confirm that the disposal of waste materials is being conducted properly.

Measures at Yamagata Creative Co. Ltd.

Employees of multiple enterprises on the same premises perform all the production tasks, from parts assembly to production completion, as part of an effort to develop ennvironmentallyfriendly manufacturing processes, by reducing and eliminating the need for packaging materials to transfer parts and materials between companies, as well as the fuel consumption and exhaust gases usually associated with transportation.

Contributions to Society

Science Class Support and Math and Science Special Program

The Science Class Support Project was started in Octber 2007 as part of the commemoration of the 60th anniversary of the JEOL Group. Initially, the activities were held at nearby elementary schools, but was later expanded to include teachers, and is now being conducted at a variety of sites, not just elementary schools. A total of 294 demonstrations on 173 days have been performed up-to-date FY2015. The Science Class Support programs are mainly conducted in classrooms by demonstrators sent from the JEOL Group using bentchtop scanning electron microscope (NeoScope). Students are able to observe pollen, insects and various mechanisms of the body in detail. Students seeing electron microsope images for the first time display a lot of interest, making comments like "It was so interesting to see the bugs so clearly and the different pollen shapes", and "I really liked being able to see what goes on inside the human body in the micro world." By actively participating in local community events and workshops for elementary and junior high school teachers we hope to provide a chance for many people to become more familiar with the microscopic world. Examples of activities include:

- "71th Annual Meeting of the Japan Society of Microscopy and Public Lectures" (Uji Campus, Kyoto University)
- JAIMA Science Summer School: Experiments with Analytic Instruments for High-School Students" National Museum of Emerging Science and Innovation)
- "2015 Youngsters' National Science Festival" (Science Museum)
- 4) RERF Open House 2015 (Radiation Effects Research Foundation (RERF), Hiroshima)
- 5) Homei Elementary School affiliated with the Japan Women's University (Mejirodai, Bunkyo Ward)
- 6) Suginami Ward Koenji Junior High School



- Science Class Support activities -

In FY2015, we held special class in 3 elementary schools in the city of Ishinomaki, and 2 in Sendai city to encourgae children affected by the Great Eastern Japan Earthquake.

In the future, we hope that the everyone, including teachers, students, and the general public will be interested in science.

Additionally, the JEOL Group has been working in collaboration with universities and other businesses to increase the number of children with an interest in mathematics, through a program organized by the Tokyo Board of Education in FY2015. We are the participants of Special Math Lesson Programs to provide young students with the opportunity to see the usefulness and appeal of mathematics. JEOL Group instructors utilize bentchtop scanning electron microscopes (NeoScope) to conduct the science support classes. We have visited 5 elementary schools and 2 junior high schools in Hino city (total of 29 classes with 938 students), giving the children a chance to experience the micro-world during FY2015.

Support of the Kazato Research Foundation

Kazato Research Foundation was established in 1969, in commemoration of the 20th anniversary of JEOL Ltd. funded by a contribution from Kenji Kazato, the founder of JEOL Ltd. The purpose of the organization is to promote the research and development of electron microscopes and other related devices, as well as application research using these instruments (medical science, biology, physics, chemistry, materials science, nanotechnology, and others). The foundation has helped many young researchers over the years, and JEOL continues to support the foundation activities with annual donations. (http://www.kazato.org/)

The young researchers below received awards in FY2015.giving the children a chance to experience the micro-world during FY2015.

9th Kazato Prize

Shigeki Kawai Senior Scientist (Department of Physics, University of Basel) "Study of high-resolution atomic force microscopy and molecular"

Shigeki Watanabe Assistant Professor (School of Medicine, Johns Hopkins University) "Cellular and molecular characterizations of synaptic vesicle cycle"

9th Kazato Research Encouragement Prize

Koji Harano Project Associate Professor (Organization for Interdisciplinary Research Projects The University of Tokyo)

"Structural Study on Nucleation Mechanism of Crystalline Molecular Assemblies by Transmission Electron Microscopy"

Kazunori Shinomiya Research Specialist

(Howard Hughes Medical Institute, Janelia Research Campus)

"Electron-microscopy based connectomics of circutits in the fruit fly brain"



- 9th Kazato Prize and Kazato Research Encouragement Prize awards ceremony -We are expecting the the prize winners to be active in the fields of life science and materials research. The awards ceremony was held at the Keidanren Hall in February 2016.

Local Communication

"Don't-Throw-Away" Campaign (campaign for cleaning up commuting routes)

The "Don't-Throw-Away'" Campaign is a volunteer community service activity that JEOL employees have been performing since 1994, and it has become a regular part of the routine. About once every 2 months, employees engage in these clean-up activities during their morning commute.

Employees will continue these activities, never forgetting the original spirit and enthusiasm that prompted the start of the Don't-Throw-Away campaign. It was depressing to see cigarette butts and other trash littering the sidewalks around the company, and along the paths to the train station. Believing that there must be something that we could do, something that we should do, we began to regularly clean the commuting routes. The name given to this clean-up activity is the [Don't-Throw-Away-Campaign]



Participation in the Akishima Evironment-Consideration Enterprise Network

The activities of the Akishima Evironment Consideration Enterprise Network were started in April 2005, with 16 member organizations. By the end of FY2012, the organization had grown to 40 member enterprises.

JEOL has been involved in the activities as an executive member since the inception of the network. During the major revision of the organization between FY2009 and FY2010, JEOL filled the role of chairman of the network, continued in the role of vice-executive for FY2011 and FY2012, and as executive secretary in 2015, continuing to promote environmentally friendly activities and practices in collaboration with the network members. Exhibits were halted and many other activities were limited during 2011 due to the Great East Earthquake and Disaster, recovered in FY 2012 afterall.

The activities are consisting of the layer of steady efforts.We intend to continue to make steady dedicated efforts to "Promote environmentallyfriendly practices in the local community".

Summary of FY 2015 activity report

1) May 2015	Exhibit booth at the Green Environment Flower Festival
2) May 2015	General Assembly
3) July 2015	Participation in the exchange
	program between Akishima
	and Iwaizumi, Iwate prefecture
4) November 2015	FY2015 1st Plenary Session
	and Energy Conservation
	Promotion Step-Up Seminar
5) November 2015	Exhibit booth at the Industry
	Fair hosted by the city of
C) Nevershar 2015	Akishima Akishima Fasility Taur
6) November 2015	Akishima Facility Tour, Environment Communication
	Center, Municipal Waterworks
	Eastern Distribution facility
7) February 2016	FY2015 2nd Plenary Session
	and "Akishima Water Brand
	Building and Promotion"
	workshop
	•

Activities at Yamagata Creative Co. Ltd.

Yamagata Creative Co., Ltd. is a production base of the JEOL group located in Tendo City, Yamagata prefecture. In order to be able to continue working for many years to come, and earn the goodwill of everyone in the region, the following efforts are being made.

- Factory tours are offered to provide opportunities to see the products being produced. Initors from 21 organizations visited our site.
- Crossing guards and patrols are provided on the roads around the company during the traffic safety campaigns in the spring and autumn. The goal is not only to prevent traffic accidents during the commute to school by the young students, but also to improve the traffic manners and practices of the employees.
- 3) Active participation in local festivals, social gatherings and events. In particular, for the local Autumn Festival, a desktop scanning electron microscope was prepared at the festival site to allow visitors to see magnified images of insects and other objects.
- 4) The company parking areas were used for the "Summer Nights" festival to provide support the local community and invite greater interaction with local residents.



- Traffic safety on school commuting routes -



- Students from nearby school -



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www.jeol.co.jp/corporate/envi/report/