Green Factories (Procurement and Production Initiatives)

Konica Minolta's Approach

**Background and Issues**

Today's increasingly urgent environmental challenges require society to use energy and resources more efficiently. There is a limit to the degree of environmental impact reduction that can be achieved solely by one company. Leading global companies should increase their positive contribution to global environmental preservation by expanding the focus of their activities to suppliers of parts and materials, throughout the entire supply chain.

**Vision**

Konica Minolta engages in Green Factory activities to reduce both environmental impact and operating costs. This includes improving efficiency in its production processes, and the development and enhancement of production technology. The company also promotes Green Supplier activities to further reduce environmental impact. The aim is to make an immense environmental contribution across the company's supply chain as the company shares its own environmental technologies and expertise and works closely with suppliers.

**Key Measures and KPIs**

**Green Factory activities**
- Achieve Excellent Green Factory Certification at major production sites worldwide by fiscal 2019
- CO₂ emissions reduction in production activities: 19 thousand tons
- Effective resource utilization: 2.8 thousand tons

**Green Supplier activities**
- CO₂ emissions reduction at suppliers: 5 thousand tons
- Effective resource utilization at suppliers: 0.25 thousand tons
Excellent Green Factory Certification System

Fiscal 2017 Activity Results

Konica Minolta’s Green Factory Certification System aims to reduce both environmental impact and operating costs. All production sites had achieved the highest standard (Level 2) by fiscal 2015. Moving forward, the company launched its Excellent Green Factory Certification System in fiscal 2016. The aim of the system is for Konica Minolta to reduce CO₂ emissions and achieve Excellent Green Factory Certification standards at all of its major production sites worldwide by fiscal 2019.

In addition to complying with the previous certification standards for reducing environmental impacts from internal sources, the new system is designed to meet the standards for reducing CO₂ emissions from external sources by working in unison with suppliers, customers and communities. Konica Minolta is also working to meet its own standards for Sustainable Green Factory Certification by sharing its environmental technologies and expertise with external stakeholders with the aim of reducing CO₂ emissions from external sources by an amount exceeding the CO₂ emissions reductions in its own business activities.

In fiscal 2017, as a result of these environmental impact reduction efforts in the production stage, compared to fiscal 2005, 116 thousand tons of CO₂ emissions and 17 thousand tons of waste were eliminated, and a total cost reduction of 6.3 billion yen was achieved.
**CO₂ Emissions Reduction Effect during Production**

- **2005:** 387 thousand tons
- **2017:** 282 thousand tons

**CO₂ emissions reduction***: 116 thousand tons

**Cost reduction:** 3.4 billion yen

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**Waste Reduction Effect during Production**

- **2005:** 26.5 thousand tons
- **2017:** 14.4 thousand tons

**Waste reduction***: 17 thousand tons

**Cost reduction:** 2.9 billion yen

*The amount of reduction calculated by subtracting the actual emissions amount in fiscal 2017 from the emissions amount estimated for cases in which the environmental conservation activity was not implemented from fiscal 2005.
Green Factories (Production Initiatives)

Saving Energy and Preventing Global Warming in Production Operations

Promoting Energy Savings at Production Sites

In line with its Green Factory certification system for comprehensively evaluating environmental activities at production sites, Konica Minolta strives to increase energy productivity and to reduce CO₂ emissions from production operations through a variety of measures.

### Energy Conservation Support Program

Konica Minolta has implemented an Energy Conservation Support Program in order to promote the reduction of CO₂ emissions at production sites. Under this program staff members within the Group who are experts in process design, production equipment design, and energy management visit production sites and conduct inspections of everything from the energy management situation to the status of utilities and production equipment such as air conditioning and boilers, based upon which they recommend measures suited to each site. Using these recommendations, the expert staff and personnel at each site conduct simulations of the energy-saving effects, which help with implementing the measures.

#### Examples of Main Measures

<table>
<thead>
<tr>
<th>Improve productivity</th>
<th>Industrial engineering (IE) work analysis, yield rate improvement, installation of automatic machines, takt time reduction, production space optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimize equipment operation time</td>
<td>Shutdown during downtime, reduction of standby power consumption</td>
</tr>
<tr>
<td>Reconsider air conditioning operation</td>
<td>Temperature setting optimization, operating time optimization</td>
</tr>
<tr>
<td>Save energy in lighting</td>
<td>Thinning out lighting, conversion to high-efficiency lighting</td>
</tr>
<tr>
<td>Save energy in molding machines</td>
<td>Infrared heating, installation of servo motors, cylinder insulation</td>
</tr>
<tr>
<td>Save energy in compressed air</td>
<td>Installation of inverters, limited number of units, air pressure optimization</td>
</tr>
<tr>
<td>Reconsider refrigerator operation</td>
<td>Refrigerator integration, reconsideration of exit temperature setting</td>
</tr>
<tr>
<td>Use waste heat</td>
<td>Heat exchange at exhaust/intake, reduction of steam production by using waste heat from dehumidifiers</td>
</tr>
<tr>
<td>Reduce heat radiation loss</td>
<td>Steam piping insulation, piping integration, reduction of valve leaks</td>
</tr>
</tbody>
</table>
Examples of Initiatives

Pursuing Energy Savings by Reviewing the Operation of Clean Rooms with High Energy Loads (Konica Minolta Business Technologies (Dongguan) Co., Ltd.)

Konica Minolta Business Technologies (Dongguan) Co., Ltd., which manufactures MFPs and other products in Dongguan, Guangdong Province, China, has achieved dramatic energy savings by conducting reviews of the operational status of clean rooms with high energy loads in the factory. Specifically, it took another look at the temperature and humidity conditions while keeping them within product specification requirements, optimized the ventilation frequency while maintaining cleanliness, reduced clean room equipment operating time by installing a timer, and reduced clean room floor space through layout review. The implementation of these measures has saved energy used by cold energy source equipment and ventilation equipment. In addition, in November 2017, full-scale use of renewable energy began, with the installation of photovoltaic equipment on the roof of the plant. These measures have greatly contributed to the Excellent Green Factory Certification System, the Konica Minolta accreditation system launched in fiscal 2016.

Energy Savings through Smaller Production Space and Shorter Production Time (Konica Minolta Business Technologies (Wuxi) Co., Ltd.)

Konica Minolta Business Technologies (Wuxi) Co., Ltd., located in Jiangsu Province, China, has adopted industrial engineering (IE) work analysis as a new endeavor aimed at reducing environmental impact through increased productivity. The analysis is based on specialized analytical knowhow cultivated in Japan by Konica Minolta. By thoroughly reconsidering operability and line of flow of production lines, the company reduced production space, shortened production times, and cut energy consumption, including that of air conditioning and lighting.

Utilizing Waste Heat from Production and Curbing Heat Dissipation to Ensure Energy Conservation (Konica Minolta Supplies Manufacturing Co., Ltd.)

With its head office in Kofu, Yamanashi Prefecture, Konica Minolta Supplies Manufacturing Co., Ltd. makes developers and photosensitive drums for multi-functional peripherals (MFPs). The company has achieved sharp reductions in energy consumption by utilizing the waste heat from the toner production process and curbing the heat dissipation from steam pipes.

Heat exchange with high-temperature water is typically used, but the company actively uses the waste heat from low-temperature water generated in the toner production process through heat exchange and produces heated water to be used in other processes. This significantly reduces the gas consumed to produce heated water.

The company also installed an automated control system to supply steam only when and in amounts needed to prevent heat from dissipating from the pipes.
In addition, outside air is used for drying, but the amount of air required differs significantly depending on fluctuations in the humidity of the outside air. The company controls the dew point of the outside air sucked in constantly, then curbs the blower’s air volume and number of rotations to conserve energy. It has also upgraded from NAS batteries to large-capacity lithium ion rechargeable batteries in order to adapt to momentary power interruptions and power outages. As a result, heaters no longer have to be used, conversion loss has been reduced and efficiency has improved, delivering significant energy conservation.

### Pursuing Energy Savings with a High-Efficiency Air Conditioning System (Konica Minolta Business Technologies (Malaysia) Sdn. Bhd.)

Konica Minolta Business Technologies (Malaysia) Sdn. Bhd., which assembles MFPs, has achieved major energy savings by actively employing high-efficiency air conditioning systems. Since Malaysia is a tropical country where air conditioning use is high, the company has installed a large-temperature-difference air conditioning system and a temperature-stratified air-conditioning system and reduced electricity consumption compared with conventional air conditioning. In the areas between each factory building, dedicated individual air conditioners had been required, but individual air conditioners were discontinued by supplying surplus cold air from air conditioners in other processes. In this way, the company has promoted high-efficiency air conditioning operations throughout the plant.

### TOPIC: New Environmentally Friendly Research Building SKT

The new R&D building (SKT) opened in April 2014 at Konica Minolta Tokyo Site Hachioji integrates environmental facilities that will contribute to environmental impact reduction, including solar panels on the roof, an atrium that brings in lots of natural light, daylight sensors to reduce lighting electricity consumption, effective natural ventilation, and use of well water. As a building with excellent environmental friendliness, SKT received the highest certification, “Class S,” in the Comprehensive Assessment System for Built Environment Efficiency (CASBEE), which is an evaluation of the environmental performance of buildings led by Japan’s Ministry of Land, Infrastructure, Transport and Tourism. The building also won a fiscal 2014 Good Design Award from the Japan Institute of Design Promotion (JDP).

### TOPIC: Installing a Gas Turbine Cogeneration System That Provides High Energy Efficiency by Effectively Using Exhaust Heat

On February 1, 2017, the Konica Minolta Kobe Site began operating a gas turbine cogeneration system that uses city gas as fuel. This system provides distributed power generation (7,000 kW class power generation output) that generates power in the places where energy is needed. By effectively utilizing exhaust heat generated at that time, it is possible to achieve overall efficiency at a high 80-90% energy efficiency (general thermal power plants are at about 40%), which greatly contributes to energy saving and CO₂ emission reduction.
This system is superior from the standpoints of both energy saving and environmental preservation because the fuel uses city gas with high combustion efficiency and low impurity, generates virtually no dust or sulfur oxides, and generates low amounts of nitrogen oxides thanks to the latest low-NOx combustion technology. When it was installed, it was assessed as a Class 2 Project, the first such project under the city of Kobe’s environmental assessment standards. The preliminary considerations of the environmental impact assessment were also disclosed to stakeholders, a briefing was held, and opinions were taken into account.

**Primary Advantage of Installation**

<table>
<thead>
<tr>
<th><strong>CO₂ reduction</strong>:</th>
<th>CO₂ reduction of 20% or more compared with previous methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peak cut</strong>:</td>
<td>Leveling of electricity demand: Electric power peak cut rate is 70%</td>
</tr>
<tr>
<td><strong>BCP</strong>:</td>
<td>The system supplies power to the premises critical load in the case of emergency</td>
</tr>
<tr>
<td><strong>Subsidies</strong>:</td>
<td>Subsidy support was received from the Energy Use Rationalization Business Support Program, in recognition of the high energy savings of the installed equipment.</td>
</tr>
</tbody>
</table>

At this site, the company has continued to install energy-saving equipment, streamlined product manufacturing processes, and achieved per-unit reductions of energy consumption by an annual average of 4% or more. The operation of this system is positioned as the core of the energy saving and CO₂ emissions reduction plan in the Medium-Term Environmental Plan 2019.
Green Factories (Production Initiatives)

Resource Conservation and Recycling in Production Operations

Promoting Resource Conservation and Recycling at Production Sites

Konica Minolta has implemented a variety of measures to reduce and recycle waste generated from production operations and is striving to reduce the amount of waste discharged, with the aim of creating a recycling-oriented society.

Examples of Main Measures

<table>
<thead>
<tr>
<th>Measures</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce material loss</td>
<td>Improvement in materials, parts, and product yield rates</td>
</tr>
<tr>
<td>Reduce packaging materials</td>
<td>Switching to simple packaging, increasing quantities inside packages</td>
</tr>
<tr>
<td>Reuse packaging materials</td>
<td>Switching to reusable shipping containers within the company, between production sites, and with parts suppliers</td>
</tr>
<tr>
<td>Reduce mold scrap</td>
<td>Adoption of dies with no molding scrap, minimization and internal recycling of molding scrap</td>
</tr>
<tr>
<td>Reduce press scrap</td>
<td>Minimization of feed pitch</td>
</tr>
<tr>
<td>Reduce support materials</td>
<td>Reuse of cleaning solvents, reuse of molding machine oil</td>
</tr>
<tr>
<td>Reuse pallets</td>
<td>Switching to reusable pallets with parts suppliers, changing the size of pallets for parts and using them to ship products</td>
</tr>
</tbody>
</table>

Examples of Initiatives

- **Reducing the Amount of Waste Discharged by Applying the 3Rs to Plastic Mill Ends**

  Konica Minolta makes an active effort to apply the 3Rs (reduce, reuse, and recycle) to the mill ends generated at production sites in the molding processes for plastic parts. Konica Minolta Business Technologies (WUXI) Co., Ltd. and Konica Minolta Business Technologies (Dongguan) Co., Ltd., which are companies producing business technologies products in China, reduced their use of plastic raw material by developing and installing molding dies that do not generate mill ends.

  They reduced the material input through the use of hot runners in molding dies, the minimization of runner sizes, and the pulverization and reuse of runner mill ends. Then, they made effective use of unneeded mill ends as material in such things as parts racks used in factories and parts boxes used in the shipment of parts from suppliers.

- **Reducing Packaging Material Waste**

  Konica Minolta is making efforts to reduce the disposal of packaging materials used at production sites when procuring materials and parts. For instance, it has simplified packaging, such as switching from stretch film for wrapping parts boxes together to packing belts that can be reused, and it has reduced the amount of packaging materials used by changing the number of units purchased when procuring materials to increase the number of units packed into boxes. Additionally, it has changed parts boxes from cardboard to reusable foldable boxes made using mill ends recycled from plastic parts. It also does not dispose of packaging cushioning, but instead returns it to suppliers for reuse, in order to reduce waste discharge. Konica Minolta
Business Technologies (Malaysia) Sdn. Bhd., which assembles MFPs in Malaysia, uses ABS plastic recovered from used game machines as a material for containers used in procurement and in-process transport in an effort to efficiently use resources.
Green Factories (Production Initiatives)

Reduction of Chemical Substances Risks in Production

Basic Concept

Working on reducing chemical risks based on the concept of the precautionary principle

There is international consensus on the need for companies that manufacture and use chemical substances to take steps to minimize the adverse effects of chemicals, not only on human health, but also on the environment. Based on this shared perception, many countries around the world are revising their regulations concerning chemical substances. Having taken a position in advance of this new international current, based on a concept known as the "precautionary principle," Konica Minolta has focused on enhancing its advance evaluation of chemical risks, reducing the emission of harmful substances into the atmosphere, and eliminating hazardous substances from production processes and products to improve safety management for workers and product users.

Prior Risk Assessment of Chemical Substances

Using its unique safety verification system to achieve the appropriate management of chemicals

Risk Assessment of Candidate Materials Using a Safety Verification System

Konica Minolta has established a safety verification system that assesses the risk of candidate materials when considering the use of new chemicals in the process of creating products. Using this system, the Group practices appropriate management based on comprehensive chemical risk assessment in terms of product safety, environmental safety, and work safety.

Safety Verification System
Designation of Prohibited and Restricted Chemical Substances

Konica Minolta designates prohibited and restricted chemicals based on its own criteria in order to eliminate chemicals with unacceptable hazards in the prior risk assessment carried out before the adoption of a chemical substance. These criteria include not only chemicals regulated by law, but also chemicals recognized as significantly hazardous by specialized institutions.

Calculating Risk Points for Chemicals

Konica Minolta calculates points for the hazard risk of substances based on a unique calculation method used in its safety verification system. This quantifies the hazardousness points based on three factors: (1) type and degree of hazardousness; (2) level of safety measures; and (3) amount used. Using these numbers, it is possible to compare different types of risks—such as the danger of an explosion or serious health effects such as carcinogenicity—on the same scale. In this way, Konica Minolta quantitatively assesses the potential risks of hazardousness in chemicals.

Risk Management That Envisions Substance Usage

Since risks differ depending on the form of exposure, Konica Minolta classifies substances into four categories that envision usage, ranging from use under strict safety controls (e.g., at production sites) to use by the general public, which cannot be assumed to take safety measures. It then specifies safety requirements according to the different risks in order to carry out more practical risk management.

When there is a necessity to use highly hazardous chemicals, Konica Minolta holds a safety determination meeting to stipulate rigorous management conditions for minimizing risks in terms of procurement, storage, handling, and disposal.

Risk Assessment During Continual Use

Even after incorporating a chemical into the production process after conducting a risk assessment, Konica Minolta checks periodically to make sure that there are no changes in the amount used or the conditions of use. If there are any changes, a risk assessment is performed again to ensure appropriate management.

Reducing and Fully Phasing out Chemicals

Reducing VOCs based on Konica Minolta’s own risk management indicators

Konica Minolta assesses risk based on a chemical’s hazardousness and amount of use and is committed to finding alternatives and reducing those substances judged to have a high risk. Since 1993 it has been making efforts to reduce atmospheric emissions of volatile organic compounds (VOCs) from production sites worldwide. It identified VOCs with particularly high risks for full phase-out, and has maintained the full phase-out status for those identified items.
Reducing Atmospheric Emissions of VOCs

Konica Minolta is systematically reducing VOCs in line with its own environmental impact index, which multiplies the impact on the human body and the environment by a location coefficient as a management indicator. Each site has established reduction goals in line with the Green Factory Certification System and is working to achieve them.

<table>
<thead>
<tr>
<th>Hazard coefficient</th>
<th>Example of substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substances that pose a risk to human health</td>
<td>×100</td>
</tr>
<tr>
<td>Substances that pose a risk to ecosystems</td>
<td>×10</td>
</tr>
<tr>
<td>Substances that pose a risk of atmospheric pollution</td>
<td>×1</td>
</tr>
</tbody>
</table>

Hazard coefficient: Set at 1-fold, 10-fold, or 100-fold depending on the severity of the impact on human health and the environment (set independently by Konica Minolta based on the coefficient used in the safety evaluations conducted by Kanagawa Prefecture in Japan)

Location coefficient: Outside the industrial park: 5; inside the industrial park: 1

Standards for Calculating Environmental Data (Page 96)

Substances for Which Konica Minolta Achieved a Full Phase–Out

Konica Minolta earmarked the VOCs below for full phase–out, having judged them as having an especially high risk based on the hazardousness and amount of use of each substance and made systematic efforts from early on toward that end. Those efforts resulted in the achievement of a full phase–out in fiscal 2010, which has been maintained ever since.
Countermeasures against Contamination of Soil and Ground Water

Striving to manage the state of contamination through regular monitoring, to facilitate cleanup, and to prevent the spread of contamination

Konica Minolta has implemented countermeasures at sites where soil or ground water contamination has been identified to ensure that the contaminants do not affect the surrounding environment. This is followed up by periodic observation and managed strictly.

The Group has organized a specialist team to manage remediation of polluted sites and to prevent the spread of contamination. Detailed surveys conducted under the team's supervision serve as the basis for developing countermeasures and examining suitable purification technologies.

The Group reports the results of its observations and remediation efforts periodically to local government agencies and to concerned neighboring residents.

> Summary of Contaminated Soil or Ground Water at Operation Sites (Page 99)

Dealing with Asbestos

Konica Minolta is conducting a survey into the usage of sprayed asbestos in the buildings of all its sites and affiliated companies in Japan. As of March 2014, it had confirmed that there are no health risks due to exposure. Going forward, it will continue to maintain and manage this situation while systematically removing the asbestos.
Dealing with PCBs (Condition of Storage)

Konica Minolta takes steps for the proper storage and management of PCB wastes kept in all its sites and affiliated companies in Japan. It also reports the condition of storage to the government in accordance with the law. Since 2007, it has been commissioning the disposal of wastes with high concentrations of PCBs to JESCO.* From here on the Group will continue to dispose of the waste as soon as possible according to JESCO’s capacity to take in batches. Since fiscal 2012, it has also been gradually disposing of waste with low concentrations of PCBs, in light of the certification status for treatment.

* JESCO: Japan Environmental Storage & Safety Corporation

Condition of Storage of PCB Waste (March 31, 2018)

<table>
<thead>
<tr>
<th>Stored items</th>
<th>Unit</th>
<th>Quantity</th>
<th>Figures in parentheses indicates low-concentration PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformers</td>
<td>Units</td>
<td>7</td>
<td>(7)</td>
</tr>
<tr>
<td>Capacitors</td>
<td>Units</td>
<td>2</td>
<td>(2)</td>
</tr>
<tr>
<td>Fluorescent ballasts</td>
<td>Units</td>
<td>1,246</td>
<td>(0)</td>
</tr>
<tr>
<td>Other devices</td>
<td>Units</td>
<td>6</td>
<td>(6)</td>
</tr>
<tr>
<td>PCB oil</td>
<td>kg</td>
<td>150</td>
<td>(0)</td>
</tr>
<tr>
<td>PCB pollutants</td>
<td>kg</td>
<td>996</td>
<td>(0)</td>
</tr>
</tbody>
</table>
Green Factories (Production Initiatives)

Addressing Biodiversity in Production Activities (Consideration of Water Resources and Wastewater, Proper Management of Greenery at Factories)

Consideration of Biodiversity at Production Sites

Carrying out efforts in accordance with the Guidelines for Biodiversity Preservation

Konica Minolta is working to preserve biodiversity as part of its unique Green Factory Certification System for comprehensive evaluation of the environmental activities of its production sites.

In April 2011, guidelines were set for water resources and wastewater, along with the proper management of greenery at factories, and the certification standards for Level 2 require compliance with these guidelines.

Guidelines for Biodiversity Preservation

<Consideration of water resources>
- Reduction targets are set for total water consumption, or for water used on site, and reduction measures are implemented
  - If groundwater is used, measures must be taken to reduce the amount used

<Consideration of wastewater>
- In order to prevent ecological damage to rivers and lakes, a risk management system must be established to eliminate highly polluted wastewater
- Checks are in place to determine the impact on ecosystems such as aquatic habitats of wastewater emitted into public water areas

<Proper management of greenery at factories>
- Invasive alien species that are likely to have a negative impact on ecosystems are not planted or sown on the factory’s premises
- When planting trees on factory grounds, management and protection must be accorded to any rare species that are discovered

Consideration of Water Resources

Konica Minolta monitors and manages the volume of water use at each site and strives to reduce its total water consumption in line with the reduction targets it has established.

In initiatives for the Excellent Green Factory Certification System, Konica Minolta’s key production sites around the world are currently working to reduce water intake to meet targets for reduction of water consumption. Konica Minolta’s key production sites are also reviewing their use of water in plants and working to make reductions. These include measures to reduce the volume of heated water used and the energy required to produce the heated water, such as changing temperature controls to only steam rather than a two-stage control process involving steam and hot water during in-process regulation of reaction temperatures. In addition, after considering the impact on users and the backup system in the event of problems, the sites decided to reuse
drain water, which has relatively few impurities and is easy to reuse, as a supplementary feed for the cooling tower. The sites are also working to efficiently use water resources outside of the production process as well through measures such as installing water-saving faucet valves, checking for leakage from piping and repairing piping damage.

In fiscal 2013, the Group adopted an analysis method using the World Resources Institute’s (WRI)1 Aqueduct2 to conduct a comprehensive risk assessment on usage of water resources at the Group’s production sites and R&D sites and major suppliers around the world. Every year since, the results have confirmed that the Group has no sites with an extremely high risk.

In the future, the Group will continue to conduct water risk assessments when establishing new sites and changing the business environment, and it will take measures to reduce water use as necessary. Additionally, production sites that use groundwater as their main intake source have set reduction targets with an indicator of the percentage of groundwater use accounted for in production output (i.e., per unit of production). They are making efforts to reduce the use of groundwater, such as by turning off the supply of cooling water when production is stopped.

*1 WRI (World Resources Institute)
*2 Aqueduct: World maps and information showing the latest water risks published by the WRI. Produced based on 12 key water risk indicators such as physical water stress and regulatory risk related to water resources.

### Consideration of Wastewater

Konica Minolta regularly conducts compliance assessments on a global basis to confirm the status of compliance with laws, ordinances, agreements, and other relevant regulations related to effluent, with the aim of preventing water pollution from effluent.

The Group has assessed the effect of effluent on the ecosystem at production sites that release effluent used in the production process into rivers. It adopted WET,* a new effluent management method using bioassays that is gaining worldwide attention, when conducting the assessments. With the cooperation of Japan’s National Institute for Environmental Studies, the Group conducted tests using three aquatic species (algae, crustaceans, and fish). The results indicated that there was no negative impact (algae: inhibition of growth; crustaceans: inhibition of breeding; fish: reduced hatching rate or reduced survival rate after hatching) on any of the three test organisms.

* WET (Whole Effluent Toxicity): A method that assesses the aggregate toxic effect of wastewater on aquatic life rather than the evaluation of individual chemical substances. Unlike conventional effluent management methods, it enables holistic assessment of the effect of an effluent, detecting impact caused by any non-regulated chemical substance or the combined impact of multiple substances.
Proper Management of Greenery at Factories

Konica Minolta practices proper management of greenery on the grounds of the Group's production sites. By preparing greenery management lists for each site and conducting periodic checks, it makes sure that there are no invasive species, including sowing seeds.

Additionally, when rare species are discovered at a site, efforts are made to protect the species by making employees and visitors aware of its presence by putting up signs and fences. For instance, the Tokyo Site Hino is managing and protecting Golden Orchid (cephalanthera falcata) and Japanese lily (lilium speciosum), which are endangered species.

Consideration of Biodiversity in Procurement

Procuring copy paper in consideration of forest resource conservation

Konica Minolta Japan, Inc., a sales company in Japan, has established the PPC Paper Purchase Standards, which have been implemented since 2007. The Standards stipulate that copy paper supplied to customers should be procured by taking into account the impact of forest destruction and degradation on the living environments of animals, plants, and people.
Green Factories (Procurement Initiatives)

Green Supplier Activities

Overview of the Activities

Konica Minolta conducts Green Supplier activities to reduce both environmental impact and operating costs by providing suppliers with environmental technologies and expertise that it has developed via its Green Factory activities. Konica Minolta's environmental experts visit supplier production sites and propose suggestions for improvement, outlining cost reduction benefits, investment rationale, and other information. They then cooperate with suppliers as they take action to reduce their environmental impact.

Fiscal 2017 Activity Results

In fiscal 2017, activities were initiated with five new companies, meaning that Konica Minolta is now working with a total of 14 companies. By the end of fiscal 2017, three of these companies had achieved their Green Supplier Activity Targets, which are equivalent to the level of the Green Factory Certification Standards, for a total of six certified companies.

Green Supplier Activity Targets

<table>
<thead>
<tr>
<th>Issue</th>
<th>Management Index</th>
<th>Target (2.5 years after activity launch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention of global warming</td>
<td>CO₂ emissions</td>
<td>5% reduction (compared to the last year before activity launch)</td>
</tr>
<tr>
<td></td>
<td>Energy costs</td>
<td>5% reduction (compared to the last year before activity launch)</td>
</tr>
<tr>
<td>Waste reduction</td>
<td>External discharge quantity</td>
<td>12.5% reduction (compared to the last year before activity launch)</td>
</tr>
<tr>
<td></td>
<td>Material / waste costs</td>
<td>Cost reduction greater than waste expenses</td>
</tr>
<tr>
<td></td>
<td>Final disposal rate</td>
<td>0.5% or less</td>
</tr>
<tr>
<td>Reduction of chemical risk</td>
<td>Reduction of chemical risk</td>
<td>Compliance with chemical substance guidelines</td>
</tr>
</tbody>
</table>

Companies That Achieved Green Supplier Activity Targets

<table>
<thead>
<tr>
<th>Achievement Date</th>
<th>Company</th>
<th>Activity Launch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar. 2016</td>
<td>Shenzhen Changhong Technology Co., Ltd.</td>
<td>FY2014</td>
</tr>
<tr>
<td>Mar. 2017</td>
<td>Toyo Communication Technology (Shenzhen) Co., Ltd.</td>
<td>FY2014</td>
</tr>
<tr>
<td>Mar. 2017</td>
<td>Allied Technologies (Saigon) Co., Ltd.</td>
<td>FY2015</td>
</tr>
<tr>
<td>Aug. 2017</td>
<td>Szepak Precision (Wuxi) Co., Ltd.</td>
<td>FY2015</td>
</tr>
</tbody>
</table>
Voice of a Supplier | Szepak Precision (Wuxi) Co., Ltd.

Through the Green Supplier activities, we received a wealth of advice on things such as energy conservation, resource reduction measures, and calculation methods. Thanks to Konica Minolta, we were able to take the first steps toward environmental contribution. For environmental measures requiring investment, we received proposals from a management perspective, including measures sorted into short-, medium-, and long-term investments, as well as by depreciation period. The government also has several requirements for environmental conservation measures, and we were able to work even more positively on them by pursuing the Green Supplier activities. In the future, we would like to develop self-diagnosis mechanisms while applying diagnostic tools from Konica Minolta.

Yushi Ueda
Director / General Manager
Szepak Precision (Wuxi) Co., Ltd.

Voice of a Supplier | Allied Technologies (Saigon) Co., Ltd.

In our daily lives, we receive much information about global warming, the greenhouse effect, and CO₂ emissions, which are contributing to environmental risk with rising temperatures, rising sea levels and extreme weather conditions that affect the lives of human beings and other living organisms around the world. Konica Minolta introduced the Green Activity program at Allied Vietnam in 2015. Through the Green Activity program, my team has been introduced to the benefits these activities can have for the company. We understand that it can contribute to cost reduction, increased sales opportunities, reduced business risk, and the environmental awareness of every employee.

Through the program, Konica Minolta, working with Allied, evaluated ways to save energy and reduce waste, took productive measures to make plans, and executed to meet the targets set. This, in turn, met the wider goal of working to curb global warming and supporting a recycling oriented society. During the activity, Konica Minolta continuously shared with Allied many methods for reducing energy use, and also shared their experience with best practices to enable us to execute the program effectively. Moving forward, Allied will continue to sustain the activities that are in place, and will also continue to make plans for reducing energy and recycling waste, working to be part of a company that exercises its social responsibility to the community.

Tung Gee Khim
Group Operation Manager
Allied Technologies (Saigon) Co., Ltd.

Voice of a Supplier | Changhong Technology Co., Ltd.

As part of the Green Supplier activities, Konica Minolta environmental manufacturing experts visited our production site, and we discussed environmental measures for molding machines and utilities use. Preparing for the actual implementation of the suggested measures, we visited a Konica Minolta production site in China, and we were able to address our situation while discussing specific ways to proceed. The local government places great importance on energy-saving activities, and we received a monetary incentive after reporting the energy-saving initiatives we took through the Green Supplier activities. We were able to reduce our emissions by 800 tons per year, and also contributed to CO₂ emissions reduction in China.
Voice of a Supplier | Toyo Communication Technology (Shenzhen) Co., Ltd.

I think the biggest feature of the Green Supplier Initiative is the way in which Konica Minolta is committed to coming into suppliers’ sites and working with them to make improvements. Indeed, the people who visited our factory did not just bring the methods cultivated in Japan as-is; rather, they thought together with us about what kinds of measures we need. This method improved the motivation of our employees, and an attitude of thinking on one’s own and devising improvements started to spread throughout the company.

Going forward, we are determined to keep cooperating with Konica Minolta to form and implement environmental plans and measures, and foster a system and culture that values environmental management.

Lou Yiliang
Chairman and Managing Director
Toyo Communication Technology (Shenzhen) Co., Ltd.

Activity Policies for the Medium-Term Environmental Plan 2019

Under the Medium-Term Environmental Plan 2019, Konica Minolta is continuing the expansion of its Green Supplier activities. Until now, Konica Minolta has been promoting its efforts by sending environmental experts to visit suppliers. With this approach, however, the number of improvement cases was limited. To increase impact, the company has digitalized its energy-saving diagnosis method and has created a database of resources to share its expertise, and is promoting its utilization. As a result, suppliers can now identify their own areas for improvement, and take action to improve their practices and cost-effectiveness. This database is expected to have a broad impact and result in an even greater contribution to environmental sustainability.
Green Factories (Procurement Initiatives)

Green Procurement System

Implementing green procurement to assess the chemical constituents of parts and components and give preference to those with the least environmental impact

Konica Minolta operates a Green Procurement System in compliance with the changing laws and regulations for chemical substances.

In the operation of the SIGMA Green Procurement System, the Group ensures its compliance with the RoHS directive,* and also rapidly complies with more stringent regulations on chemical substances in products by expanding its coverage to include substances of very high concern (SVHCs) on the candidate list for authorization and other substances restricted under REACH regulations.* Through these efforts in assessment and management of chemical substances in products, the Group is keeping an eye on trends in regulations and alternative technologies and is working on plans to eliminate hazardous materials in order to be sure it avoids risks.

In addition, in order to ease the workload of suppliers, the Group uses the international standard IEC 62474 declarable substance list of the International Electrotechnical Commission (IEC) to define the substances covered in its survey. Moreover, the Group regularly holds briefings on trends in environmental laws and regulations for its suppliers to ensure understanding of Konica Minolta’s initiatives.

* RoHS directive: Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment
* REACH regulations: Regulations enacted by the EU in June 2007 concerning the registration, evaluation, authorization and restriction of chemicals, to consolidate existing regulations concerning chemical substances.
Main Features

- Japanese, English and Chinese language support
- Supports three standard chemical substance surveys (JAMP*1, JGPSSI*2, and chemSHERPA*3) and independent methods
- Separates the procedures for checking for prohibited substances and for collection of information on reported substances in products
- Sharing of information from surveys and responses with business partners
- Storage of communication records in databases ensures compliance through tracking
- Simplifies the response to changes in regulations and substances subject to control

*1 JAMP: Standards for chemical substance surveys established and implemented by the Joint Article Management Promotion–consortium.
*2 JGPSSI: Standards for chemical substance surveys established and implemented by the Japan Green Procurement Survey Standardization Initiative.
*3 chemSHERPA: The Joint Article Management Promotion–consortium is responsible for administrating this scheme, developed by Japan’s Ministry of Economy, Trade and Industry in Japan, which facilitates the sharing of information on chemical substances contained in products in the supply chain. Konica Minolta plans to start using this scheme internally at the beginning of fiscal 2017.

> Green Procurement Guidelines (Japanese, English, Chinese)
https://green2.konicaminolta.net/sigma/index.jsp

Environmental Collaboration

The Business Technologies Business has implemented Environmental Collaboration to establish strong partnerships through on-site evaluations and educational support for suppliers in order to strengthen suppliers' environmental management.

This is an initiative to help suppliers develop independent environmental management. Konica Minolta employees go directly to suppliers’ factories and provide guidance based on assessment results for the management of chemical substances as well as to provide guidance in document management, including for measurement results and materials information.

Every year Konica Minolta provides education to suppliers’ employees and certifies those who pass as internal evaluators for suppliers. In addition, each year the Group also conducts group education for new evaluators as well as paper–based follow–up education for existing internal evaluators.