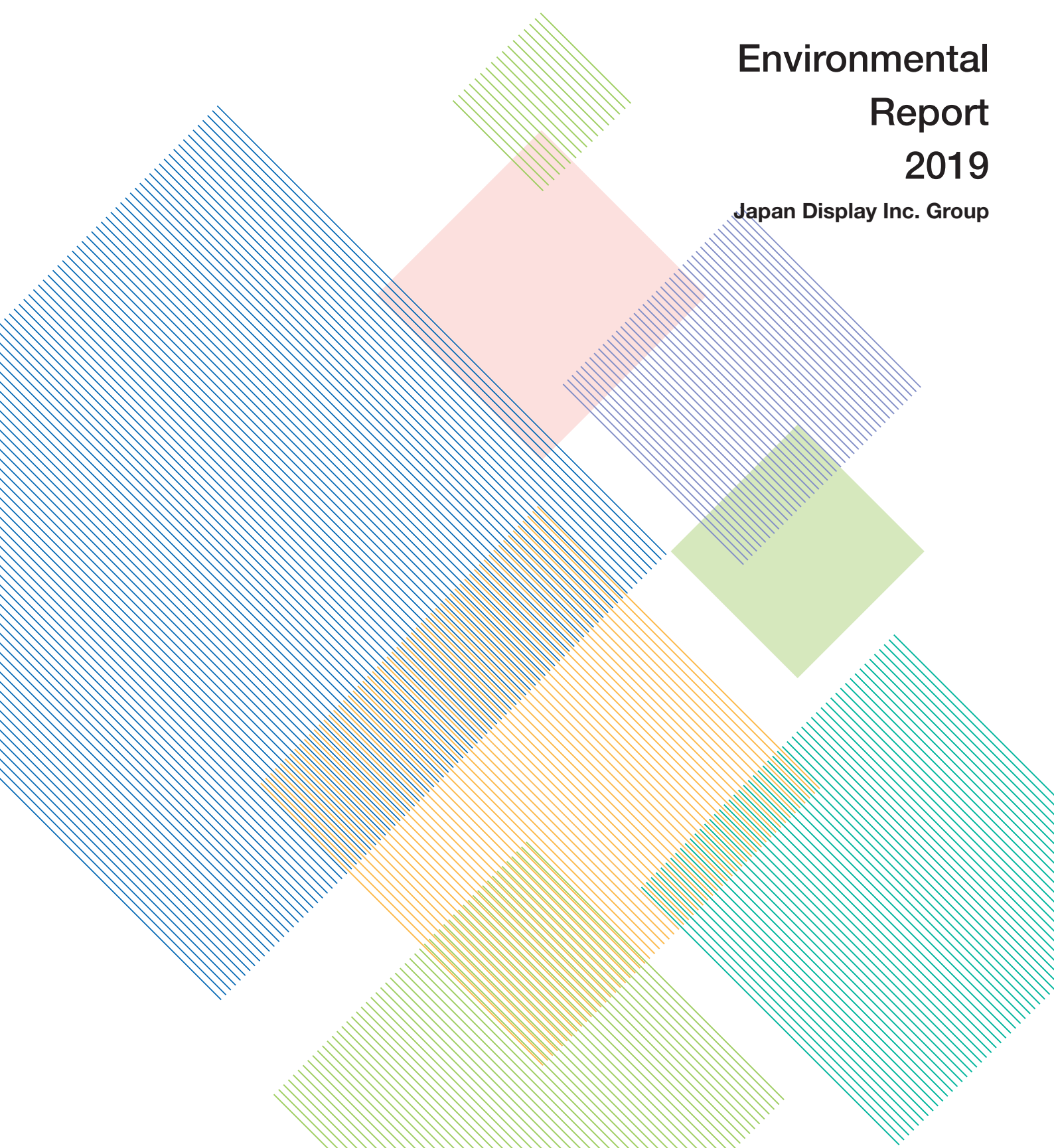




# Environmental Report 2019

Japan Display Inc. Group



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## Editorial Policy

We believe it is important to disclose information and appropriately communicate them to our stakeholders. The purpose of this report is to convey our efforts on how to realize a sustainable society in comprehensible terms. In editing the report, we have included the data and details of activities taken by overseas manufacturing subsidiaries.

We also expressed ideas by incorporating as many figures and photographs as possible, and we introduce each of our activities through their own page layout.

We also welcome people to view the English version that is available from our website (<http://www.j-display.com/Environment/report.html>).

Please contact us via our website below with any comments, suggestions, and so on, so that we can use these as reference in the future. Please use the URLs below to access our website and contact us using these forms.

[Inquiries about products, etc. >>>](https://www.webcoms.jp/jdi/jp/form.php) <https://www.webcoms.jp/jdi/jp/form.php>  
[Inquiries from shareholders and investors >>>](https://www.webcoms.jp/jdi/ir/jp/form.php) <https://www.webcoms.jp/jdi/ir/jp/form.php>

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Covered Organizations .....	This report lists a portion of the activities of the domestic sites and the overseas manufacturing subsidiaries of Japan Display Inc.
Target Period .....	April 2018 – March 2019 (Some activities outside of the above period are also included.)
Guidelines referenced .....	Environmental Report Guidelines 2018
Publisher .....	Japan Display Inc. (Issued by CSR & Environment Promotion Department, Environmental Promotion Section)
Month Issued .....	August 2019

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## Environmental Policy

**Recognizing that global environment conservation is one of the most important challenges for humanity, we at Japan Display Inc. Group aim to be a company that respects people and the environment, and contributes to a sustainable society.**

### Basic policy

- We will continually improve its environmental management system and, taking the lifecycles of our display products into account, will work to reduce environmental burdens.
- We will comply with domestic and foreign legal requirements and other voluntarily accepted requirements.
- We will set environmental targets and other objectives concerning the following priority themes, and will promote activities for their achievement for their achievement in order to conserve the environment.

### Priority themes

**1) We will work to reduce the environmental burden of our business activities.**

- We will:**
- 1-1)** Promote global warming countermeasures, energy conservation, and the effective use of water;
  - 1-2)** Thoroughly manage chemical substances and promote their reduction and substitution;
  - 1-3)** Promote the 3Rs (Reduce, Reuse, Recycle) to address waste.

**2) We will reduce the environmental burden of our products.**

- We will:**
- 2-1)** Promote the development of environmentally conscious products.;
  - 2-2)** Thoroughly manage chemical substances contained in our products;
  - 2-3)** Promote green procurement.

**3) We will work on activities for the conservation of biodiversity and environmental activities in local communities.**

May 16, 2019

**Yoshiyuki Tsukizaki**

CEO, Representative Director and President  
Japan Display Inc.

## Message from the Management

Thank you very much for your continued support regarding the environmental activities of Japan Display Inc.

In recent years, the movement to incorporate non-financial information into the management's sustainability decisions and assessments, such as ESG (Environment, Social, and Governance) and SDGs (sustainable development goals to be achieved by 2030, as summarized by the United Nations in 2015, such as the eradication of hunger and measures against global warming), is rapidly expanding.

The most recent movements in Japan concerning the environment include setting a target of reducing greenhouse gas emissions by Fiscal Year 2030 to a level 26% lower than that of Fiscal Year 2013, against the backdrop of the Paris Agreement that went into effect on November 2016. Out of concerns over the emergence of impacts from climate change and further worsening of the issue, Japan advocated a “decarbonized society” as the final achievement. The Climate Change Adaptation Act was enacted in December 2018 to achieve a positive environmental and growth cycle through innovation. Additionally, related initiatives are being strengthened.

Moreover, in June 2019, a long-term growth strategy has been decided in a Cabinet meeting as a growth strategy based on the Paris Agreement, calling for efforts to reduce greenhouse gas emissions by 80% by 2050.

JDI is continuously improving its environmental activities, paying more attention to the relationship between business plan and management, and strategic directions, which are in accord with the Environmental Management System Standard, ISO 14001 (2015 version). We are also promoting ongoing improvements by incorporating new perspectives, such as responses to survey items by third-party assessment institution (CDP).

As a foundation of our business operations, we comply with laws and regulations and respond to demands from customers and various stakeholders regarding environmental issues. We strive to prevent production- or product-related incidents to create a sustainable environment.

Next, in product-related areas, we have established and implemented development processes aimed at providing products that meet environmental requirements, such as the management of chemical substances contained in products and the design of environmentally conscious products, and are working to meet various regulations and customer requirements.

Additionally, we are continuously working on reducing our overall environmental burden since we are aware of the responsibility that comes with using considerable amounts of energy and resources for the manufacturing of displays.

Reaffirming that environmental initiatives are extremely important issues for our company, we will put forth environmental policies shared across the Group, strive to achieve environmental goals for key topics and strengthen our initiatives aimed at environmental issues, and, to improve our corporate value, will push forward with both business activities and environmental activities.

We appreciate your continuing support.



**Yoshiyuki Tsukizaki**  
CEO, Representative Director and President  
Chief Environmental Officer

# Providing Environmentally Conscious Products and Services

Through the development and manufacturing of displays, display-related products and services, we will contribute to the achievement of a low-carbon society.

Mobile Category	Automotive Category	Non-mobile Category
<ul style="list-style-type: none"> <li>● Displays for smartphones, tablets, etc.</li> </ul>	<ul style="list-style-type: none"> <li>● Displays for in-vehicle devices (car navigation systems, instrument panels, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>● Display for consumer appliances (digital cameras, wearable devices, etc.)</li> <li>● Displays for industrial use (medical monitors, etc.)</li> </ul>
<ul style="list-style-type: none"> <li>● High display quality, high definition, narrow bezels</li> <li>● Thin, light, compact design</li> <li>● Low power consumption, high-speed response</li> </ul>	<ul style="list-style-type: none"> <li>● Products with excellent visibility; larger screens</li> <li>● High reliability and durability</li> <li>● High-speed response</li> <li>● Curved-displays and other products for interior design and intelligent devices</li> </ul>	<ul style="list-style-type: none"> <li>● Thin, light, compact design</li> <li>● Expressiveness through precise optical design</li> <li>● High visibility in outdoor light</li> <li>● Long life, ultra-low power consumption</li> <li>● Flexible displays</li> </ul>



## Unplugged Reflective Display

JDI introduces the Reflective Display that cuts power consumption unlimitedly.

The Reflective Display Shows images reflecting the sunlight to cut power consumption. Memory In Pixel or MIP installed in it enables even lower power consumption. The MIP consumes little electricity as it keeps images on the display.

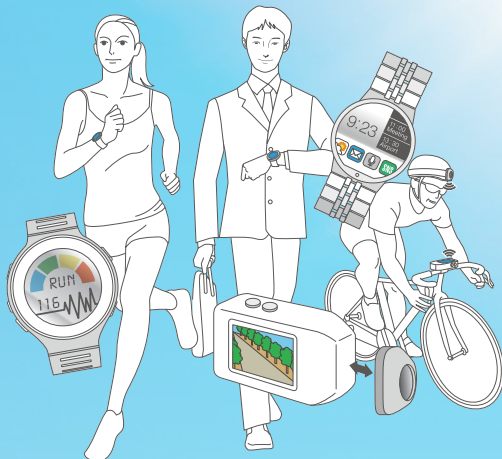
The Reflective Display expands its application to Wear

able Device and Digital Signage which are required outdoor visibility.

The Reflective Display unlimitedly reduces the power consumption. This leads to reduce the frequency of charging and bring out the displays off the electrical grid.

We continue to supply the Reflective Displays to contribute to a low-carbon society, and to introduce innovative solution services.

### Wearable Device



JDI is one of the top players in technology and business of color MIP reflective LCDs. Through product development that envision market trends and latent needs of its customers, We are proud to be the No. 1 in regard to the global share in applications that are required low power consumption and outdoor visibility such as Sport Watch.



Takehiro Shima, Kenji Tanase and Kazuyuki Maeda, left to right in back row  
Takahito Harada, Yoko Fukunaga and Takayuki Nakao, left to right in front row,  
The Developers

### Digital Signage



Every day, we can see Digital Signages. JDI continues to supply Reflective Displays for outdoor use that can be installed anywhere and that can contribute to reducing environmental impacts, without consuming the large amounts of power like backlit LCDs.

## Halogen-free and SVHC-free Transparent Display

JDI is developing Transparent Display.

Our Transparent Display becomes transparent, as if no display is present, when the display is turned off.

The Transparent Display is expected to introduce it in tourism navigation and in train and automobile windows, taking advantage of their ability to display images integrated with the surrounding landscape to achieve augmented reality or AR.

Innovative design of the display leads to expect Halogen-free<sup>\*1</sup> and SVHC-free<sup>\*2</sup>.

We have received requests regarding Halogen-free from

most of its customers. SVHCs or Substances of Very High Concerns are chemical substances specified in the EU REACH regulations for the high concern over their impacts on the human health and the environment.

We are developing the Transparent Display to contribute to the conservation of the global environment and to a sustainable society.

\*1 Halogen-free refers to less than 900 ppm each of chlorine or bromine and less than 1500 ppm of chlorine and bromine combined, per unit of weight of homogeneous substance.

\*2 As of July 16, 2019, SVHC-free refers to less than 1,000 ppm of substances conforming to SVHCs, per unit of weight of an article.

### Transparent Display



Turning OFF



Turning ON

With our technologies, we are developing the products which not only achieve new features but also take the environment into consideration, which are appropriate the new era of sustainability.



Kentaro Okuyama,  
The developer

### Expectations for Transparent Displays



Tourism navigation



Window in vehicle

### Workstyle Reform

JDI is promoting a workstyle reform with its main products, Displays.

We distribute notebook PCs, smartphones, and tablets, all of which include displays, to our staffs. With the displays, We engage in the business activities using information systems that protect the information of our stakeholders. We are building a work-friendly environment that achieves a work-life balance between home and work life through enabling Telework, working outside the office such as satellite offices and staffs' home.

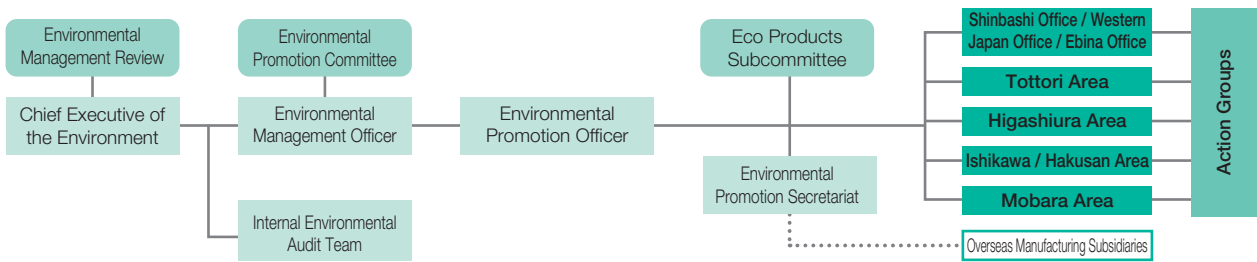


# Management Organization

JDI's environmental management organization in Japan, which promotes continuous environmental management activities, consists of a structure with the Chief Executive Officer (CEO), Representative Director, and Chairman as the Chief Executive for the Environment, under which are an Environmental Management Officer and Environmental Promotion Officer, the Shinbashi, Nishinohon, and Ebina Offices,

and manufacturing sites. The JDI Group's overseas manufacturing subsidiaries, too, have set up environmental management organizations to promote environmental activities. To secure the consistency of environmental activities across the JDI Group, we are making efforts to strengthen governance in our overseas manufacturing subsidiaries through means such as periodic liaison conferences.

## The Environmental Management Organization in Japan and Overseas Manufacturing Subsidiaries



## Activity Plans and the Results

In accordance with activity plans approved through Environmental Management Reviews, we operate a PDCA cycle to implement continuous improvement activities.

### Fiscal Year 2018 Activities and the Results

○ Plan ● Result

Items	Category	1st Quarter (April – June)	2nd Quarter (July – September)	3rd Quarter (October – December)	4th Quarter (January – March)
Environmental Management Review	Plan				○ Environmental Management Review (Mar)
	Result				● Environmental Management Review (Mar 25)
Environmental Promotion Committee	Plan			○ Environment Promotion Committee (Oct)	○ Environment Promotion Committee (Mar)
	Result			● Environment Promotion Committee (Oct 12)	● Environment Promotion Committee (Mar 15)
Internal / external audits	Plan		○ Internal audits (Jul-Aug)	○ External assessment (Nov)	
	Result		● Implemented (Jul-Aug)	● External assessment (Nov 12-Nov 21)	
Message from the Management	Plan	○ Environment Month Message (Jun)			○ Environment Month Message (Feb)
	Result	● Environment Month Message (Jun 1)			● Energy Conservation Month Message (Feb 1)
Confirm legal compliance / target progress	Plan	○ Apr	○ Jul	○ Oct	○ Jan
	Result	● Apr (4th Quarter FY2017)	● Jul (1st Quarter FY2018)	● Oct (2nd Quarter FY2018)	● Jan (3rd Quarter FY2018)
Environmental education	Plan	○ General environmental education (May-Jun) ○ Auditor training (Apr-Jun)	○ Product-related environmental education (Aug-Oct)		
	Result	● General environmental education (May-Jun) ● Auditor training (Jun 1 - 30)	● Product-related environmental education (Sep 13 - Oct 12)		
External communication	Plan	○ Update of environmental website (Apr-May)	○ Publication of Environmental Report (Aug)	○ Update of environmental website (Oct - Nov)	
	Result	● Update of environmental website (Apr 1)	● Publication of Environmental Report (Aug 20)	● Update of environmental website (Nov 13)	
Overseas subsidiary governance (KOE, SE, NXP)	Plan	○ Business liaison meeting (Apr)	○ Product liaison meeting (Sep-Oct) ○ Inspection (2Q)	○ Business liaison meeting (Oct)	○ Product liaison meeting (Mar) ○ Inspection (4Q)
	Result	● Business liaison meeting KOE, SE (Apr 24) ● Business liaison meeting NXP (Apr 25)	● Product liaison meeting SE (Sep 10) ● Product liaison meeting KOE (Sep 11) ● Product liaison meeting NXP (Oct 4) ● Business liaison meeting NXP (Jul 25) ● Business liaison meeting KOE, SE (Jul 27)	● Business liaison meeting NXP (Oct 23) ● Business liaison meeting KOE, SE (Oct 24) ● Inspection SE (Dec 21, 22)	● Product liaison meeting KOE (Feb 26) ● Product liaison meeting SE (Mar 1) ● Product liaison meeting NXP (Mar 4) ● Inspection KOE (Feb 25, 26) ● Business liaison meeting NXP (Jan 29) ● Business liaison meeting KOE, SE (Jan 30)
Develop annual plan for next year	Plan				○ Development of plan (Feb-Mar)
	Result				● Development of plan (Mar 30)



## Environmental Targets

We have set eight environmental targets on a companywide basis. They conform to our Environmental Policy and are aimed at reducing the environmental impacts of our business activities and products, and conserving biodiversity. We intend to make continual improvements.

### FY2018 performance/FY2019 targets

Our FY2018 environmental targets and performance, and our FY2019 targets, are shown in the table below. Our FY2018 initiatives are introduced on the following pages. Regarding FY2019, due to anticipated changes in our production scale, reduction measures were incorporated in accordingly.

### FY18 Environmental Plans and Results

### FY19 Plans (absolute amounts are monitored items)

No.	Action Items	Indicator	Target value	Actual value	Evaluation <sup>5</sup>	Indicator	Target value
①	Reduce emissions of energy-derived CO <sub>2</sub> <sup>1</sup>	Reduction amount (t-CO <sub>2</sub> )	3,545 or more	10,756	○	Reduction amount (t-CO <sub>2</sub> )	5,639 or more
		Absolute amount (t-CO <sub>2</sub> )	546,007 or less	507,314	○	Absolute amount (t-CO <sub>2</sub> )	531,733 or less
②	Reduce the amount of water used <sup>2</sup>	Reduction amount (m <sup>3</sup> )	288,000 or more	135,000	× <sup>6</sup>	Reduction amount (m <sup>3</sup> )	20,000 or more
		Absolute amount (m <sup>3</sup> )	24,548,000 or less	21,012,000	○	Absolute amount (m <sup>3</sup> )	19,173,000 or less
③	Reduce emissions of waste, etc. <sup>3</sup>	Reduction amount (t)	2,337 or more	2,629	○	Reduction amount (t)	64 or more
		Absolute amount (t)	30,129 or less	21,400	○	Absolute amount (t)	18,424 or less
④	Thorough management of chemical substances and promotion of their reduction and substitution	No misapplication of chemical substances		Appropriate management	○	No misapplication of chemical substances	
⑤	Implementation of biodiversity conservation activities and environment-related activities in the locality	Implemented as planned		Implemented as planned	○	Implemented as planned	
⑥	Supply Eco-products that take the product life-cycle into consideration	Suitability of Eco-products <sup>4</sup> (excluding customer-originating)		100%	○	Compliance rate of harmonized products (excluding those from customers) 100%	
⑦	Confirmation of chemical substances contained in products in the development process	Appropriate management of judgment on contained chemical substances		All cases appropriate	○	Appropriate management of judgment on contained chemical substances	
⑧	Promote environmentally conscious procurement activities	Discussion of Green Procurement Guideline revision in light of legal and other considerations		Implementation of revisions	○	Discussion of Green Procurement Guideline revision in light of legal and other considerations	

Applicable range: (1) to (3) apply to five manufacturing site plants in Japan: Tottori, Higashiura, Ishikawa, Hakusan, and Mobara. (Mobara V3 is excluded, and only monitoring is performed)

\*1: CO<sub>2</sub> emissions from electrical power are based on 0.476 t-CO<sub>2</sub>/MWh (the receiving-end CO<sub>2</sub> emissions basic unit for 2011 released by the Federation of Electric Power Companies of Japan). The other conversion factors are from the Act on the Rational Use of Energy and the Act on Promotion of Global Warming Countermeasures.

\*2 Total amount of water used = amount of water received + amount of water recycled + amount of water reused (with optimal total amount of water used without waste, and with water received after recycling and reuse of water, as the aim).

Amount of water reduction uses total amount of water used before reflection of improvement efforts as its criteria, and uses amount of effective usage after reflection of improvement efforts as its metric.

\*3: Waste, etc. = General waste + Industrial waste + Valuables

\*4: Suitability of Eco-products = Number of Eco-products on-site / Number of products developed

\*5: "○" indicates that target was achieved.

\*6: Some items in the water reduction plan have been suspended (reduction of applied measures); efforts for recovery were made company-wide but were not achieved.

## Major Activities and their Outcomes

### Results of activities in FY2018

Sites	Initiative	Results of activities
Domestic sites	Environmental Targets	Achievement of targets in 7 out of 8 topics. Completion of the measures against unachieved topic (reduction of total amount of water used).
	Compliance activities	No non-conformance in conformance evaluation.
	Internal audits	Implemented at all sites. Number of findings: 30. Handling has been completed for all.
	External examinations	Implemented at all sites (re-certification examination). Certification determined. Number of findings: 10. Handling has been completed for all.
Overseas sites*	Environmental Targets	Achievement of targets in all topics.
	Compliance activities	No non-conformance in conformance evaluation.
	Internal audits	Implemented at all sites. Measures against all findings has been completed.
	External examinations	Implemented at all sites. Measures against all findings has been completed. (Certifications are ongoing at all companies.)

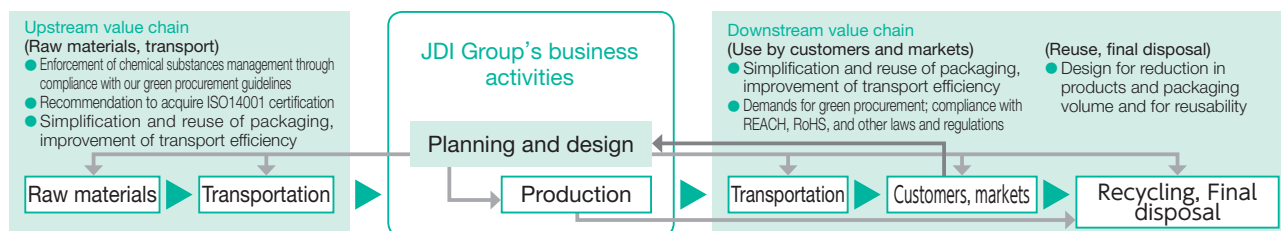
\* 3 manufacturing subsidiaries (Suzhou JDI Electronics Inc., Nanox Philippines Inc., Kaohsiung Opto-Electronics Inc.)

# The Value Chain and Minimization of Environmental Risks

In order to minimize the risks of the environmental pollution and the destruction of ecosystems, JDI continually implements activities for water quality and air quality management, establishing our own voluntary standard values that are stricter than the regulated values of laws and regulations.

Furthermore, throughout the value chain of our products, from Raw materials procurement, Transport, Production, Use by customers and markets, until Final disposal, we engage in environmentally considerate business activities. In coop-

eration with our business partners, we advocate compliance with green procurement guidelines and the acquisition of ISO14001 certification, enforce chemical substances management, and use environmentally considerate materials. In response to the demands of customers and markets, we provide products and services that contribute to the reduction of environmental burdens, through means such as thin, light, and compact design and low power consumption.



## JDI's business activities

### ● Efforts to prevent air pollution

We operate smoke and soot emitting facilities and volatile organic compound emitting facilities under the Air Pollution Control Law.

Regular measurements and on-the-spot inspections by authorities in FY2018 found no exceeding of regulatory values for all measured items. We will continue to work toward management of atmospheric emission standards and improvement of related facilities.

### ● Efforts to prevent water pollution

In accordance with the Water Pollution Control Law, we have established voluntary standards that are more than 20% stricter than regulated values for water discharged into rivers and sewage systems for a number of items and substances of 15 items related to the living environment and 28 items related to hazardous substances, which are agreed upon with local government agencies in the vicinity of each of our plants.

Regular measurements and on-the-spot inspections by authorities in FY2018 found no exceeding of regulatory values for all measured items. We will continue to work toward management of discharged water quality and improvement of related facilities.

### ● Chemical substances management

We control the use of chemical substances used in manufacturing and other processes, under internal rules categorized in accordance with legal regulations. We manage the use of chemical substances contained in products in accordance with the RoHS directives, REACH regulations, and other laws and regulations, as well as through green procurement.

Overseas manufacturing subsidiaries are also managed in a similar manner to prevent environmental pollution, to

comply with legal requirements, and to reduce the environmental impacts.

### ● Proper disposal of wastes

In our Environmental Policy, we approach to wastes reduction and promote 3Rs (Reduce, Reuse, and Recycle) activities. Moreover, in accordance with the Waste Management and Public Cleansing Act, we separate specially-controlled industrial wastes, industrial wastes, and general wastes, and perform the risk management for each.

We comply with the proper disposal of wastes and also work to reduce the risk of illegal dumping.

### ● Noise and vibration management

In accordance with the Noise Regulation Act, the Vibration Regulation Act, and other related regulations, we are operating the specified facilities (compressors, blowers, etc.)

We perform measurements of noise and vibration at the boundaries of our plants grounds every year to confirm that these are within regulatory values. In FY2018, no items exceeded regulatory values.

### ● Conservation of biodiversity

In accordance with the Basic Act on Biodiversity, we work toward the conservation of ecosystems through greening activities at our plants and nature restoration activities in surrounding areas.

Within the area of our Mobara plant, an artificial "Hotarugawa" creek and a "Koi-carp" pond were setup. Furthermore, the Ishikawa plant is home to the Sozo-no-Mori forest.

We will continue maintaining environments that are friendly to fireflies, Koi-carps, wild birds, and other creatures.

# Global Warming Prevention and Energy Conservation Activities

JDI is promoting global warming prevention and energy conservation according to our Environmental Policy. We also participate in the Action Plan for Commitment to a Low Carbon Society being implemented by the electrical and electronics industry as a whole, and are

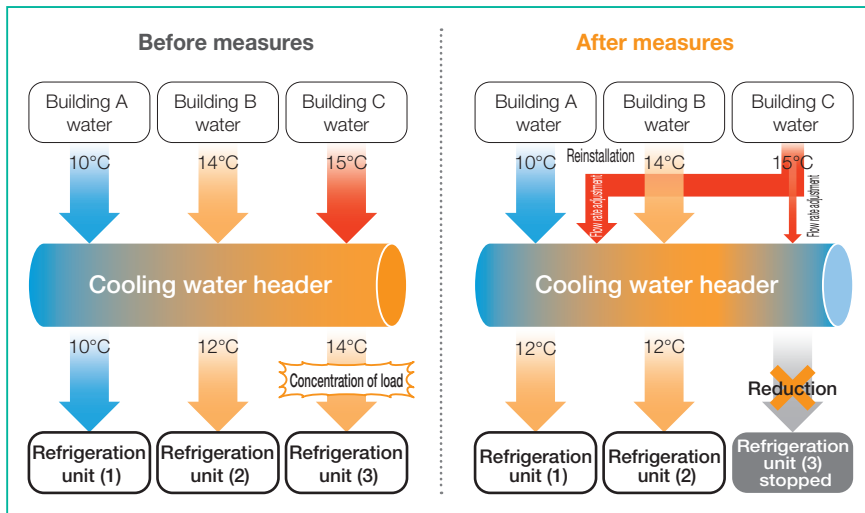
working on improving energy efficiency to achieve the FY2020 targets. Examples from our Ishikawa, Hakusan, Higashiura, and Tottori Plants are introduced below.

## Ishikawa Plant Energy conservation through changes in cooling water piping

The water flowing from buildings at the Ishikawa Plant to the cooling water header has a temperature difference that depends on the prior application of the water. The refrigeration unit cooling high-temperature water showed a high load. In response, by installing new

piping and improving the heat (temperature) balance between the inflows so that the water temperature in the cooling water header becomes uniform, we succeeded in reducing the number of refrigeration units operating and in suppressing CO<sub>2</sub> emissions.

### Content of Improvement



### Effect (expected amount of reduction)

- Power consumption 756 (MWh/year)
- CO<sub>2</sub> emissions 360 (t-CO<sub>2</sub>/year)



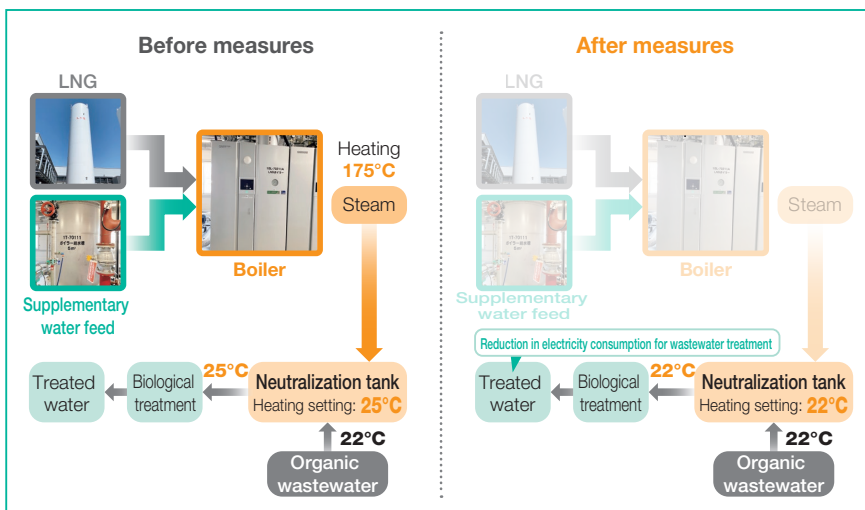
Header piping

## Hakusan Plant Energy conservation through reduction of amount of steam used

In organic wastewater treatment, the Hakusan Plant has used steam for heating wastewater to temperatures suited to biological treatment. As improvement, the plant lowered the heating settings within a range that did not affect

the treatment, but reduced the amount of steam used. It succeeded in reducing fuel and electrical power related to the creation of steam, thereby suppressing CO<sub>2</sub> emissions.

### Content of Improvement



### Effect (expected amount of reduction)

- Electricity consumption 20.1 (MWh/year)
- CO<sub>2</sub> emissions 2,124 (t-CO<sub>2</sub>/year)  
\*Including LNG effect

### About biological treatment

No decline in organic matter removal capability

Set temperature	BOD	COD
25°C	Standard value or lower	Standard value or lower
24°C	No change	No change
23°C	No change	No change
22°C	No change	No change

## Global Warming Prevention and Energy Conservation Activities

### Higashiura Plant

Energy conservation through winter free cooling (shutdown of refrigeration units)

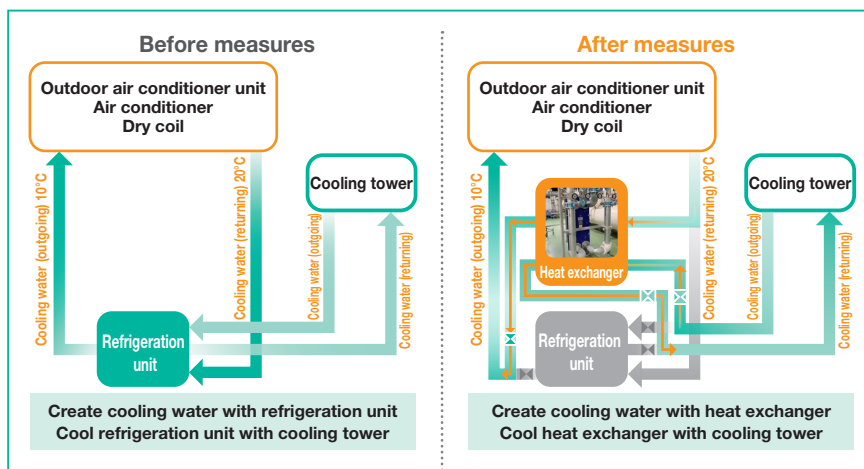
Our plant uses large amounts of cooling water for air conditioning and other applications. The cooling water is normally made with a refrigeration unit that uses electrical power. However, depending on the conditions, it is possible to create the cooling water without a refrigeration unit during winter seasons when the ambient temperature is low enough. This technique is known as free cooling.

Through previous energy conservation activities, the Hi-

gashiura Plant had reduced the thermal load handled by the refrigeration unit in the C Building<sup>\*1</sup> to a level compatible with free cooling. It then installed new heat exchangers and connected these to the cooling water system in the cooling tower. The plant stopped the refrigeration unit in winter, achieving even greater energy conservation.

<sup>\*1</sup> The Higashiura Plant has two manufacturing buildings, the F Building and C Building.

### Content of Improvement



### Effect (expected amount of reduction)

- Power consumption: 374 (MWh/year)
- CO<sub>2</sub> emissions: 178 (t-CO<sub>2</sub>/year)

## Renewable Energy Activities

The popularization and spread of renewable energies throughout society is becoming important from the perspectives of global warming countermeasures and energy

source diversification.

Our plants are introducing solar power generation systems to promote renewable energy.

### Tottori Plant

Renewable energy activity

As a part of our measures against global warming, the Tottori Plant introduced a plant rooftop solar power generation system in 2001.

The system was installed and launched jointly with The New Energy and Industrial Technology Development Organization (NEDO), to expand the adoption of solar power generation. Its maximum power output is 150kW (with a total of 900 solar power generating panels). The system generated 113 MWh of electricity in FY2018, contributing to the reduction of approximately 58 t-CO<sub>2</sub>.



# Waste Management

## Efforts for Waste Reduction

In its Environmental Policy, JDI's approach is to reduce (control generation), reuse, and recycle wastes, through a variety of activities. We introduce the examples as following.

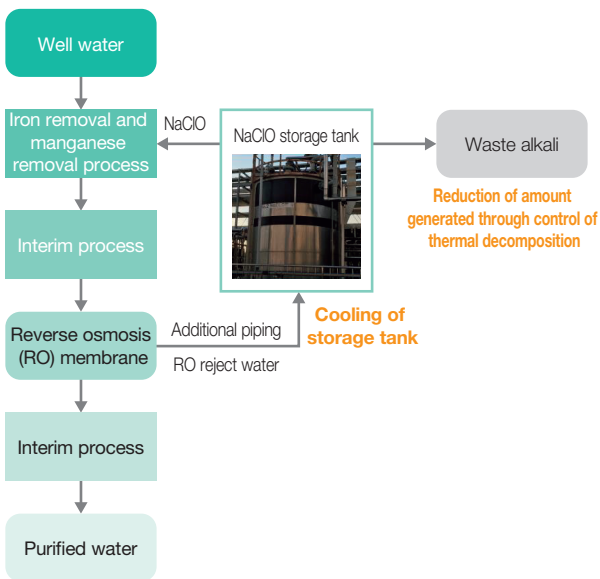
- Control of thermal decomposition of sodium hypochlorite for the manufacture of purified water (Higashiura Plant)

In the process of manufacturing purified water for use in production, we use sodium hypochlorite (NaClO) to remove iron and other impurities. The substance is unstable and is normally prone to thermal decomposition in summer, and waste fluid containing generated material turns into industrial waste (waste alkali). The amount of NaClO used was also increasing.

By cooling the NaClO storage tanks in summer, the plant reduced thermal decomposition. For cooling, the plant decided to use RO reject water<sup>\*1</sup> that is generated in the latter part of the purified water manufacturing process and that had been discarded. To do so, the plant installed new piping that carries fluid to the exterior walls of the storage tanks. Through this simple method that does not require the installation of cooling equipment, the plant reduced the amount of industrial waste generation without increasing the amount of water used. At the same time, it reduced the amount of NaClO used.

\*1 Water containing components that are unable to pass the RO membrane (a reverse osmosis membrane that does not allow impurities to pass through).

## Content of Improvement



## Effect (expected amount of reduction)

Amount of industrial wastes generated: 2.5t

## Efforts for reducing indirect risks from wastes (illegal dumping, accidents, etc.)

To reduce illegal dumping and other indirect risks from wastes, JDI uses a check sheet that specifies legal requirements and our voluntary standards to conduct regular on-site checks of business partners (collection and transport operators, intermediate treatment operators), and uses the results to make judgments on the continuation of contracts. Continuation was deemed possible for all business partners visited in FY2018.

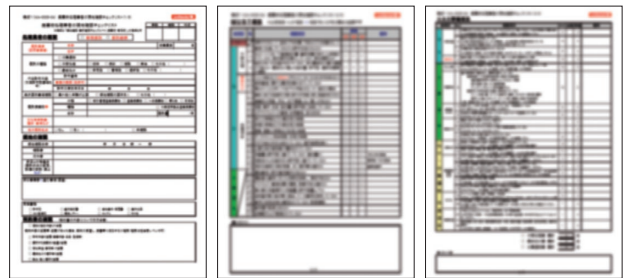
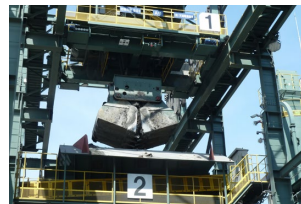


Image of JDI's Standards checklist

- Example of on-site-checks of suppliers (intermediate products suppliers)



Sludge acceptance facility (crane)



Signboard at intermediate treatment facility



Waste mixing equipment



Temporary storage area for wastes

## PCB waste treatment

JDI stores polychlorinated biphenyl (PCB) wastes at the Tottori Plant and Mobarra Plant. The PCB wastes (fluorescent lamp ballasts) stored at the Tottori Plant was disposed of in February 2019. At the Mobarra Plant, we plan to perform an appropriate disposal by March 31, 2022.

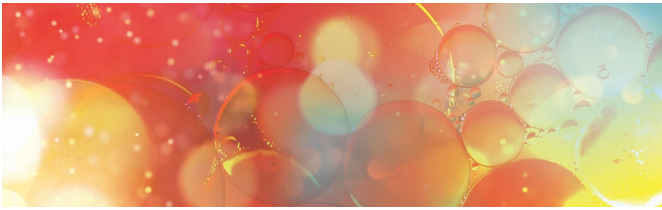


PCB wastes (Tottori Plant)



Out-shipment of drums containing PCB ballasts (Tottori Plant)

## Management of Chemical Substances



JDI complies with laws and regulations regarding chemical substances, conducts green procurement, collects data on chemical substances and measures chemical substances. Our overseas subsidiaries manage chemical substances as well.



**Compliance with laws and regulations**

- Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture etc. (Chemical Substances Control Law)
- Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Law)
- RoHS Directive
- ELV Directive
- REACH Regulation

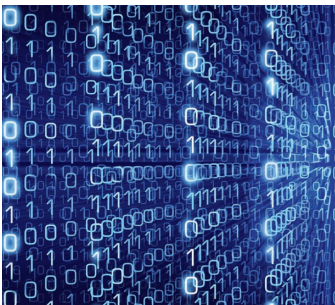
JDI complies with laws and regulations concerning chemical substances used at the plants and contained in the products.



**Green procurement**

- Establishment and disclosing of Green Procurement Guideline


JDI has established Green Procurement Guideline based on laws, regulations, and requests from our customers, and promotes green procurement. We provide the Green Procurement Guideline to our suppliers and other stakeholders. And we disclose the Green Procurement Guideline on our website.



**Collection data on chemical substances**

- Data on chemical substances used at JDI plants
- Data on chemical substances in parts and materials composing JDI products

Cooperating with our suppliers, JDI collects data on the chemical substances that are used at the plants and contained in the parts and materials composing the products. We monitor the use of chemical substances in accordance with laws, regulations, and requests from our customers.



**Measurement of chemical substances**

- Chemical substances discharged from JDI plants
- Chemical substances contained in JDI products

JDI regularly measures the chemical substances contained in atmospheric emissions and wastewater discharged from the plants. We sample the products and measures the chemical substances contained in the products.

JDI monitors the use of the chemical substances and promote the reduction of discharged amounts of the chemical substances to respect for biological diversity and to contribute to conservation of the environment and a sustainable society.

## Environmental Burden

Our business activities consist of inputting energy and resources to create products, which are accompanied by outputs such as CO<sub>2</sub>, wastes, and so on.

An overview of this is shown in the figure below (covering all domestic plants + overseas manufacturing subsid-

aries in FY2018). The basis of our environmental improvement activities lies in reducing the amount of inputs and outputs, and we work to address such activities by determining each of these items for every area in a detailed manner.

INPUT		FY2018	
		Japan	Overseas
Electricity (purchased power)	MWh	1,066,129	88,365
Electricity (solar power)	MWh	113	0
City gas	million m <sup>3</sup>	13.114	0.091
Heavy fuel oil	kL	3,455	122
LPG	t	3,517	14
LNG	t	786	0
Diesel oil	kL	0	134
Amount of water received	million m <sup>3</sup>	13.108	1.016
Amount of priority controlled chemical substances <sup>1</sup> used	t	16,938	111

OUTPUT		FY2018	
		Japan	Overseas
Energy-derived CO <sub>2</sub> <sup>2</sup>	t-CO <sub>2</sub>	556,000	43,000
Greenhouse gases <sup>3</sup>	t-CO <sub>2</sub>	70,000	0
Wastewater	million m <sup>3</sup>	12.066	0.759
Amount of priority controlled chemical substances <sup>1</sup> emitted	t	195	13 <sup>4</sup>
Amount of industrial materials, etc. emitted (including valuables)	t	22,296	3,754
Industrial waste	t	14,359	822
Valuables	t	7,763	1,458
General waste	t	174	1,474

\*1: The priority controlled chemical substances refer to 38 substances selected as being subject to priority control efforts.

\*2: The CO<sub>2</sub> emissions coefficient for electricity in Japan is 0.476 t-CO<sub>2</sub>/MWh (the receiving-end CO<sub>2</sub> emissions basic unit for FY2011 released by the Federation of Electric Power Companies of Japan). The other conversion factors are from the Act on the Rational Use of Energy and the Act on Promotion of Global Warming Countermeasures. Local emissions coefficients for China, Taiwan, and the Philippines were used for the CO<sub>2</sub> emissions coefficients from electricity in other countries.

\*3: Among substance covered in the Act on Promotion of Global Warming Countermeasures, we use the term "greenhouse gases" to refer to these seven substances: PFC (CF<sub>4</sub>, c-C<sub>4</sub>F<sub>8</sub>), HFC (CHF<sub>3</sub>, C<sub>2</sub>HF<sub>5</sub>), SF<sub>6</sub>, NF<sub>3</sub> and N<sub>2</sub>O. Emission factors of AR4 are used.

\*4: Within Japan, this refers only to emissions of the 38 priority controlled chemical substances designated by JDL, and overseas it refers only to emissions of VOC.

## Substances Subject to Notification under PRTR

The chemical substances used in manufacturing processes in our plants are assessed monthly in terms of amount used, amount discharged, amount transported, and so on, in line with laws, regulations, and local ordinances,

and are managed appropriately. Currently, we carry out notifications for 7 substances based on the PRTR system, with amounts discharged and amounts transported shown in the table below.

Table of Substances Subject to PRTR Notification

Unit: kg

	Quantity discharged				Quantity transferred			
	To air		To public water bodies		Sewer		Off-site	
	FY2017	FY2018	FY2017	FY2018	FY2017	FY2018	FY2017	FY2018
acetic acid 2-Methoxyethyl	1,570	3,570	0	0	0	0	0	0
2-Aminoethanol	152	112	1,743	1,272	0	0	2,700	0
Hydrogen fluoride and its water-soluble salts	1,767.8	1,330.3	0	0	0	0	1,900	490
Boron and its compounds	0	0	0	0	0	0	0	0
Indium and its compounds	0	0	28	13	0	0	136	150
Molybdenum and its compounds	0	0	865	770	0	0	3,504	2,502.5
Ferric chloride	0	0	0	0	0	0	0	0

Since the actual quantities discharged into soil and disposed in landfill for the concerned sites were zero, these were not recorded.

The major difference in the amount of acetic acid 2-Methoxyethyl emissions compared to the previous fiscal year was attributable to an increase in production at some factories. The change in the transported amount of 2-Aminoethanol was due to the timing of industrial wastes collection and transportation.

# Environmental Measurement Data

Our environmental measurement data for domestic sites in FY2018 is shown in the table below.

## Wastewater Management

Living environment items

Name of plant	Discharge location	BOD*1 (mg/L)					COD*2 (mg/L)					SS*3 (mg/L)					Hydrogen ion concentration (pH)				
		Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value
Mobara (1)	River	10	8	<0.5	1.1	2.4	25	20	2.9	3.8	4.6	20	15	<0.5	0.9	1.5	5.8~8.6	6.0~8.4	7.1	7.3	7.7
Mobara (2)	River	10	8	<0.5	0.9	2.5	25	20	3.7	4.1	4.4	20	15	<0.5	0.6	1.0	5.8~8.6	6.0~8.4	7.2	7.3	7.4
Tottori	Sewer	600	450	65	168	290	-	-	-	-	-	600	300	14	41	110	5.0~9.0	6.0~8.7	7.0	7.1	7.3
Higashiura	River	15	12	<0.5	0.6	0.9	10	8	2.3	3.1	4.6	15	12	<1	1.1	2	5.8~8.6	6.0~8.3	7.3	7.5	7.6
Ishikawa	River	80	29	2.7	4.3	5.8	160	125	1.9	2.8	3.6	120	60	1	3	6	5.8~8.6	6.1~8.2	7.0	7.3	7.4
Hakusan	River	80	29	<1.0	<1.0	<1.0	160	125	1.5	3.1	6.2	120	70	<1.0	4	7	5.8~8.6	6.1~8.2	7.0	7.16	7.4

Name of plant	Discharge location	Normal-hexane extracts (mg/L)					Phenols (mg/L)					Phosphorus (mg/L)					Nitrogen (mg/L)				
		Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value
Mobara (1)	River	2	1.6	<0.5	<0.5	<0.5	0.50	0.40	<0.05	<0.05	<0.05	16	6.4	<0.1	0.10	0.10	120	80	7.4	10.9	14
Mobara (2)	River	2	1.6	<0.5	<0.5	<0.5	0.50	0.40	<0.05	<0.05	<0.05	16	6.4	<0.1	<0.1	<0.1	120	80	18	25.5	29
Tottori	Sewer	5	2.5	<1.0	<1.0	<1.0	5	2.5	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	
Higashiura	River	2	1.6	<0.5	<0.5	<0.5	5	4	<0.05	<0.05	<0.05	1	0.8	0.06	0.15	0.24	10	8	3.3	4.5	6.1
Ishikawa	River	5	4	<1.0	<1.0	<1.0	5	4	<0.05	<0.05	<0.05	16	14.9	<0.06	1.1	4.7	120	95	4.4	4.8	5.6
Hakusan	River	5	4	<1.0	<1.0	<1.0	5	4	<0.05	<0.05	<0.05	16	14.9	<0.06	<0.06	<0.06	120	95	14	17	20

## Hazardous substances

Name of plant	Discharge location	Ammonia, ammonium compounds, nitrites, and nitrates (mg/L)					Boron and its compounds (mg/L)					Fluorine and its compounds (mg/L)				
		Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value	Legal limit	JDI standards	Minimum value	Average	Maximum value
Mobara (1)	River	100	80	5.4	9	11	10	8	0.11	0.10	0.18	8	6.4	0.1	0.6	1.2
Mobara (2)	River	100	80	13	19	23	10	8	0.28	0.70	1.00	8	6.4	0.8	1.7	2.6
Tottori	Sewer	380	190	1.0	5.2	12.3	10	5	<0.2	<0.2	<0.2	8	5	0.2	1.2	2.1
Higashiura	River	100	80	3.1	4.0	5.0	10	8	<1.0	<1.0	<1.0	8	6.5	1.7	2.7	3.8
Ishikawa	River	100	80	2.8	3.45	3.9	10	8	<0.1	<0.1	<0.1	8	6	0.6	0.72	0.9
Hakusan	River	100	80	6.9	12.8	20.0	10	8	<0.1	0.30	0.40	8	6	1.0	1.35	1.8

\*1: Biochemical Oxygen Demand \*2: Chemical Oxygen Demand \*3: Suspended Solids

## Air Emissions Management

Name of plant	Once-through boiler	Number	Particulate matter*4 (g/Nm <sup>3</sup> )			Nitrogen oxides*5 (vol ppm)			Sulfur oxides*6 (Nm <sup>3</sup> /h)		
			Legal limit	JDI standards	Result	Legal limit	JDI standards	Result	Legal limit	JDI standards	Result
Mobara	Once-through boiler	20	0.1	0.01	<0.01	150	120	17	-	-	-
Tottori	Once-through boiler	7	0.1	0.05	<0.001	150	75	36	-	-	-
	Absorption chiller	2	0.1	0.05	0.001	150	75	36	-	-	-
Higashiura	Flue and smoke tube boiler	5	0.1	0.08	0.004	150	120	39	-	-	-
	Multitubular once-through boiler	6	0.1	0.08	<0.003	150	120	35	-	-	-
Ishikawa	Once-through boiler	3	0.3	0.15	<0.01	180	105	50.3	2.05	0.28	0.0055
	Flue and smoke tube boiler	2	0.3	0.15	<0.01	180	164	82.5	6.4	3.21	0.55
	Gas turbine	4	0.05	0.025	<0.01	70	56	43.9	9.53	5	0.148
Hakusan	Once-through boiler	5	0.3	0.15	<0.001	180	105	35.2	2.05	0.28	0.0136

\*4: "Particulate matter" refers to soot and other solid particulate matter resulting from combustion.

\*5: "Nitrogen oxides" is a generic term that refers to compounds that arise from a combination of nitrogen atoms (N) and oxygen atoms (O).

\*6: "Sulfur oxides" is a general term for sulfur trioxide and other compounds of sulfur and oxygen, particularly sulfur dioxide (sulfurous acid gas).

## Noise/vibration management:

Unit: dB

Name of plant	Category	Time period		Legal limit	JDI standards	Actual (maximums)	Name of plant	Category	Time period		Legal limit	JDI standards	Actual (maximums)	
Mobara	Noise	Morning	06:00~08:00	65	60	54	Higashiura	Noise	Morning	06:00~08:00	55	55	53	
		Daytime	08:00~19:00	70	65	54			Daytime	08:00~19:00	60	60	53	
		Evening	19:00~22:00	65	60	54			Evening	19:00~22:00	55	55	54	
	Night	22:00~06:00	60	57	53	Night			22:00~06:00	50	50	50		
	Vibration	Daytime	07:00~22:00	65	60	37		Vibration	Daytime	07:00~22:00	60	40	25	
		Night	22:00~07:00	60	55	38			Night	22:00~07:00	55	40	23	
Tottori <sup>7</sup>	Noise	Morning	06:00~08:00	70	70	47	Ishikawa	Noise	Morning	06:00~08:00	60	60	48	
			Daytime	08:00~19:00	70	70			52	Daytime	08:00~19:00	65	65	49
		Evening	19:00~22:00	65	65	48			Evening	19:00~22:00	60	60	48	
			Night	22:00~06:00	70	70			47	Night	22:00~06:00	50	50	48
		Vibration	Daytime	08:00~19:00	65	65		47	Vibration	Daytime	07:00~22:00	65	30	- <sup>8</sup>
			Night	22:00~06:00	65	65		47		Night	22:00~07:00	60	30	- <sup>8</sup>
	Hakusan	Noise	Morning	06:00~08:00	65	65	52	Hakusan	Noise	Morning	06:00~08:00	65	65	52
			Daytime	08:00~19:00	70	70	52			Daytime	08:00~19:00	70	70	52
			Evening	19:00~22:00	65	65	50			Evening	19:00~22:00	65	65	50
			Night	22:00~06:00	60	60	52			Night	22:00~06:00	60	60	52
Vibration	Daytime	08:00~19:00	65	65	36	Vibration	Daytime	07:00~22:00	65	30	<30			
	Night	19:00~08:00	60	60	37		Night	22:00~07:00	60	30	<30			

<sup>7</sup>: Noise regulation areas are of two types, differing by position at the plant ground boundary.

<sup>8</sup>: No corresponding facilities



## Environmental Measurement Data

### Odor Management

Plant name	Items	Compounds	Units	Legal limits	JDI standards	Results	Compounds	Units	Legal limits	JDI standards	Results	Compounds	Units	Legal limits	JDI standards	Results		
Mobara	No. 1 regulation (site boundary)	-	Odor index	14	14	<10	-	-	-	-	-	-	-	-	-	-		
Tottori	No. 1 regulation (site boundary)	Ammonia	ppm	5	5	<0.1	Hydrogen sulfide	ppm	0.2	0.2	<0.002	Xylene	ppm	1	1	<0.1		
		Toluene	ppm	10	10	<1	-	-	-	-	-	-	-	-	-	-		
	No. 2 regulation (gas outlet)	Ammonia	m <sup>3</sup> /h	730	730	<0.0019	Toluene	Exhaust tower for organic abatement	m <sup>3</sup> /h	1200	1200	<0.0037	Xylene	Exhaust tower for organic abatement	m <sup>3</sup> /h	120	120	<0.00037
								Air release port for organic abatement	m <sup>3</sup> /h	890	890	<0.0080		Air release port for organic abatement	m <sup>3</sup> /h	89	89	<0.00080
Purge gas outlet for organic abatement	m <sup>3</sup> /h							1100	1100	<0.015	Purge gas outlet for organic abatement	m <sup>3</sup> /h		110	110	<0.0015		
No. 3 regulation (effluent)	Hydrogen sulfide	mg/L	0.2	0.2	<0.0005	-	-	-	-	-	-	-	-	-	-	-		
Higashiura	No. 1 regulation (site boundary)	-	Odor index	18	15	<10	-	-	-	-	-	-	-	-	-	-		
	No. 3 regulation (effluent)	-		34	27	<3	-	-	-	-	-	-	-	-	-	-		
Ishikawa	No. 1 regulation (site boundary)	Ammonia	ppm	2	1	<0.1	Methyl mercaptan	ppm	0.004	0.0012	<0.0001	Hydrogen sulfide	ppm	0.06	0.018	<0.0001		
		Methyl sulfide	ppm	0.05	0.01	<0.0001	Methyl disulfide	ppm	0.03	0.009	<0.0001	Trimethylamine	ppm	0.02	0.006	<0.002		
		Propionic acid	ppm	0.07	0.03	<0.0007	n-butyric acid	ppm	0.002	0.001	<0.0002	n-valeric acid	ppm	0.002	0.0009	<0.0002		
		Isovaleric acid	ppm	0.004	0.001	<0.0002	Acetaldehyde	ppm	0.1	0.03	<0.01	Propionaldehyde	ppm	0.1	0.03	<0.0007		
		n-butyraldehyde	ppm	0.03	0.009	<0.0004	Isobutyl aldehyde	ppm	0.07	0.021	<0.0005	n-valeraldehyde	ppm	0.02	0.006	<0.0004		
		Isovaleraldehyde	ppm	0.006	0.0018	<0.0004	Isobutyl alcohol	ppm	4	1.2	<0.1	Ethyl acetate	ppm	7	2.1	<0.3		
		Methyl isobutyl ketone	ppm	3	0.9	<0.1	Toluene	ppm	30	9	<1	Styrene	ppm	0.8	0.24	<0.04		
		Xylene	ppm	2	0.6	<0.1	-	-	-	-	-	-	-	-	-	-		
	No. 3 regulation (effluent)	Methyl mercaptan	mg/L	0.003	0.003	<0.0004	Hydrogen sulfide	mg/L	0.02	0.02	<0.001	Methyl sulfide	mg/L	0.07	0.07	<0.003		
		Methyl disulfide	mg/L	0.09	0.09	<0.01	-	-	-	-	-	-	-	-	-			
Hakusan	No. 1 regulation (site boundary)	Ammonia	ppm	2	2	<0.1	Methyl mercaptan	ppm	0.004	0.004	<0.0001	Hydrogen sulfide	ppm	0.06	0.06	<0.0001		
		Methyl sulfide	ppm	0.05	0.05	<0.0001	Methyl disulfide	ppm	0.03	0.03	<0.0001	Trimethylamine	ppm	0.02	0.02	<0.002		
		Propionic acid	ppm	0.07	0.07	<0.0007	n-butyric acid	ppm	0.002	0.002	<0.0002	n-valeraldehyde	ppm	0.002	0.002	<0.0002		
		Isovaleric acid	ppm	0.004	0.004	<0.0002	Acetaldehyde	ppm	0.1	0.1	<0.01	Propionaldehyde	ppm	0.1	0.1	<0.0007		
		n-butyraldehyde	ppm	0.03	0.03	<0.0004	Isobutyl aldehyde	ppm	0.07	0.07	<0.0005	n-Valeraldehyde	ppm	0.02	0.02	<0.0004		
		Isovaleraldehyde	ppm	0.006	0.006	<0.0004	Isobutyl alcohol	ppm	4	4	<0.1	Ethyl acetate	ppm	7	7	<0.3		
		Methyl isobutyl Ketone	ppm	3	3	<0.1	Toluene	ppm	30	30	<1	Styrene	ppm	0.8	0.8	<0.04		
		Xylene	ppm	2	2	<0.1	-	-	-	-	-	-	-	-	-			
	No. 3 regulation (effluent)	Methyl mercaptan	mg/L	0.003	0.003	<0.0004	Hydrogen sulfide	mg/L	0.02	0.02	<0.001	Methyl sulfide	mg/L	0.07	0.07	<0.003		
		Methyl disulfide	mg/L	0.09	0.09	<0.01	-	-	-	-	-	-	-	-				

## Environmental Accounting

We carry out environmental accounting so that investments and expenses related to environmental conservation, as well as their results, are tallied up to give us a reference point for decision-making. We have chosen items to be recorded in consideration of their importance in reference to the Ministry of Environment's Environmental Accounting Guideline.

Environmental conservation costs and impacts for FY2018 are shown in the table below. Among environmental conservation costs, investments were primarily re-

lated to energy conservation and risk reduction (replacement of plumbing, etc.). Costs were primarily outlays for outsourcing, waste treatment, consumable materials, repairs, environmental analysis and measurement.

Regarding environmental conservation effects (physical unit), both energy-derived CO<sub>2</sub> emissions and waste emissions improved from year-earlier levels, due in part to effects of our Environmental Policy. Regarding valuables, sales volume increased slightly from the previous year but sales value decreased due to market fluctuations, etc.

### Summary of Environmental Conservation Costs in Japan Units: 1 million yen

Major category	Items	Details	Investment	Expenses
Environmental conservation costs <sup>1</sup> (cost within business area)	Pollution prevention cost	Costs for preventing air pollution, water pollution, soil pollution, noise, foul odors, and more	16	3,334
	Global environmental conservation cost	Costs for preventing global warming, conserving energy, preventing the depletion of the ozone layer, and more	34	96
	Resource recycling costs	Costs for the efficient utilization of resources, as well as the recycling, treatment and disposal of industrial waste and general waste	0	1,306
	Total			50

<sup>1</sup>: Analysis and measurement costs related to the environment are also included in the costs within business areas.

### Summary of Environmental Conservation Effects in Japan

Major categories	Categories	Items	Effect	Units
Environmental conservation effects (physical unit)	Environmental conservation effects related to environmental burdens and waste <sup>2</sup>	Emissions of energy-derived CO <sub>2</sub>	88	million t-CO <sub>2</sub>
		Emissions of waste, etc.	2,449	t
Economic benefits associated with environmental conservation activities	Operating revenue related to environmental burdens and waste	Revenue from the sale of valuables	48	1 million yen

<sup>2</sup>: In order to consider the changes in the production output, values were derived using the following formula, which was established by referring to the Environmental Accounting Guideline.  
Effects = emissions from the previous fiscal year x (glass substrate area from the fiscal year in question / glass substrate area from the previous fiscal year) - emissions from the fiscal year in question

Environmental accounting is applied to the 5 plants of Tottori, Higashiura, Ishikawa, Hakusan, and Mobara).

## Ecosystem Conservation Activities

### ● Hotaru-gawa Creek and Koi Pond (Mobara Plant)

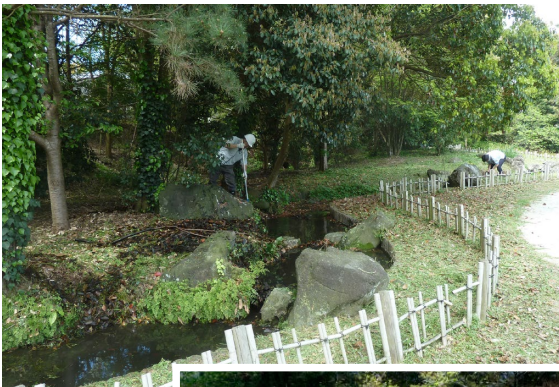
There are artificially created “Hotaru-gawa” creek and “Koi-carp” pond in our site.

Fireflies live around Hotaru-gawa Creek, and flights by dozens of fireflies can be seen in late May of every year.

The creek also has a small waterfall about a meter in height, and freshwater snails (*Semisulcospira*) can be seen climbing it.

The Koi-carp Pond is home to dozens of beautiful colored carps (Koi). Many killifishes are also bred in the pond, and both koi-carps and killifishes can be seen swimming gracefully.

The plant will actively undertake environmental conservation activities such as cleanup of the surrounding area and the maintenance/management of water quality, to enable future maintenance of this ecosystem.



Cleanup of the Hotaru-gawa Creek



Cleanup of the koi pond



Lotus flowers and Koi-carps



A firefly in the Hotaru-gawa creek



Japanese rice fishes



Kawanina (*Semisulcospira libertina*)

### ● SOZO-no-Mori (Ishikawa Plant)

On the grounds of the Ishikawa Plant in 2006, employees, their families, and local people took part in the planting of tree saplings, particularly local species (Japanese elm, cherry, etc.), in the SOZO-no-Mori forest. This was created as a space for enjoying flowers from spring, fall foliage in autumn, and changing scenery in winter.

Every year, we perform planting of seasonal flowers in flower beds, weeding, and other maintenance work throughout the forest, mostly through the efforts of employees and their families. In addition, many birds fly around the factory, so we made and installed birdhouses in order to provide them a place to rest.

This forest aims to raise employees' environmental awareness and to provide a place for customers and employees to enjoy the greenery.

We will continue to promote conservation activities together with local communities so that the trees and flowers of the “SOZO-no-Mori” forest grow further.



SOZO-no-Mori



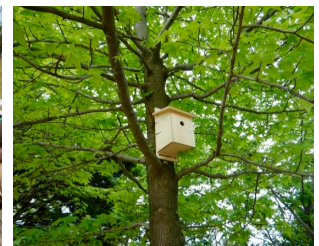
Weeding



Making birdhouses



Flower planting



Installing birdhouse

## Activities undertaken by Domestic Sites

### Mobara Plant

The Mobara Plant took part in the cleanup of the Ichinomiya Shore on Saturday, September 1, which was conducted by three organizations: the Ichinomiya River Watershed Environmental Conservation Promotion Conference, to which the plant belongs, and the Chosei District Kujukuri Shore Clean Countermeasure Conference and the Group to Beautify Ichinomiya River.



Ichinomiya Sea Shore cleanup

On Friday, February 1, the Mobara Plant took part in the cleanup of Ichinomiya River, an activity of the Ichinomiya River Protection Group.



Ichinomiya River cleanup

### Hakusan Plant

The Hakusan Plant takes part in the cleanup activities organized by the Hokubu Industrial Park, which are held twice a year. On Friday, October 26, approximately 140 people took part in the cleanup along sidewalks around the plant, collecting 45 90-liter bags of fallen leaves and other debris within an hour before working time.



Cleanup around the Hakusan Plant

### Ishikawa Plant

In Ishikawa plant, we have sent staffs to conduct the education to three public nursing offices in the Kawakita town, on the theme of “Let’s think of Waste (Mottai-nai)” for 10 years. The activity conducts games on the theme of garbage, to study the 3Rs (Reduce, Reuse, Recycle).

This helps children nurture a mindset of caring for things.



Environmental education at nursery school

### Higashiura Plant

On Saturday, December 1, the Higashiura Plant conducted the volunteer cleanup activity around its plant.



Cleanup activity around the Higashiura Plant

We took part in the rice transplanting event on Saturday, June 2, and the harvesting event on Monday, October 8, in rice paddies in the “Higashiura Natural Environment Learning Forest” located next to the Higashiura Plant.



Rice transplanting and the harvesting

### Tottori Plant

The Tottori Plant conducted cleanup activities around the plant early in the morning on Friday, May 25 and on Friday, September 21.



Cleanup activities around the Tottori Plant

### Shinbashi Office

The Shinbashi Office took part in the cleanup activity “Shiba District Cleanup Campaign: Zero Smoking on the Street!”



Cleanup activity by Shiba District Cleanup Campaign

# Activities Undertaken by Overseas Sites

We have three overseas manufacturing subsidiaries which mainly assemble LCD modules. All of the companies have acquired ISO14001 certification, promote the reduction of environmental burdens, and work on conservation of global warming (reducing CO<sub>2</sub>) and effectively using resources (reusing water resources and re-

ducing the amount of waste generated) as priority issues. We work to communicate with the companies by holding regular meetings to confirm and to ascertain the progress of each company.

The following article introduces the activities of Suzhou JDI Electronics Inc. (SE).

## Environmental activities at Suzhou JDI Electronics Inc. (SE)



Company name	Suzhou JDI Electronics Inc. (SE)
Address	No.168 Jin Feng Road, Suzhou New District, Suzhou, 215011, PRC
Start of business	February 1996
Representative	Kotaro Ueno
Business content	Manufacture of medium- and small-size LCD displays
Number of employees	2,368 (as of end of March 2019)

### 1. Environmental plans and results of FY2018, and plans for FY2019

Activities	Unit	Amount of reduction in FY2018		Achievement ratio	Value of reduction (million yen/year)	Assessment	Reduction target for FY2019
		Target	Result				
(1) Reduction of CO <sub>2</sub> emissions	t-CO <sub>2</sub>	638	983	154%	12.3	○	1,688
(2) Reduction of amount of water used	m <sup>3</sup>	54,000	77,786	144%	5.1	○	7,176
(3) Reduction of VOC emissions	kg	1,929	2,058	107%	0.2	○	1,904
(4) Collection of general wastes (collection rate)	Companies	4	4	100%	22	○	80%

\* Result = Cumulative value of effects of implemented environmental measures

### 2. Examples of FY2018 environmental conservation activities

The following article introduces the environmental conservation activities in FY2018.

#### 1 Energy conservation through inverters for air-conditioners, etc.

- We modified air conditioning systems to install inverters in some of them when the introduction of automated production lines in the clean room. Following the installation, the system can use varied frequencies according to production status, instead of the past fixed frequency of 50Hz. This eliminates excessive operation and has greatly reduced power consumption.
- We also installed inverters in the exhaust fans in the cafeteria, enabling adjustment of operating status to match cooking times instead of operating 24 hours a day at the past fixed frequency (50Hz). Other than cooking times, it was operated at a lower frequency, which has significantly reduced power consumption.

#### Reduction effect: 294,293.6 kWh/year reduction

#### 2 Reduction in amount of municipal water used

We considered the reuse of wastewater from the polarizer laminating machines, confirmed the feasibility through water quality analysis, and added the equipment for wastewater reuse to them.

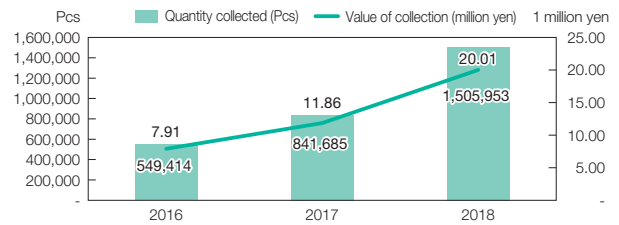
Following this, it reduced the amount of municipal water used through the complete collection of wastewater and its reuse in the production of purified water.

#### Reduction effect: 101,181.7 kWh/year reduction in municipal water used

#### 3 Collection of general wastes

- We started the activities of collection of components' trays in 2016, and carried it out with all models in 2018.

#### Change in quantity and value of components' trays collected



- In addition, it has expanded collection to packaging materials (cardboard, pallets, etc.) related to the components.
- Effects: (1) General waste collection effect value 22 million yen/year  
(2) Components' trays collection ratio 80%

#### 4 Voluntary energy conservation activities in summer and winter

With the aim of raising energy conservation awareness, in summer and winter, we implemented voluntary energy conservation activities such as enforcement of power saving in lighting, PCs, and office equipment; setting of appropriate temperatures for air conditioning; and conservation of water.

#### 5 Contribution activities for local communities

- No Car Day activity (every month)
- KIDS environmental education activity (every year)
- Environmental conservation volunteer activities (every year)



Tips for setting air conditioning temperature



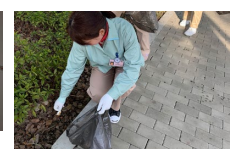
Environmental conservation volunteer activities



KIDS environmental education



at entrances to changing rooms  
Installation of thermal curtains



Trash pickup activity



**Japan Display Inc.**

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