

# Environmental Efforts

Main target companies of environmental efforts:  
New JRC Head Office and Kawagoe Works, NJR Trading, NJR Chichibu, NJR Service, Saga Electronics, NJR FUKUOKA, THAI NJR

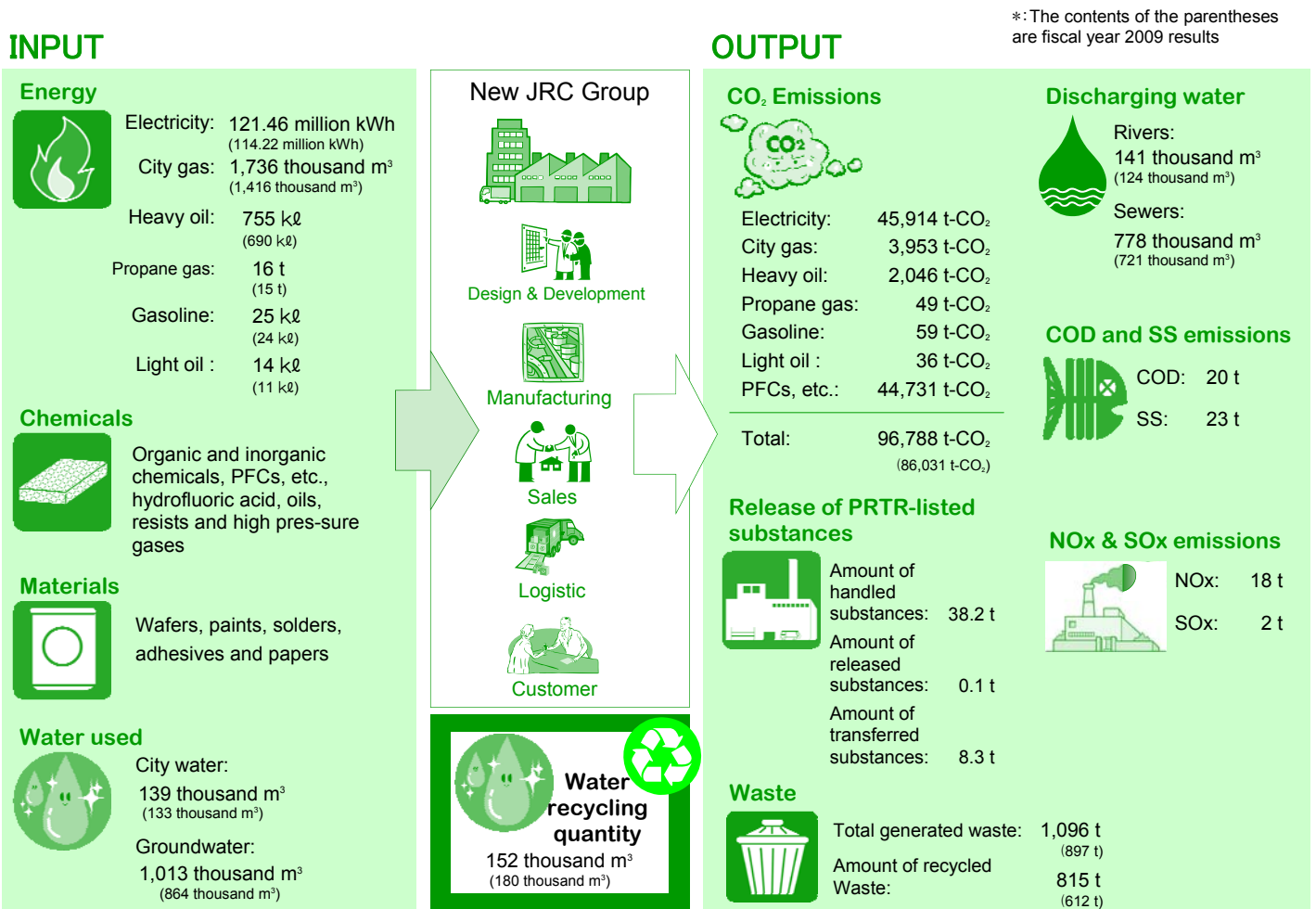
## Involvement in Business Activities and Environmental Protection

Business activities such as design & development, raw materials procurement, manufacturing, sales and logistic of each product family have various environmental impacts on surrounding areas and the global environment. We are assessing these impacts, and promoting load reduction activities for activities with greater impact.

### New JRC Group's material flow

When reducing environmental load, the New JRC Group works to understand the environmental load of its business activities. The following outlines the environmental load caused by the business activities of the New JRC Group from input of raw materials and energy to logistic of final products.

In fiscal 2010, both INPUT and OUTPUT increased as production increases.



### Environmental aspect and impact assessment

In addition to INPUT and OUTPUT assessments, New JRC introduced a system to extract and assess the environmentally friendly operations of each department to help promote measures with beneficial impacts on the environment. Thus, we promote measures to create beneficial impacts on the environment.

This environmental impact assessment is conducted every year. Through this assessment, we aim to again acknowledge the relationship between each department's operations and the environment as well as to raise each and every employee's environmental awareness.

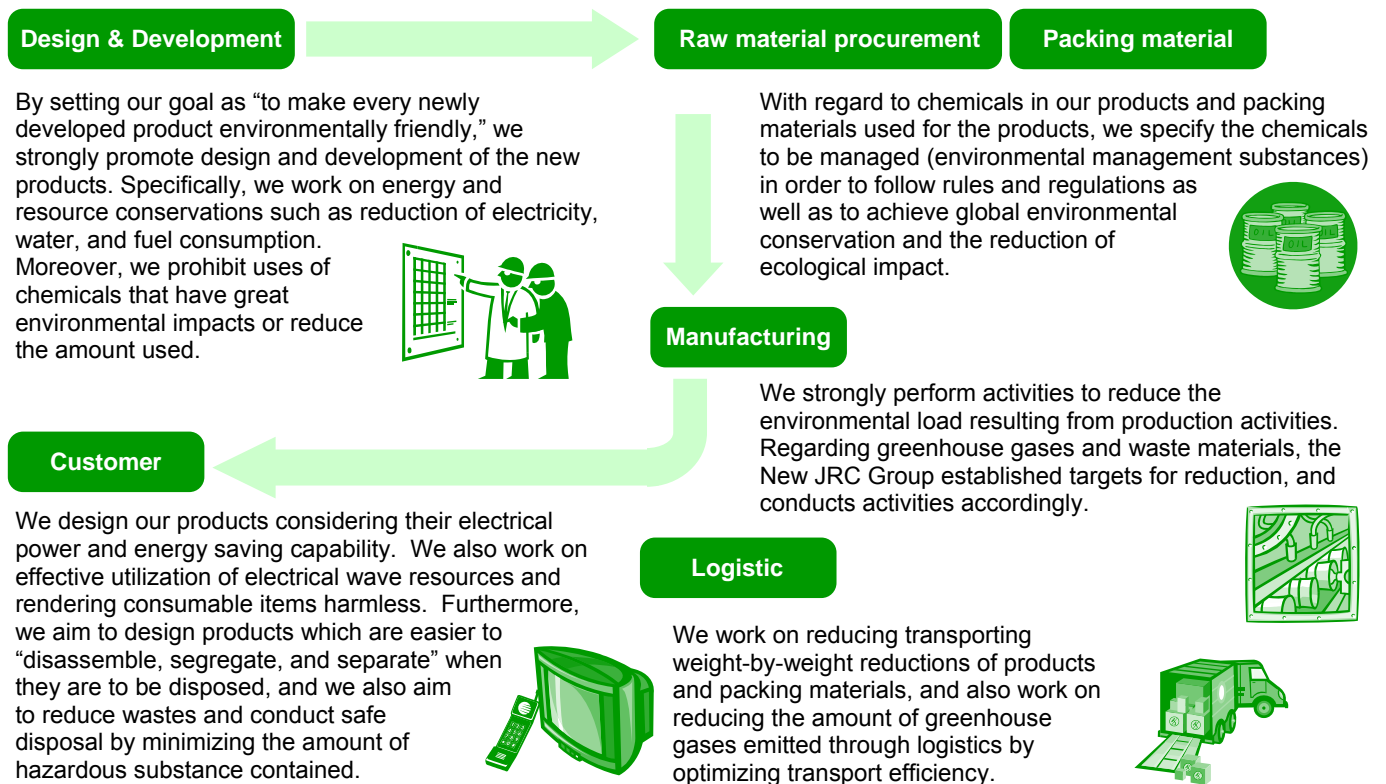
In fiscal 2010, we determined from the results of our assessment that electricity and 28 different chemicals among INPUT and chrome etching waste liquid and calcium fluoride sludge among OUTPUT had high environmental impacts; we identified these substances as "substances which have impacts on the environment." Accordingly, we reduced amount of consumption for INPUT and enforced recycling for OUTPUT.

## Reducing the Environmental Load in the Product Life Cycle

The New JRC Group aims to reduce its environmental load through business activities and product lifecycles.

### Environmentally Friendly Products

The New JRC Group is developing new products while considering, throughout the course of product development, the various impacts that products have on the environment.



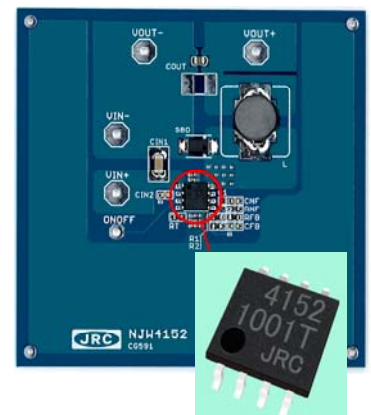
### © “Wide input-range products” contributing to conservation of ecology

New JRC names semiconductor products which operate with a wide range on supply voltages “wide input-range products,” and 34 new products have been developed. Power supply ICs which accommodate a wide range of supply voltages are needed in a broad number of areas including in-vehicle devices, industrial instruments, and home appliances.

For example, car navigation systems are usually designed to operate with 12 V batteries, but they need to withstand a pulse voltage of around 35 V for safety design reasons. Moreover, new needs of “being able to operate with low voltages” have also arisen, in addition to the ones mentioned above, for eco friendly vehicles such as idling-stop vehicles and electric vehicles. An engine starter has to turn over often in idling-stop vehicles, and therefore, it has to operate uninterruptedly even under a temporarily low voltage condition when starting up the engine.

“Wide input-range products” have been developed to meet these needs.\*

NJW4152 (representative product)



\*: For more information on “Wide input-range products,” please visit New JRC’s website: <http://semicon.njr.co.jp/eng/wideinputrange/>

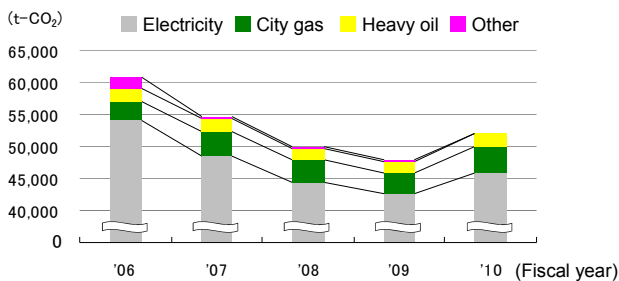
## Prevention of Global Warming

A major cause of global warming is increased emissions of “greenhouse gases”. So, we are committed to taking energy-saving measures, using energy effectively to reduce CO<sub>2</sub> emissions from energy use. Also, we are committed to reducing PFCs, etc., high Global Warming Potential (GWP) Gases, and replacing by lower GWP gases.

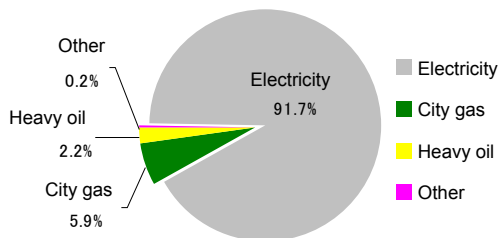
### Reduction of the energy origin CO<sub>2</sub> emissions

To reduce CO<sub>2</sub> emissions as far as possible, the New JRC Group is working on energy-saving manufacturing and air-conditioning facilities, high-efficiency operation, installation of inverters in air conditioners, lighting and extraction fans, streamlining and rationalization of manufacturing, and fuel conversion from heavy oil to city gas.

#### Amount of the energy origin CO<sub>2</sub>



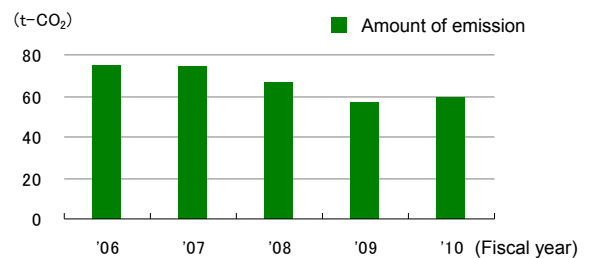
#### Energy breakdown of New JRC Group in 2010



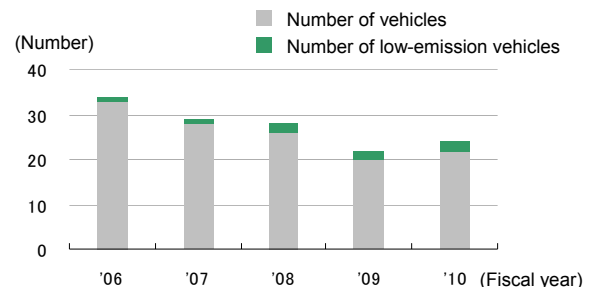
### CO<sub>2</sub> reduction for company-owned vehicles

The New JRC Group is practicing idling-stops to reduce CO<sub>2</sub> emissions from company-owned vehicles.

#### Changes in the amount of CO<sub>2</sub> emissions from gasoline



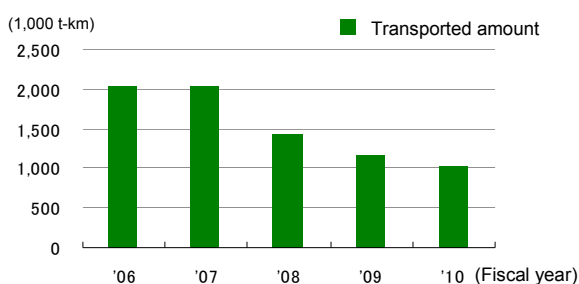
#### Number of company-owned vehicles



### Reduction of CO<sub>2</sub> emissions from product transportation

The New JRC Group works on the reduction of CO<sub>2</sub> emissions from manufacturing processes, and each facility of each Group company works on reduction of CO<sub>2</sub> emissions through measures of effective logistics and measures for improving fuel efficiency by weight reductions.

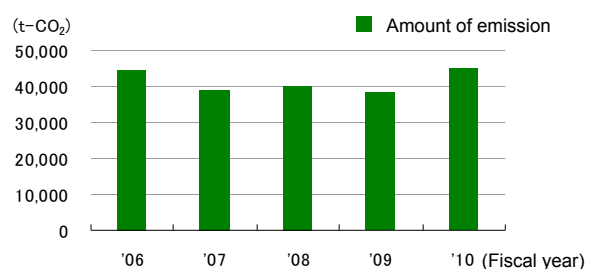
#### Transported amount



### Reduction of PFCs, etc.

The New JRC Group uses various greenhouse gases, such as perfluorocarbon (PFC), hydrofluorocarbon (HFC) and sulfur hexafluoride (SF<sub>6</sub>) in semiconductor-related manufacturing. To help prevent global warming, we are working to reduce and substitute these greenhouse gases.

#### Emissions of PFCs, etc.



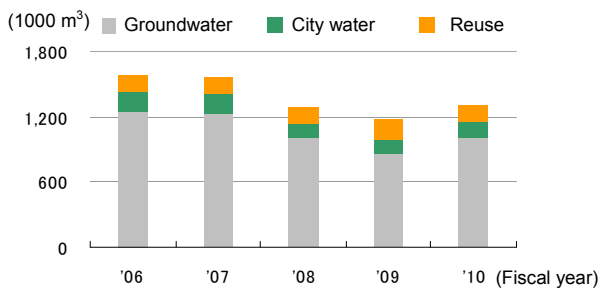
## Building a "Sound Material Cycle Society"

To maximize the efficiency in usage of the limited resources is a major challenge in global environment conservation. We are committed to reducing environmental loads by promoting consumption reduction, resources reconversion, and recycling.

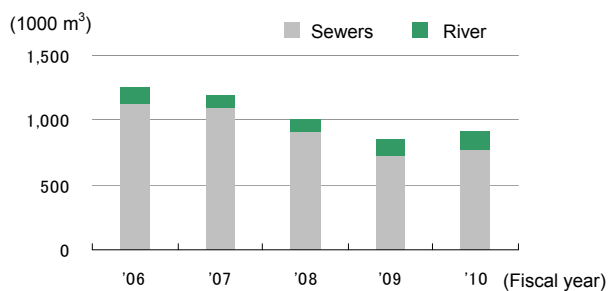
### Control of the water usage

About 89% of the water used by the New JRC Group is supplied from groundwater. It is used as pure water for the processes in semiconductor manufacturing, cooling water for equipment, air conditioning water for temperature regulation, and other water for miscellaneous uses. We have always been promoting activities to reduce the amount of water use and to improve water-use efficiency, and we will continue maintaining and managing the activities.

#### Changes in water usage



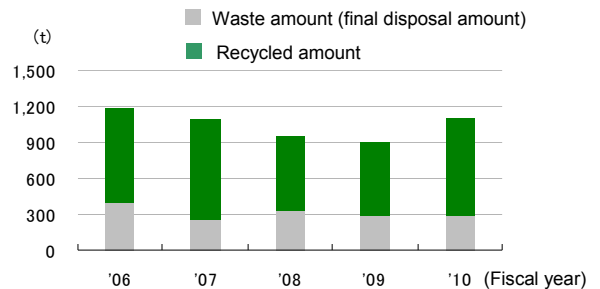
#### Changes in water discharge



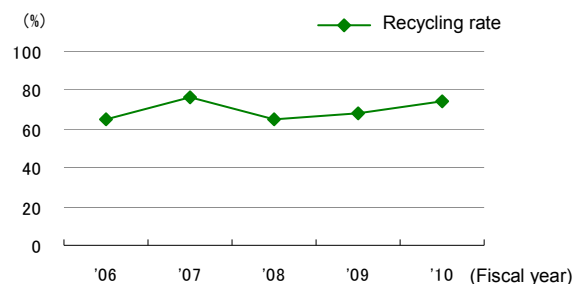
### Reduction of the total volume of waste generation

The New JRC Group controls waste generation and reused or recycled waste. We carefully sort the various wastes generated by facilities based on resource and type. We also review collection methods to familiarize employees with separation methods for reusing or recycling waste. In future, we will continue to promote turning water into valuable resources through separation and breakdown and to control the total volume of waste generation in addition to recycling.

#### Changes in waste discharge amount



#### Recycling rate



Segmented valuable resources

## Response to Environmental Risks

Some chemicals used in manufacturing can damage health or have a serious adverse effect on the natural environment even in small amounts. In addition to managing appropriate use of chemicals, we are working to replace hazardous chemicals with harmless ones as well as on reducing emissions. Moreover, in order to comply with regulations, we voluntarily set more stringent standards than the regulation values.

### Environment-related regulatory compliance

The New JRC Group established a system to take prompt and appropriate measures to take in cases of violation of law or an incident related to the environment and any other problems.

#### [Accidents and violations of legal regulations and other requirements]

No accident or violation has occurred in fiscal 2010.

#### [Whether or not environment-related lawsuits have been filed, content of lawsuits, and state of response to lawsuits]

No environment-related lawsuits have been filed in fiscal 2010.

#### [Amount of penalty, fine, etc., concerning environment; number of penalties, fines, etc. concerning environment]

No penalties, fines, etc., have occurred in fiscal 2010.

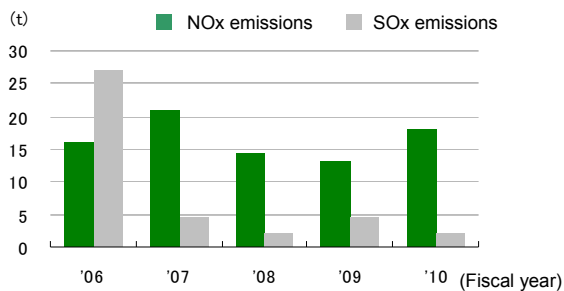
#### [Complaints about environment]

No complaints, etc., have occurred in fiscal 2010.

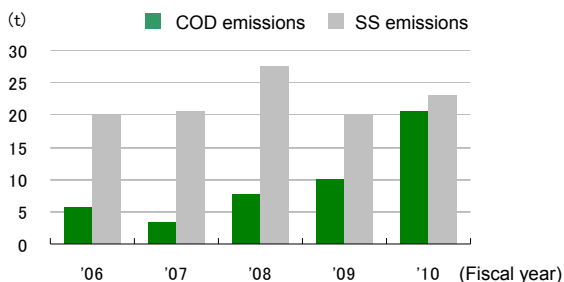
### Air pollution and water pollution prevention measures

The New JRC Group has set severer "voluntary management criteria" for emissions than the stipulated emission concentrations in government standards, and we prevent environmental contamination such as air pollution and water pollution by conducting periodic measurements.

#### Changes in SOx and NOx emissions



#### Changes in COD and SS emissions



Note: In addition to the measurement of storm water discharge, we have added the measurement of public sewers for COD emissions monitoring since fiscal year 2010.

### Appropriate Management of Chemicals

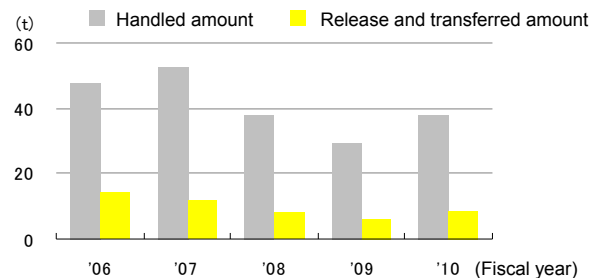
The New JRC Group uses various chemicals and is establishing a management system for chemicals while working on reducing the amounts used.

With regard to the main chemicals that are used, chemicals that are thought to be possibly used and substances which are prohibited for use, New JRC has established the "environmentally safe chemical management standards", which specifies the names of approximately 350 kinds of substances and their classifications, in order to ensure appropriate management.

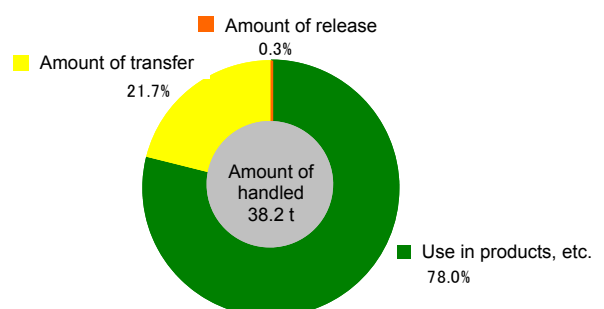
### Reduction of PRTR Law-listed Substances

New JRC Group companies and facilities in Japan abide by the Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (PRTR Law). We monitor the releases of chemical substances to the air and public waters and the amounts of waste transferred out of the facilities as well as released to the sewer, and report releases to the municipalities.

#### Changes in PRTR Law-listed substances



#### Handled amount of PRTR Law-listed substances and amount of release and transfer in 2010



## Conservation of Biological Diversity

As the awareness of the Earth's environment heightens, environmental challenges that corporations have to work on have been diversified.

In addition to activities for reduction of environmental loads such as prevention of global warming, resources circulation, and management of chemicals, consideration of biological diversity is expected.

We engage in minimizing the impacts that our business operations could have on living organisms, as well as promoting the conservation of biological diversity through cooperation with society.

### Approach to conservation of biological diversity

The New JRC Group has been continuously conducting greening activities such as tree planting, green roof, and green curtain. We also engage in the conservation of biological diversity which is a foundation of ecosystem services.

New JRC has been conducting forest conservation activities since fiscal 2010.

A large volume of groundwater is used for production of semiconductor products. Water is purified by organisms in the forest and becomes groundwater. We need to conserve the biological diversity of forests in order to continue utilizing natural resources such as groundwater.

In fiscal 2010, we planted 240 trees including sawtooth oak (*Quercus acutissima*), konara oak (*Quercus serrata*), wild chestnut (*Sterculia murex*), and wild cherry (*Prunus jamasakura*) trees in "Tatsugaya" Ogosemachi, Saitama. The staff who could not participate in tree planting instead participated in forest conservation activities by means of a donation.

We will continue engaging in the conservation of biological diversity through forest conservation activities such as greening and underbrush trimming.



Green Curtain



Green Roof



Tree Planting, November, 2010

## Medium-term Environmental Targets

We set the fiscal year 2010 medium-term environmental targets for the New JRC Group, and activities were implemented independently at each company.

### New JRC Group medium-term environmental targets

(Judgment; OK: achieved, NG: not achieved)

Target items	Target type	Unit	Fiscal 2010 results/judgement		
			Target for fiscal year	Actual results	Judgement
Copy paper usage (absolute quantity) <Converted in Size A4 >	Absolute quantity target	1,000 sheets	8,266	5,034	OK
Energy used	Absolute quantity target	1,000 GJ	1,599	1,152	OK
Carbon dioxide emissions	Absolute quantity target	t-CO <sub>2</sub>	78,821	89,357	NG
Transported amount	Absolute quantity target	1,000 t-km	6,969	1,031	OK
Amount of PRTR substances handled	Absolute quantity target	Kg	67,190	38,164	OK
Amount of non-recycled waste discharged	Absolute quantity target	t	354	281	OK

(Reasons for the judgment "NG" and the plans for improvement)

Carbon dioxide emission: We made improvement by using hexafluoroethane as an alternative gas and by shortening the time of product treatment performed with equipment that uses octafluoropropane. However, types of products and production of products which use PFC gas have both increased, and therefore, the amount of emission increased. In fiscal 2011, we are planning to introduce a PFC treatment facility as a plan to reduce PFC gas emissions.

### ◆ New JRC, NJR Trading, NJR Chichibu, NJR Service

Target items	Target type	Unit	Fiscal 2010 results/judgement		
			Target for fiscal year	Actual results	Judgement
Copy paper usage (absolute quantity) <Converted in Size A4 >	Absolute quantity target	1,000 sheets	5,593	2,873	OK
Energy used	Absolute quantity target	1,000 GJ	802	590	OK
Carbon dioxide emissions	Absolute quantity target	t-CO <sub>2</sub>	48,100	30,821	OK
Transported amount	Absolute quantity target	1,000 t-km	5,417	938	OK
Amount of PRTR substances handled	Absolute quantity target	Kg	25,090	12,523	OK
Amount of non-recycled waste discharged	Absolute quantity target	t	35	2	OK

### ◆ Saga Electronics

Target items	Target type	Unit	Fiscal 2010 results/judgement		
			Target for fiscal year	Actual results	Judgement
Copy paper usage (absolute quantity) <Converted in Size A4 >	Absolute quantity target	1,000 sheets	2,400	1,927	OK
Energy used	Absolute quantity target	1,000 GJ	190	194	NG
Carbon dioxide emissions	Absolute quantity target	t-CO <sub>2</sub>	7,400	7,282	OK
Transported amount	Absolute quantity target	1,000 t-km	72	67	OK
Amount of PRTR substances handled	Absolute quantity target	Kg	1,100	1,235	NG
Amount of non-recycled waste discharged	Absolute quantity target	t	11	0	OK

### ◆ NJR FUKUOKA

Target items	Target type	Unit	Fiscal 2010 results/judgement		
			Target for fiscal year	Actual results	Judgement
Copy paper usage (absolute quantity) <Converted in Size A4 >	Absolute quantity target	1,000 sheets	273	234	OK
Energy used	Absolute quantity target	1,000 GJ	607	368	OK
Carbon dioxide emissions	Absolute quantity target	t-CO <sub>2</sub>	23,321	51,254	NG
Transported amount	Absolute quantity target	1,000 t-km	1,480	26	OK
Amount of PRTR substances handled	Absolute quantity target	Kg	41,000	24,406	OK
Amount of non-recycled waste discharged	Absolute quantity target	t	2	2	OK

### ◆ THAI NJR

Target items	Target type	Unit	Fiscal 2010 results/judgement		
			Target for fiscal year	Actual results	Judgement
Amount of non-recycled waste discharged	Absolute quantity target	t	306	277	OK

## Data Resources

This report is written based on the sources of data in the table below and conversion formulas.

Item	Unit	Data resources/data conversion unit
Power usage	kWh	"Electricity charge account statement" issued by electric power company
City gas usage	m <sup>3</sup>	"Bill" issued by city gas company
Heavy oil usage	kℓ	"Bill" issued by company supplying heavy oil
Propane gas usage	m <sup>3</sup>	"Bill" issued by propane gas company
Groundwater usage	m <sup>3</sup>	Flow meter by each company
Service water usage	m <sup>3</sup>	Flow meter by each company
Discharge to sewers	m <sup>3</sup>	Flow meter by each company
River drainage	m <sup>3</sup>	Flow meter by each company
CO <sub>2</sub> Emissions	t-CO <sub>2</sub>	Power: Amount of electricity (MWh) × 0.368 (t-CO <sub>2</sub> /MWh) (New JRC, NJR Trading, NJR Chichibu, NJR Service) Power: Amount of electricity (MWh) × 0.348 (t-CO <sub>2</sub> /MWh) (Saga Electronics) Power: Amount of electricity (MWh) × 0.387 (t-CO <sub>2</sub> /MWh) (NJR FUKUOKA) Power: Amount of electricity (MWh) × 0.425 (t-CO <sub>2</sub> /MWh) (THAI NJR) City gas: City gas (m <sup>3</sup> ) × 45 (MJ/m <sup>3</sup> ) × 10 <sup>-3</sup> × 0.0138 (t-C/GJ) × 44/12 Heavy oil A: Heavy oil A (kℓ) × 39.1 (GJ/kℓ) × 0.0189 (t-C/GJ) × 44/12 Propane gas: Propane gas (t) × 50.2 (GJ/t) × 0.0163 (t-C/GJ) × 44/12 Gasoline: Gasoline (kℓ) × 34.6 (GJ/kℓ) × 0.0183 (t-C/GJ) × 44/12 Light oil: Light oil (kℓ) × 38.2 (GJ/kℓ) × 0.0187 (t-C/GJ) × 44/12
Waste emissions	t	Weight measured by waste disposer: recorded on manifest slip
Recycling rate	%	Defined as follows: {(Recycled object weight)/(Waste weight + Recycled object weight)} × 100
Energy in crude oil equivalent	kℓ	Day power: Amount of electricity (MWh) × 9.97 (GJ/MWh) × 0.258 (kℓ/10GJ) × 10 <sup>-1</sup> Night power: Amount of electricity (MWh) × 9.28 (GJ/MWh) × 0.258 (kℓ/10GJ) × 10 <sup>-1</sup> City gas: Amount of city gas (m <sup>3</sup> ) × 0.045 (GJ/m <sup>3</sup> ) × 0.258 (kℓ/10GJ) × 10 <sup>-1</sup> Heavy oil A: Amount of heavy oil A (kℓ) × 39.1 (GJ/kℓ) × 0.258 (kℓ/10GJ) × 10 <sup>-1</sup>
Greenhouse gases emissions	t-CO <sub>2</sub>	Calculated by IPCC (Intergovernmental Panel on Climate Change) equation
PRTR Aggregate	t	Handled amount: total quantity of purchased and produced substances using materials management system Releases to atmosphere: atmosphere concentration analyzed Transferred amount of waste to sewer drainage: drainage concentration analyzed Transferred amount of waste to outside relevant office: waste concentration analyzed