



*shaping your dreams*



# Environmental Report

# 2019



As a step toward OSG’s corporate principle of “Global Presence”, we will actively engage in environmental activities raising each employee’s environmental awareness and make efforts to realize a sustainable and prosperous future in changing times.



OSG Corporation  
President and CEO

In fiscal year 2018, OSG celebrated the 80th anniversary of its founding and achieved a record high performance.

Fiscal year 2019 is the final year of our three-year management plan “The Next Stage 17.” We expect the growing demand for cutting tools even though we should pay attention to the global economic trends such as U.S.-China trade friction and an economic slowdown in some emerging countries. Today, we are facing a major paradigm shift in technology on automotive, medical, and clean energy, etc. In this situation, in order to respond to diverse customer needs and issues, we have launched a new project called “OSG 4.0”. This project aims to improve productivity by creating smart production line which enables both small-lot production of trial and special products and mass production, develop products to meet the changing times, promote labor-saving and unattended operation, and also, on the basis of our One Factory vision, connect Japanese mother factory to every factory in the world. Also, by developing OSG Product Data Management (named OPDM) which enables to centrally manage input and output of all the information needed for manufacturing by digitizing product data, sales data, and technical data, etc., we work on reforming our domestic production system with the goal to be a Smart Factory. Through these efforts, with strong environmental consciousness, we will further promote the development of environmentally friendly products with energy saving and high efficiency.

With the challenging spirit, we will continue our efforts to contribute to the sustainable development of manufacturing industries in the world. We sincerely ask for your continued understanding and support.

## shaping your dreams

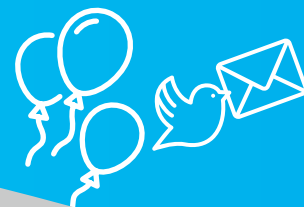
OSG introduced its new brand statement and tagline “shaping your dreams” toward the 100th anniversary.

The power of OSG lies in our assured innovative technological know-how for producing high-quality and high-performance products; our exceptional services to respond to situations diligently; and our out-of-the-box thinking to provide total solutions that anticipate our customers’ needs.

As a comprehensive cutting tool provider with operations spanning across the globe, we are committed to contribute to the advancement of the manufacturing industries by shaping our customers’ dreams into reality.  
<http://www.osg-global.jp/brand/>



shaping your dreams



### Fundamental Business Policy

- Always aware that our corporation is an institution that serves society, we provide products that are appreciated by our customers.
- We assign our employees appropriate jobs and strive to improve their daily lives.
- We strive to provide stable dividends to our stockholders.
- We implement sound business practices that earn enhanced social trust and develop the corporation into a worldwide business.

### Basic Environmental Ideas

- All will work to maintain the global environment in harmony with OSG's basic business policies.
- OSG publicizes information on its three declarations made in October 1996 (i.e., Global Expansion, Health-consciousness, and Eco-friendliness).
- OSG conducts activities with consideration of the environment while offering products and services that contribute to society.
- Following societal norms, OSG promotes communication with the local community.

### Environmental Policy

OSG strives to protect the global environment and act in harmony with nature under OSG's slogans of "an Eco-friendly Company" and "a Culture That Cares for the Environment."

### Seventh Mid-Term Environmental Plan (From FY2018 through FY2020)

**Slogan: Achieve further environmental improvement as a leading eco company**

[We aim to reduce costs by actively promoting eco-factory activities and developing eco-products]

#### ● Priority activities

##### [Eco-factory]

Reduction in consumption of energy and indirect materials such as cutting oils and grinding wheels

##### [Eco-product]

Development of cutting tools with long life and that help customers to reduce their environmental impact

##### [Energy conservation]

Productivity enhancement by reducing setup time and improving cycle time

### FY2018 Targets and Results, FY2019 Targets

Environmental Objectives		FY2018		FY2019 Target	
		Target	Result		
1	Energy Conservation	Total Energy Use Reduction (Energy sources: Electric power, Fuel oil and LPG) Total use of energy BM: 96,676 GJ/month	1.0% reduction 957 GJ/month reduction	1.9% reduction 1,776 GJ/month reduction	<b>1.0% reduction</b> <b>957 GJ/month</b> <b>reduction</b>
		Basic unit of production BM: 20 GJ/million yen	1.0% reduction 0.20 GJ/million yen reduction	1.4% reduction 0.27 GJ/million yen reduction	<b>1.0% reduction</b> <b>0.20 GJ/million</b> <b>yen reduction</b>
2	Eco-Products	Eco-Friendly Product Development	29 points	35 points	<b>31 points*</b>
3	Eco-Factory	Eco-Friendly Production	31 points	38 points	<b>34 points*</b>

\*Improvement of environmental activities Evaluation by scoring (60 points maximum)

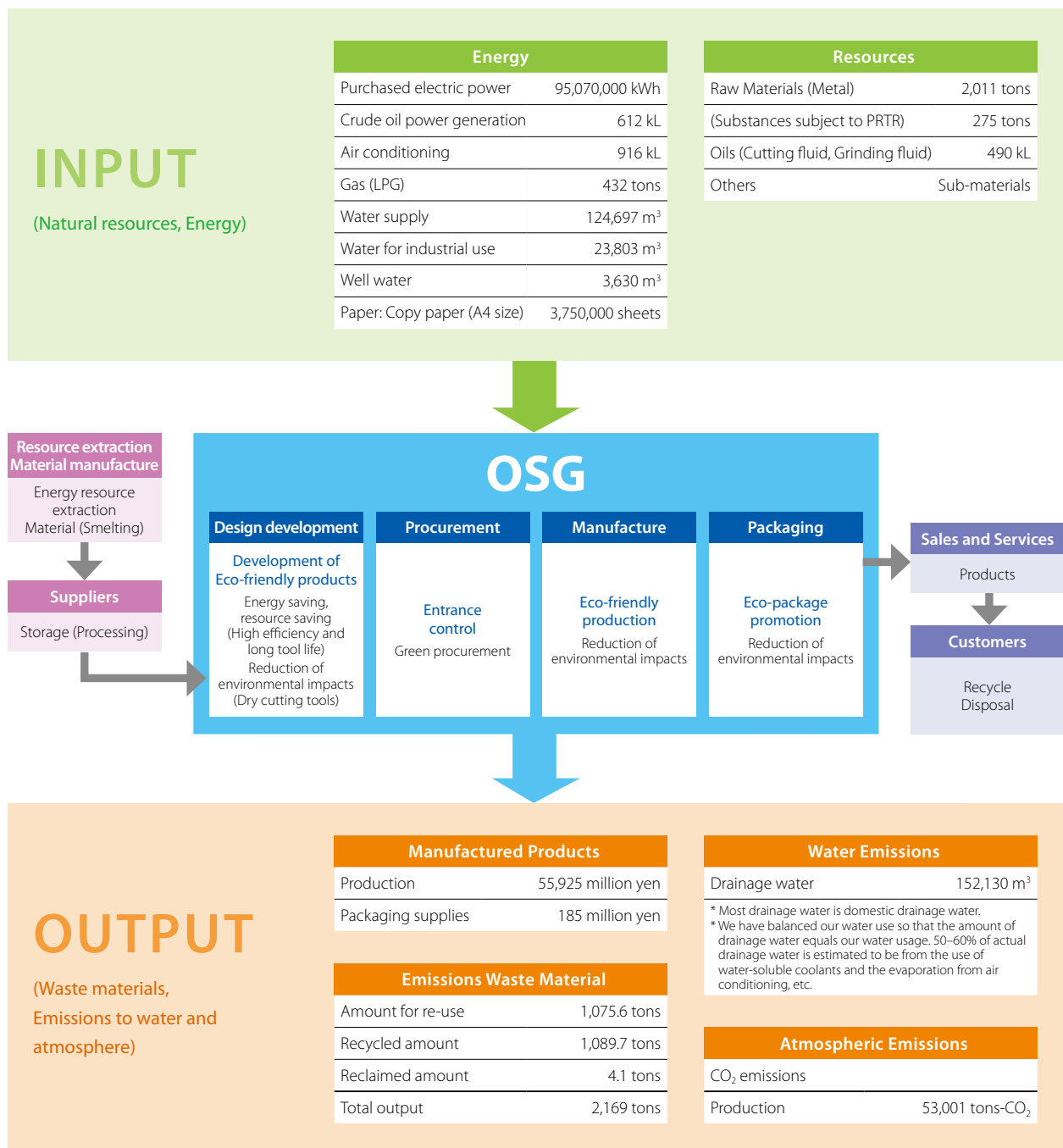


# Environmental Activities

An important task for OSG is to address environmental issues, which will impact future generations. We aim to reduce environmental impacts and build a recycling-oriented society, while making efficient use of resources, promoting eco-friendly production and providing eco-friendly products and services to our customers.

## Material Balance

In order to contribute to the realization of a low-carbon society and the creation of a resource recycling society, OSG understands and manages the various environmental impacts of our business activities. We remain committed to initiatives such as reducing energy use and using waste from our manufacturing processes as recycled materials.





## Promotion of Resources Recycling

OSG has promoted zero emission activities to reduce waste. We developed a system to recycle reusable and recyclable resources, and established a structure to ensure the proper disposal of waste from our operations. Therefore, our recycling rate has been over 99% since 2005.

Recycling Rate  
**99%**

### Waste Recycling

Metal scrap	799.8 tons
Cardboard boxes (sold for re-use)	76.8 tons
Waste oil (sold for re-use, recycled)	416.3 tons
Oil sludge (sold for re-use, recycled)	175.0 tons
Diatomaceous soil (sold for re-use, recycled)	462.9 tons
Waste grinding wheels (recycled)	41.9 tons
Waste plastic (recycled)	53.0 tons
Wood chips (recycled)	83.4 tons
Others (recycled)	56.1 tons
<b>Total</b>	<b>2,165.3 tons</b>

## Reductions in Environmental Impacts

OSG has strived to reduce energy consumption, CO<sub>2</sub> emissions and waste output. Focusing on efficient energy use and switching to energy-saving equipment, we have worked to promote continuous improvement in environmental impact throughout the entire company.

### Reductions in Energy Use

By promoting the replacement with energy-efficient air conditioners and the switch to LED lighting across the entire company, our energy consumption per unit of production was 18.4 GJ/million yen, a 2% improvement from the previous year.

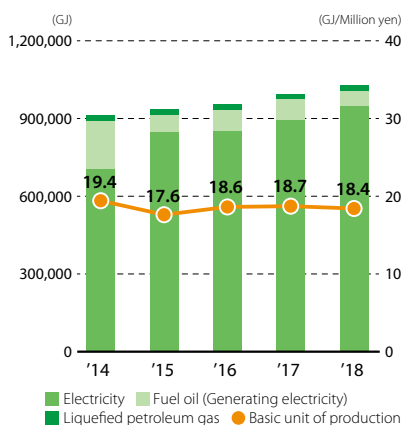
### CO<sub>2</sub> Emissions

Through the installation of energy-efficient equipment that could reduce CO<sub>2</sub> emissions, our CO<sub>2</sub> emissions per unit of production improved by 2% over the previous year despite the increase in production.

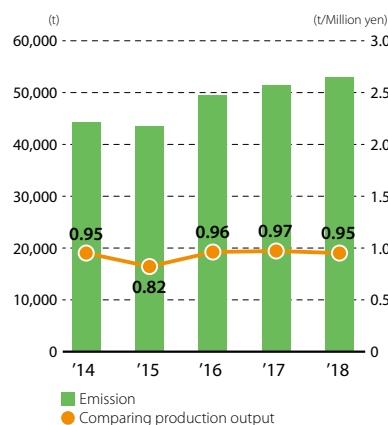
### Waste Emissions and Valuable Materials Ratio

We are continuing our efforts to reduce waste and recover valuable materials from waste. In FY2018, we reduced the amount of waste by 6% from the previous year while our production increased. On the other hand, the recovery rate of valuable materials dropped by 4% year-on-year due to the decrease in the amount of valuable materials recovered from waste.

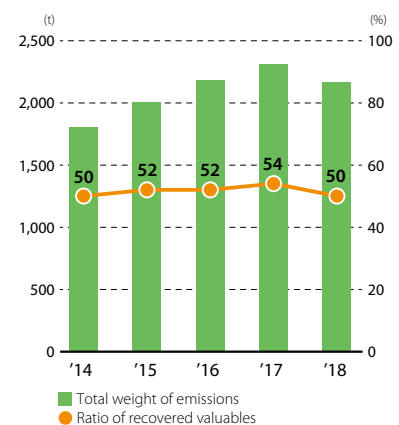
### Energy Use



### Carbon-Dioxide Emissions



### Waste Output and Ratio of Recovered Valuables





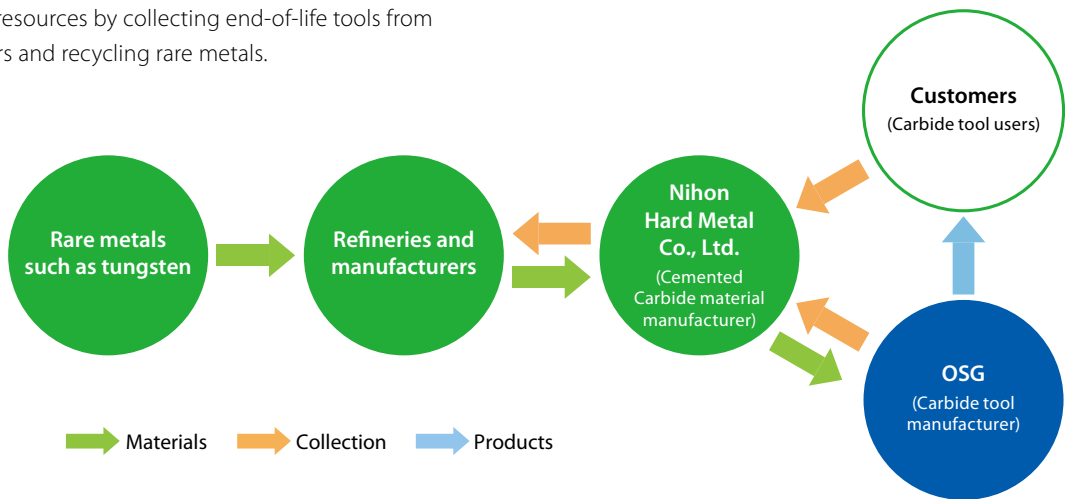
### Eco-Friendly Products and Services

OSG is striving to produce eco-friendly products and provide them to our customers. We are actively working to reduce environmental impacts by enhancing regrinding services and developing energy-saving products and high-efficiency products that enable high speed and long-life.

#### ■ Carbide Material Recycling

Raw materials of carbide tools include rare metals such as tungsten and cobalt.

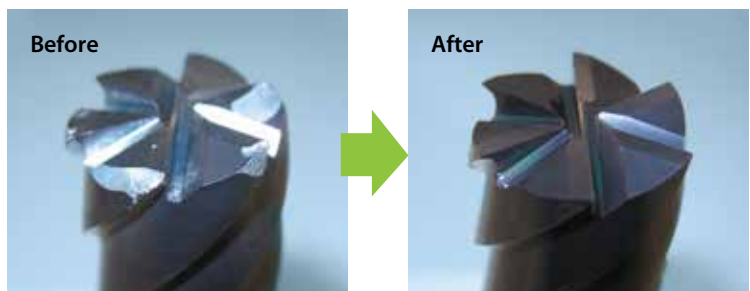
OSG group promotes recycling of carbide tools. For customers' CSR activities and zero-emission promotion, we utilize these resources by collecting end-of-life tools from our customers and recycling rare metals.



#### ■ Regrinding Services

Cutting tools such as taps, end mills and drills become worn and dull after repeated use.

These tools can be returned to their original as-new condition by regrinding. OSG group provides regrinding services and meets customer's various needs.





## ADO-TRS-3D/5D 'Triple Revolution' 3-Flute Carbide Drill with Oil Hole

### The New Standard of 3-flute Drills

#### • Unique R gash geometry

The ADO-TRS' R shape geometry improves chip separation and chip forming stability in the processing of steel materials that are difficult with conventional 3-flute drills. In addition, this geometry can reduce cutting resistance by over 30% versus conventional 3-flute drills in high-feed processing, which enables low cutting resistance comparable to 2-flute drills.

#### ■ End cut shape



#### ■ Chip shape comparison in mild steels that are difficult to break chips

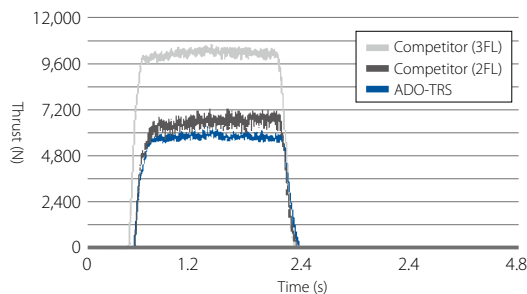


Conventional 3-flute

Conventional 2-flute

ADO-TRS

#### ■ Cutting resistance comparison with conventional 2-flute and 3-flute drills



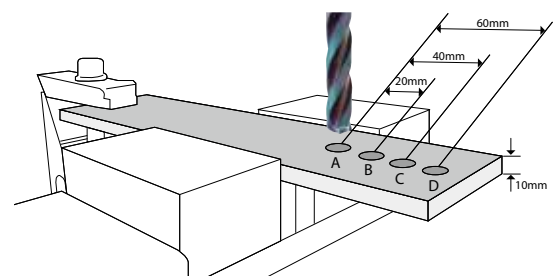
#### Over 30% reduction in thrust force against a competitor 3-flute drill with even lower thrust force versus a competitor 2-flute drill

By low cutting resistance, in comparison to conventional 3-flute drills, the ADO-TRS can work in a wide range of cutting conditions with few constraints such as machining environment.

#### ■ Hole accuracy comparison in thin plate processing with high cutting resistance

Tool	ADO-TRS-3D	Competitor (3FL)	Competitor (2FL)
Size	φ14		
Work Material	S53C (30HRC)		
Cutting Speed	100mm/min (2,275min <sup>-1</sup> )		
Feed	1,274mm/min (0.56mm/rev)	956mm/min (0.42mm/rev)	
Depth of Hole	10mm (Through)		
Coolant	Water-Soluble		
Machine	Vertical Machining Center		

#### Hole accuracy equivalent to low-feed 2-flute drills



Unit:mm

Tool	Feed	Hole Position Accuracy				Hole Diameter			
		A	B	C	D	A	B	C	D
ADO-TRS-3D	1,274mm/min	0.031	0.033	0.038	0.042	13.996	13.998	14.009	14.022
Competitor (3FL)	1,274mm/min	0.055	0.075	0.131	0.272	14.004	14.007	14.020	14.062
Competitor (2FL)	956mm/min	0.023	0.029	0.045	0.046	14.013	14.021	14.026	14.026

#### • Long tool life and stable performance in the processing of steel materials that conventional 3-flute drills are unable to achieve

With the above features, the ADO-TRS achieves long and stable tool life in the processing of a wide range of materials including high-strength steels, which ensures the reduction of both machine operation time and power consumption with high efficiency machining, and also contributes to the reduction of waste with increased tool life.



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