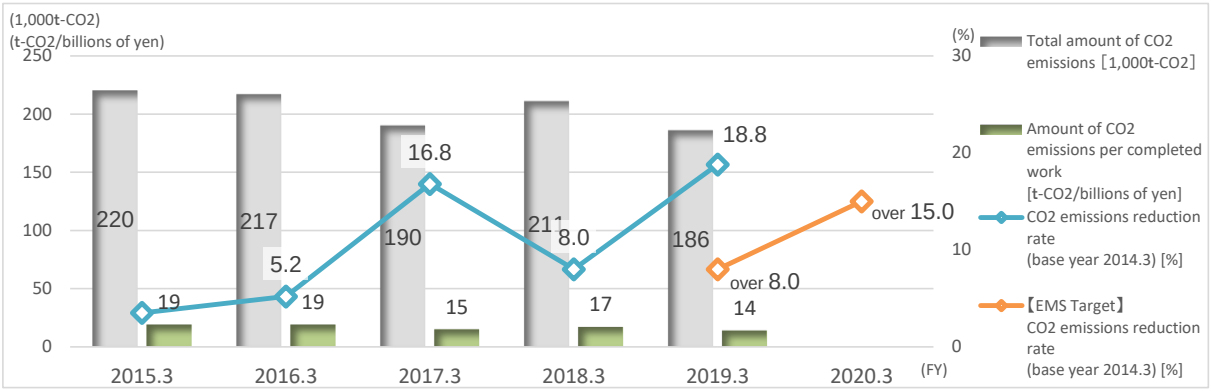
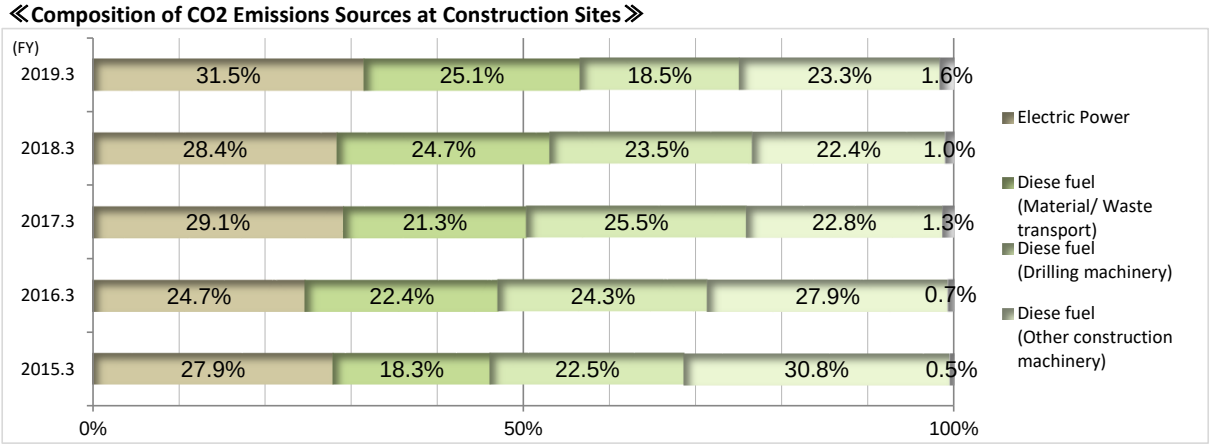
Activities to Realize a Low-Carbon Society

Reducing CO2 Emissions

CO2 Emissions Reduction at Construction Sites



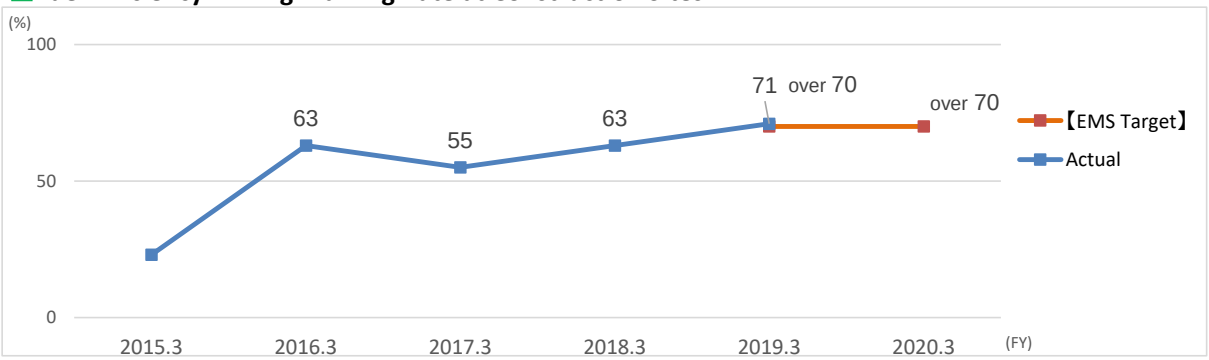
≪Composition of CO2 Emissions Sources at Construction Sites≫



	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
CO2 Emissions Reduction at Construction Sites						
Total amount of emissions	1,000t-CO2	220	217	190	211	186
Amount of emissions per completed work	t-CO2/billions of yen	19	19	15	17	14
CO2 emissions reduction rate *1	%	3.5	5.2	16.8	8.0	18.8
Composition of CO2 Emissions Sources at Construction Sites						
Electric Power	%	27.9	24.7	29.1	28.4	31.5
Diesel fuel		71.6	74.6	69.6	70.6	66.9
Material/ Waste transport		18.3	22.4	21.3	24.7	25.1
Drilling machinery		22.5	24.3	25.5	23.5	18.5
Other construction machinery		30.8	27.9	22.8	22.4	23.3
Kerosene		0.5	0.7	1.3	1.0	1.6

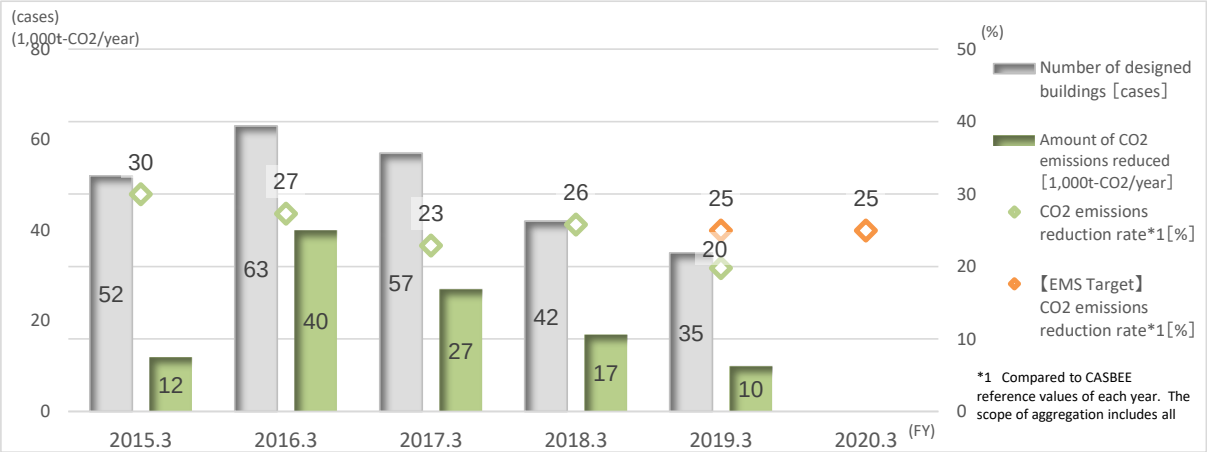
*1 base year 2014.3

Fuel Efficiency Driving Training Rate at Construction Sites



	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Fuel efficiency driving training rate at construction sites	%	23	63	55	63	71

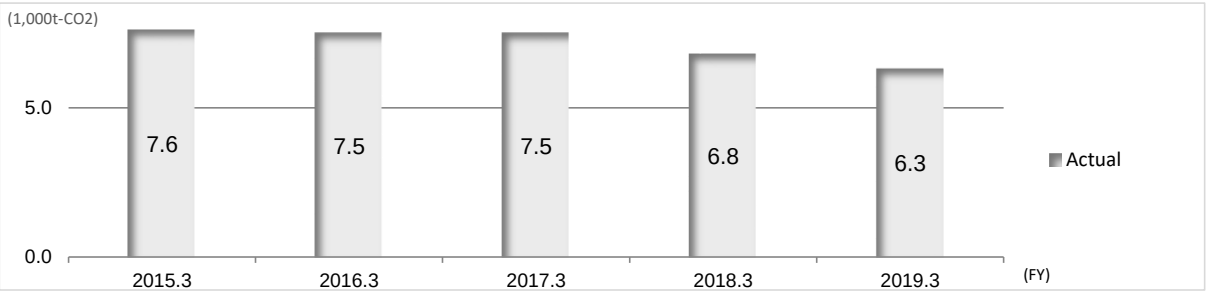
CO2 Emissions Reduction of Designed & Build Buildings



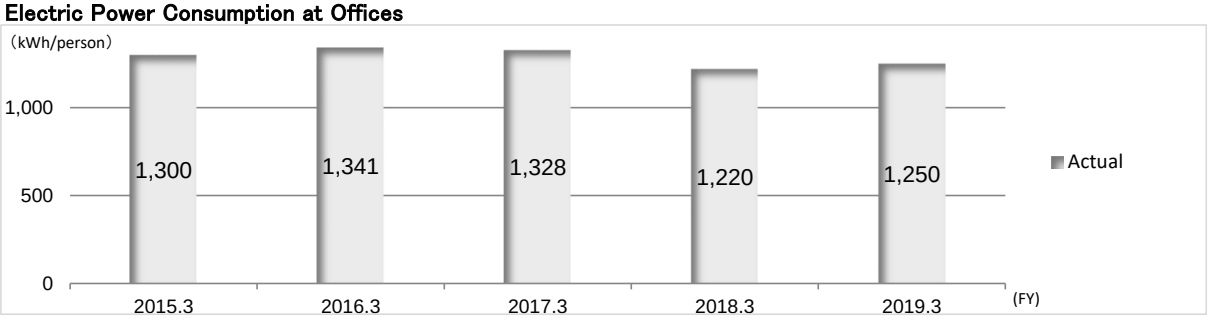
	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Number of designed buildings	cases	52	63	57	42	35
Total area of designed buildings	m2	631,555	1,769,579	1,430,612	832,529	735,082
Amount of CO2 emissions reduced	1,000t-CO2/year	12.0	40.0	27.0	17.0	10.0
CO2 emissions reduction rate	%	29.7	27.3	22.9	25.8	19.8

Reduction at Offices (Applicable facilities: Head Office, Tokyo Main Office, Osaka Main Office and other branch offices)

CO2 Emissions at Offices



Electric Power Consumption at Offices



	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
CO2 Emissions at Offices						
	1,000t-CO2	7.6	7.5	7.5	6.8	6.3
Electric Power Consumption at Offices						
	kWh/person	1,300	1,341	1,328	1,220	1,250

Renewable Energy Generated

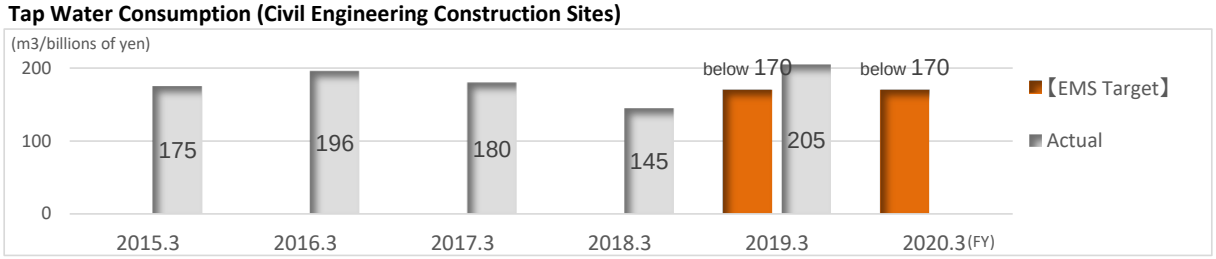
	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Renewable Energy Generated per year	MWh	69,335	89,414	97,516	161,686	201,353

Activities to Realize a Recycling Oriented Society

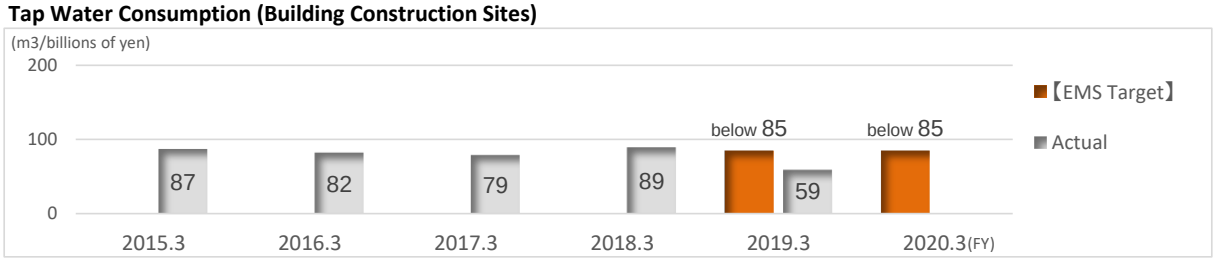
Reducing Tap Water Consumption

Tap Water Consumption Reduction at Construction Sites

Tap Water Consumption (Civil Engineering Construction Sites)



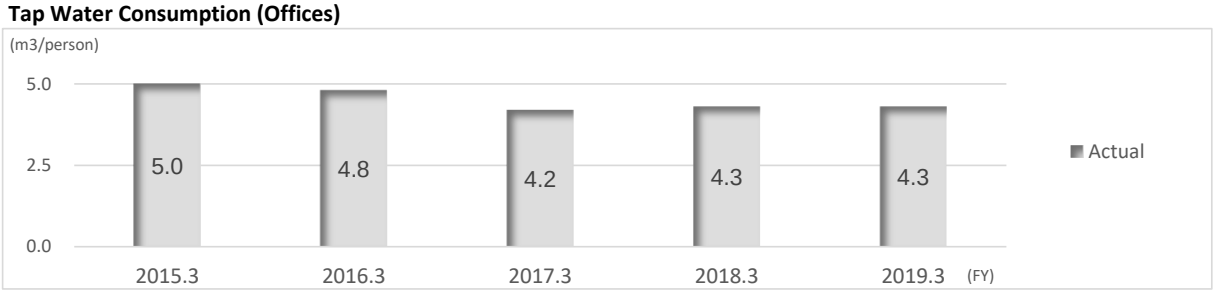
Tap Water Consumption (Building Construction Sites)



Tap Water Consumption Reduction at Offices

(Applicable facilities: Head Office, Tokyo Main Office, Osaka Main Office and other branch offices)

Tap Water Consumption (Offices)



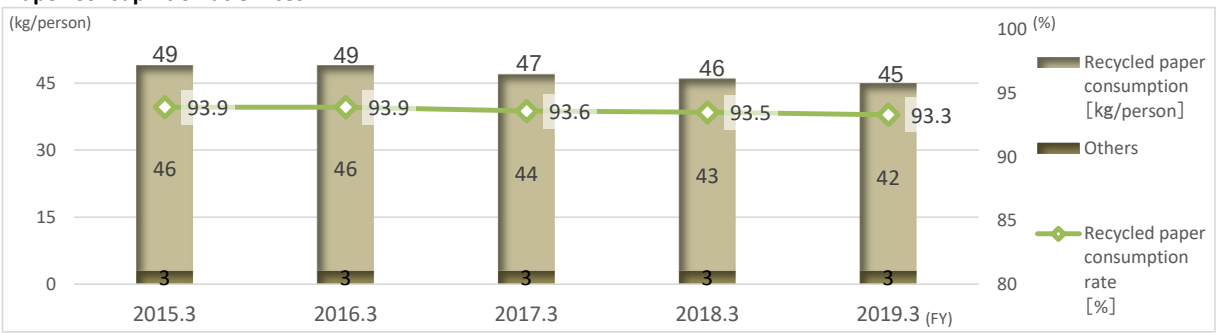
Tap Water Consupmtion	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Civil engineering construction sites	m3/billions of yen	175	196	180	145	205
Building construction sites	m3/billions of yen	87	82	79	89	59
Office	m3/person	5.0	4.8	4.2	4.3	4.3

Reducing Paper Consumption

Paper Consumption Reduction at Offices

(Applicable facilities: Head Office, Tokyo Main Office, Osaka Main Office, other branch offices, machinery plants, material/equipment centers, the Obayashi Technical Research Institute)

Paper Consupmtion at Offices

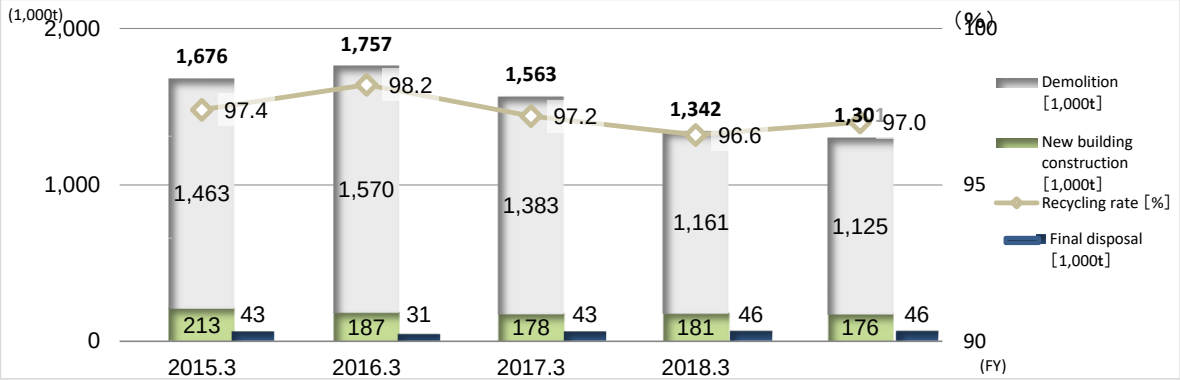


		Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Paper consumption at offices		kg/person	49	49	47	46	45
	Recycled paper		46	46	44	43	42
	Others		3	3	3	3	3
Recycled paper consumption rate at offices		%	93.9	93.9	93.6	93.5	93.3

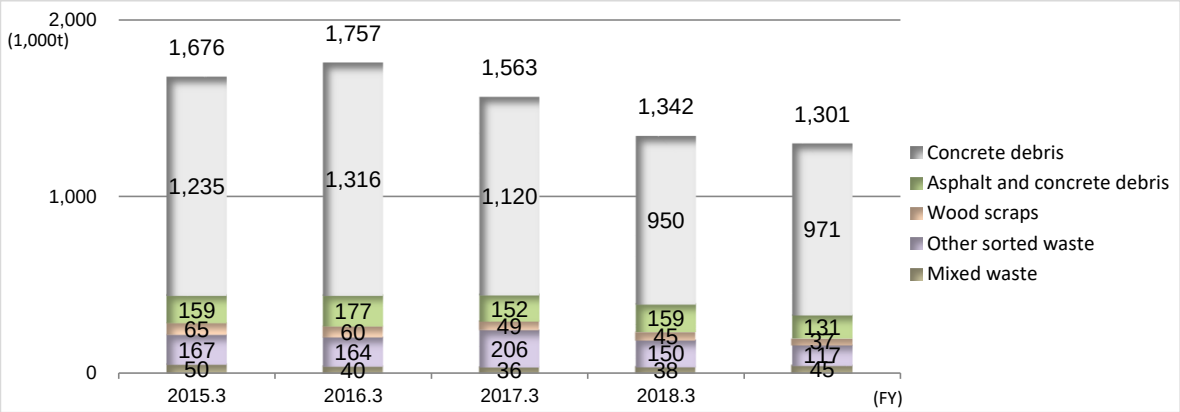
Reducing Waste Emissions

Construction Waste Emission Reduction

Amount of Construction Waste Emission, Final Disposal and Recycling Rate (Excluding sludge)



▼Breakdown of Waste Emissions by Type



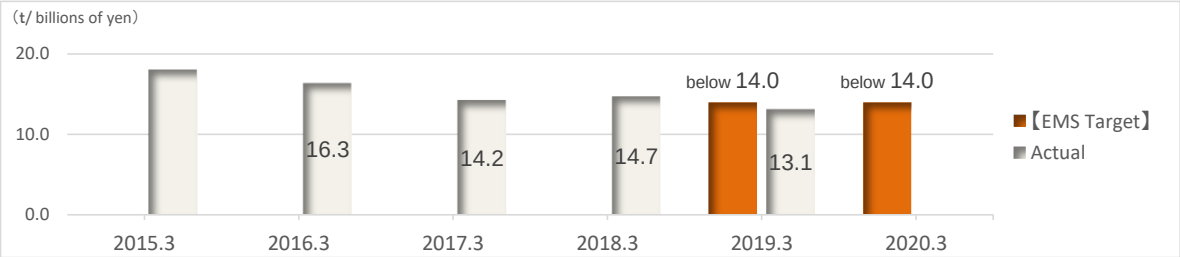
		Unit	2015.3	2016.3	2017.3	2018.3	
Amount of Construction Waste Emission, Final Disposal and Recycling Rate (Excluding sludge)							
Construction Waste Emissions		1,000t	1,676	1,757	1,563	1,342	1,301
	New building construction		213	187	178	181	176
	Demolition		1,463	1,570	1,383	1,161	1,125
Final disposal		1,000t	43	31	43	46	46
Recycling rate		%	97.4	98.2	97.2	96.6	97.0
▼Breakdown of Waste Emissions by Type							
Construction Waste emissions		1,000t	1,676	1,757	1,563	1,342	1,301
	Concrete debris		1,235	1,316	1,120	950	971
	Asphalt and concrete debris		159	177	152	159	131
	Wood scraps		65	60	49	45	37
	Other sorted waste		167	164	206	150	117
	Mixed waste		50	40	36	38	45

<<Construction Waste Disposal/ Recycling Ratio by Type>>

		Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Concrete debris	Final disposal	%	0.0	0.0	0.1	0.5	0.1
	Reduction		0.0	0.1	0.0	0.1	0.0
	Recycle and reuse		100.0	99.9	99.9	99.4	99.9
Asphalt and concrete debris	Final disposal	%	0.0	0.0	0.1	0.1	0.2
	Reduction		0.7	0.1	0.0	0.0	0.0
	Recycle and reuse		99.3	99.9	99.9	99.9	99.8
Wood scraps	Final disposal	%	0.2	0.4	0.3	0.5	0.6
	Reduction		3.3	3.8	1.9	1.8	1.6
	Recycle and reuse		96.5	95.8	97.8	97.7	97.8
Other sorted waste	Final disposal	%	19.0	13.6	16.1	21.0	23.1
	Reduction		1.6	1.2	0.8	1.4	2.7
	Recycle and reuse		79.4	85.2	83.1	77.6	74.2
Mixed waste	Final disposal	%	22.7	21.5	24.6	25.0	39.0
	Reduction		5.6	6.1	5.4	6.3	4.2
	Recycle and reuse		71.7	72.4	70.0	68.7	56.8
sludge	Final disposal	%	7.8	6.7	6.6	1.7	2.5
	Reduction		27.8	33.4	27.8	25.5	25.8
	Recycle and reuse		64.4	59.9	65.6	72.8	71.7

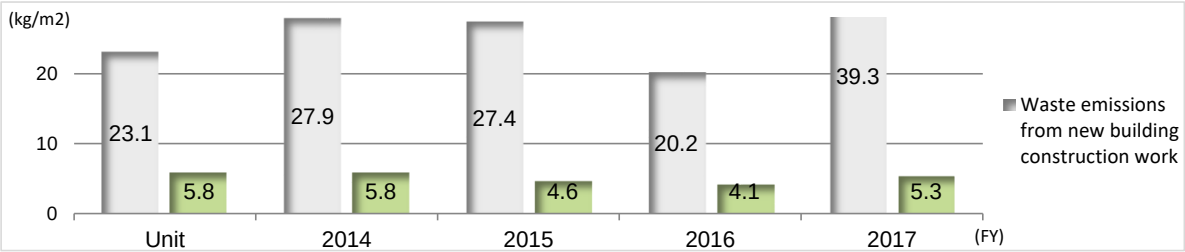
Construction Waste Emission Reduction of New Building Construction

Amount of Construction Waste Emission Reduction of New Building Construction per Completed Work (excluding sludge)



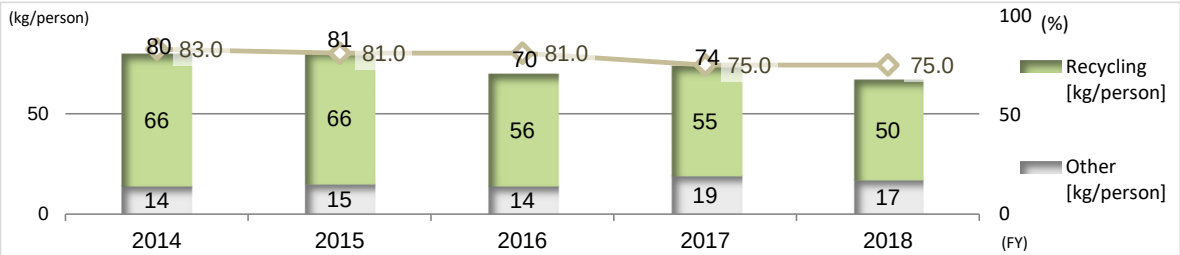
Construction Waste and Mixed Waste Emission of New Building Construction

Amount of Construction Waste and Mixed Waste Emission per Floor Area from New Building Construction (Excluding sludge)



General Waste Emissions Reduction at Offices

Amount of General Waste Emissions at Offices



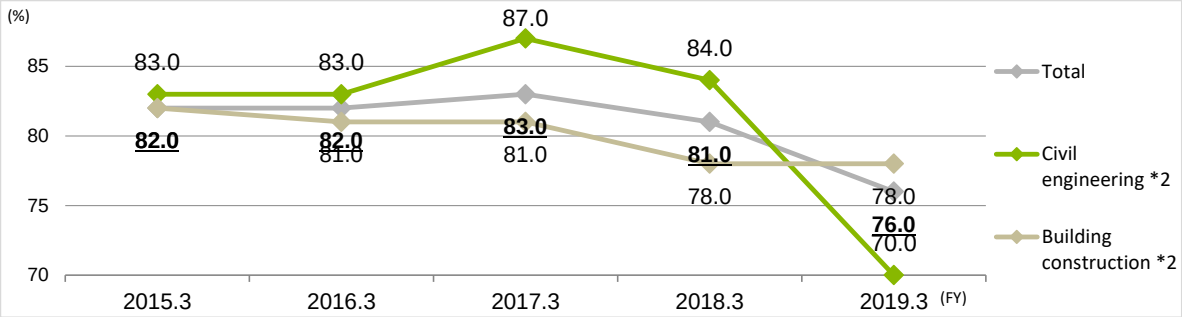
	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Waste emission per completed work (New Building Construction)	t/billions of yen	18.0	16.3	14.2	14.7	13.1
Waste emissions from new building construction work	kg/m2	23.1	27.9	27.4	20.2	39.3
Mixed waste Emission from new building construction		5.8	5.8	4.6	4.1	5.3
Amount of general waste emissions at office *1	kg/person	80	81	70	74	67
Recycling		66	66	56	55	50
Other		14	15	14	19	17
Recycling rate	%	83.0	81.0	81.0	75.0	75.0

*1 Applicable facilities: Head Office, Tokyo Main Office, Osaka Main Office, branch offices, machinery plants, material/equipment centers, the Obayashi Technical Research Institute

Emissions Reducing Management

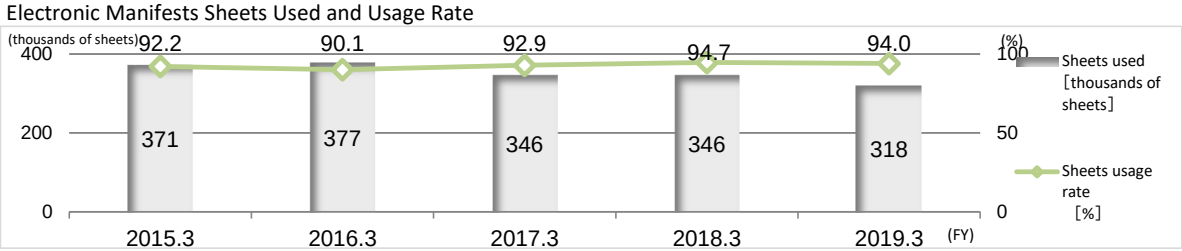
Zero Emissions

Zero Emissions Standards Achievement*1 Rate of Construction Sites



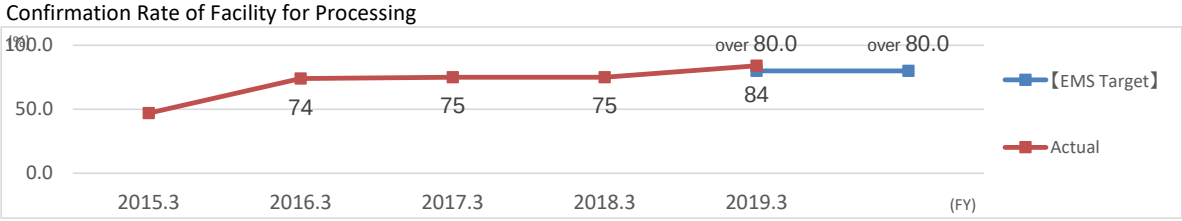
Electronic Manifests Sheets

Electronic Manifests Sheets Used and Usage Rate



Confirmation of Facility for Processing

Confirmation Rate of Facility for Processing



		Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Total		%	82.0	82.0	83.0	81.0	76.0
	Building construction *2		82.0	81.0	81.0	78.0	78.0
	Civil engineering *2		83.0	83.0	87.0	84.0	70.0
Electric manifests sheets used		thousands of sheets	371	377	346	346	318
Electric manifests sheets usage rate		%	92.2	90.1	92.9	94.7	94.0
Confirmation of facility for processing implementation rate		%	47.0	74.0	75.0	75.0	84.0

*1 Final disposal rate of construction Waste (excluding sludge) is below 5%. That amount of new building construction is below 5kg/㎡.

*2 Construction waste emissions (excluding sludge) below 1,000t of renewal construction and waste emissions (excluding sludge) below 10t of Civil Engineering Work is

Activities to Realize a Society that Respect for the Natural World

Based on Biodiversity Policy within our Environment Policy, we aim to realize a society that respects the natural world.

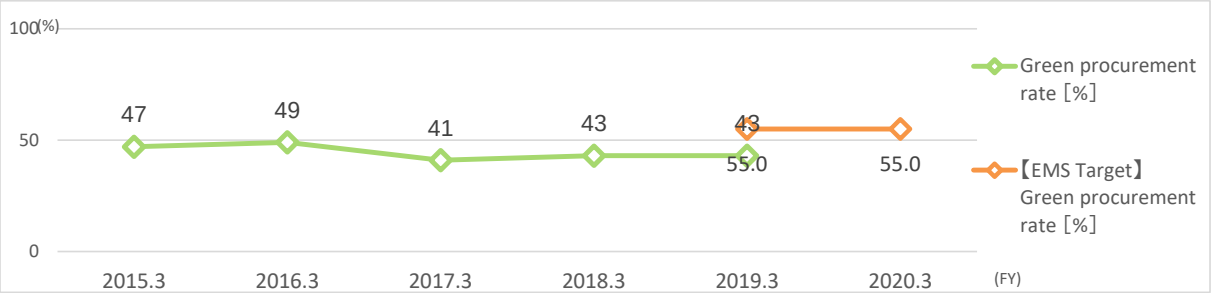
Obayashi Biodiversity Policy	
1	Contribute in making a recycling oriented society which conserves biodiversity.
2	Develop and make full use of new technologies to conserve biodiversity.
3	Promote sustainable society which reduces the impact on ecosystems.
4	Conserve biodiversity through self-owned facilities.
5	Communicate with the society to create a society in harmony with nature.
6	Educate and Promote biodiversity.

Other Activities

Construction Equipment Procurement

Green Procurement of Construction Equipment

Green Procurement Rate of Construction Equipment



	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Green procurement rate	%	47	49	41	43	43

Calculation formula:

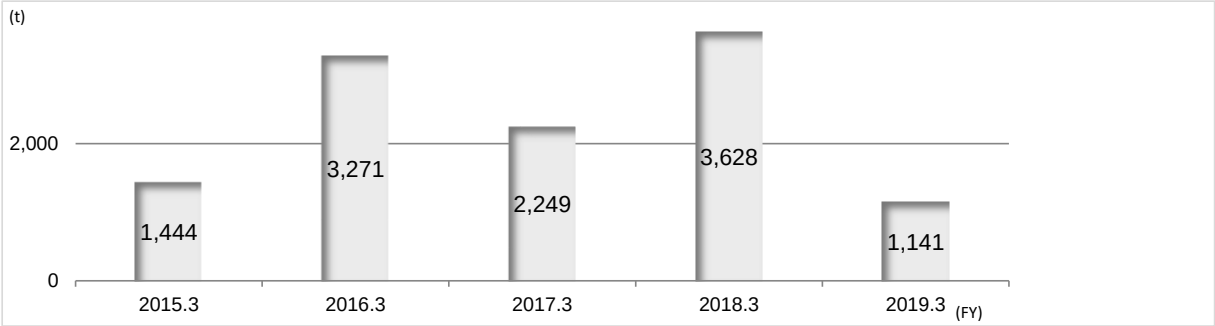
Green procurement: Green procurement cost divided by total cost of construction equipments

Grenn procurement include (treated soil, construction waste soil, recycled concrete aggregate, recycled asphalt and concrete, blast furnace cement concrete, blast furnace raw concret, steel scrap, polycarbonate (Precast concrete)

Chemical Substances Management

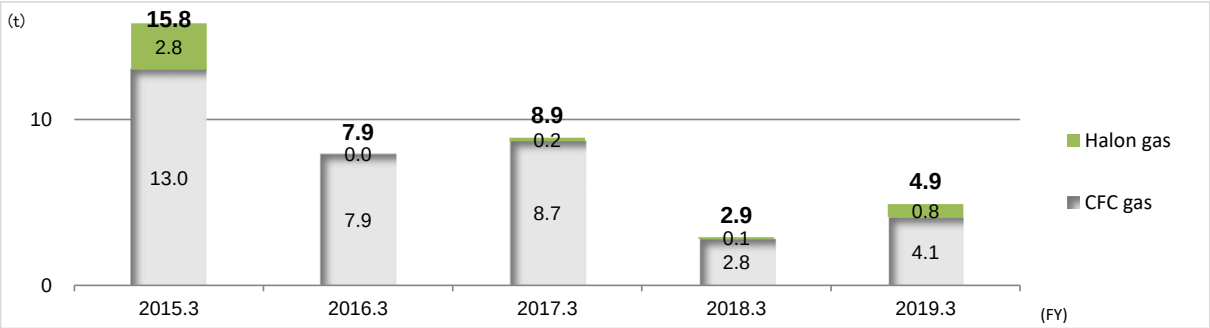
Asbestos

Asbestos Processed



CFC and Halon Gases

CFC and Halon Gases Collected and Processed



	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Asbestos Processed						
Amount processed	t	1,444	3,271	2,249	3,628	1,141
CFC and Halon Gases Collected and Processed*1						
CFC and Halon Gases Collected and Processed	t	15.8	7.9	8.9	2.9	4.9
CFC gas		13.0	7.9	8.7	2.8	4.1
Halon gas		2.8	0.0	0.2	0.1	0.8

*1 Amount of recycled CFO gas and Halon gas was 0.9t and the amount of disposed CFO gas and Halon gas was 2.0t in FY2018.3.

PCB

Removal*2 of PCB waste materials*3

	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Capacitors	Units	2	133	140	0	0
Transformers		0	0	0	0	0

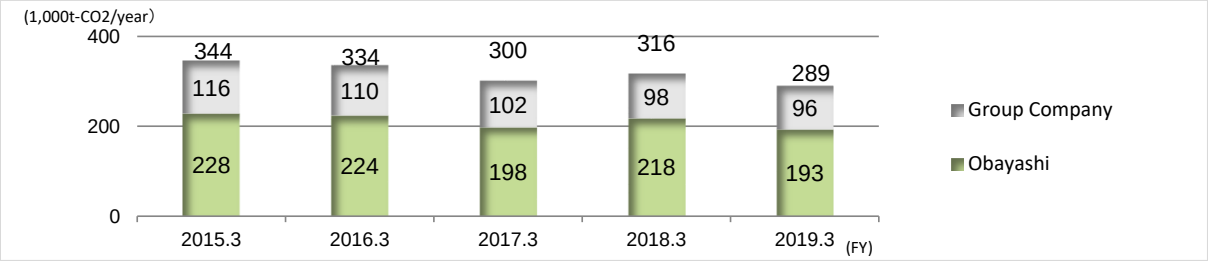
*2 Methods for the storage and disposal are regulated by law because these materials contain polychlorinated biphenyl (PCB), which is a toxic substance.

*3 PCB waste materials must be transported to Japan Environmental Safety Corporation, the company designated by the government of Japan.

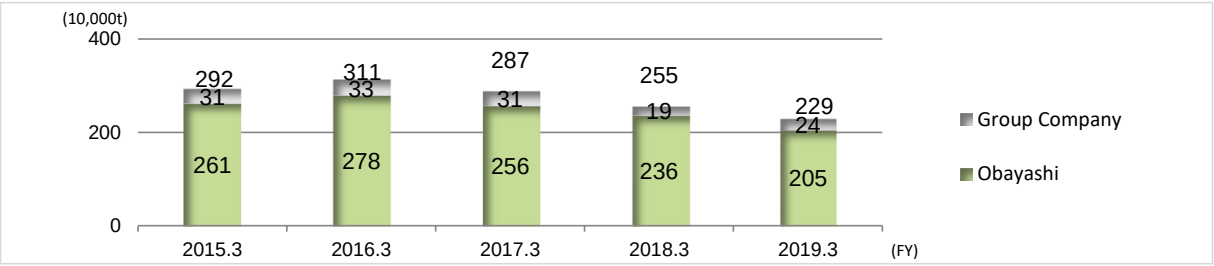
Obayashi Group Activities

CO2 Emissions Reduction

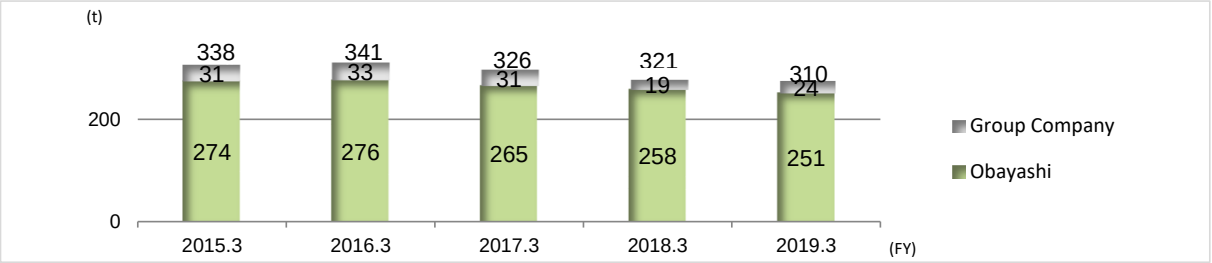
CO2 Emissions



Construction Waste Emissions



Paper Consumption



	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
CO2 Emissions	1,000t-CO2	344	334	300	316	289
Group Company		116	110	102	98	96
Obayashi		228	224	198	218	193
	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Construction Waste Emissions	10,000t	292	311	287	255	229
Group Company		31	33	31	19	24
Obayashi		261	278	256	236	205
	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Paper Consumption	t	338	341	326	321	310
Group Company		64	65	61	63	59
Obayashi		274	276	265	258	251

Scope of Group companies (Exclude companies for which separate data does not need to be collected, such as companies that operate within Obayashi offices)

[Construction Business] Obayashi Road Corporation, Naigai Technos Corporation, Obayashi Facilities Corporation, Oak Setsubi Corporation, Tokken Corporation, Soma Environmental Service Corporation, ATELIER G&B Co., Obayashi Design Partners

[Real Estate Business] Obayashi-Shinseiwa Real Estate Corporation

[Other Businesses] <Information> Oak Information System Corporation
<Golf course> Ibaraki Green Co., Ltd.
<Restaurant> Le Pont de Ciel Co., Ltd.
<Renewable energy generation> Obayashi Clean Energy Corporation

Environmental policy includes support for Group companies in order to lower the environmental impact of the entire Obayashi Group. In line with this policy, the Group Company Environmental Activity Liaison Conference was formed to deal with issues for the entire Group. In addition, individual companies use their business activities for developing recyclable materials and increasing their use, combating the heat island effect, conserving energy for building operations, and other purposes.

Environmental Management System (EMS)

Results of External Assessment of EMS

		2018.3
Certification body		Japan Testing Center for Construction Materials
Implementation period		From June 24 to August 1, 2018
Assessed items		Head Office, Tokyo Main Office, Nagoya Branch, Shikoku Branch, Hokuriku Branch, Technical Research Institute, Tokyo Machinery Works
Number of deficiencies	Serious deficiencies	0 case
	Minor deficiencies	0 case
Number of items under observation		0 cases

Results of Internal Audit of EMS

			2019.3
Audited items			All branches and departments
Number of audits		Planned/ Implemented (Implementation rate)	253cases／250cases（101%）
	Permanent divisions		53cases／53cases（100%）
	Construction offices		191cases／188cases（101%）
	Secretariats		9cases／9cases（100%）
Number of internal auditors (active)			482people
Number of deficiencies			4cases
Number of items under observation			149cases

Environmental Targets and Results

Environmental Targets	Unit		2015.3	2016.3	2017.3	2018.3	2019.3			2020.3
			Actual				EMS Target	Actual	Evaluation	Target
Reducing CO2 Emissions										
CO2 emissions reduction rate from construction sites (base year 2014.3)	%	Low-Carbon	3.5	5.2	16.8	8.0	over 8.0	18.8	○	over 15.0
CO2 emissions reduction rate of designes & build buildings*1			30	27	23	26	over 25	20	×	over 25
Fuel efficiency driving training rate at construction sites			23	63	55	63	over 70	71	○	over 70
Reducing Resource Consumption										
Water consumption at construction sites	m3/billions of yen	Recycling-Oriented	Civil: 175 Building: 87	Civil: 196 Building: 82	Civil: 180 Building: 79	Civil: 145 Building: 89	Civil: below 170 Building: below 85	Civil: 205 Building: 59	△	Civil: below 170 Building: below 85
Reducing Waste Emissions										
Amount of construction waste emissions (excluding sludge) per completed work from new building construction work	t/billions of yen	Recycling-Oriented	18.0	16.3	14.2	14.7	below 14.0	13.1	○	below 14.0
Confirmation rate of facilities for processing	%		47	74	75	75	over 80	84.0	○	over 85.0
Implementing Green Procurement										
Green procurement ratio for construction materials and supplies *2	%	Others	47	49	41	43	over 55	43.0	×	over 55

Legend and Notes

○: Targets achieved

△: Targets have yet to be achieved, but results have improved from the previous fiscal year

×: Targets have yet to be achieved

*1 Figure represent comparisons with the CASBEE reference values, with the scope of aggregation including all building uses.

*2 The ratio of the green procurement value to the total procurement value of all monitored items for the green procurement ratio.

Deficiencies and Complaints

Items	Unit	2015.3	2016.3	2017.3	2018.3	2019.3
Deficiencies	cases	6	0	1	6	2
Claims	cases	828	891	1,056	1,229	622

Obayashi designates items as deficient and requiring management in the following cases:
Note that we strive to prevent conflicts for reoccurring by aptly responding to the complaints we receive and caring for the environment surrounding our sites.

- When administrative guidance has been received
- When a written apology must be submitted
- When there is compensation payment
- When a civil fine must be paid
- When there is a penalty involving more than a small fine
- When a government agency has submitted a recommendation to take corrective actions

2 deficiencies of 2018 were used industrial waste disposal carrier with expired permission.
We have submitted a remedial report for updating the permission, and placed the outline of the contract in the construction site so that all employee can check the expiration date.