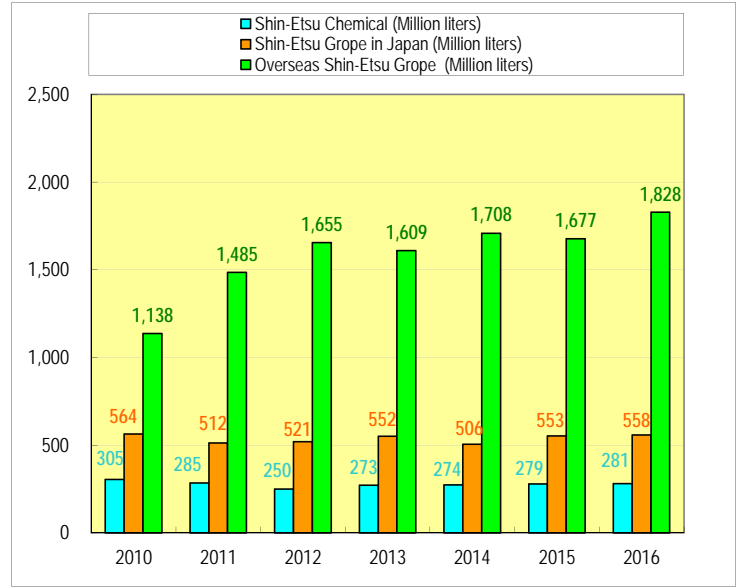
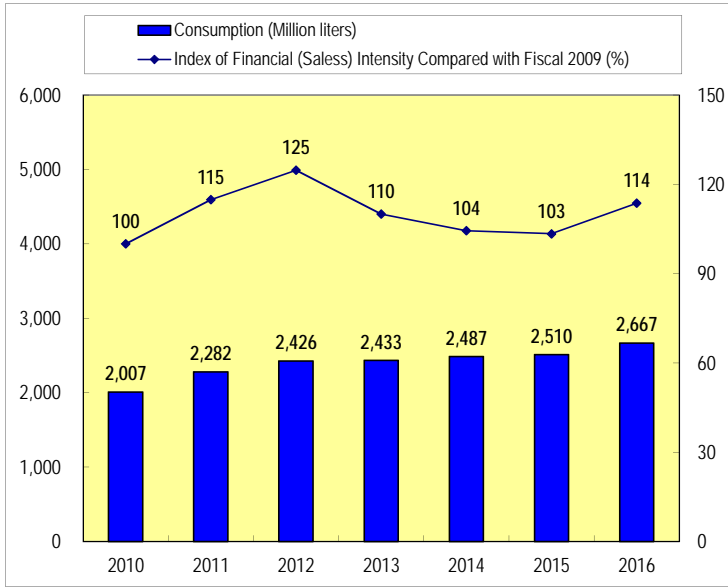


# Environmental Data of Shin-Etsu Group

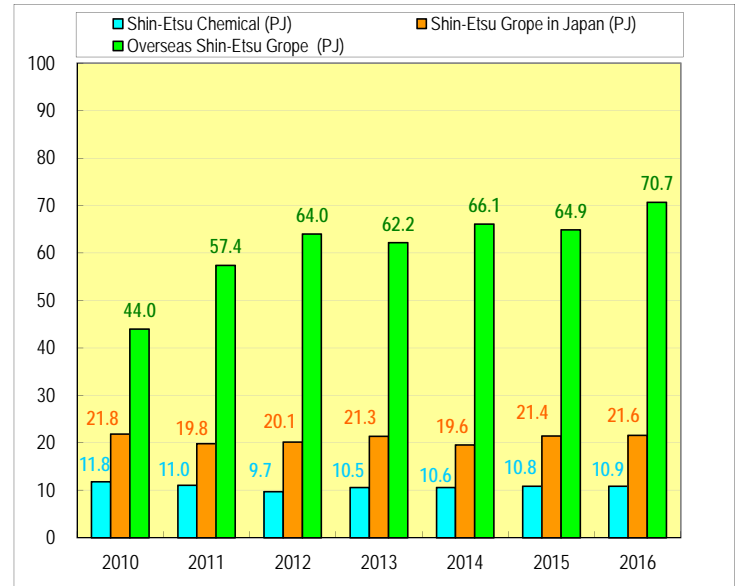
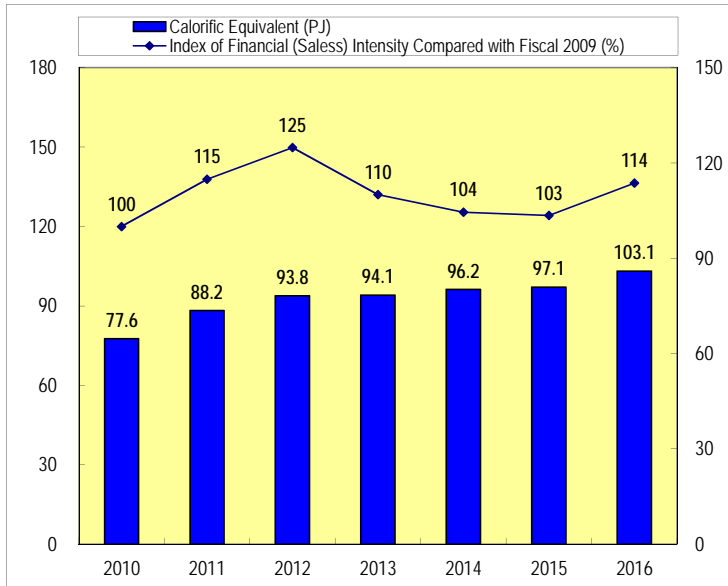
## Contents

Energy Consumption, CO <sub>2</sub> Emissions.....	1
Energy Consumption (Detailed Data).....	2
Greenhouse Gas Emissions.....	3
Water Withdrawals, Amount of Water Recycled, Discharges of Water.....	4
Water Withdrawals by Water Sources.....	5
Discharge of Water Pollutant (COD, BOD, SS).....	6
Emissions of Air Pollution Substances (Soot, NO <sub>x</sub> , SO <sub>x</sub> ).....	7
Amount of Waste Generated, Waste Recycled and Waste for Landfill.....	8
Amount of Waste Generated, Waste Recycled and Waste for Landfill (Detailed data).....	9
PRTR Systems	
Total Released Amounts, Total Transferred Amounts, Chloromethane Released Amounts, 1,2-Dichloroethane Released Amounts, Chloroethylene Released Amounts.....	10
Scope 3 Greenhouse Gas Emissions.....	11
The list of covering companies.....	12

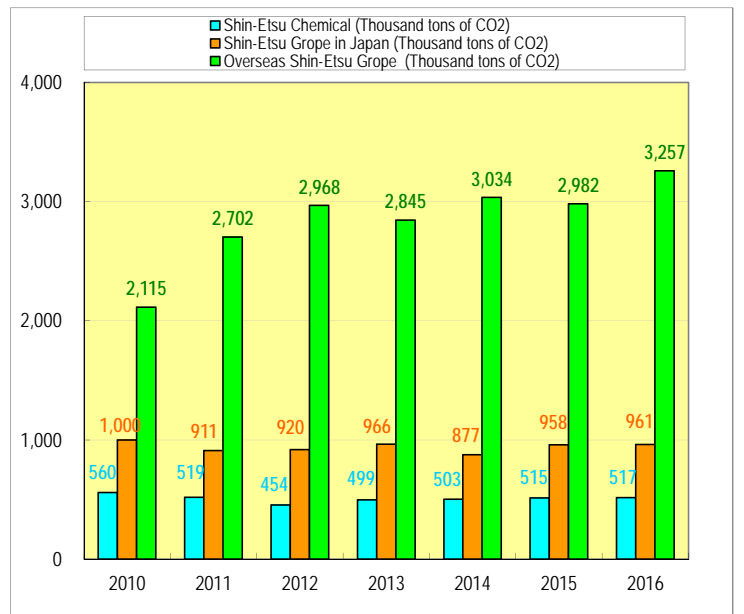
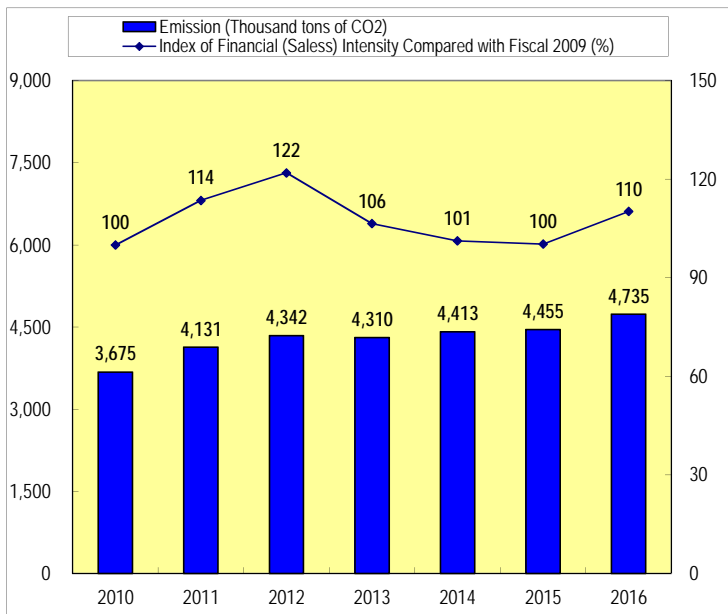
### Energy Consumption (Crude Oil Equivalent)



### Energy Consumption (Calorific Equivalent)



### CO<sub>2</sub> Emissions (Energy Related)



## Energy Consumption (Detailed Data)

### Energy Consumption (Results)

Item	Unit	2010	2011	2012	2013	2014	2015	2016
Purchased Electricity	GWh	5,484	6,313	6,957	7,341	7,195	7,235	7,741
Purchased Steam	Thousand tons	2,246	2,129	2,059	2,073	1,946	1,996	2,202
A-tape Heavy Oil	Thousand liters	1,746	1,235	1,048	1,544	1,065	965	976
C-tape Heavy Oil	Thousand liters	11,886	15,177	10,074	5,803	6,251	5,779	5,906
Kerosene	Thousand liters	15,217	8,064	6,628	6,160	5,588	3,868	3,799
Natural Gas	MNm <sup>3</sup>	467	555	556	486	577	578	600
Gasoline	Thousand liters	906	871	963	944	969	987	886
Light Oil	Thousand liters	2,180	2,452	3,026	2,641	2,314	2,643	2,984
Liquefied Petroleum Gas	Thousand tons	30	29	32	31	25	32	33
Hydrogen	MNm <sup>3</sup>	9	9	25	38	47	55	59
Liquefied Natural Gas	tons	48	36	40	62	72	68	54

### Energy Consumption (Crude Oil Equivalent)

Item	Unit	2010	2011	2012	2013	2014	2015	2016
Purchased Electricity	ML	1,248	1,437	1,584	1,671	1,638	1,647	1,762
Purchased Steam	ML	159	151	146	147	138	142	156
A-tape Heavy Oil	ML	2	1	1	2	1	1	1
C-tape Heavy Oil	ML	13	16	11	6	7	6	6
Kerosene	ML	14	8	6	6	5	4	4
Natural Gas	ML	525	624	625	546	649	649	675
Gasoline	ML	1	1	1	1	1	1	1
Light Oil	ML	2	2	3	3	2	3	3
Liquefied Petroleum Gas	ML	39	39	43	41	33	43	43
Hydrogen	ML	3	2	7	10	13	15	16
Liquefied Natural Gas	ML	0	0	0	0	0	0	0
<b>Total</b>	<b>ML</b>	<b>2,007</b>	<b>2,282</b>	<b>2,426</b>	<b>2,433</b>	<b>2,487</b>	<b>2,510</b>	<b>2,667</b>

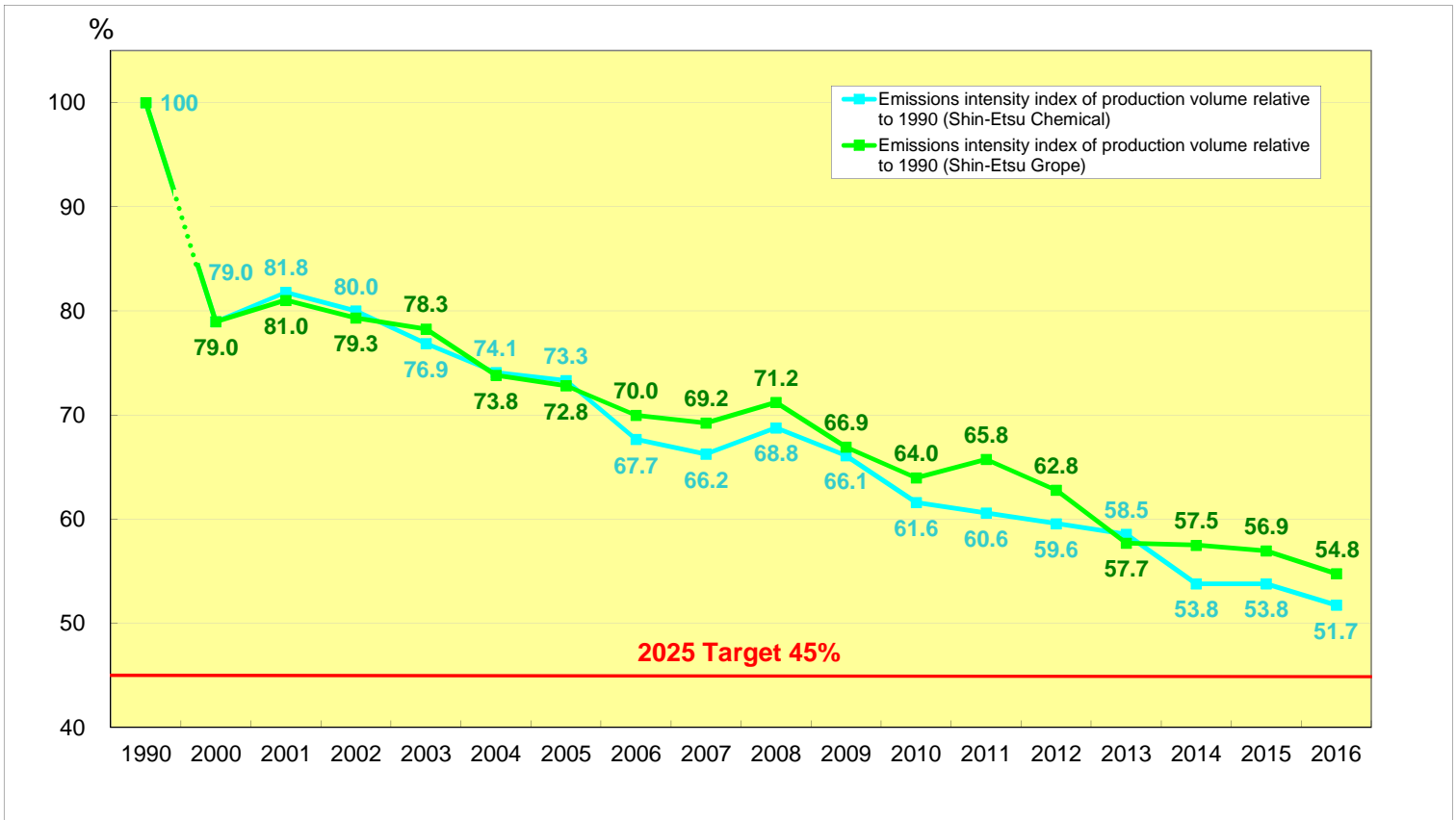
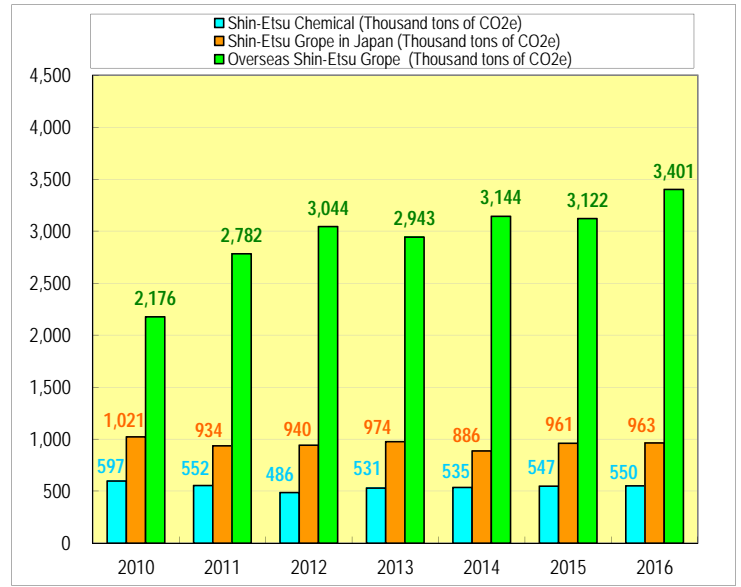
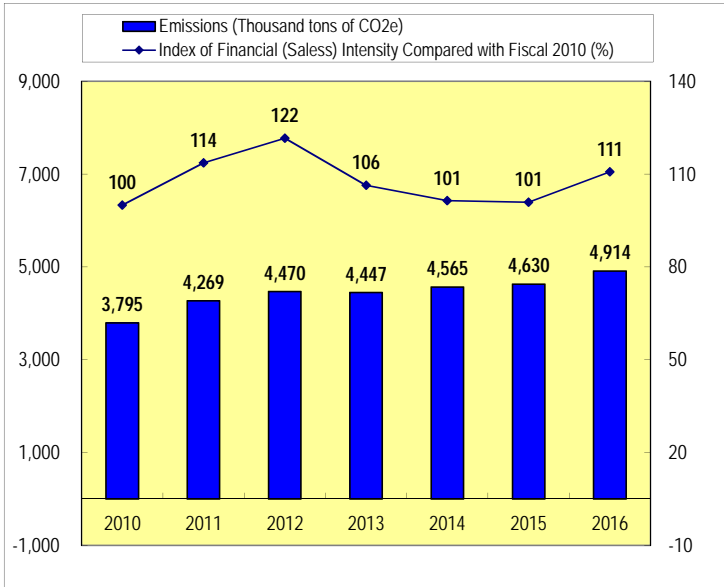
### Energy Consumption (Calorific Equivalent)

Item	Unit	2010	2011	2012	2013	2014	2015	2016
Purchased Electricity	TJ	48,312	55,613	61,293	64,661	63,386	63,742	68,195
Purchased Steam	TJ	6,088	5,769	5,580	5,617	5,272	5,408	5,967
A-tape Heavy Oil	TJ	68	48	41	60	42	38	38
C-tape Heavy Oil	TJ	498	636	422	243	262	242	247
Kerosene	TJ	558	296	243	226	205	142	139
Natural Gas	TJ	20,331	24,146	24,180	21,136	25,114	25,123	26,116
Gasoline	TJ	31	30	33	33	34	34	31
Light Oil	TJ	82	92	114	100	87	100	113
Liquefied Petroleum Gas	TJ	1,523	1,491	1,646	1,588	1,288	1,650	1,669
Hydrogen	TJ	97	93	267	399	494	578	619
Liquefied Natural Gas	TJ	3	2	2	3	4	4	3
<b>Total</b>	<b>TJ</b>	<b>77,592</b>	<b>88,217</b>	<b>93,822</b>	<b>94,075</b>	<b>96,188</b>	<b>97,060</b>	<b>103,137</b>

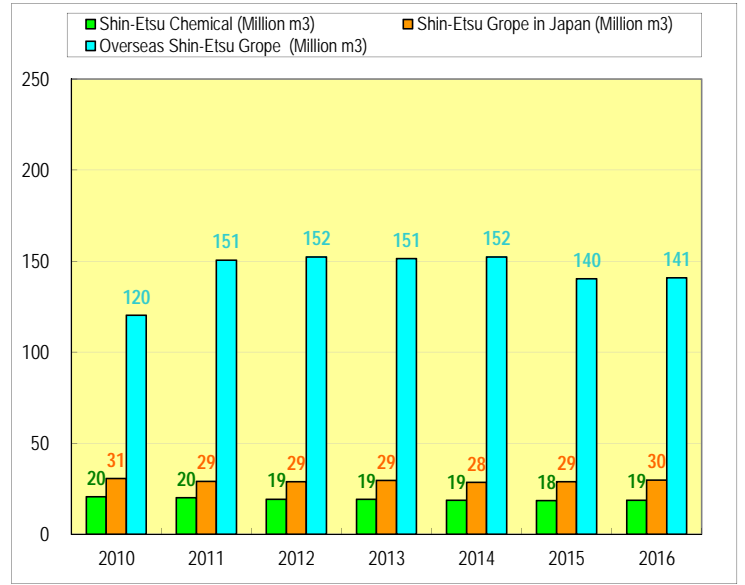
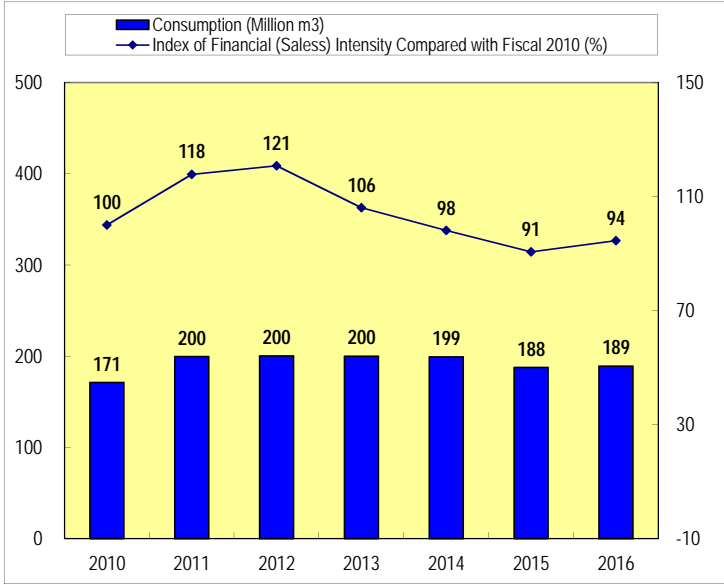
### CO<sub>2</sub> Emissions

Item	Unit	2010	2011	2012	2013	2014	2015	2016
Purchased Electricity	Thousand tons of CO <sub>2</sub>	1,974	2,273	2,505	2,642	2,590	2,605	2,787
Purchased Steam	Thousand tons of CO <sub>2</sub>	487	462	446	449	422	433	477
A-tape Heavy Oil	Thousand tons of CO <sub>2</sub>	5	3	3	4	3	3	3
C-tape Heavy Oil	Thousand tons of CO <sub>2</sub>	36	46	30	17	19	17	18
Kerosene	Thousand tons of CO <sub>2</sub>	38	20	17	15	14	10	9
Natural Gas	Thousand tons of CO <sub>2</sub>	1,036	1,231	1,232	1,077	1,280	1,280	1,331
Gasoline	Thousand tons of CO <sub>2</sub>	2	2	2	2	2	2	2
Light Oil	Thousand tons of CO <sub>2</sub>	6	6	8	7	6	7	8
Liquefied Petroleum Gas	Thousand tons of CO <sub>2</sub>	91	89	99	95	77	99	100
Hydrogen	Thousand tons of CO <sub>2</sub>	0	0	0	0	0	0	0
Liquefied Natural Gas	Thousand tons of CO <sub>2</sub>	0	0	0	0	0	0	0
<b>Total</b>	<b>Thousand tons of CO<sub>2</sub></b>	<b>3,675</b>	<b>4,131</b>	<b>4,342</b>	<b>4,310</b>	<b>4,413</b>	<b>4,455</b>	<b>4,735</b>

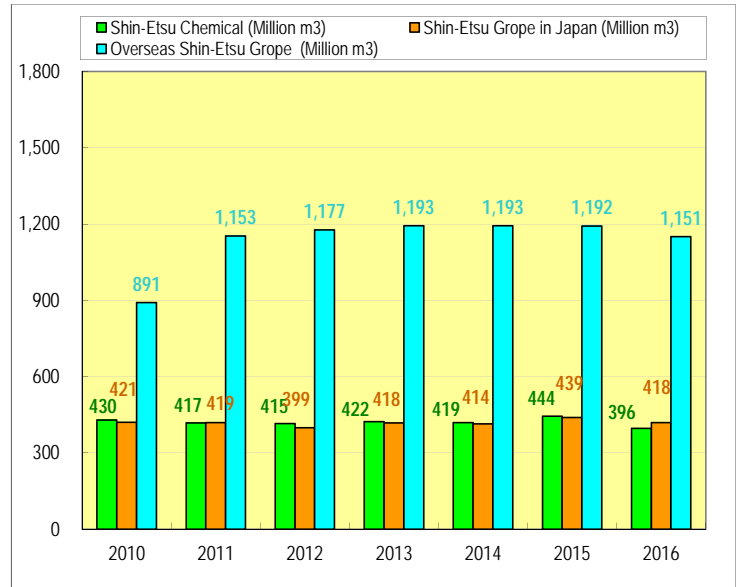
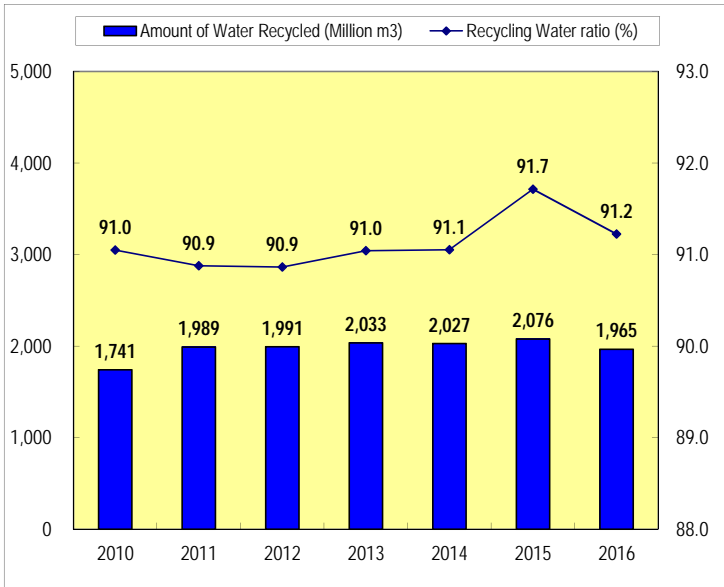
## Greenhouse Gas Emissions



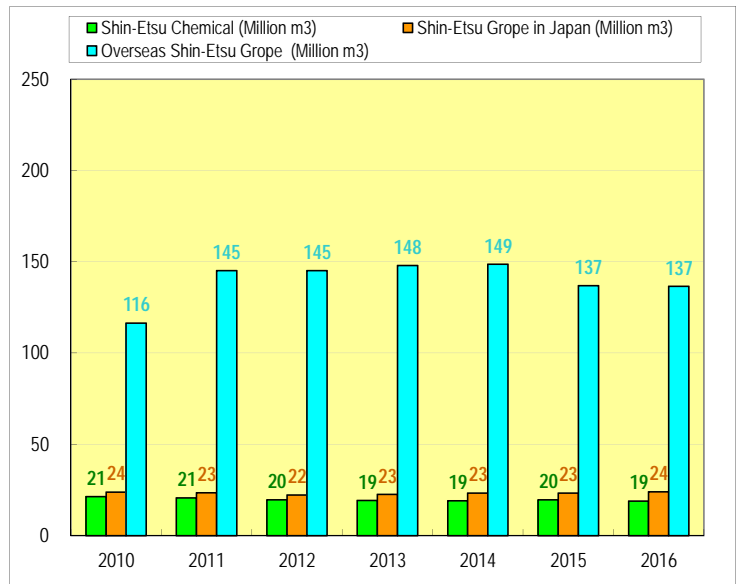
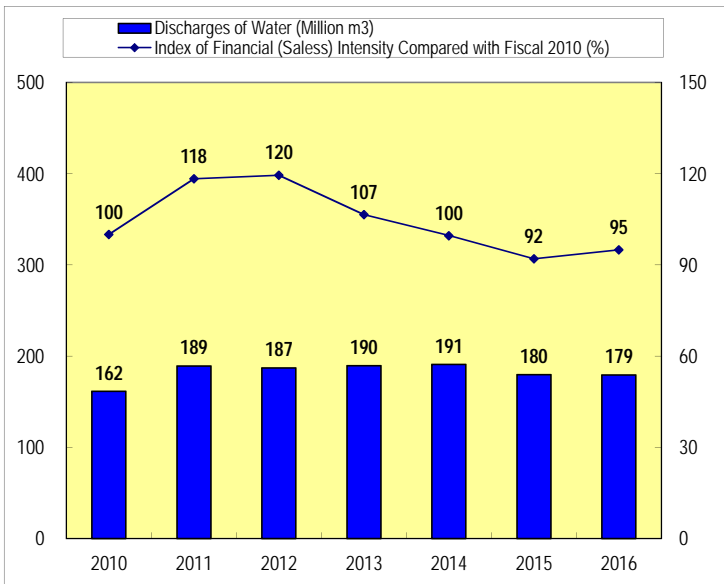
## Water Withdrawals



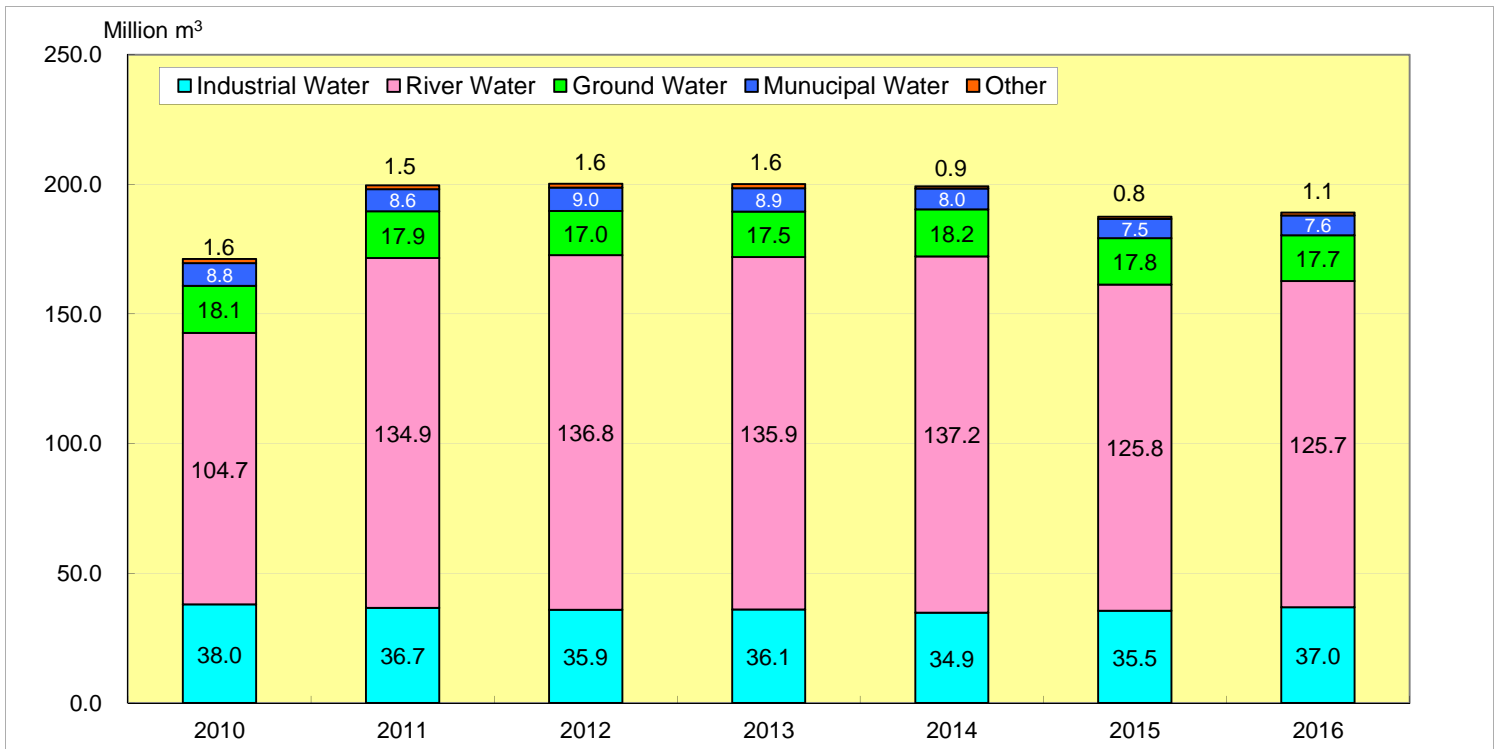
## Amount of Water Recycled



## Discharges of Water



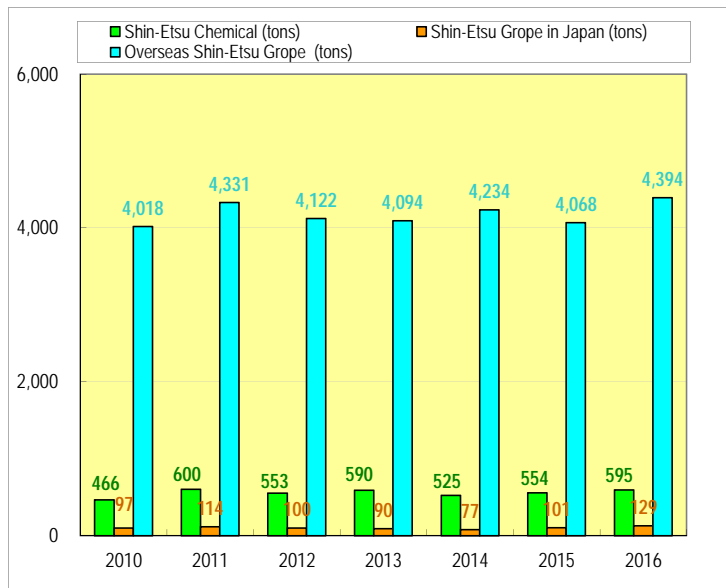
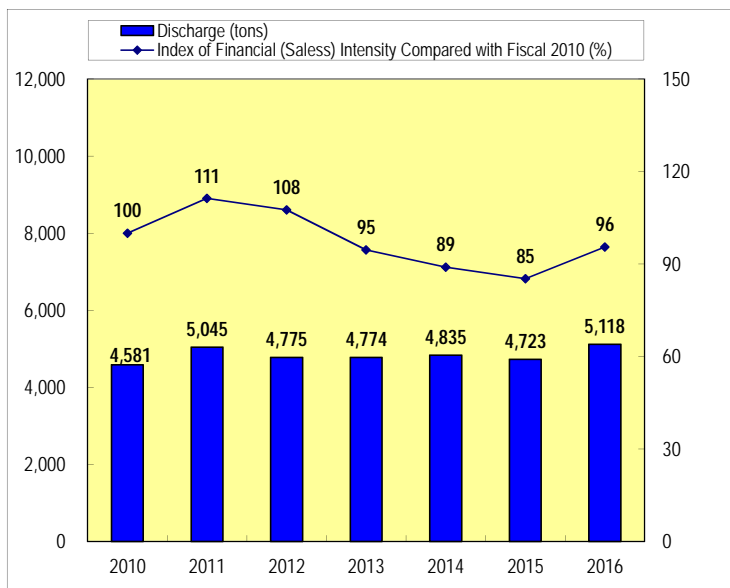
## Water Withdrawals by Water Sources



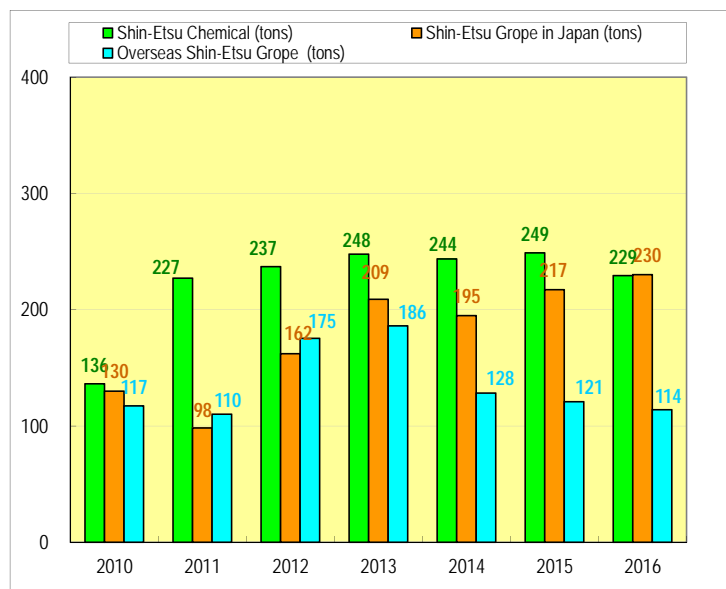
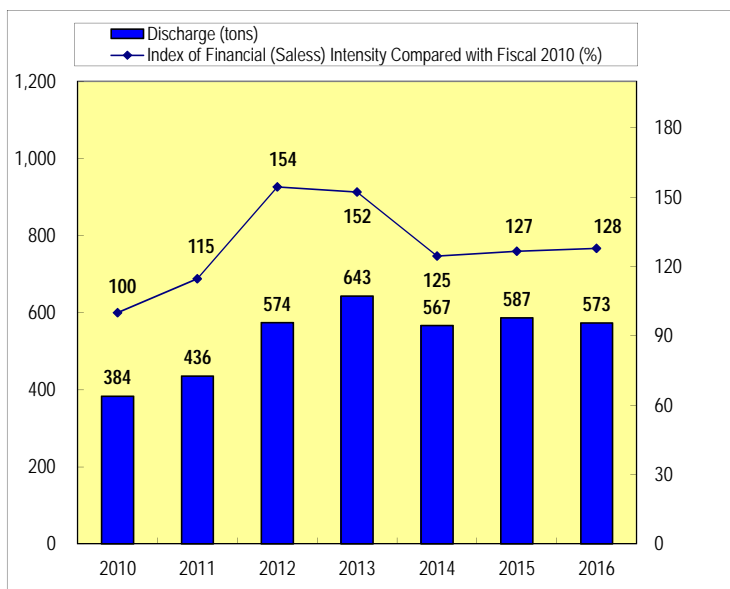
Water Sources	Water Withdrawals (Unit: million m <sup>3</sup> )						
	2010	2011	2012	2013	2014	2015	2016
Industrial Water	38.0	36.7	35.9	36.1	34.9	35.5	37.0
River Water	104.7	134.9	136.8	135.9	137.2	125.8	125.7
Ground Water	18.1	17.9	17.0	17.5	18.2	17.8	17.7
Municipal Water	8.8	8.6	9.0	8.9	8.0	7.5	7.6
Other	1.6	1.5	1.6	1.6	0.9	0.8	1.1
<b>Total</b>	<b>171.2</b>	<b>199.6</b>	<b>200.3</b>	<b>200.1</b>	<b>199.2</b>	<b>187.5</b>	<b>189.1</b>

# Discharge of Water Pollutant

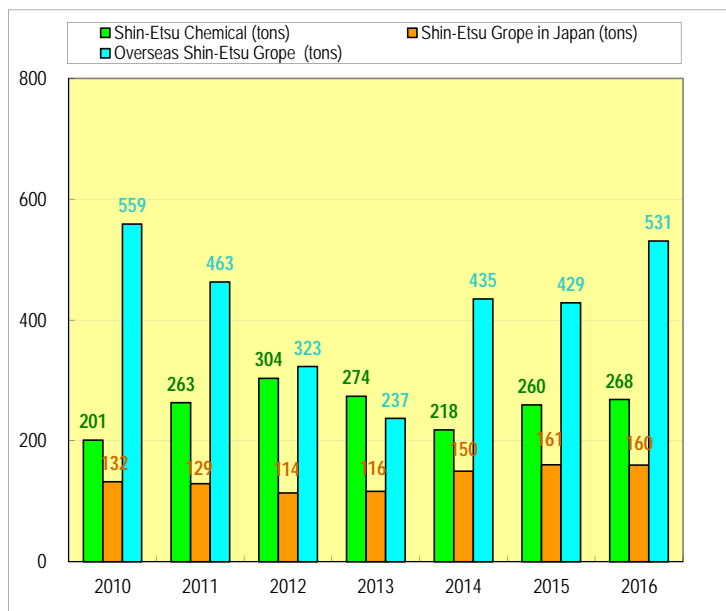
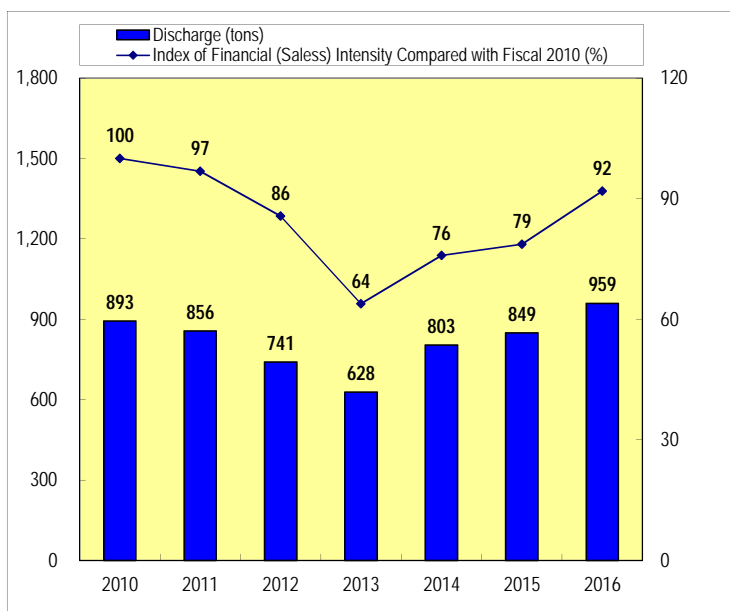
## COD



## BOD

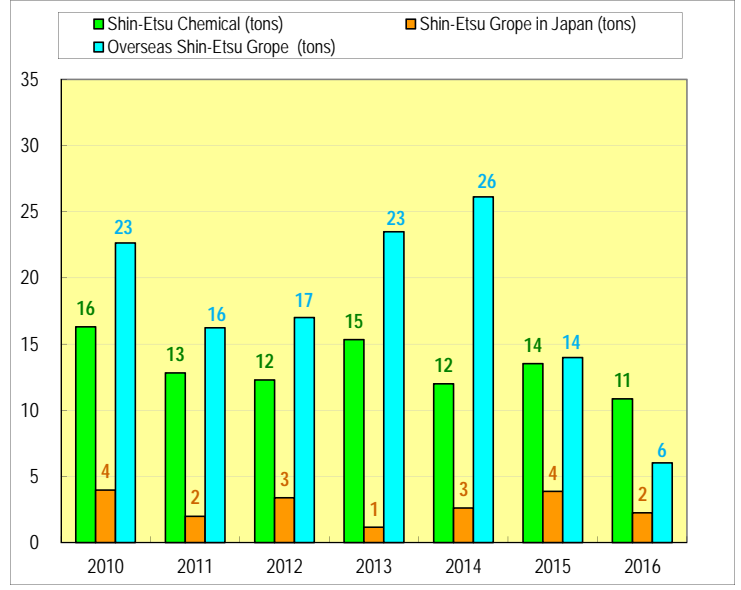
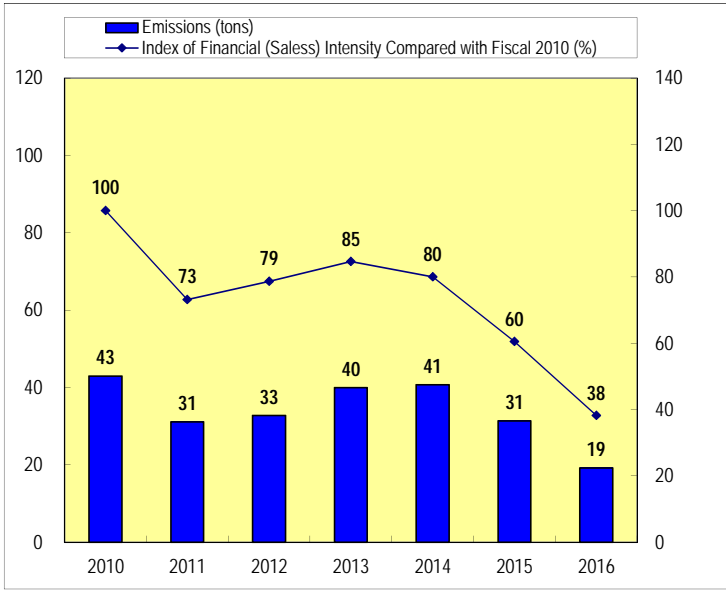


## SS

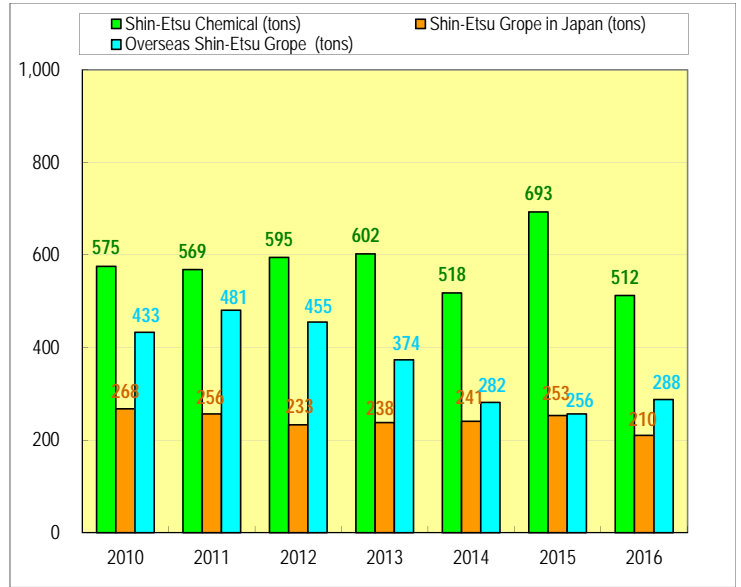
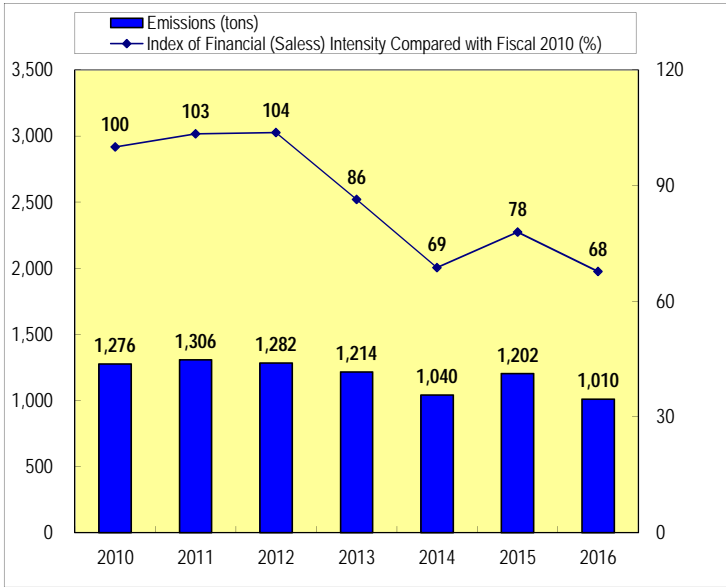


# Emissions of Air Pollution Substances

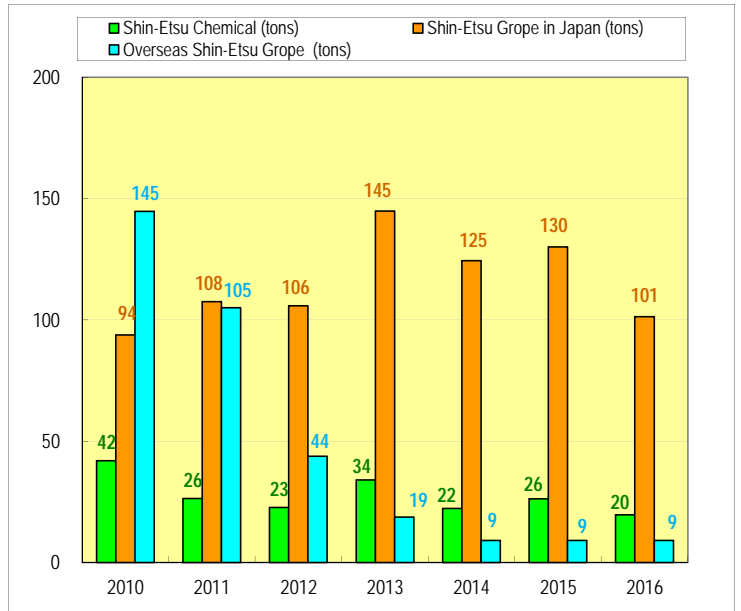
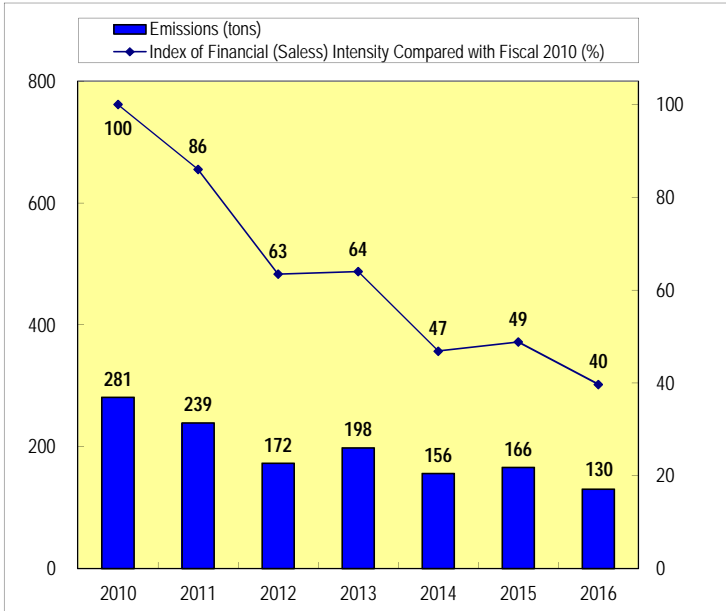
## Soot



## NOx

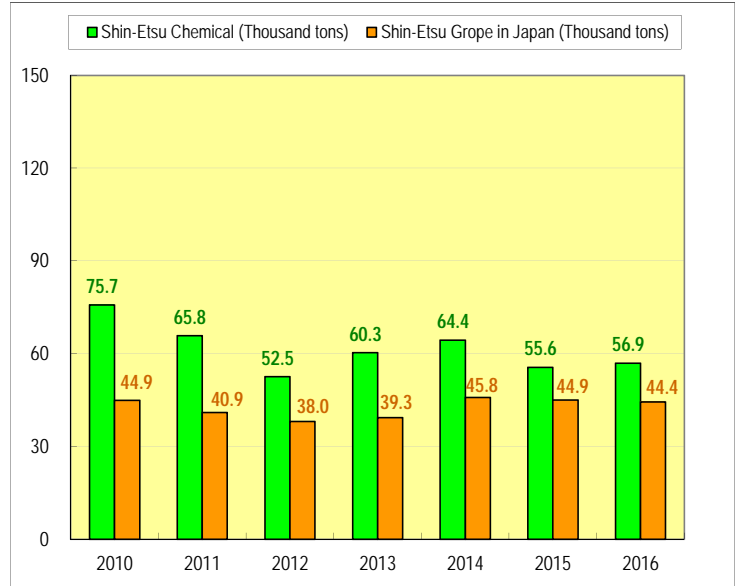
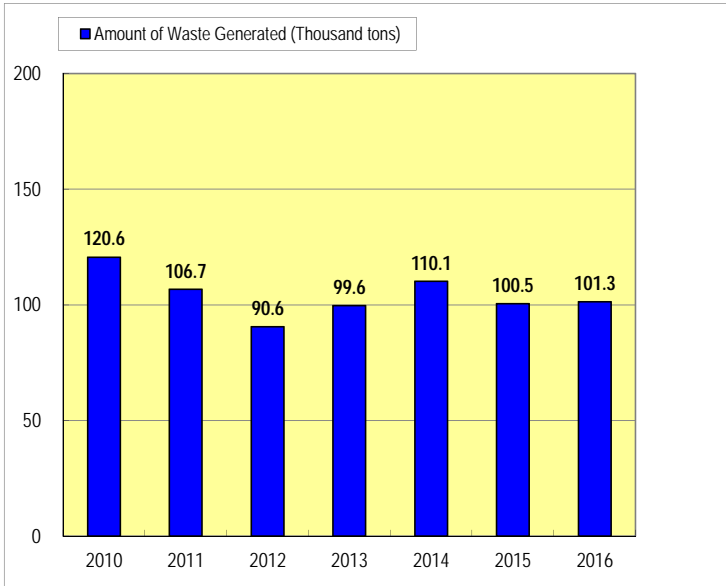


## SOx

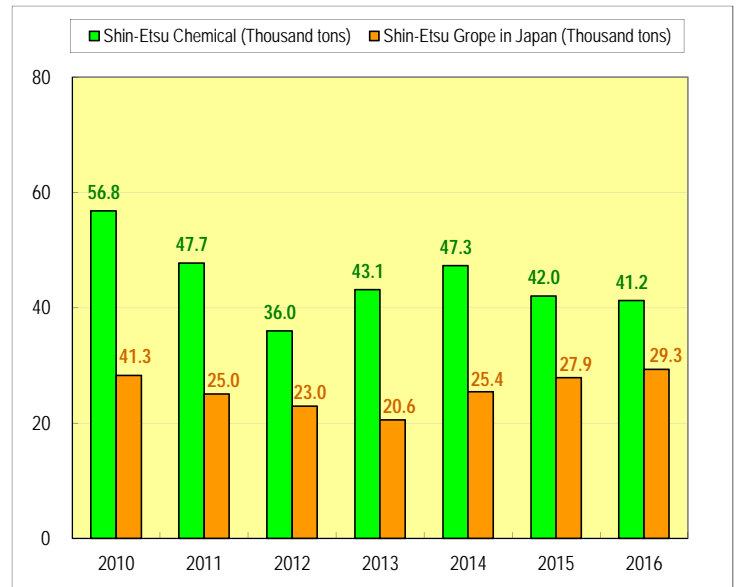
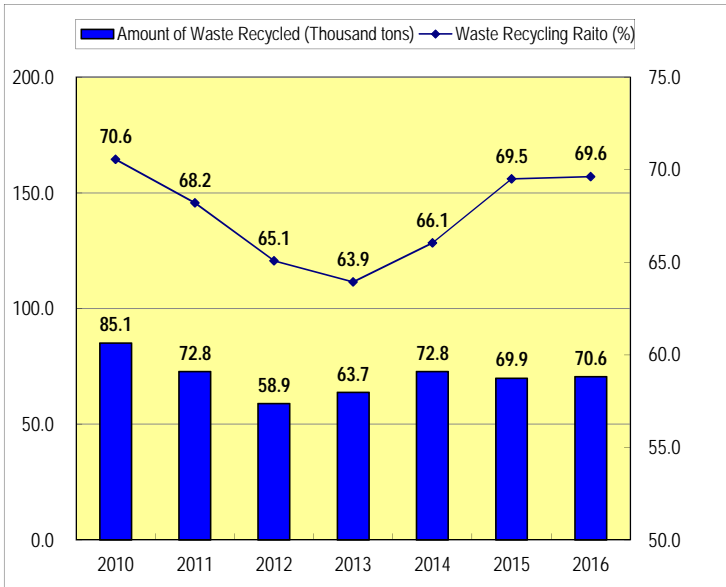




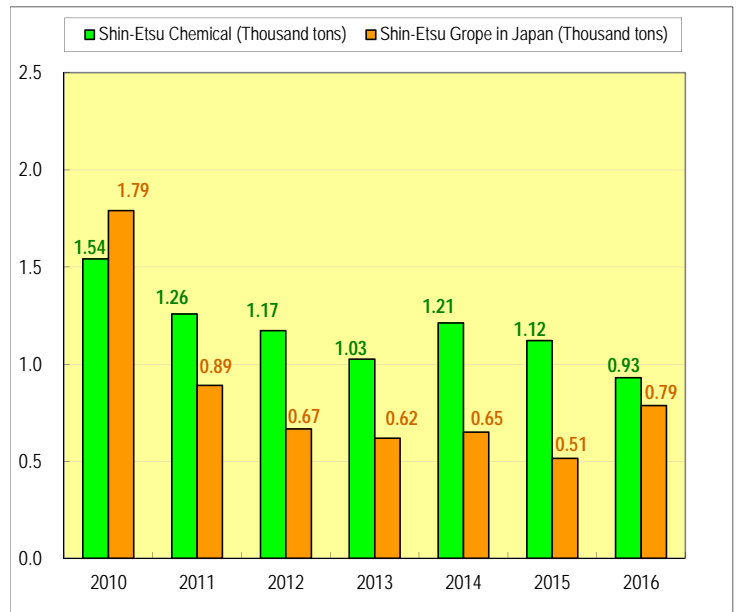
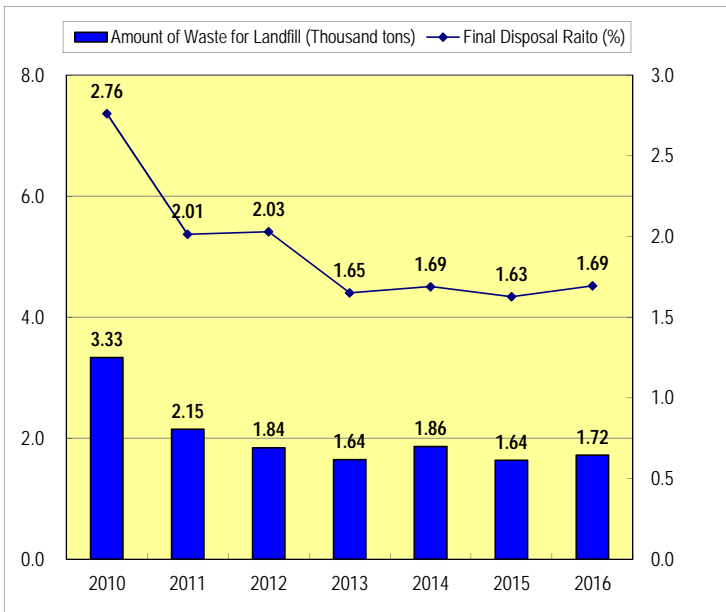
### Amount of Waste Generated



### Amount of Waste Recycled



### Amount of Waste for Landfill



\* Because standards applicable to waste differ by country, only data for group companies in Japan are given.

### Amount of Waste Generated

Item	Unit	2010	2011	2012	2013	2014	2015	2016
Sluge	tons	59,220	52,098	41,124	29,219	31,695	41,002	41,462
Waste Oil	tons	24,774	24,259	22,822	23,829	24,499	13,262	17,183
Waste Acid	tons	15,717	11,698	7,197	9,834	8,740	5,417	4,666
Waste Alkaline	tons	4,096	3,037	4,254	21,210	28,548	24,925	21,546
Waste Plastic	tons	3,751	3,849	6,371	7,916	8,023	7,878	7,808
Waste Paper	tons	1,886	1,793	1,956	2,018	2,115	1,807	2,102
Waste Wood	tons	628	691	692	734	702	649	698
Metal Scraps	tons	4,347	3,983	3,686	3,622	4,641	4,494	4,496
Glassl Scraps	tons	897	993	845	833	754	767	982
Others	tons	5,289	4,313	1,604	429	431	338	101,333
<b>Total</b>	<b>tons</b>	<b>120,607</b>	<b>106,715</b>	<b>90,551</b>	<b>99,644</b>	<b>110,148</b>	<b>100,539</b>	<b>101,333</b>

### Amount of Waste Recycled

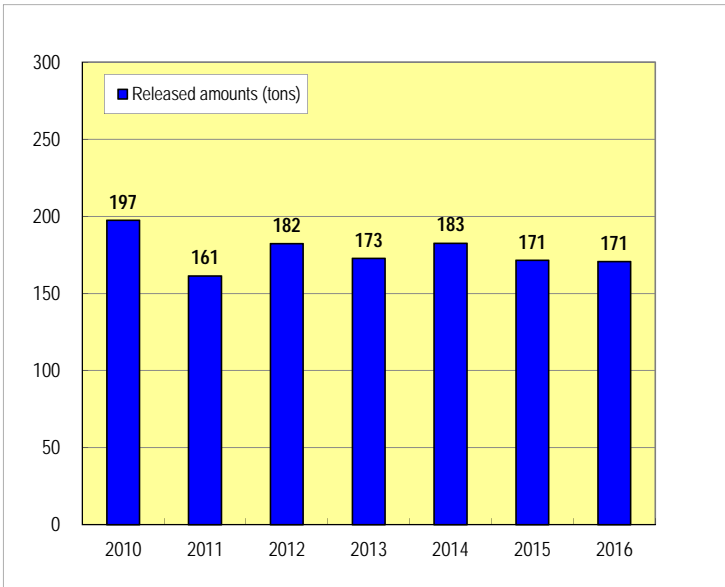
Item	Unit	2010	2011	2012	2013	2014	2015	2016
Sluge	tons	45,673	39,470	29,293	15,672	17,658	20,917	25,000
Waste Oil	tons	7,571	7,215	6,615	5,636	6,029	6,353	7,515
Waste Acid	tons	14,997	10,966	6,699	8,550	7,447	4,371	3,408
Waste Alkaline	tons	2,600	2,297	3,212	20,168	26,912	23,882	20,047
Waste Plastic	tons	3,040	2,696	5,733	7,280	7,394	7,417	7,305
Waste Paper	tons	1,037	917	1,266	1,405	1,506	1,321	1,419
Waste Wood	tons	473	404	536	606	575	503	554
Metal Scraps	tons	4,333	3,963	3,668	3,572	4,569	4,438	4,393
Glassl Scraps	tons	529	667	561	589	477	513	720
Others	tons	4,852	4,201	1,340	227	187	162	200
<b>Total</b>	<b>tons</b>	<b>85,107</b>	<b>72,796</b>	<b>58,923</b>	<b>63,704</b>	<b>72,753</b>	<b>69,878</b>	<b>70,560</b>

### Amount of Waste for Landfill

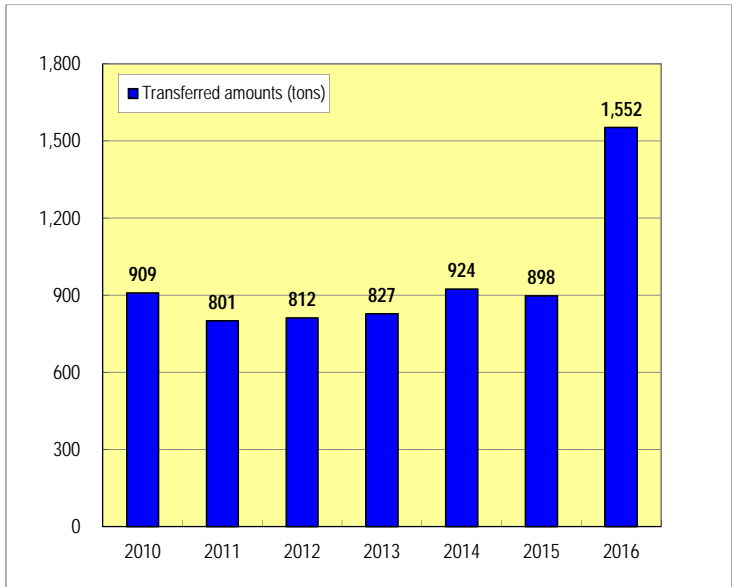
Item	Unit	2010	2011	2012	2013	2014	2015	2016
Sluge	tons	2,283	1,266	1,110	1,000	1,165	1,119	1,163
Waste Oil	tons	38	80	22	19	19	17	18
Waste Acid	tons	121	58	18	16	15	15	16
Waste Alkaline	tons	34	43	93	80	66	32	53
Waste Plastic	tons	193	242	169	170	188	154	135
Waste Paper	tons	82	88	94	59	49	20	32
Waste Wood	tons	3	5	4	3	4	2	2
Metal Scraps	tons	1	4	2	7	2	4	11
Glassl Scraps	tons	338	273	254	241	254	238	242
Others	tons	240	91	73	50	101	35	45
<b>Total</b>	<b>tons</b>	<b>3,333</b>	<b>2,149</b>	<b>1,839</b>	<b>1,645</b>	<b>1,861</b>	<b>1,636</b>	<b>1,717</b>

\* Because waste standards differ from country to country, the figures for the Company and Group companies in Japan were counted.

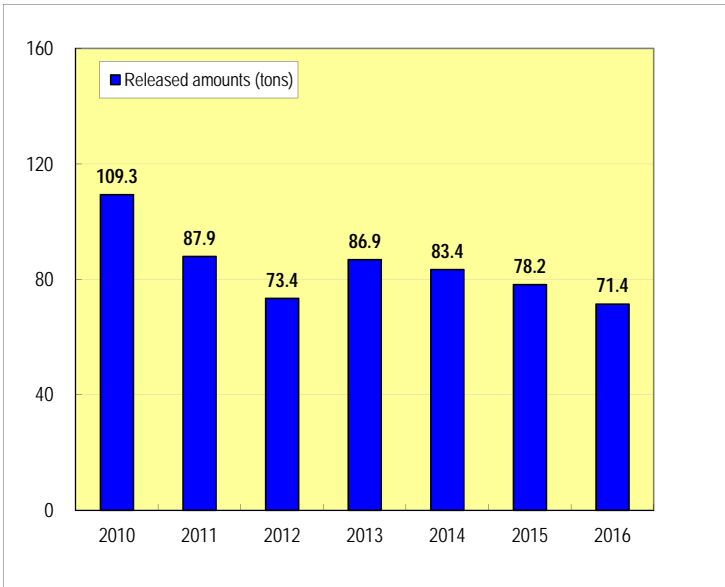
**PRTR System Total Released Amounts**



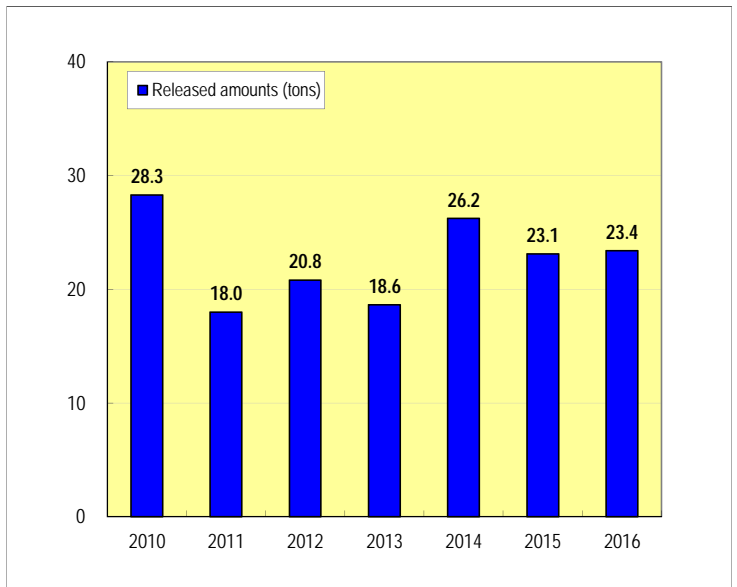
**PRTR System Total Transferred Amounts**



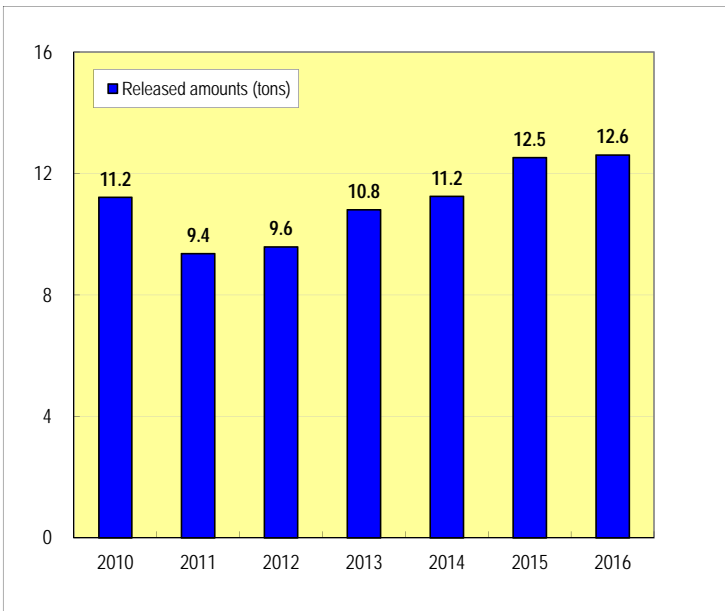
**PRTR System Chloromethane Released Amounts**



**PRTR System 1,2-Dichloroethane Released Amounts**



**PRTR System Chloroethylene Released Amounts**



\* The figures for the Company and Group companies in Japan were counted based on the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof and the PRTR.

## Scope 3 Greenhouse Gas Emissions

Unit: thousand tons of CO<sub>2</sub>e

Category	2016	2015	2014	2013	2012
1. Purchased Goods and Services	2,545	2,834	2,813	2,301	2,270
2. Capital Goods	398	368	300	243	196
3. Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2	445	420	415	406	403
4. Upstream Transportation and Distribution *Transport of products purchased *Export of products (freight was paid by Shin-Etsu Group)	671	700	775	686	232
5. Waste Generated in Operations	61	52	88	80	79.5
6. Business Travel	11	13	11	10	8.7
7. Employee Commuting	24	22	22	20	18.3
8. Upstream Leased Assets <sup>1</sup>	-	-	-	-	0.283
9. Downstream Transportation and Distribution <sup>2</sup> *Export of products (freight was paid by customers)	220	-	-	-	354
10. Processing of Sold Products	5,818	-	-	-	-
11. Use of Sold Products	-	-	-	-	-
12. End-of-life Treatment of Sold Products	4,610	-	-	-	-
13. Downstream Leased Assets	-	-	-	-	-
14. Franchises	-	-	-	-	-
15. Investments	-	-	-	-	-
Total	14,803	4,409	4,423	3,745	3,562

1: Category 8 covers rental expense of our overseas non-manufacturing bases. However, it is extremely little, so Category 8 has been eliminated from calculations from FY2013.

2: The emissions of export of products (freight was paid by Shin-Etsu Group) that was calculated as pertaining to Category 9 for FY 2012 has been included in Category 4 from FY2013 on reconsidering the contents of Category 9.

\* Since fiscal 2016, the Group started disclosing the green gas emissions in the downstream supply chain. This move has considerably increased the total green gas emissions in the Group's Scope 3.

## The list of covering companies

Japan
Shin-Etsu Chemical Co., Ltd.
Shin-Etsu Handotai Co., Ltd.
Nagano Electronics Industrial Co., Ltd.
Naoetsu Electronics Co., Ltd.
Mimasu Semiconductor Industry Co., Ltd.
Iwaki Semiconductor Co., Ltd.
Nissin Chemical Industry Co., Ltd.
JAPAN VAM & POVAL CO., LTD.
Shin-Etsu Quartz Co., Ltd.
Yamagata Shin-Etsu Quartz Co., Ltd.
Fukui Shin-Etsu Quartz Co., Ltd.
Shinano Electric Refining Co., Ltd.
Shin-Etsu Polymer Co., Ltd.
Urawa Polymer Co., Ltd.
Shinano Polymer Co., Ltd.
Niigata Polymer Co., Ltd.
Kashima Vinyl Chloride Monomer Co., Ltd.
Kashima Chlorine and Alkali Co., Ltd.
Shin-Etsu Film Co., Ltd.
Shinmujiko Co., Ltd.
Shin-Etsu Magnet Co., Ltd.
TATSUNO CHEMICAL INDUSTRIES INC.
Naoetsu Precision Co., Ltd.
Shinkoh Mold Co., Ltd.
Saitama Shinkoh Mold Co., Ltd.
Shin-Etsu Engineering Co., Ltd.
Skyward Information System Co., Ltd.
Human Creat Co., Ltd.
Shin-Etsu Astech Co., Ltd.
Nihon Resin Co., Ltd.
Adomatechs Co., Ltd.
Shin-Etsu Finetech Co., Ltd.
SAN-ACE Co., Ltd.
Naoetsu Sangyo Co., Ltd.
Shin-Etsu Technology Service Co. Ltd.
Fukui Environmental Analysis Center Co., Ltd.
Others (19 companies)

Overseas
Shintech Inc.
Shin-Etsu PVC B.V.
CIRES, S.A.
Simcoa Operations Pty. Ltd.
K-Bin Inc.
Shin-Etsu Silicones Europe B.V.
Shin-Etsu Silicones of America Inc.
Shin-Etsu Silicone Korea Co., Ltd.
Shin-Etsu Silicone Taiwan Co., Ltd.
Shin-Etsu Silicones (Thailand) Ltd.
Zhejiang Shin-Etsu High-Tech Chemical Co., Ltd.
Asia Silicones Monomer Ltd.
Shin-Etsu Silicone (Nantong) Co., Ltd.
Shin-Etsu Singapore Pte. Ltd.
Shin-Etsu Silicone International Trading (Shanghai) Co., Ltd.
Shin-Etsu do Brasil Representação de Produtos Químicos Ltda.
Shin-Etsu (Malaysia) Sdn. Bhd.
Shin-Etsu Electronics (Malaysia) Sdn. Bhd.
Shin-Etsu Magnetics Philippines Inc.
Shin-Etsu Magnetics (Thailand) Ltd.
Shin-Etsu Technology (Suzhou) Co., Ltd.
Shin-Etsu (Changting) Technology Co., Ltd.
Shin-Etsu Magnetic Materials Vietnam Co., Ltd.
Shin-Etsu Electronics Materials Vietnam Co., Ltd.
SE Tylose GmbH & Co.KG
SE Tylose USA, Inc.
Shin-Etsu Handotai America Inc.
S.E.H. Malaysia Sdn. Bhd.
S.E.H. (Shah Alam) Sdn. Bhd.
Shin-Etsu Handotai Europe Ltd.
Shin-Etsu Handotai Taiwan Co., Ltd.
Shin-Etsu Opto Electronic Co., Ltd.
Suzhou Shin-Etsu Polymer Co., Ltd.
Dongguan Shin-Etsu Polymer Co., Ltd.
Shin-Etsu Polymer (Malaysia) Sdn. Bhd.
Shin-Etsu Polymer Hungary Kft.
Shin-Etsu Polymer India Pvt. Ltd.
P.T. Shin-Etsu Polymer Indonesia
Shin-Etsu Polymer Thailand Ltd.
Shin-Etsu (Jiangsu) Optical Preform Co., Ltd.
Shin-Etsu International Europe B.V.
Shin-Etsu MicroSi, Inc.
Shin-Etsu Electronics Materials Singapore Pte. Ltd.
Shin-Etsu Magnetics Inc.
Shin-Etsu Magnetics Europe GmbH
Shin-Etsu Polymer Shanghai Co., Ltd.
Shin-Etsu Polymer Hong Kong Co., Ltd.
Shin-Etsu Polymer Europe B.V.
Shin-Etsu Polymer America, Inc.
Shin-Etsu Polymer Singapore Pte. Ltd.
Others (19 companies)