Toho Gas Group

Integrated Report 2018 | Environmental Data Book |

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1. Energy Resources Used and Product Production and Sales Volumes

Toho Gas	Unit	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
LNG volume	thousand tons	5,198	4,774	4,320	4,550	4,396
LPG volume	thousand tons	225	232	146	107	107
Gas production volume	Million ㎥N	6,517	6,039	5,385	5,576	5,398
City gas sales volume	Million ㎥N	3,998	3,958	3,841	3,910	3,954
Heat sales volume	thousand GJ	386	358	340	359	352

・Toho Gas non-consolidated (not including affiliated companies)
・LNG volume and gas production volume include gas processed for thermal electric power plants contracts

2. Energy Consumption

Toho Gas and Affiliated Companies			Unit	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Purchased electricity	Total*		thousand kWh	146,494	143,129	143,822	144,239	144,998 ☑
	Toho Gas	Total*	thousand kWh	125,669	123,281	124,299	124,491	128,888 ☑
		City gas plants*	thousand kWh	91,031	90,260	90,653	90,082	94,090 ☑
		District heating & cooling	thousand kWh	18,117	16,812	17,294	17,320	20,084 ☑
		Offices, etc.	thousand kWh	16,521	16,209	16,352	17,219	16,107 ☑
	Affiliated companies		thousand kWh	20,825	19,848	19,523	20,139	19,819 ☑
City gas	Total		thousand ㎥N	15,321	16,122	16,052	17,035	17,096 ☑
	Toho Gas		thousand ㎥N	14,448	15,288	15,294	16,204	16,492 ☑
		City gas plants	thousand ㎥N	1,359	1,586	1,842	1,812	1,906 ☑
		District heating & cooling	thousand ㎥N	10,030	8,873	8,306	8,837	9,176 ☑
		Offices, etc.	thousand ㎥N	3,060	4,829	5,146	5,555	5,410 ☑
	Affiliated companies		thousand ㎥N	873	834	758	831	604 ☑
Vehicular fuel	Total		GJ	103,576	105,061	103,692	104,105	110,145 ☑
	Toho Gas		GJ	28,679	31,213	30,773	31,080	30,259 ☑
	Affiliated companies		GJ	74,897	73,848	72,919	73,025	79,886 ☑
Other energy	Total*		GJ	269,169	304,455	265,095	262,080	448,044 ☑
	Toho Gas		GJ	257,765	293,894	255,454	251,793	437,730 ☑
	Affiliated companies		GJ	35,656	33,436	31,073	32,987	40,608 ☑

3. Emission into the Atmosphere and Water Systems, Water Usage

Toho Gas and Affiliated Companies			Unit	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
CO_2		Total*	tons-CO_2	131,489	133,134	129,878	131,031	143,503 ☑
	Toho Gas	Total*	tons-CO_2	111,947	115,425	111,922	113,982	127,530 ☑
		City gas plants*	tons-CO_2	59,339	61,815	59,212	58,163	70,108 ☑
		District heating & cooling	tons-CO_2	35,244	32,167	30,780	31,918	34,306 ☑
		Offices, etc.	tons-CO_2	17,364	21,443	21,923	23,955	24,011 ☑
	Affiliated companies		tons-CO_2	19,542	17,709	17,956	18,505	19,668 ☑
NOx	Toho Gas	Total	tons	26	26	25	21	23
		City gas plants	tons	9	10	12	10	10
		District heating & cooling	tons	17	16	12	11	13
COD load	Toho Gas	City gas plants	tons	0.3	0.2	0.2	0.2	0.2
Discharge water volume	Toho Gas	City gas plants	thousand ㎥	41	40	40	41	38
Water for irrigated used		Total	thousand ㎥	1,387	1,325	1,250	1,328	1,273 ☑
	Toho Gas		thousand ㎥	1,192	1,167	1,098	1,181	1,128 ☑
	Affiliated companies		thousand ㎥	195	158	152	147	145 ☑

・Emissions of greenhouse gases other than CO_2: 546 tons-CO_2 (FY2017, volume of methane released in city gas production and supply)
・Since FY2017, CO_2 emissions (city gas plant portion) includes the portion for the electricity business.
* Portions corresponding to double counting from intra-group exchanges are excluded, and as a result, totals may not match.
Note: Because of rounding off of decimals, totals may not match.

4. Waste

Toho Gas and Affiliated Companies			Unit	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Industrial waste	Amount generated	Total	tons	28,625	30,326	37,439	43,399	43,278 ☑
		Toho Gas	tons	1,414	1,758	1,813	1,120	1,735 ☑
		Affiliated companies	tons	27,211	28,568	35,626	42,279	41,543 ☑
	Reduction amount	Total	tons	1,561	1,852	1,939	1,988	2,141 ☑
		Toho Gas	tons	148	224	238	129	266 ☑
		Affiliated companies	tons	1,413	1,628	1,701	1,859	1,875 ☑
	Recycled resources	Total	tons	26,160	27,536	34,279	40,053	40,001 ☑
		Toho Gas	tons	1,242	1,503	1,532	962	1,419 ☑
		Affiliated companies	tons	24,917	26,033	32,747	39,091	38,582 ☑
	Final disposal amount	Total	tons	902	941	1,225	1,357	1,136 ☑
		Toho Gas	tons	24	35	47	29	50 ☑
		Affiliated companies	tons	879	906	1,178	1,329	1,086 ☑
General waste	Amount generated	Toho Gas	tons	462	504	540	570	554 ☑
	Recycled resources	Toho Gas	tons	374	419	452	478	454 ☑
	External disposal amount	Toho Gas	tons	88	85	88	92	100 ☑

Note: Because of rounding off of decimals, totals may not match.

Calculation Standards for Main Environmental Data

Item		Calculation Method
Atmosphere & water quality	CO_2 emissions volume	Formula: CO_2 emissions volume = Purchased electricity, Fuel used, Purchased heat × CO_2 emissions coefficient The CO_2 emissions coefficient below was used as the CO_2 emissions coefficient
	NOx emissions volume	Formula: Emissions volume = Annual emissions volume (45 MJ conversion) × NOx concentration × 45/22.4
	COD load	Formula: Emissions volume = Waste water volume × COD concentration (annual average of measures figures)
	Discharge water volume	Volume of tap water and industrial water used at city gas plants
	Water for irrigated used	Total of tap water, industrial water, and well water used
Waste	Amount generated	Volume generated based on manifests or total volume handled by waste processors
	Reduction amount	Reduction in volume of water and so on as a result of incineration, dehydration and so on at intermediate processing facilities Formula: Reduction in volume = Volume of waste generated × Volume reduction rate Figures from the Japan Environmental Management Association for Industry, "Recycling Data Book 2017" were used for volume reduction rates; however, reported values from industrial waste processors were used for Toho Gas rubble, asphalt and concrete, gas pipes, and the like.
	Recycled resources	Volume recycled for reuse as raw materials through sorting and so on at intermediate processing facilities. Formula: Resource recycling volume = Volume of waste generated × Resource recycling rate Figures from the Japan Environmental Management Association for Industry, "Recycling Data Book 2017" were used for resource recycling rates; however, reported values from industrial waste processors were used for Toho Gas rubble, asphalt and concrete, gas pipes, and the like.
	Final disposal amount	Formula: Final disposal volume – [Volume generated – (Volume reduction + recycled resource volume)]

CO_2 Emissions Coefficients

		Unit	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	Remarks
Purchased electricity	Average coefficient for all electricity sources	tons-CO_2/thousand kWh	0.516	0.513	0.497	0.486	0.485	Source: In the table of figures by electric power company released pursuant to ministerial directive under the Act on Promotion of Global Warming Countermeasures "Chubu Electric Power (actual emissions coefficient) is listed as an example
	Thermal electricity coefficient	tons-CO_2/thousand kWh	0.69	0.69	0.65	0.65	0.65	Source: Central Environment Council, Interim Summary of the Target Achievement Scenario Subcommittee (June 2001) (application: Up to FY2014) "Global Warming Countermeasures Plan (May 2016)" (application: From FY2015)
City gas	13 A (46 MJ)	tons-CO_2/thousand m³N	2.36	2.36	2.36	—	—	Heating value (0°C, 1 atmosphere) calculated by the Company's city gas (13A) representative organization In accordance with changes, 2.36 was used until August 31, 2015, and 2.29 has been used since September 1, 2015
	13 A (45 MJ)	tons-CO_2/thousand m³N	—	—	2.29	2.29	2.29	
Other fuels	LPG (Gas)	tons-CO_2/thousand m³	6.12	6.12	6.12	6.12	6.12	Source: Calculated using the figure equal to the unit calorific value multiplied by the emissions coefficient per unit of heat generated and 44/12 pursuant to the Act on Promotion of Global Warming Countermeasures
	LPG (Liquid)	tons-CO_2/thousand ℓ	1.71	1.71	1.71	1.71	1.71	
	LNG	tons-CO_2/tons	2.70	2.70	2.70	2.70	2.70	
	Light oil	tons-CO_2/thousand ℓ	2.58	2.58	2.58	2.58	2.58	
	Gasoline	tons-CO_2/thousand ℓ	2.32	2.32	2.32	2.32	2.32	
Purchased heat	Steam (excluding industrial steam), hot water, cold water	tons-CO_2/GJ	0.057	0.057	0.057	0.057	0.057	

Unit Calorific Values

		Unit	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	Remarks
City gas	13 A (46 MJ)	GJ/thousand m³N	46.04655	46.04655	46.04655	—	—	The Company's city gas heating value (0°C, 1 atmosphere) Total heat generated 46.04655 GJ/thousand m³N (up to August 31, 2015) Total heat generated 45 GJ/thousand m³N (since September 1, 2015)
	13 A (45 MJ)	GJ/thousand m³N	—	—	45.0	45.0	45.0	
Other fuels	LPG	GJ/tons	50.8	50.8	50.8	50.8	50.8	Source: Unit heating value pursuant to ministerial directive under the Law to Promote Measures to Deal with Global Warming
	LNG	GJ/tons	54.6	54.6	54.6	54.6	54.6	
	Light oil	GJ/thousand ℓ	37.7	37.7	37.7	37.7	37.7	
	Gasoline	GJ/thousand ℓ	34.6	34.6	34.6	34.6	34.6	

Note: Scope of total for affiliated companies: Mizushima Gas Co., Ltd., Toho Liquefied Gas Co., Ltd., Toeki Kyokyu Center Co., Ltd., Toei Co., Ltd., Toho Gas Engineering Co., Ltd., Toho Gas Techno Co., Ltd., Toho Gas Living Co., Ltd., Gas Living Mie Co., Ltd., Eco-life Corporation Co., Ltd., Toho Gas Safety Life Co., Ltd., Toho Gas Customer Service Co., Ltd., Toeki Customer Service Co., Ltd., Toho Reinetsu Co., Ltd., Chita Tansan Co., Ltd., Toho Gas Information System Co., Ltd., Toho Service Co., Ltd., Toho Real Estate Co., Ltd., Howa Building Service Co., Ltd., Waseda Gas Co., Ltd. (added this fiscal year) (as of end of March 2018)

5. Environmental Accounting

FY 2017 Environmental Accounting (scope of accounting: Toho Gas unconsolidated; period covered: April 2017 – March 2018)

Figures in parentheses are results from FY 2016

Environmental Preservation Costs		Main Details	Investment Amount (million yen)	Expenses (million yen)	Material Effects (environmental impact levels)	2016	2017
Toho Gas Operations	Pollution prevention	Noise prevention, water pollution prevention, etc.	21 (28)	33 (31)	NOx [Plants] (mg/㎥-gas production volume)	1.8	1.9
					NOx [District heating and cooling] (g/GJ-heat sales volume)	29	34
					COD [Plants] (mg/㎥- gas production volume)	0	0
	Global environmental preservation	Global warming prevention, energy conservation, ozone layer protection, etc.	3,046 (1,078)	422 (151)	CO_2 [Plants] (g-CO_2/㎥- gas production volume)	10.4	11.0
					CO_2 [Offices] (kg-CO_2/㎡-floor area)	87	90
					CO_2 [District heating and cooling] (kg-CO_2/GJ- heat sales volume)	83	90
	Resource recycling	Reduction of excavated soil for gas pipeline construction, recycling, waste management, etc.	0 (0)	101 (98)	Volume of excavated soil disposed of externally (tons/km-gas pipeline construction length)	348	307
					Asphalt and concrete blocks disposed of externally (tons/km- gas pipeline construction length)	0	0
					Used polyethylene pipe disposed of externally (tons)	0	0
					General waste disposed of externally (tons)	92	100
					Industrial waste disposed of externally (tons)	29	50
	Environmental management	Environmental education, development of EMS, environmental countermeasure organizations	0 (0)	138 (198)			
	Other	Greening of plants, soil environment countermeasures	1 (2)	84 (71)			
Customers	Environmental R&D	R&D on technologies that reduce environmental impact, environmentally-conscious products, etc.	132 (369)	577 (618)	Reduction of CO_2 emissions through improvement in gas equipment energy usage efficiency and the spread of natural gas (ten thousand tons-CO_2)	6	5
	Product recycling	Product, container, and packaging recycling	0 (0)	12 (8)	Used gas equipment recovery volume (tons)	918	915
					Styrene foam recovery volume (tons)	36	36
Social contribution activities		Self-initiated greening, advertising, environmental information	32 (27)	131 (140)			
		Total	3,232 (1,503)	1,498 (1,315)			
Total capital investment			35,251 (43,411)				
Environmental capital investment rate (%)			9.169 (3.462)				

Economic Effects	(million yen)
Amount of expense reduction from operation of energy-saving facilities	402 (385)
Amount of expense reduction from reduced excavated soil from gas pipeline construction	1,076 (1,143)
Proceeds from the sale of valuable materials	73 (71)
Total	1,551 (1,599)

Calculation Method

- The investment amount is the total of non-current assets acquired in FY 2017.
- Expense amounts include personnel expenses and depreciation.
- Customer material effects are reference information taking into consideration that the affected party is a customer, that the effects of environmental R&D will not appear in the year that the costs were expenses, and other factors.
- District heating and cooling covers only direct management by Toho Gas.
- When calculating economic effects, the scope of covered cogeneration facilities was reviewed, and accordingly, figures for prior years were corrected retroactively.
- The method of calculating the amount of expense reduction from reduced excavated soil from gas pipeline construction is comparison with the earlier construction method.
- Reference was made to Ministry of the Environment, "Environmental Accounting Guidelines" (2005 version) and Japan Gas Association, "Guide on the Introduction of Environmental Accounting by City Gas Companies."

＜Reference＞

1. Environmental Action Principles (established 1993)

Environmental Action Principles	Basic Policy		Toho Gas and its Group companies recognize the importance of preserving the environment on regional and global basis. By giving priority to supplying clean energy, the Group will do its utmost to create an environmentally harmonious society through all its business activities.
	Principles	1	The Group will contribute to reducing the impact of its business activities on the environment related to customers.
		2	The Group will reduce the impact of its business activities on the overall environment.
		3	The Group will contribute to environmental preservation in collaboration with local communities and the global community
		4	The Group will set up research and development regarding environmental preservation technologies.

2. Environmental Action Guidelines (Established 2011)

Global Warming countermeasures	Reduce customer CO_2 emission and implement effective and feasible global warming countermeasures by diffusion and high-efficiency/advanced use of clean energy such as natural gas, environmental-friendly energy, and utilize renewable energy.
	Make continuous improvements in business operations in an attempt to reduce CO_2 emissions in the Company's own business activities.
Resource recycling	Effectively use resources in all stages of business activities and endeavor to minimize external releases of waste by reducing occurrence, reusing, and recycling.
Biodiversity conservation	Be cognizant of the importance of biodiversity, strive to understand and analyze the impact on business activities, and encourage activities that take biodiversity into consideration.
Environmental contribution to society	Undertake social contribution activities relating to the environment through participation in environmental activities and projects, which are conducted in collaboration with the local communities and the global community, and educational programs targeting future generations.
Development of environmental technologies	Promote the development of technologies that contribute to reducing environment impact such as technologies for the efficient and advanced use of energy in the form of gas and use of renewable energy.
Environmental management	Be aware of environment impacts, implement thorough environment management, and develop human resources that consider the environment and take action.