

Status overview of our business activities and environmental load (FY 2017)

Input

e.	Fuels for powe	er generation	
Relation	Coal	4,288 thousand t (dry coal weight)	
r ger	Heavy oil	157 thousand kL	
bowe	Crude oil	345 thousand kL	
Ĩ.	LNG (liquefed natus	ilges) 7,287 thousand t	
uet for thermal power generatio	Wood pellets	16 thousand kL (heavy oil equivalent) 361 thousand kL	
Fuet	Other	361 thousand kL (heavy oil equivalent)	
	Is for nuclear	37 tU ightof pre-inadiation unanium)	
	a galaatoli m	for the second second	
	Water for pow	er generation	
Ind	lustrial water	3.85 million m ²	
	an water	1.14 million m ³	
gro	er water, undwater, etc.	0.36 million m ²	
Sec.	water	n en alle alle	
	salinated)	2.63 million m ²	
		2.63 million m ⁴	
(de	salinated)		
(de	salinated) Resou	irces	
(de	salinated) Resou nestone	rces 71 thousand t	
(de	salinated) Resou nestone	71 thousand t 10 thousand t	
(de Lin Am	salinated) Resou nestone imonia	71 thousand t 10 thousand t	
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(de Lin Am Off	salinated) Resou nestone imonia Offi ice electricity ice water	rces 71 thousand t 10 thousand t ice 0.077 TWh 0.45 million m ²	
(de Lin Am Off	salinated) Resou mestone monia Offi ice electricity ice water mter paper	rces 71 thousand t 10 thousand t ice 0.077 TWh 0.45 million m ³ 809 t	

Business activities

Power g	eneration
Nuclear power generation*1	12.9 TWh
Thermal power generation ⁺¹	67.8 TWh
Hydropower generation*1	13.8 TWh (0.07 TWh from (small-scale hydropower) generation
Renewable energies*1	0.07 тWh
Purchased from other companies 27.5 TWh of which solar, wind, biomess, and waste-derived power 5.8 TWh	Pumped-storage hydropower –1.5 TWh
Power transmissi	on and distribution
SFs gas recovery rate	(upon inspection) 99.6 %
Office Low-pollution vehicle adoption rate 90.0%	Losses in transmission and distribution inducing electricity consumed within transformer substations -5.3 TWh
Environmenta	lefficiency Electric power so
(FY 1990 :	= 100) Composite Inde

Output

Power g	eneration		Released into	
		CO _{t (ca}	2% (abixib nodia	50.18 million t-CO (48.22 million t-CO ₂) ⁸
lear power eration ⁺¹	12.9 тWh	N₂O (ni	itrous cxide) 🕫	28 thousand t-CO2
			fur hexafiuoride(**	46 thousand t-CO ₂
rmal power eration ⁺¹	67.8 TWh		ulfur oxides) nitrogen oxides)	2,734 t 5,402 t
	13.8 TWh	Heat	in ogin ostani,	21+02 1
ropower	/ 0.07TWh from \		Released into	water areas
eration*1	(small-scale hydropower) generation		emissions	18 t
ewable	• •	Total	effluents	4.93 million m ²
rgles+1	0.07 TWh		Radioacti	ve waste
		Low-le	evel radioactive	1.451 drums
asedfrom			egenerated ¹⁵	(200 L drums)
ompanies	Pumped-storage		-	
5 TWh hich solar,	hydropower		Industrial v	vaste, etc.
iomass and \	-1.5 TWh		l emissions	654 thousand t
erived power 8 TWh		Poccepto destination a set	Recycling	652 thousand t
		a still o	aduction in Internediate treatme	1.1 thousand t
		£8 F	inal disposal	0.9 thousand t
er transmissio	on and distribution	R	ecycling rate	99.9%
gas	(upon inspection)	CO. en	nissions resulting	fromoffice activities
wery rate	99.6%		emissions	38,270 t-CO2
		₹ c	Office electrici	tv 22.522+00-
	Losses in	p (142 kg-COs/WH)	ty 32,532 t-CO2
ffice	transmission and	ě C	Office water 123 kg-C0s/m ³)	104 t-OD2
pollution	distribution including electricity	i i	/ehicle fuels	
ehicle ition rate	consumed within		Savoline: 2.32 kg-COa Diesel oil: 2.58 kg-COa	
0.0%	transformer substations		-	COs emission factors. ce electricity consumption
0.0%	-5.3 TWh	The en reflects	nission factor for offi s carbon credit office	ce electricity consumption its and other factors.
			Custo	mers
		sold	tric power	115.2 TWh
Environmental	efficiency Electric powe	er sold	Electric po	wersold
(FY 1990 =			CO ₂ em	
* Composite index –	Environmental load caused by - CD ₃ SOx, NOx, and landfill disposi	al of industrial waste	-	ces consumed

- Note I: This table contains non-consolidated figures for Kansai Electric Power Co., Inc. only.
- Note 2: Totals may not sum due to rounding.
- Note 3 Thermal power generation figures do not include biomets power generation.
- Includes amounts of power for inside power plants
 Includes COs originating from electricity purchased from other electric power companies
- •3 Emissions taking carbon credits into account 4 COsconversion
- *5 Net generation (generated amount reduced amount)

+ In calculations starting in FY 2007, we are using the LIME2 integrated coefficient developed by the National Institute of Advanced industrial Science and Technology. • The amount of CO₂ emissions shown takes carbon credits into account.

Reference : Status overview of our business activities and environmental load (FY 2016)

Input

Fault for powe	er generation
a Coat	4053 (NUMBER OF C
	dycal wight
B Heavy of	25 bookard K.
Crude oil	Utilitiants
Crude all Crude all References Wood pallets	SSM-benardt
Wood pallets	The same of the second
2 Cew	AGD Restand N. Deprisoners
Foets for nuclear power generation	
Water for pow	or generation
Industrial water	4.30 million m ²
Clean water	1.66 million m ³
Elver water, groundwater, etc.	129millionm ²
Seawarfor (desailnated)	257 million m ²
Gener	121
Limestone	17 IbisAvnill
Ammonia	54 thissand1
DA	lca:
Office electricity	0.01 bilken With
Office water	645 million m ¹
Printer paper	9011
Contraction (22 thousand lit.
Gausline	

Business activities

Output

Power generation Power generation Nuclear power generation* -0.4 billion kWh		(2 million i CDr aphillion i CDr 20 thousand i CDr 40 thousand i CDr
generation" generation" -0.4 billion kWh 81.5 billion kWh	Sinkiwakaby*** Sitenduraites	20 (braiend) (C)
generation" generation" -0.4 billion kWh 81.5 billion kWh	Stephenets	4 traventi CD
generation" generation" -0.4 billion kWh 81.5 billion kWh		
generation" generation" -0.4 billion kWh 81.5 billion kWh	NOt retrain sizes	3,625.1
-0.4 billion KWh 81.5 billion KWh		4,5781
	 Initial-Chargester in Initial-Chargester in Initial-Chargester in Initial-Chargester in Chargester in Initial-Chargester in Ini	and the second se
	Suburned toto w	ration areas
Helenderthy server Researching	COD emissions	.214
Hydroelectrk power Renowable generation* energies* 13.4 billion kWh 0.1 billion kWh	Total effluents	4.30 million m ³
13.4 billion kWh 0.1 billion kWh (13.7 billion kWh (13.7 billion kWh)) (13.7 billion kWh (13.7 billion kWh))	Radioactive	wate
- relative property of power	Las-invited such a varie generaled"	-3,598 drums grass shut g
to rule pave pira	*bipinin(produce)	ani miantanaat
Purchased from ather companies 342 bites MA	Industrial we	nte, etc.
a second s	Total articulars	70 traverid
Contraction and	28 Secuting	/2. bowed
C ALTRADUCTION /	detaction in the state institute	Unwell
	Final displaced	19 mounds
Power transmission and distribution	Recycling rate	16.78
Sec. 2010 Inc.	CD emission reading h	on office activities
SF- gas recovery rate supon inspections	Total emissions	45,1%+00
99.3%		7 305') (D
Contract of the local division of the local	Office water satisfication	1041-023
Office	Publicle Basis statistic public statistic parties a public statistic	SMIHO
adoption rate 86.4%	 rigan a partitiva and formalization to the effect value cell after. 	NR. 2 CONTRACTOR
-67 Silor 1/h	Custon	hers
		Directric power sold 7.3 billion KWh

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	ACCOUNT OF THE OWNER.	the second test and	10000	

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Environmental accounting (KEPCO 1)

KEPCO has introduced environmental accounting both on a nonconsolidated basis and for group companies to clarify the costs of environmental conservation in our business activities and the benefits achieved.

FY2017 assessment (Environmental conservation costs)

For environmental conservation costs, investments were about 9 billion yen, about 3 billion less than the previous fiscal year. Due to industrial waste processing costs and other cost reduction efforts, expenses were about 18 billion yen, which is about 1 billion yen less than the previous fiscal year.

Environmental conservation costs (100 million yen)

C -to-solution	Investment		Expenses		
Category	FY2016	FY2017	FY2016	FY2017	Major items
 Global environmental conservation costs (CO₂ reductions,etc.) 	8.5	3.4	1.9	0.7	SF ₆ gas collection
2. Local environmental conservation costs	109	87	46.8	44.0	
(1)Measuring/monitoring environmental impact	1.9	4.0	11.4		Radiation control and measurement, air quality concentration measurement, marine area surveys
(2)Pollution control(air pollution, water contamination, oil leakage, etc.)	106.8	82.5	27.6	23.4	Air pollution control measures, water contamination prevention measures
(3)Nature conservation	0	0	7.8	8.1	Revegetation
3. Costs to build a circular economy	3.4	1.2	140.5	134.7	
(1)Industrial waste processing, recycling	3.3	1.2	65.7	63.9	Industrial waste processing, PCB processing
(2)General waste processing, recycling	0	0	0.1	0.1	Paper recycling
(3)Radioactive waste processing	0	0	74.7	70.7	Low-level radioactive waste processing
(4)Green purchasing	0.1	0.1	0	0	Research-related work
4. Environmental management costs	0	0	1.1	0.8	Environmental reports
5. R&D costs	0.2	0.2	4.3	3.0	Load leveling, environmental conservation, energy savings and recycling, natural energy
6. Other costs	0	0	0.2	0.2	Research Laboratory repairs
Total	120.7	91.3	194.9	183.5	
Total capital investment during the period	2,324	2,954	_	_	
Operating expenses during period Note: Based on the Environmental Reporting Guidelines (FY2005 ve	-	-	24,499	25,185	

Note: Based on the Environmental Reporting Guidelines (FY2005 version) issued by the Ministry of the Environment. Depreciation is not calculated into expenses. Composite costs are tallied proportionally by one of three methods: (1)calculation of differences; (2) proportional division based on rational criteria; (3) proportional division based on criteria of expediency. Costs involved in generating nuclear power are calculated with the sum of individual measures to protect the environment taken as environmental conservation costs (radiation control and measurement, low-level radioactive waste processing, etc.). Figures may not add up due to rounding off.

Environmental accounting (KEPCO 2)

FY2017 assessment (Effects of environmental conservation)

We improved the CO₂ emission intensity over the previous fiscal year. In addition to the increased utilization ratios of nuclear power and hydroelectric power compared to the previous fiscal year, this result was due to the increased utilization rate of high-efficiency natural gas power generation equipment at the Himeji No.2 Power Station as well as the increased use of renewable energy using a feed-in tariff system and other efforts for carbon reduction.

Moreover, the SOx and NOx emission intensities improved over the previous fiscal year as a result of the the suitable use of sulfur scrubbers and nitrogen scrubbers, and other efforts.

Effects of environmental conservation

Category	Item (unit)		FY2016	FY2017	Year-on-year change	
	CO ₂ emissions (before carbon credits)	(10,000t-CO ₂)	6,179	5,018	▲ 1,161	
1. Global environmental	CO_2 emissions intensity (before carbon credits)	(kg-CO ₂ /kWh)	0.509	0.435	▲ 0.07	
conservation	CO ₂ emissions (after carbon credits)	(10,000t-CO ₂)	5,989	4,822	▲ 1,167	
	CO ₂ emissions intensity (after carbon credits)	(kg-CO ₂ /kWh)	0.493	0.418	▲ 0.08	
	Air pollution control					
	SOx emissions	(t)	3,635	2,734	▲ 901	
2. Local	SOx emissions intensity	(g/kWh)	0.043	0.039	▲ 0.004	
environmental	NOx emissions	(t)	6,528	5,402	▲ 1,126	
conservation	NOx emissions intensity	(g/kWh)	0.077	0.077	0.000	
	Landscape integration					
	Revegetation area	(1,000 m ²)	3,425	3,341	▲ 84	
3. Building a	Industrial waste and other emissions	(1,000 t)	708	654	▲ 54	
circular economy	Recycling rate for industrial waste, etc	(%)	99.7	99.9	0.2	
	Low-level radioactive waste processing	(Rods)	-2,598	1,451	4,049	

Note: CO_2 emissions: including from power supplied by other companies; CO_2 emissions coefficient: by amount of power sold(after adjustment CO_2 emission factors include deductions that reflect CO_2 credits and other deductions, as well as environmental value

adjustments based on the purchasing system for surplus solar and the purchasing system for total amounts of renewable); SOx and NOx emissions: only KEPCOgenerated power; SOx and NOx emissions coe cient: by amount of power generated by KEPCO thermal power plants

Environmental accounting (KEPCO 3)

FY2017 assessment (Economic benefits from environmental conservation measures)

Economic benefits increased approximately 1.7 billion yen from the previous year due to a reduction in results from efforts that lead to cost savings.

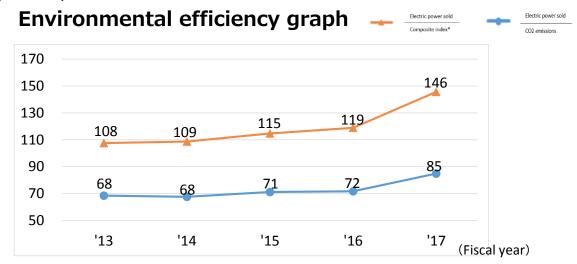
Economic benefits from environmental conservation measures (100 million yen)

Category		FY2016	FY2017	Major Items
Revenue	Operating revenues from	23.2	39.9	Gain on sale of disused articles(recycling)
Revenue	recycling, etc.	23.2	55.5	
Cost	Cost savings from reuse and	0.11 0.11		Cost savings from the purchase of
savings	recycling, etc.			recycled items
Total		23.3	40.0	

Environmental efficiency

Environmental efficiency (with FY1990 as the base year) is calculated to indicate the relationship between environmental load and economic value.

Environmental efficiency for fiscal 2017 include scores of 146 for electric power sold/composite index, which is an increase of 27 points from the previous fiscal year, and 85 for electric power sold/ CO_2 emissions, which is an increase of 13 points from the previous fiscal year. Main factors for this included reductions in CO_2 , SOx and NOx emissions intensities and a decrease in fuel consumption accompanying the resumption of nuclear power plant operation.



Note: LIME2 integration coefficients developed by the National Institute of Advanced Industrial Science and Technology have been used for calculations since fiscal 2007.

Environmental accounting (group companies)

Environmental accounting in group companies

Environmental accounting figures are totaled for group companies represented on the Group Environmental Management Committee in FY2017, composed of 15 companies.

Environmental conservation costs (million yen)

Category	Major Items	Inves	tment	Expenses	
Category			FY2017	FY2016	FY2017
Costs for pollution control	Air, water and soil pollution prevention	4.5	-	37.7	35.2
Costs for resource recycling	General and industrial waste processing and recycling	0	0.4	710.0	952.4
Costs for management activities	Environmental protection efforts, environmental education and related activities at business places and in their neighborhoods	0.1	0	217.7	147.4
Costs for community activities	Contributions to and support of environmental protection activities and environmental protection organizations outside the company	-	-	0.7	0.7
Costs for research and development	Research and development of products, for example, that contribute to environmental protection	-	-	3.0	6.4
Costs related to environmental damages	Natural restoration, damage compensation, etc.	-	-	0.3	0.3
Other costs		-	-	0.1	0.1
	Total	4.5	0.4	969.5	1,142.7

Environmental conservation effects (physical effects)

Category	Items (unit)	FY2016	FY2017
Clobal and local	CO_2 emissions (10,000 t- CO_2)	31	28
Global and local environmental conservation	SOx emissions (t)	0.4	0.3
	NOx emissions (t)	29	24
Environmental management	ISO or other external certifications(locations)*	56	95
Building a circular economy	Industrial waste emissions (1,000 t)	115	181

*Cumulative to end of fiscal year Economic benefits from environmental conservation effects (million ven)

Category	Major Items	FY2016	FY2017
Revenue	Business income from recycling	901.6	1210.0
Cost savings	Cost savings from re-use and recycling, etc.	0.2	0.1
	Total	901.8	1,210.1

OInitiatives contributing to the realization of a low-carbon society

Fiscal year	2014	2015	2016	2017
Total direct GHG emissions (Scope1)*1	4,571	4,180	3,949	3,284
Indirect greenhouse gas emissions from energy purchased and consumed (Scope2)*2	1.0	1.0	1.0	1.0
Other indirect greenhouse gas emission amounts*3 (related to scope 3, categories 4 and 5)	_	3.6	2.6	1.9

1 The direct greenhouse gas emission amounts (scope 1) are totals of direct greenhouse gas emissions (CO₂, SF₆ and N₂O from energy) reported (for the business) in accordance with the Warming Countermeasures Act and CO₂ emissions from vehicle fuel not included in this reporting.

2 The indirect greenhouse gas emission amounts (scope 2) are totals of CO₂ emissions from electricity and heat purchased from others among those reported (for the business) in accordance with the Warming Countermeasures Act as indirect CO_2 emissions.

3 For other indirect greenhouse gas emission amounts (scope 3, categories 4 and 5), contracted transportation amounts were extracted from the reporting (of the shippers) in accordance with the Warming Countermeasures Act. They were mainly calculated using the ton-kilometer method.

		Fiscal year	2013	2014	2015	2016	2017	Unit
CO ₂ emissions	s (before adju	stment) ^{**1}	7,325	7,141	6,487	6,179	5,018	10,000 t-CO ₂
CO ₂ emissions	s (after adjust	ment) ^{* 2}	7,251	7,029	6,331	5,989	4,822	10,000 t-CO ₂
CO ₂ emissions (by amount c	0.522	0.531	0.509	0.509	0.435	kg-CO ₂ /kWh		
	s coefficient (e of electric pow	end use)(after adjustment) rer sold) ^{≋3}	0.516	0.523	0.496	0.493	0.418	kg-CO ₂ /kWh
	Global CO ₂ e	missions ^{**4}	321	324	_	_	0.42	100 million t-CO ₂
	Japan's CO_2	emissions ^{* 5}	13.16	12.66	12.26	12.06	_	100 million t-CO ₂
	Electric power industry ^{*6}	CO ₂ emissions (before carbon credits,etc.)	4.94	4.70	4.44	4.32	—	100 million t-CO ₂
Reference		CO ₂ emissions (after carbon credits,etc.)	4.93	4.69	4.41	4.30	—	
		CO ₂ emissions (before carbon credits,etc.) (by amount of electric power sold)	0.567	0.553	0.534	0.518	_	
		CO ₂ emissions (after carbon credits,etc.) (by amount of electric power sold)	0.567	0.552	0.531	0.516	—	
Greenhouse	gases	N ₂ O (dinitrogen oxide) ^{**7}	2.6	2.9	2.7	2.8	2.8	10,000 t-CO ₂
other than C	02	SF_6 (sulfur hexafluoride) ^{$\%7$}	4.9	5.0	4.4	4.8	4.6	10,000 t-CO ₂
	Utilization rate of nuclear power facilities ^{**8}			0.0	1.0	0.0	18.0	%
Net thermal efficiency of thermal power facilities ^{**9}			44.6	46.5	46.6	47.6	48.3	%
Total energy	' use ^{**10}		765,923	760,782	701,315	675,113	554,793	1,000GJ

*1 The amount of CO₂ emissions is the amount produced from consumption of fuel used for power generation by thermal power plants and includes that for power purchased from other companies.

After adjustment figures include deductions that reflect CO₂ credits as well as environmental value adjustments based on the purchasing system for surplus solar and the purchasing system for total amounts of renewable energy in the \overline{CO}_2 emissions amounts.

CO₂ emissions amount = CO₂ emissions amount(before adjustment) + feed-in tariff adjustment CO₂ emissions amount,etc.

CO2 emissions coefficient (end use) is the amount of CO₂ emissions per kWh of Kansai Electric Power Company electricity used.
 CO₂ emissions coefficient (end use) (before adjustment) = amount of CO₂ emissions (before adjustment) ÷ electricity sales volume
 CO₂ emissions coefficient (end use) (after adjustment) = amount of CO₂ emissions (after adjustment) ÷ electricity sales volume

34 Global Co₂ emissions: IEA "CO₂ Emissions From Fuel Combustion" 2015 Edition %5 Japan's CO₂ emissions: Source: Greenhouse Gas Inventory Office of Japan (Center for Global Environmental Research, National Institute for Environmental Studies) Resources and Energy Working Group of the Electric Power Council for a Low Carbon Society(ELCS). (Through fiscal 2014, the total of results of the Federation of Electrical Power Companies of Japan and volunteering PPS (power producer and supplier) companies are used. In fiscal 2015, the results of 39 companies that undertook business activities that fiscal year among member businesses of the ELCS are used.)

※7 Published in FY2010 results; figures are CO₂ equivalents

%8 Utilization rate of nuclear power facilities = amount of power generated \div (permitted output× calendar hours)×100

%9 Net thermal efficiency of thermal power facilities = (amount of power transmitted \times quantity of heat per kWh)

10 Figures reported to the government based on the Act on the Rational Use of Energy (Fossil fuel used, purchased electricity, purchased heat)

OInitiatives contributing to the realization of a low-carbon society

	Fiscal year	2013	2014	2015	2016	2017	Unit	
	Coal	3,890	4,034	3,871	4,163	4,288	1,000 t	
	Heavy oil	289	332	193	275	157	1,000 kL	
	Crude oil	6,044	4,240	3,366	1,358	345	1,000 kL	
	LNG	7,729	8,824	8,319	8,686	7,287	1,000 t	
Thermal fuel consumption	Wood pellets	19	17	18	18	16	1,000 kL (equivalent in heavy oil)	
	Other	0.2	0.1	0.6	460	361	1,000 kL (equivalent in heavy oil)	
Fuel for nuclear power (weight of pre-irradiat	—	—	61	—	37	tU		
Hydroelectric power s	•	10	0	1,744	1500	500	kW	
Power distribution loss	s rate ^{×11}	5.1	5.4	5.2	5.5	5.5 4.4 %		
SF ₆ gas emissions		0.2	0.1	0.1	0.1	0.1	t	
• (Repe	 (Repeated) Upon inspection 		0.1	0.1	0.1	0	t	
• (Repe	eated) Upon removal	0	0	0	0	0.1	t	
SF ₆ collection rate								
	nspection	99.1	98.8	99.1	99.3	99.6	%	
●Upon r	emoval	99.4	99.5	99.1	99.6	99.3	%	
Making efforts for renewable energy	each year	6,490	36,500	31,464	9,080	500		
development	Cumulative total ^{*12}	30,390		98,354	107,434	107,934	kW	
	power generation	11,204	11,662	11,000	11,000	11,000		
	ower generation	153	153	0	0	0		
•Fuel ce	ell batteries	0	0	0	0	0		
	Office electricity use ^{*13}	85	79	78	80	77	GWh	
Energy and	Everyday water use ^{**13}	473	461	424	454	452	1,000 m ³	
resource savings	Vehicle fuel costs	10.44	10.73	11.13	11.13	11.31	km/L	
(Office division)	Vehicle fuel use(gasoline)	2.7	2.6	2.3	2.2	2.1	1,000 kL	
	Vehicle fuel use(diesel)	0.5	0.5	0.3	0.3	0.3	1,000 kL	
	Copier paper use	873	839	908	961	809	t	
Low-pollution vehicle introduction rate ^{%14}		87.5	86.1	86.2	86.4	90.0	%	
CO ₂ emissions	Office electricity	4.4	4.2	3.9	3.9	3.3	10,000 t-CO ₂	
from office	Everyday water	0.01	0.01	0.01	0.01	0.01	10,000 t-CO ₂	
activities ^{** 1 5}	Vehicle fuel	0.7	0.7	0.6	0.6	0.6	10,000 t-CO ₂	

※11 Power distribution loss rate =[1-{(amount of power sold + amount of power at transformer substation) ÷ (generated and purchased electric power - amount of power at KEPCO power plants)}]×100

X12 Actual figures for FY2014 include equipment used by the company.

%13 The scope for calculation of office electricity use and everyday water use has been revised.

*14 Rate of introduction of low-pollution Vehicles = No. of low-pollution vehicles purchased ÷ Total no. of vehicles ×100

*15 CO₂ emissions from office activities = amount of electricity used ×CO₂ emissions coefficient after carbon credits, etc.

 CO_2 emissions from everyday water use = amount of everyday water used × emissions coefficient

 CO_2 emissions from vehicle use = amount of vehicle fuel used × coefficient by type of fuel

Source : Ministry of the Environment, Summary of Energy & Economic Statistics

$\bigcirc\ensuremath{\mathsf{Initiatives}}$ contributing to the realization of a recycling-oriented society

	Fiscal yea	ar	2013	2014	2015	2016	2017	Unit
Amount of in	ndustrial waste and other emis	sions	747.1	698.6	670.2	707.9	653.6	1,000 t
	(Repeated) Special c	ontrolled industrial waste	12.0	3.4	4.0	4.4	5.5	
● Soc	ot particles (Heavy/crude oil a	sh, coal ash,etc.)	477.1	474.3	443.8	480.6	438.3	
	dge (Desulfogypsum,wastewa	ater processing sludge,etc.)	156.9	143.2	141.9	141.1	130.3	
●Cine	ders		29.7	27.4	28.8	28.0	28.6	
	molition debris(Waste concrete	e utility poles,etc.)	19.3	21.0	23.8	18.3	16.5	
• Met	tal scraps		42.4	21.7	20.6	28.9	29.1	1,000 t
	ss/ceramic scraps(Thermal in: aps, etc.)	sulation scraps,insulator	2.7	2.5	2.2	2.6	1.8	
• Was	ste oil		3.4	2.4	2.2	2.4	2.2	
• Was	ste plastic		1.2	1.0	0.8	0.8	0.9	
● Oth	ier		14.5	5.1	6.0	5.4	6.0	
Amount of in	ndustrial waste for landfill disp	osal	1.3	1.2	0.9	1.8	0.9	1,000 t
	(Repeated) Total am cont	0.00	1.20	0.90	1.40	0.50		
	• Glass/ceramic scraps (Thermal insulation scraps,insulator scraps,etc.)				0.10	0.33	0.06	
●sluc	dge(Wastewater processing slu	udge,etc.)	0.73	0.74	0.47	0.34	0.19	1,000 t
	nolition debris		0.09	0.11	0.03	0.02	0.03	
● Cine	ders		0.0	0.0	0.0	0.0	0.0	
	ste plastic		0.23	0.07	0.09	0.07	0.05	
	tal scraps		0.10	0.05	0.10	0.55	0.19	
● Oth			0.06	0.13	0.14	0.52	0.42	
Industrial was	ste recycling rate ^{**1}		99.8	99.8	99.9	99.7	99.9	%
-		psum waste recycling rate $^{\times 1}$	100	100	100	100	100	%
	ration PCB industrial waste	Insulating oil	7.7	7.7	7.7	-	-	10,000kL
Amount proc (utility pole t		Transformer cases	20.6	22.7	about 24	-	-	10,000 units
Total net free	sh water consumption ^{**3}		7.10	6.76	6.86	6.25	5.35	1,000,000 m ³
River	water		0.42	0.40	0.36	0.29	0.36	1,000,000 m ³
Grour	Groundwater Total municipal water supplies Amount of industrial water used (for power generation)				0.00	0.00	0.00	1,000,000 m ³
Total					6.50	5.96	4.99	1,000,000 m ³
					4.53	4.30	3.85	1,000,000 m ³
	Amount of service wat	2.22	2.05	1.97	1.66	1.14	1,000,000 m ³	
Seawater (de	esalinated)		2.63	2.45	2.55	2.62	2.63	1,000,000 m ³

1 Industrial waste recycling rate = [(Industrial waste and other emissions - Amount of landfill disposal) \div (Industrial waste and other emissions)]100

2 Processing at pole-mounted transformer case recycling center was completed in July 2015.

X3 Excluding desalinated seawater

OPromotion of environmental protection in local communities

	Fiscal year	2013	2014	2015	2016	2017	Unit
SOx emissions ^{**1}		7,089	5,635	4,735	3,635		t
	KEPCO-generated power) ^{*2}	0.062	0.052	0.046	0.037	0.028	
SOx emissions intensity (by power generation)(for KEPC	0.077	0.059	0.055	0.043	0.039	g/kWh	
NOx emissions ^{**4}		10,013	8,221	7,397	6,528	5,402	t
NOx emissions intensity (for	0.087	0.076	0.072	0.067	0.055		
NOx emissions intensity (by power generation)(for KEPC	0.108	0.086	0.085	0.077	0.077	g/kWh	
Amount of limestone used		87	79	74	77	71	1,000 t
Amount of ammonia used		14	15	14	14	10	1,000 t
COD emissions ^{**7}		27	18	21	21	18	t
Revegetation	Thermal power plants	37	38	37	37	38	
rate ^{% 8}	Nuclear power plants	75	74	73	71	68	%
(end of fiscal year)	Electric power offices (substations)	28	28	28	28	28	
Rate of conversion to under (end of fiscal year)	19.5	17.1	17.3	17.2	17.3	%	
Rate of conversion to under (end of fiscal year)	rground distribution lines	10.1	10.1	10.2	10.2	10.3	%

 $\times 1$ This is calculated from amounts of sulfur in fuel as well as SOx concentrations in gas emissions (measured values) and gas emission volumes. (Some previous fiscal year amounts were calculated from the amount removed by desulfurization equipment.)

%2 SOx emissions intensity (for KEPCO-generated power) = SOx emissions amount + power generated amount (for KEPCO-generated power)

*3 SOx emissions intensity (by volume of power from thermal power generation (for KEPCO-generated power)) = SOx emissions amount÷volume of power from thermal power generation (for KEPCO-generated power)

%4 This is calculated from Sox concentrations in gas emissions (measured values) and gas emission volumes.
%5 NOx emissions intensity (for KEPCO-generated power) = NOx emissions amount ÷power generated amount

(for KEPCO-generated power)

*6 NOx emissions intensity (by volume of power from thermal power generation (for KEPCO-generated power)) = NOx emissions amount÷volume of power from thermal power generation (for KEPCO-generated power)

%7 This is calculated from analyzed wastewater concentration values.

%8 Revegetation rate = (Business site revegetation area÷Business site total area)×100

4

OManagement of chemical substances (PRTR)

Name of targeted		En	nissions (t/yea	r)	
chemical substance	2013	2014	2015	2016	2017
2-aminoethanol	0	0	-	-	0
Asbestos (specified)	0	0	0	0	0
Ethylbenzene	6.0	6.2	12	11	3.8
Ferric chloride	0	0	0	0	0
Xylene	12	12	16	17	5.4
HCFC-225	3.6	-	0	-	-
Styrene	2.6	-	2	1.5	-
Dioxins (specified)	0.13	0.28	0.54	0.66	
	(mg-TEQ/year)	(mg-TEQ/year)	(mg-TEQ/year)	(mg-TEQ/year)	(mg-TEQ/year)
1,2,4-trimethylbenzene	_	_	0	0	1.9
Toluene	14	12	11	7.2	5.9
Hydrazine	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
n-Hexane	8.3	5.9	4.6	0.6	-
Benzenes (specified)	3.3	2.4	1.9	0.8	0.2
Boron compound	0	0	0	0	0
PCB	Ι	Ι	I	Ι	0
Methylnaphthalene	2.8	3.3	3.4	3.2	2.4
Methylenebis (4,1- phenylene) diisocyanate	_	_	_	_	_

Name of targeted		Amo	unt moved (t/y	/ear)	
chemical substance	2013	2014	2015	2016	2017
2-aminoethanol	5.6	8.9	-	-	4.1
Asbestos (specified)	2.7	5.1	3.4	1.3	4.7
Ethylbenzene	0	0	0	0	0
Ferric chloride	0	3	0	0	0
Xylene	0	0	< 0.1	0	0
HCFC-225	0	_	2.2	-	-
Styrene	0	_	0	0	-
Dioxins (specified)	0.0016	0.0050	0.000079	0.04	1.4
Dioxins (specified)	(mg-TEQ/year)	(mg-TEQ/年)	(mg-TEQ/年)	(mg-TEQ/年)	(mg-TEQ/年)
1,2,4-trimethylbenzene	—	_	0	0	0
Toluene	0	0	0	0	0
Hydrazine	< 0.1	3.1	3	0.9	2.5
n-Hexane	0	0	0	0	-
Benzenes (specified)	0	0	0	0	0
Boron compound	1.1	6.7	7.3	6.3	8.4
РСВ	—	Ι	I	I	5.3
Methylnaphthalene	0	< 0.1	0	0	0
Methylenebis (4,1-					
phenylene) diisocyanate	_	_	_	-	_

Notes : \bullet The chart show total values reported in compliance with the PRTR Law

• "0" indicates no emissions or transfers at targeted business site

"<0.1"indicates less than 0.1 t/year emissions, etc.
" - " indicates no business sites targeted for totaling
Significant figures are displayed in two digits

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Environment-related data

ORadioactive substances, radioactive waste

	Fiscal	year	2013	2014	2015	2016	2017	Unit	
	Evaluated dose values	Mihama Nuclear Power Station	N.D.	N.D.	N.D.	< 0.001	N.D.		
	for the public in the vicinity of power plants	Takahama Nuclear Power Station	N.D.	< 0.001	< 0.001	N.D.	N.D.	$Millisieverts^{\times 1}$	
Gaseous	(inert gases)	Ohi Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.		
waste	Evaluated dose values	Mihama Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.		
	for the public in the vicinity of power plants	Takahama Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.	Millisieverts ^{** 1}	
	(iodine)	Ohi Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.		
	Evaluated dose values	Mihama Nuclear Power Station	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		
Liquid	for the public in the	Takahama Nuclear Power Station	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	Millisieverts ^{**1}	
waste	vicinity of power plants	Ohi Nuclear Power Station	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		
Radioactive	e gaseous	Mihama Nuclear Power Station	N.D.	N.D.	N.D.	2.7E+9	N.D.		
waste disch		Takahama Nuclear Power Station	N.D.	2.3E+08	2.5E+08	N.D.	N.D.	Becquerel ^{* 2}	
(inert gas)		Ohi Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.	.]	
Radioactive	e gaseous	Mihama Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.	Becquerel ^{** 2}	
waste disch	harged	Takahama Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.		
(iodine)		Ohi Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.		
Radioactive	e gaseous	Mihama Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.	Becquerel ^{∞2}	
waste disch	5	Takahama Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.		
(excluding	tritium)	Ohi Nuclear Power Station	N.D.	N.D.	N.D.	N.D.	N.D.		
Radioactive	e solid nuclear waste generat	ed (200-L drums) ^{*4}	12,372	15,756	14,318	13,750	15,863		
	Mihama Nuclear Power Stat	on	4,299	4,888	4,978	4,302	5,000	Equivalent	
	Takahama Nuclear Power St	ation	3,649	6,368	4,471	5,002	5,722	in drums	
	Ohi Nuclear Power Station	-	4,424	4,500	4,869	4,446	5,141		
Radioactive	e solid nuclear waste shrinkag		13,972	18,082	20,298	16,348	14,412		
	Mihama Nuclear Power Stat	· · · · · · · · · · · · · · · · · · ·	4,085	5,710	6,583	4,514	5,424	Equivalent	
	Takahama Nuclear Power St	ation	4,893	6,152	7,402	6,984	4,354	in drums	
	Ohi Nuclear Power Station		4,994	6,220	6,313	4,850	4,634		
	solid radioactive waste generative waste reduced (200-L		-1,600	-2,326	-5,980	-2,598	1,451	Equivalent	
	Mihama Nuclear Power Stat	214	-822	-1,605	-212	-424	in drums		
	Takahama Nuclear Power St	-1,244	216	-2,931	-1,982	1,368	in aranis		
	Ohi Nuclear Power Station		-570	-1,720	-1,444	-404	507		
	Radioactive solid nuclear waste cumulative amount stored			104,735	98,756	96,159	97,610		
(200-L dru		107,061		,			Equivalent		
	Mihama Nuclear Power Stat		28,313	27,491	25,887	25,675	25,251	in drums	
	Takahama Nuclear Power St	ation	46,616	46,832	43,901	41,919	43,287		
	Ohi Nuclear Power Station	·	32,132	30,412	28,968	28,565	29,072		

*1 Millisieverts (effective dose): unit indicating the degree of radiation's effect on the human body

*2 Becquerel: Unit of radioactivity (one becquerel is defined as one nucleus decaying per second, representing the rate at which radioactive material emits radiation)

*3 Notes 4-7 are for the storage status at power plants

*4 This is the amount of solid low-level radioactive waste produced in the fiscal year.

*5 This is the total of amount of solid waste with low-level radioactivity reduced through incineration, for example, and transported out of facilities in the fiscal year.

*6 This is the net increase of solid waste with low-level radioactivity calculated by deducting the amount reduced from the amount generated in the fiscal year.

*7 Cumulative amount of low-level solid radioactive waste

*8 Totals might not match due to rounding after conversion to drum equivalent.

Environmental protection records at thermal power plants (1)

		Item		Sak Power	aiko Station	Tanagawa No. 2 Power Station	Nanko Power Station	Miyazu Energy Research Center	Kansai International Airport Energy Center	Maizuru Power Station
		Main fuel			L	Heavy/crude oil	L	Heavy/crude oil	Kerosene	Coal
		Amount emitted hourly	Air Pollution Control Law (total amount regulation)	8	34	-	98	306 ^{≋1}	13	515 ^{×1}
		(m3N/h)	Agreed value	-		-	-	112	-	255
			Actual value	-	-	Stopped	-	Stopped	-	187
	Sulfur oxide	Amount emitted daily	Agreed value	10	0.1	9.3	-	-	-	-
		(t/d)	Actual value	-		Stopped	-	Stopped	-	-
		Amount emitted annually	Agreed value	94	40	3,020	-	492×10 ³ m ³ N	-	1523×10 ³ m ³ N
		(t/y)	Actual value	-	-	Stopped	-	Stopped	-	829×10 ³ m ³ N
Air quality related		Amount emitted hourly	Air Pollution Control Law (total amount regulation)	6	25	-	255	-	-	-
related		(m3N/h)	Agreed value		-	-	-	58	-	244
	Nitrogen oxide		Actual value	5	50	Stopped	35	Stopped	-	218
		Amount emitted daily	Agreed value	7	.7	7.2	1.8	-	-	-
		(t/d)	Actual value	2.0		Stopped	1.3	-	-	-
		Amount emitted annually	Agreed value	1,4	420	2,100	400	$244 \times 10^3 m^3 N$	-	1457×10 ³ m ³ N
-		(t/y)	Actual value	59	9 0	Stopped	212	Stopped	-	1420×10 ³ m ³ N
			Air Pollution Control Law	0.	04	0.07	0.03	0.05	0.05	0.1
	Soot particles	Emission concentration (g/m3N)	Agreed value	0.	02	0.02	Not emitted	0.014	-	0.01
			Actual value	<0.	.002	Stopped	-	Stopped	-	0.005
	Water pollution laws and regulations		No.1 drain outlet 5.8 ⁻	No.2 drain outlet ~8.6	5.8~8.6	5.0~9.0 ^{**2}	5.0~9.0	-	5.0~9.0	
			Agreed value		-	5.8~8.6	-	5.8~8.6	5.8~8.6	5.8~8.6
			Actual value	7.9	7.5	Stopped	-	7	-	6.5~7.2
		Highest concentration	Water pollution laws and regulations	12	160	160	-	160	-	160
		(mg/L)	Agreed value		-	15	-	15	-	15
	Chemical oxygen		Actual value	2	2	Stopped	-	7	-	6
Water quality	demand	Pollution load amount	Water pollution laws and regulations	38	8.4	55	-	-	-	-
related		(kg/d)	Agreed value		-	14	-	20.8	-	22
			Actual value	28	3.2	Stopped	-	0.1	-	5
	Amount of suspended	Highest concentration	Water pollution laws and regulations		50	90	600 ^{×2}	200	-	200
	solids	(mg/L)	Agreed value		-	20	-	20	-	15
			Actual value	<	:5	Stopped	19	1	-	2
	Amount of inclusion of	Highest concentration	Water pollution laws and regulations		2	3	4 ^{**2}	5	-	5
	normal hexane extractable	(mg/L)	Agreed value		-	1	-	1	-	1
	substances		Actual value	<	:1	Stopped	<1	<0.5	-	<1

X1 Regulation in rules for the execution of ordinances to protect and nurture the environment of Kyoto Prefecture

2 Regulated value of Osaka City sewer ordinance execution rules

Environmental protection records at thermal power plants ⁽²⁾

		Item		Kainan Power Station	Gobo Power Station	Himeji No.1 Power Station 5,6U & GT1,2U	Himeji No.2 Power Station	Aioi Power Station	Ako Power Station
		Main fuel		Heavy/crude oil	Heavy/crude oil	LNG	LNG	LNG/ Heavy/crude oil	Heavy/crude oil
		Amount emitted hourly	Air Pollution Control Law (total amount regulation)	646	6,510 ^{≋3}	126	582	2,757 ^{**3}	2,158 ^{₩3}
	Sulfur oxide	(m3N/h)	Agreed value	310	184	-	-	165	180
			Actual value	91	130	-	-	44	50
		Amount emitted daily	Agreed value	-	-	-	-	-	-
		(t/d)	Actual value	-	-	-	-	-	-
		Amount emitted annually	Agreed value	1,760×10 ³ m ³ N	970×10 ³ m ³ N	-	-	885×10 ³ m ³ N	650×10 ³ m ³ N
		(t/y)	Actual value	55×10 ³ m ³ N	46×10 ³ m ³ N	-	-	14×10 ³ m ³ N	15×10 ³ m ³ N
Air quality		Amount emitted hourly	Air Pollution Control Law (total amount regulation)	-	-	-	-	-	-
related		(m3N/h)	Agreed value	370	110	123.5	463	85	94
	Nitrogen oxide		Actual value	44	75	55.0	105	69	66
		Amount emitted daily	Agreed value	-	-	-	-	-	-
·		(t/d)	Actual value	-	-	-	-	-	-
		Amount emitted annually	Agreed value	1,970×10 ³ m ³ N	560×10 ³ m ³ N	701×10 ³ m ³ N	2,263×10 ³ m ³ N	390×10 ³ m ³ N	340×10 ³ m ³ N
		(t/y)	Actual value	23×10 ³ m ³ N	32×10 ³ m ³ N	178×10 ³ m ³ N	478×10 ³ m ³ N	80×10 ³ m ³ N	35×10 ³ m ³ N
			Air Pollution Control Law	0.07	0.07	0.05	0.05	0.07	0.05
	Soot particles	Emission concentration (g/m3N)	Agreed value	0.02	0.01	-	-	0.015	0.015
			Actual value	0.001	0.005	-	-	0.003	0.003
	Hydrogen ion concentration index Water pollution laws and regulations Agreed value		5.0~9.0	-	5.0~9.0	5.0~9.0	5.0~9.0	5.0~9.0	
			Agreed value	5.8~8.6	5.8~8.6	5.8~8.6	5.8~8.6	5.8~8.6	5.8~8.6
			Actual value	6.0~8.0	6.3~7.9	6.7~7.6	7.1~7.8	6.7~7.3	6.5~7.9
		Highest concentration	Water pollution laws and regulations	10	-	70	70	70	70
		(mg/L)	Agreed value	10	10	15	15	15	15
	Chemical oxygen		Actual value	5	7	4	3	3	3
Water quality	demand	Pollution load amount	Water pollution laws and regulations	187.7	-	38.8	173.9	67.8	85.5
related		(kg/d)	Agreed value	50	36.8	15.2	35	18	22.4
			Actual value	7.9	11.4	3.5	11.5	2.3	4.6
	Amount of	Highest concentration	Water pollution laws and regulations	40	-	90	90	90	90
	suspended solids	(mg/L)	Agreed value	20	20	20	20	20	20
	301103		Actual value	6	3	1	2	2	<1
	Amount of inclusion of	Highest concentration	Water pollution laws and regulations	2	-	5	5	5	5
	normal hexane extractable	(mg/L)	Agreed value	2	1	1	1	1	1
	substances		Actual value	<0.1	0.2	<0.1	<0.1	0.4	<0.5

※3 Regulated K value