

CSR REPORT 2017

Corporate Social Responsibility Report 2017

Environmental Data

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About Environmental Data

• Editorial Policy

This Report discloses the detailed Environmental data which are not included in ADEKA Group CSR Report 2017.

• Period Covered by This Report

Fiscal 2016 (April 1, 2016 to March 31, 2017)
Some parts of this report refer to recent activities taking place in fiscal 2017.

* From January 1, 2016 to December 31, 2016 for overseas affiliated companies

• Scope Covered by This Report

This Report covers the whole ADEKA Group. Where necessary, "ADEKA Group" and "the Group" refer to the entire ADEKA Group, while "ADEKA" and "the Company" refer to ADEKA Corporation.

Domestic Affiliated Companies

- ADEKA CHEMICAL SUPPLY CORP.*
- ADEKA LIFE-CREATE CORP.*
- OXIRANE CHEMICAL CORP.*
- ADEKA CLEAN AID CORP.*
- ADEKA FINE FOODS CORP.*
- ADEKA ENGINEERING & CONSTRUCTION CORP.*
- ADEKA LOGISTICS CORP.*
- ADEKA FOODS SALES CORP.*
- YONGO CO., LTD.*
- UEHARA FOODS INDUSTRY CO., LTD.*
- TOKYO ENVIRONMENTAL MEASUREMENT CENTER CO., LTD.

Overseas Companies

- ADEKA FINE CHEMICAL (SHANGHAI) CO., LTD.*
- ADEKA FINE CHEMICAL (CHANGSHU) CO., LTD.*
- ADEKA FOODS (CHANGSHU) CO., LTD.*
- ADEKA FINE CHEMICAL TAIWAN CORP.*
- ADEKA KOREA CORP.*
- ADEKA FOODS (ASIA) SDN.BHD.*
- ADEKA (SINGAPORE) PTE.LTD.*
- ADEKA FINE CHEMICAL (THAILAND) CO.,LTD.*
- ADEKA PALMAROLE SAS*
- AMFINE CHEMICAL CORP.*
- ADEKA AL GHURAIR ADDITIVES LLC

■ Chemicals business ■ Food business ■ Other business ★ : Consolidated

Basic Environmental Policy

1. Strive to conserve resources and energy, recycle resources, and reduce the generation of waste, in order to prevent environmental pollution
2. Comply with domestic and foreign laws and regulations related to the environment, and at the same time strive to strengthen voluntary management and achieve further environmental conservation
3. Be aware that corporate activities are dependent upon the blessings produced through biodiversity, and seek to protect biodiversity
4. Take a proactive stance in procuring raw materials that impose a low burden on the environment, and contribute to the realization of a recycling-oriented society
5. Disclose the results of environmental conservation activities to society
6. Communicate with stakeholders and provide support to society and local communities in environmental conservation activities

Environmental Initiatives System

Under the policy set by Environmental Protection Division headed by an operating officer, an execution plan is established and formulated by each business office and environmental management activities, which meet the local communities' needs, are implemented through PDCA cycle.



Environmental Action Goals, Plans

ADEKA has established quantitative targets for important items related to environmental conservation, and we conduct our business activities toward achieving these targets.

(scope: ADEKA)

Self-evaluation: ● Exceeded target ○ In line with target △ Below target

Item	Targets for FY2016	Actual results for FY2016	Self-evaluation	Targets for FY2017
Promote energy conservation	•Reduce energy intensity by 1% or more year on year	•Energy intensity: 0.1794 kiloliters per tonne (2.8% reduction from previous year)	●	•Reduce energy intensity by 1% or more year on year
	•Reduce CO ₂ emissions by 1% or more year on year	•CO ₂ emissions: 0.406 t-CO ₂ /t (3.7% reduction from previous year)	●	•Reduce CO ₂ emissions by 1% or more year on year
Reduce industrial waste	•Maintain complete zero emissions* rate	•Maintained complete zero emissions* rate •Landfill disposal volume: 27.3 tonnes (0.064% of industrial waste generated)	○	•Promote and maintain zero emissions through recycling •Promote appropriate disposal of industrial waste (reviewing contracts, inspecting subcontractors, preventing resale of food waste, and other actions)
Promote green purchasing	•Achieve green purchasing rate of 80% or more for 43 designated stationery items	•79.5% (6,435 items out of 8,091 items purchased)	△	•Achieve green purchasing rate of 80% or more for 43 designated stationery items

* ADEKA defines "complete zero emissions" as landfill waste that amounts to less than 0.1% of the total volume of industrial waste output.

Environmental Accounting

ADEKA Group calculates and verifies costs required for environmental conservation and its effect in order to facilitate environmental management.

As tools to quantitatively assess the effects of environmental conservation activities, we have adopted "Environmental Accounting Guidelines 2005" and "Environmental Conservation Cost Category Handbook 2003" published by the Ministry of Environment, as well as "Environmental Accounting Guidelines for Chemical Companies" published by the Japan Chemical Industry Association. With these tools, we disclose environmental accounting information with a focus on reliability, comparability, and verifiability.

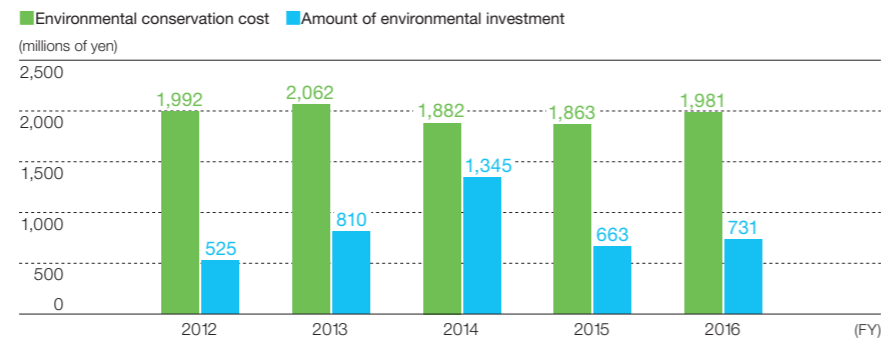
(Scope: ADEKA (production and R&D divisions), ADEKA Fine Foods Corp., Oxirane Chemical Corp., UEHARA FOODS INDUSTRY CO., LTD)

Environmental Conservation Costs

(millions of yen)

Category	Description of Main Initiatives	Cost of Environmental Initiatives	Amount of Investment
1. Business area cost	All environmental conservation activities aimed at limiting environmental impact	1,851	730
(1) Pollution prevention costs	Prevention of air, water, and soil pollution, and of noise, stench, and land subsidence	1,099	273
(2) Global environmental conservation costs	Preventing global warming (conserving energy), preventing damage to the ozone layer	345	332
(3) Resource recycling costs	Reducing and recycling resources, and minimizing the generation of waste material	407	125
2. Upstream/downstream cost	Green procurement, reducing the environmental burden imposed by containers and packaging, collecting and re-commercializing products	13	0
3. Administration cost	Environmental ISO, disclosure of environmental information, environmental impact monitoring, greening	79	1
4. R&D cost	R&D expenses for environmental conservation	31	0
5. Social activity cost	Greening and beautification of areas outside the offices and plants, donating and supporting environmental conservation organizations	4	0
6. Environmental remediation cost	Purification efforts to improve water quality and remove soil pollution, restoration of nature	3	0
Total		1,981	731

Cost of Environmental Initiatives and Amount Invested



Economic Effects with Environmental Conservation Measures

(millions of yen)

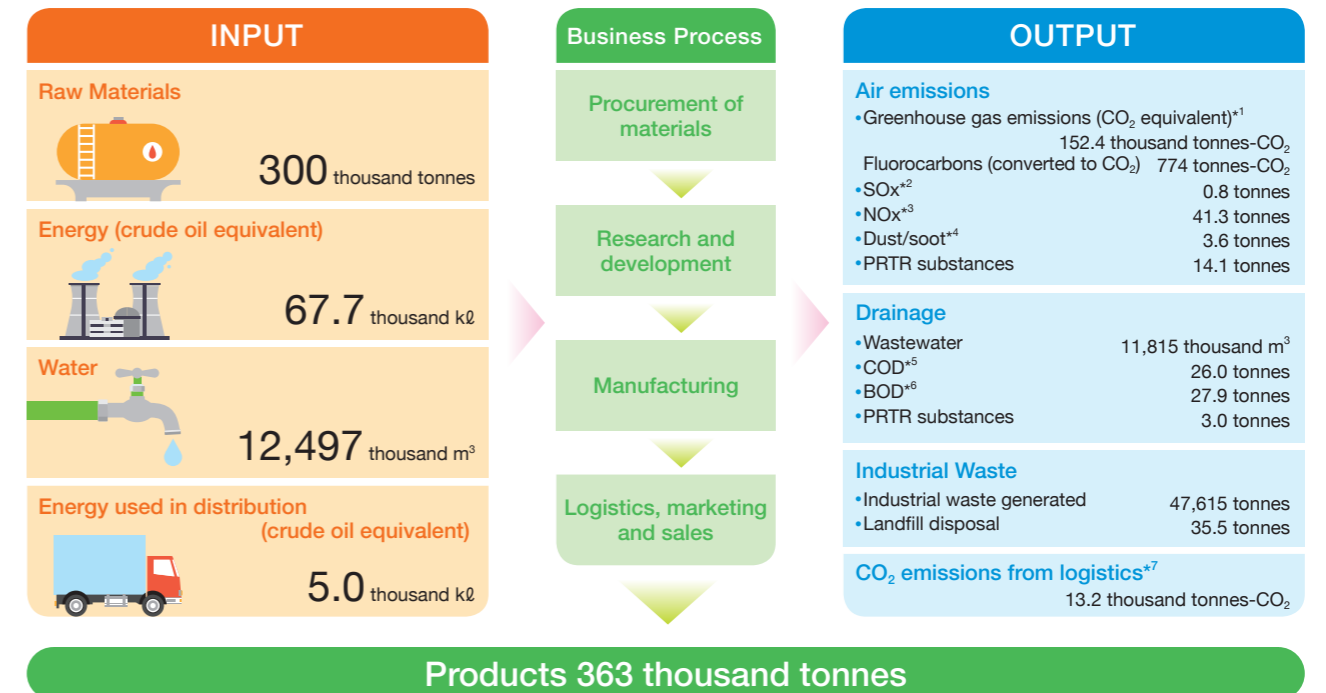
Details of effects	Amount (millions of yen)
Income earned by recycling, profits from the sale of valuable resources, etc.	150
Reduction in costs through introducing resources from the environment into business activities	163
Reduction in the burden imposed by business activities on the environment and costs related to the generation of waste material	67
Reduction in costs related to dealing with environmental damage	0
Reduction in distribution cost and other costs	72
Total	452

Environmental conservation effect

Environmental Performance Indicators	Value
Quantity of containers and packaging used Quantity of specific managed substances input	18,055 t
Quantity of products transported Circulation and usage of used products, containers, and packaging	446 t
Quantity of containers and packaging used	6,107 t
Quantity of products transported	135,247 thousand t·km

Environmental Initiatives System

(scope: ADEKA and 11 Group companies in Japan)

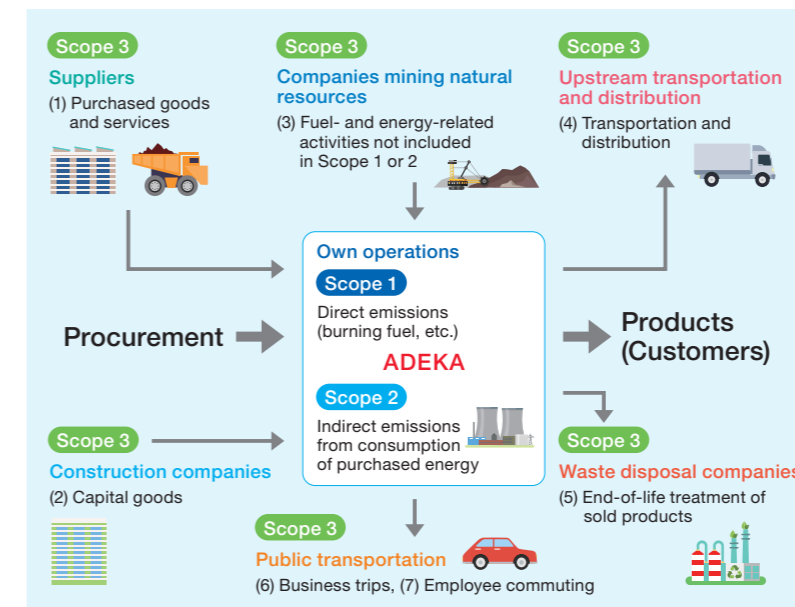


*1 Total emissions arising from energy sources, non-energy sources, and processes / *2 Sulfur oxides generated during the use of fuels that contain sulfur / *3 Nitrogen oxide generated during combustion in plant boilers and incinerators / *4 Fine particles generated during the combustion of fuels and other materials / *5 Amount of oxygen consumed during the oxidation of organic substances / *6 Amount of oxygen required during the mineralization and gasification of contaminants in river water and industrial wastewater by microorganisms / *7 Scope : ADEKA

Scope 3 Calculations

In fiscal 2016, ADEKA began calculating greenhouse gas emissions across its entire supply chain in accordance with the Scope 3 international standards for reporting emissions. ADEKA will promote reductions in greenhouse gases by visualizing CO₂ emissions along its supply chain, upstream to downstream.

Flow Chart of ADEKA's Scope 3 Emissions



CO₂ Emissions and Scope 3 Breakdown (scope: ADEKA)

(Unit: thousand tonnes-CO₂)

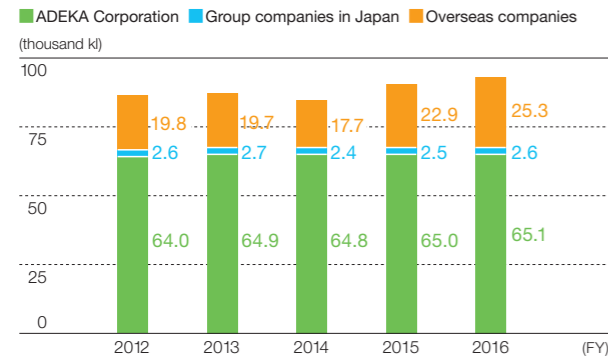
Scope category	Emissions	
Scope 1	60.9	
Scope 2	85.5	
Scope 3	767.4	
Category 1	Purchased goods and services	702.3
Category 2	Capital goods	26.9
Category 3	Fuel- and energy-related activities not included in Scope 1 or 2	12.0
Category 4	Transportation and distribution	13.2
Category 5	Waste generated by operations	12.2
Category 6	Business trips	0.2
Category 7	Employee commuting	0.6

Total: 913.8 thousand tonnes-CO₂

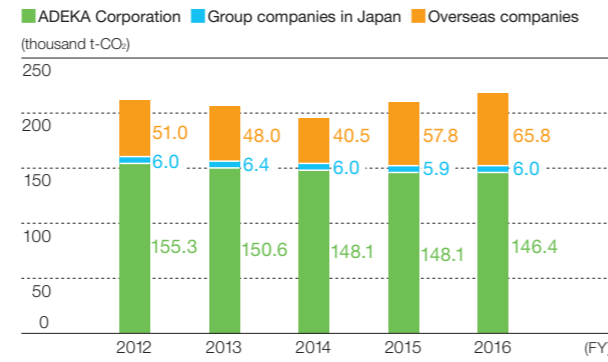
Prevention of Global Warming

Aiming for the realization of a sustainable society through its business activities, the ADEKA Group is striving to promote energy conservation by improving processes, implementing systematic reductions in bound energy consumed by the sustained heating of steam pipes and tanks, and cutting the consumption of all kinds of energy used during production

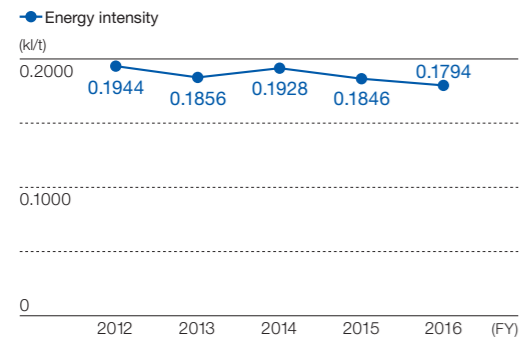
Energy Consumption by Crude Oil Equivalent



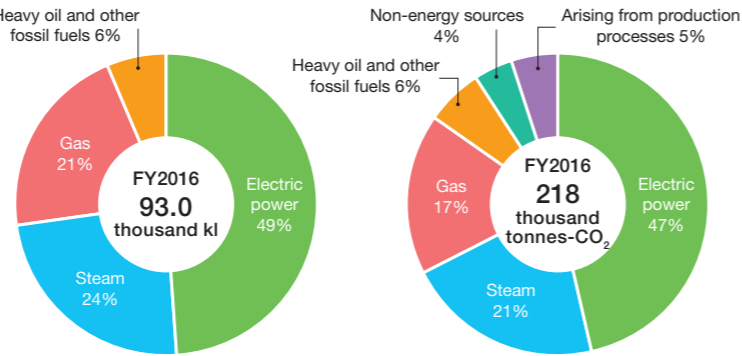
CO₂ Emissions



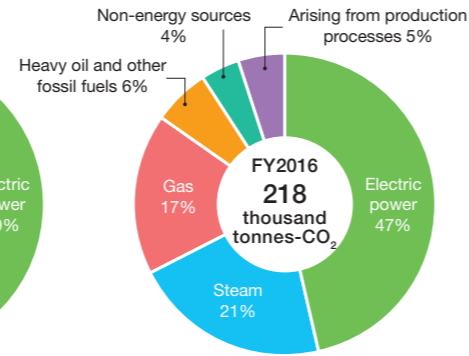
Energy Intensity Index from Manufacturing (ADEKA Corporation : production divisions)



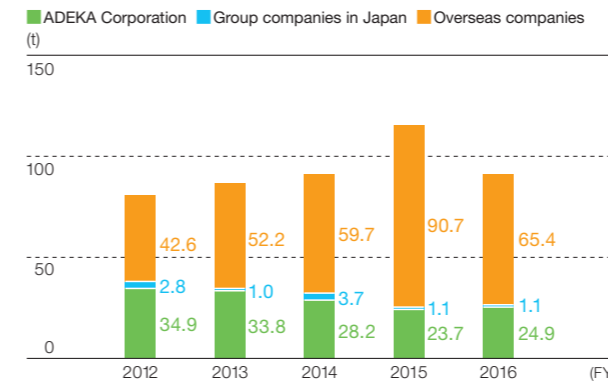
Breakdown of energy consumption



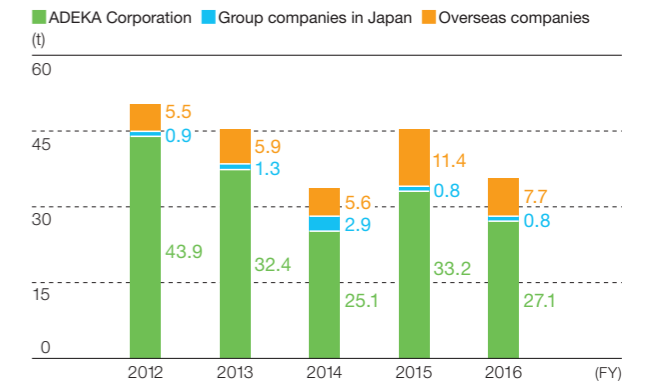
Breakdown of greenhouse gas emissions



Chemical Oxygen Demand Emissions



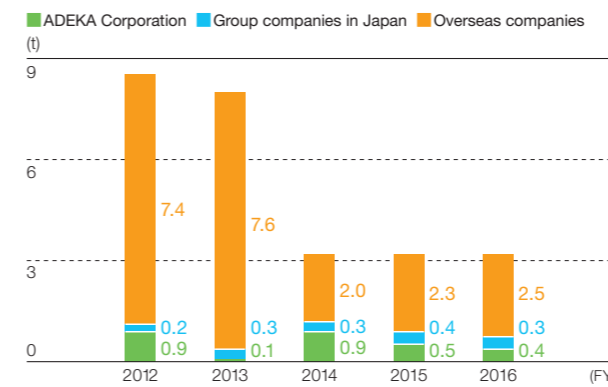
Biological Oxygen Demand Emissions



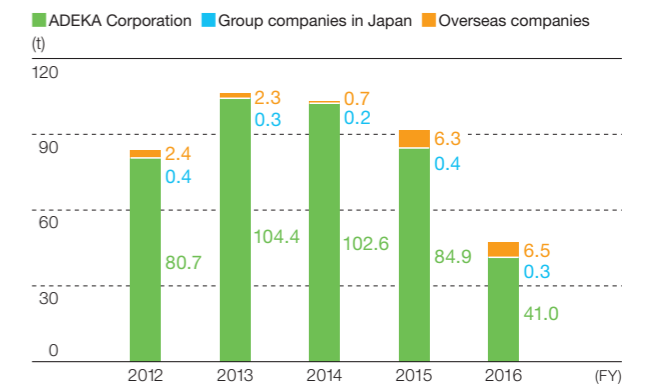
Prevention of Air Pollution

As part of environmental conservation measures put in place by our production and R&D divisions, the ADEKA Group strives constantly to prevent air pollution, and is committed to efforts to minimize the emissions of SO_x, NO_x, dust and soot into the air.

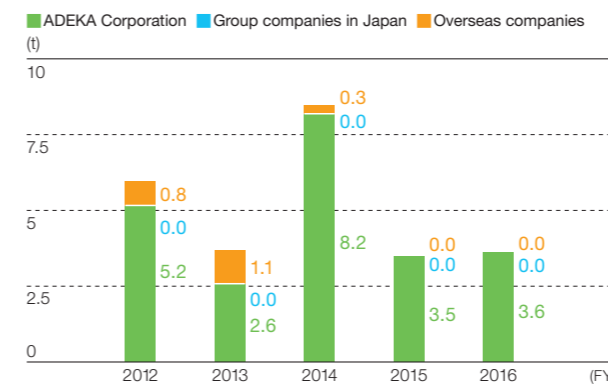
SO_x Emissions



NO_x Emissions



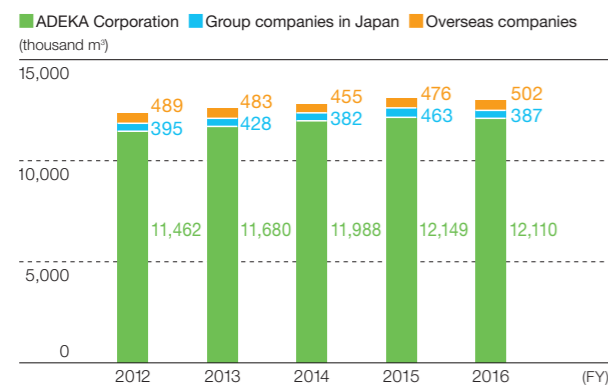
Soot/Dust Emissions



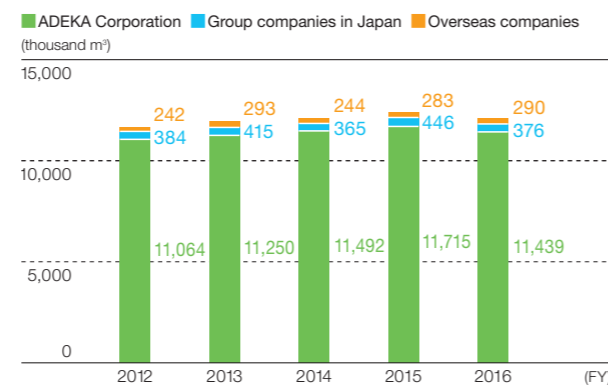
Prevention of Water Pollution

The ADEKA Group collects, recycles, and reuses wastewater from production processes, with the aims of preventing water pollution and the conservation of water resources, which are vital for a recycling-based society. The Group is also committed to reducing the environmental effects of wastewater, in accordance with various laws and regulations.

Usage of Water



Waste water Discharge



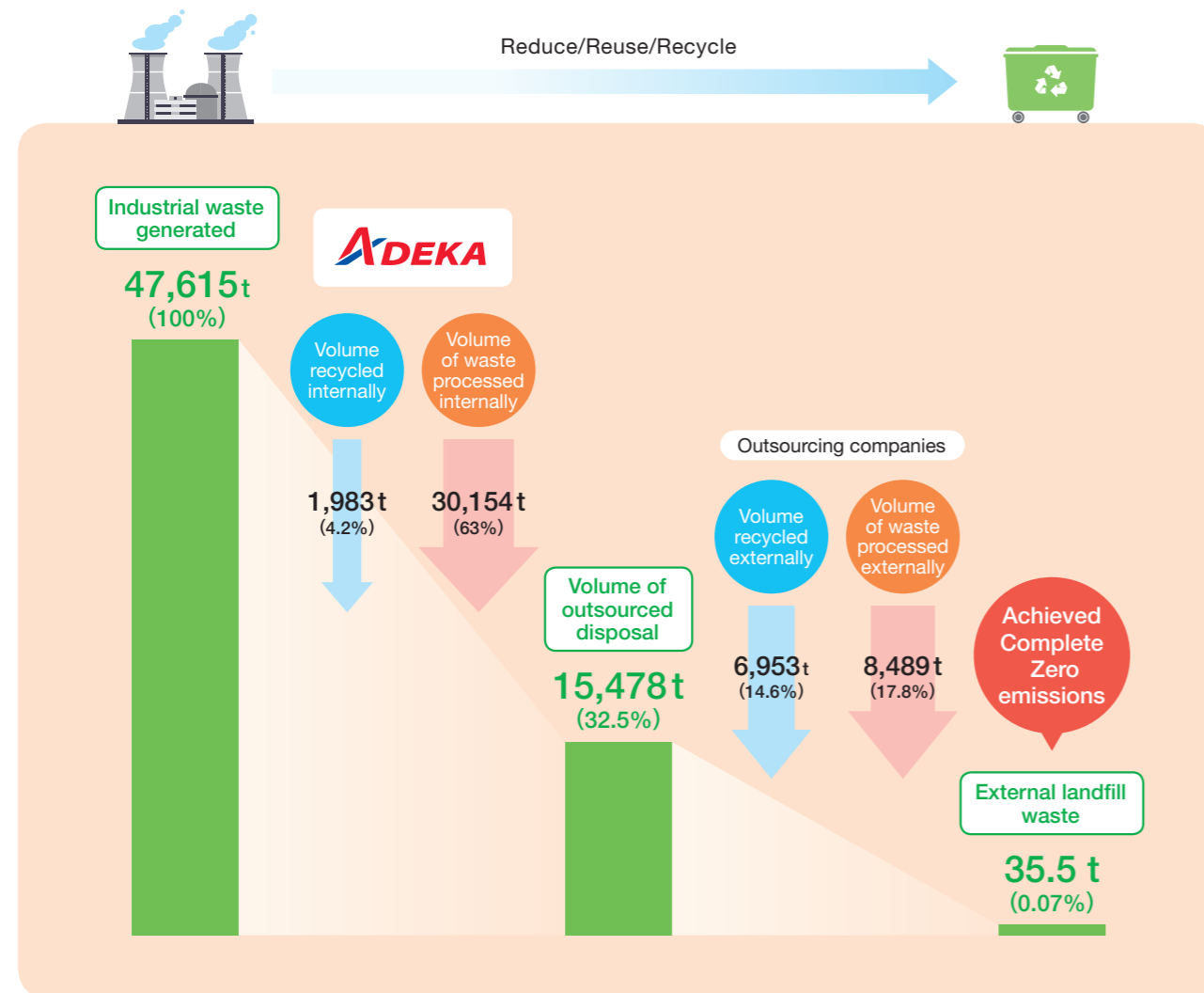
Reducing Industrial Waste

The ADEKA Group implements the 3R approach of “reduce, reuse, recycle” to reduce the amount of industrial waste discharged, and has achieved zero emissions since 2007.

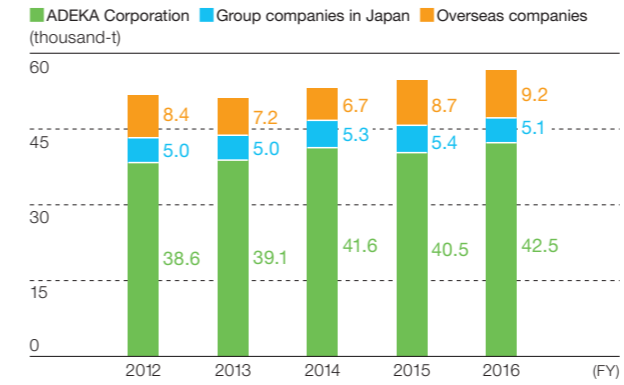
Production volume and the volume of industrial waste generated in FY2016 increased 3.0% and 3.8% year on year, respectively. The zero emissions rate was 0.07%, having achieved the complete zero emissions since last year.

(Scope: ADEKA and 11 Group companies in Japan)

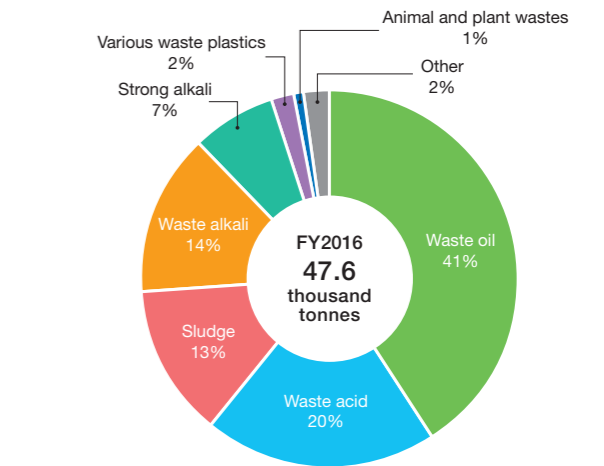
▶ The entire flow of recycling and disposal of waste (Within the brackets are the relative proportions of industrial waste)



Industrial waste generated

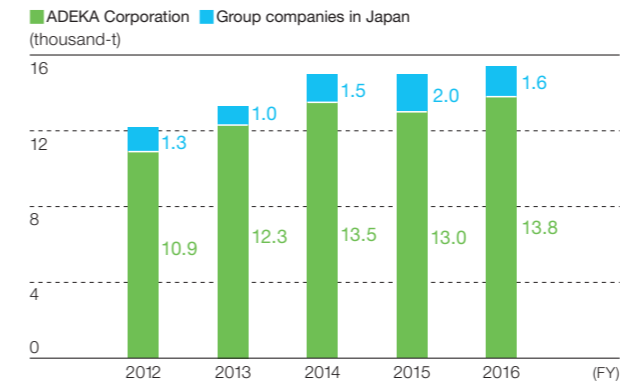


Breakdown of industrial waste*

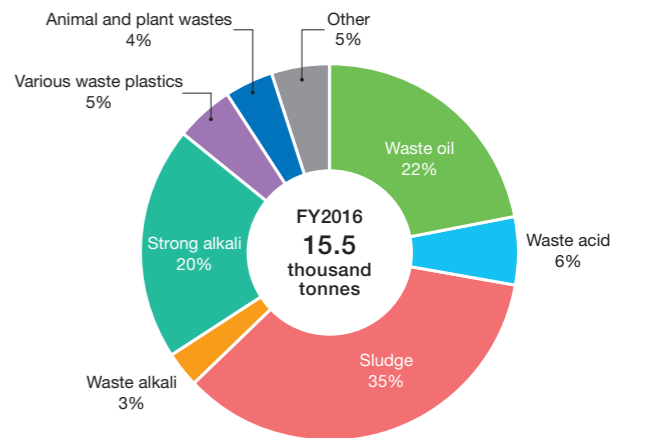


* ADEKA Corporation and group companies in Japan

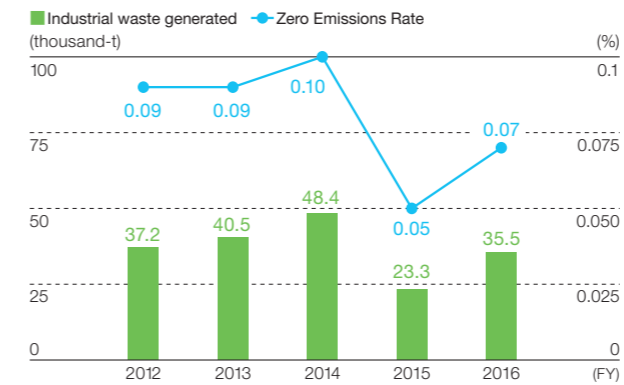
Outsourced Disposal of Industrial Waste



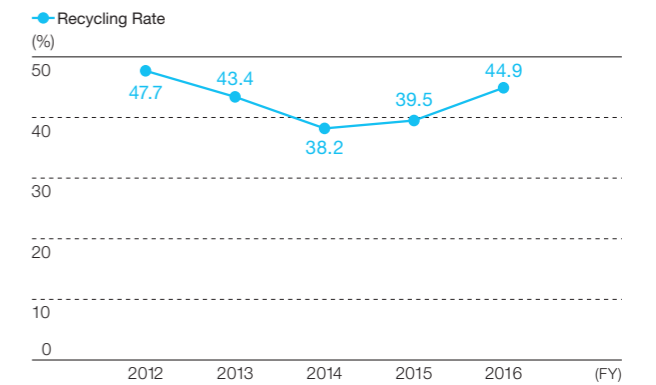
Breakdown of the total volume of waste treated by external contractors



Zero Emissions Rate for Landfill Disposal of Industrial Waste



Recycling Rate



Reducing Emissions of Chemical Substances

ADEKA Group began conducting studies on PRTR in fiscal 1997. We strive to ensure appropriate management by carrying out quantitative assessments of the quantity of target chemical substances used as well as the quantity generated through our production processes.

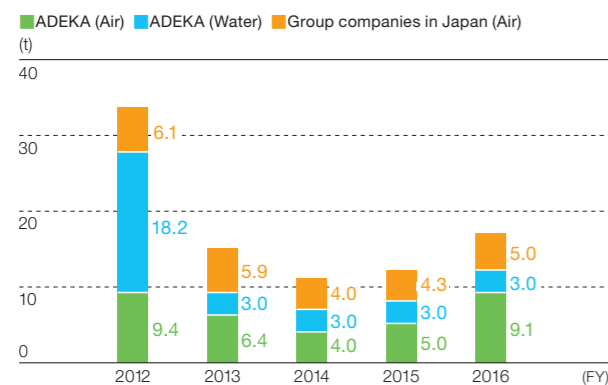
With the revision of the law for PRTR, the number of target substances in the fiscal 2011 report was 462. For fiscal 2016, we will report on 68 of these 462 substances.

(scope: ADEKA(production and research divisions), Oxirane Chemical Corp.)

(t)

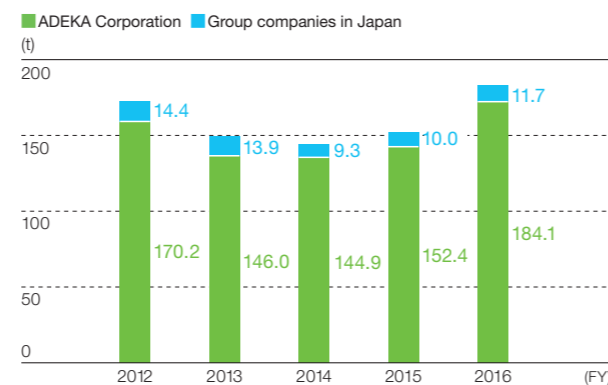
Substance	Discharge				Transfer	
	Air	Public Waters	Soil	Landfill Waste	Sewage	External Transfer
Ethylbenzene	0.0	0.0	0.0	0.0	0.0	15.0
Epichlorohydrin	0.1	0.0	0.0	0.0	0.0	0.0
Ferric chloride	0.0	0.0	0.0	0.0	0.0	2.4
Xylene	0.0	0.0	0.0	0.0	0.0	12.1
Chlorobenzene	0.4	0.0	0.0	0.0	0.0	20.0
Chloromethane	0.2	0.0	0.0	0.0	0.0	0.0
1,2-Dichloroethane	2.1	0.0	0.0	0.0	0.0	100.0
Dichloromethane	0.2	0.0	0.0	0.0	0.0	1.8
dibutylhydroxytoluene	0.0	0.0	0.0	0.0	0.0	1.1
N,N-dimethylformamide	0.0	0.0	0.0	0.0	0.0	0.0
Triethylamine	0.0	0.2	0.0	0.0	0.0	7.4
Toluene	3.6	0.0	0.0	0.0	0.0	9.7
Naphthalene	0.0	0.0	0.0	0.0	0.0	0.1
Carbon disulfide	3.3	0.0	0.0	0.0	0.0	0.0
Pyridine	0.0	0.0	0.0	0.0	0.0	1.4
N-hexane	3.8	0.0	0.0	0.0	0.0	14.3
Water-soluble salts of peroxodisulfuric acid	0.0	2.8	0.0	0.0	0.0	0.0
Boron compounds	0.0	0.0	0.0	0.0	0.0	0.1
Molybdenum and its compounds	0.0	0.0	0.0	0.0	0.0	1.1
TRIS(2-ETHYLHEXYL)	0.1	0.0	0.0	0.0	0.0	8.9
Sub-total (t)	13.8	3.0	0.0	0.0	0.0	195.6
Other substances (48 types) (t)	0.3	0.0	0.0	0.0	0.0	0.1
Total (t)	14.1	3.0	0.0	0.0	0.0	195.7

Discharge of PRTR Substances



* There are no emissions into the waters of group companies in Japan.

Transfer of PRTR Substances



Acquisition of Management System Certification

ISO 14001 (Environmental Management Systems)

Mie Plant (Dec. 1996)
 Kashima Plant, Kashima Plant-West (Mar. 1998)
 Fuji Plant (Apr. 2000)
 Chiba Plant (May 2000)
 Soma Plant (Aug. 2000)
 Akashi Plant (Mar. 2001)
 OXIRANE CHEMICAL CORP. (Mar. 2001)
 TOKYO ENVIRONMENTAL MEASUREMENT CENTER CO., LTD. (Feb. 2003)
 ADEKA KOREA CORP. (Jan. 2006)
 ADEKA FINE CHEMICAL (CHANGSHU) CO., LTD. (Jul. 2006)
 ADEKA FINE CHEMICAL TAIWAN CORP. (Feb. 2007)
 AMFINE CHEMICAL CORP. (Sep. 2007)
 ADEKA FINE CHEMICAL (SHANGHAI) CO., LTD. (Jan. 2009)
 ADEKA FOODS (CHANGSHU) CO., LTD. (Aug. 2009)
 ADEKA FINE CHEMICAL (THAILAND) CO.,LTD. (Jan. 2010)
 ADEKA PALMAROLE SAS (Aug. 2010)

OHSAS 18001 (Occupational Health and Safety Management Systems)

Mie Plant (Sep. 2000)
 Kashima Plant, Kashima Plant-West (Nov. 2002)
 Soma Plant (Dec. 2002)
 Akashi Plant (Mar. 2003)
 Chiba Plant (Oct. 2003)
 Fuji Plant (Dec. 2003)
 ADEKA FINE CHEMICAL TAIWAN CORP. (Jun. 2007)
 ADEKA FINE CHEMICAL (CHANGSHU) CO., LTD. (Jul. 2009)
 ADEKA FOODS (CHANGSHU) CO., LTD. (Aug. 2009)
 ADEKA KOREA CORP. (Apr. 2010)
 ADEKA PALMAROLE SAS (Dec. 2013)

ISO 22000 (Food Safety Management Systems)

ADEKA FOODS (CHANGSHU) CO., LTD. (Apr. 2007)
 ADEKA (SINGAPORE) PTE.LTD. (May 2009)

FSSC 22000 (Food Safety System Certification)

Kashima Plant-West (Dec. 2011)
 Kashima Plant (Dec. 2014)
 Akashi Plant (Mar. 2015)
 ADEKA FINE FOODS CORP. (Apr. 2016)
 ADEKA (SINGAPORE) PTE.LTD. (May 2016)
 ADEKA FOODS (CHANGSHU) CO.,LTD. (Sep. 2016)

HACCP (Hazard Analysis and Critical Control Point)

Kashima Plant (Mar. 2002)
 ADEKA (SINGAPORE) PTE.LTD. (Aug. 2004)
 ADEKA FOODS (ASIA)SDN.BHD. (Apr. 2015)

ISO 9001 (Quality Management Systems)

Mie Plant (Jun. 1993)
 Kashima Plant, Kashima Plant-West (Apr. 1996)
 Fuji Plant (Jan. 1997)
 Chiba Plant (Jul. 1997)
 ADEKA PALMAROLE SAS (Jul. 1997)
 OXIRANE CHEMICAL CORP. (Oct. 1997)
 Soma Plant (Aug.1998)
 ADEKA CLEAN AID CORP. (Oct. 1999)
 ADEKA KOREA CORP. (Jan.2001)
 AMFINE CHEMICAL CORP. (Oct.2001)
 ADEKA ENGINEERING & CONSTRUCTION CORP. (Mar. 2002)
 KUKDO CHEMICAL (KUNSHAN) CO., LTD. (Mar. 2004)
 ADEKA FINE CHEMICAL (SHANGHAI) CO., LTD. (May 2005)
 TOKYO ENVIRONMENTAL MEASUREMENT CENTER CO., LTD. (Aug. 2005)
 ADEKA FINE CHEMICAL (CHANGSHU) CO., LTD. (Oct. 2005)
 UEHARA FOODS INDUSTRY CO., LTD. (Nov. 2005)
 ADEKA (SINGAPORE) PTE. LTD. (Apr. 2006)
 FELDA IFFCO OIL PRODUCTS SDN.BHD. (Jun. 2006)
 ADEKA FINE CHEMICAL TAIWAN CORP. (Jul. 2006)
 ADEKA FINE CHEMICAL (THAILAND) CO.,LTD. (Dec. 2006)
 ADEKA AI GHURAIR ADDITIVES LLC (Aug. 2012)
 AM STABILIZERS CORP. (Mar. 2013)

IMS (Integrated Management System)

Soma Plant (Dec. 2004)
 Kashima Plant, Kashima Plant-West (Dec. 2008)
 Fuji Plant (Dec. 2009)
 Chiba Plant (Aug. 2011)

TPM (Received Total Productive Maintenance)

Chiba Plant: 1994 Excellence Award
 Mie Plant: 1995 Excellence Award
 OXIRANE CHEMICAL CORP.: 1995 Excellence Award
 Akashi Plant: 2004 Excellence Award
 Kashima Plant, Kashima Plant-West: 2007 Excellence Award
 —Special Award for TPM Achievement
 Chiba Plant: Award for TPM Excellence, Category A (2010)

ISO 14064-1(Standard concerning calculation, reporting, and verification of emissions and reduced amount of greenhouse gases)

ADEKA FINE CHEMICAL TAIWAN CORP. (Mar. 2013)

ISO 22301 (BCM: Business continuity management)

Head Office relevant departments and Soma Plant (Nov. 2013)