夢・化学-21
Chemistry Makes Our Dreams Come True.

Chemistry and chemical products play an extremely important role in many aspects of daily living. To raise the awareness and understanding of such chemical technology and products, the Japan Chemical Industry Association has established the "Dream Chemistry 21" Organizing Committee. The "Dream Chemistry 21" campaign aims at promoting the importance of chemical technology and the usefulness of chemical products, particularly by appealing to young people's interest in the wonders of chemistry, and at the same time, fostering internationally active chemists.

The typical activities include "Dream Chemistry 21" Summer Holiday Children's Chemical Experiment Show, "Dream Chemistry 21" Weekend Experiment Classroom, Nationwide Senior High School Chemistry Grand Prix Contest for the participation in International Chemistry Olympiad and Chemistry Experiment in the Classroom program.

Japan Chemical Industry Association

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Photos are provided by courtesy of the member companies of the Japan Chemical Industry Association.

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Chemical Industry of Japan 2007

Introduction

The chemical industry is frequently described as quite difficult to understand by people outside of the industry. The chemical industry has been defined as "the industry that manufactures various products from various raw materials for various purposes by using primarily chemical technologies. However, like steel, those which are categorized separately are excluded." (Mr. Yoshiro Tokuhisa, "Is There A Future for The Chemical Industry?" published by Nihon Keizai Shimbun Co.)

Viewed that way, the scope of the chemical industry changes depending on what is categorized separately from among manufacturing that primarily uses "chemical technologies." Although there are various opinions, the statistics on which major charts and tables of this brochure are based conform to the category "17 - Chemical Industry" of the Standard Industrial Classification for Japan (second classification). Its contents are described in detail on Page 5.

Even among published government statistics, the definition of the chemical industry could differ due to differences in the purposes for compilation and use by ministries and agencies. For example, in the trade statistics of the Ministry of Finance, synthetic rubbers, artificial fibers, and materials for photos and movies are excluded from the "Chemical Industry" category and radioactive elements are included because the ministry uses the unified classification under an international treaty.

Moreover, there are cases in which pharmaceuticals are not treated as chemical products. An example is the ranking data of the world's chemical companies on Page 10.

Meanwhile, there are opinions that the scope of the chemical industry is wider. In such a case, plastic products and rubber products are added to the "Chemical Industry." Total shipments of the former amounted to 25 trillion yen and the latter to 39 trillion yen in2005. At any rate, the chemical industry ranks second in manufacturing after transportation machinery.

** The statistics used in this brochure conform to the Standard Industrial Classification for Japan (second classification): "Chemical Industry."

Following are the figures for value-added, shipments and number of employees for different definitions of the chemical industry:

	Amount of value- added (unit: trillion yen)	Amount of shipment (unit: trillion yen)	Number of employees (unit: 10,000 persons)
Chemical industry in a broad sense: "Chemical"+plastics+rubber	17.0 (Ranks first 16.3%)	39 (Ranks second 13.2%)	90 (Ranks fourth 11.1%)
Chemical industry	11.2 (Ranks third 10.7%)	25 (Ranks third 8.5%)	34 (Ranks eighth 4.2%)
Chemical industry in a narrow sense:"Chemical" -pharmaceuticals	6.8	18	25
(Reference) Other industries	Transportation Machinery 15.1 Industrial Machinery 12.1	Transportation Machinery 54 Industrial Machinery 31	Foods 110 Industrial Machinery 98 Transportation Machinery 94

(Source)
Ministry of Economy, Trade and Industry [Census of Manufactures] [Basic Survey of Overseas Business Activities]

Ministry of Internal Affairs and Communications [Survey of Research and Development]

Ministry of Finance [Financial Statements Statistics of Corporations by Industry]

Ministry of Education, Culture, Sports, Science and Technology [Annual Report on the Promotion of Science and Technology]

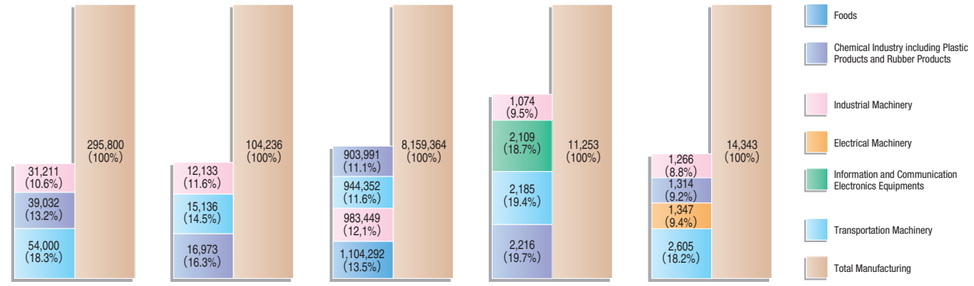
Ministry of Health, Labour and Welfare [Monthly Labor Survey]

Japan Productivity Center for Socio-Economic Development

Contents

Highlights:

Total shipments amount to approximately 39 trillion yen, which ranks second among all manufacturing industries. Total value- added amounts to approximately 17 trillion yen, which ranks first among all manufacturing industries. Chemical industry is an R&D-driven industry.



(Source)
Ministry of Economy, Trade and Industry [Census of Manufactures]

(Source)
Ministry of Internal Affairs and Communications [Survey of Research and Development]

(Source)
Ministry of Finance [Financial Statements Statistics of Corporations by Industry]

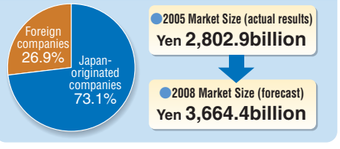
Exports by chemical industry continue to exceed imports.

Unit: US$1 million

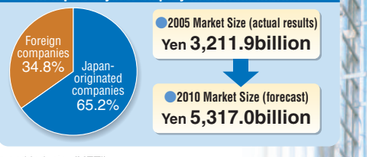
	2001	2002	2003	2004	2005
Export	30,816	33,385	39,104	48,306	53,007
Import	25,638	25,932	29,878	35,288	39,244
Difference	5,178	7,453	9,226	13,018	13,762

The Japanese chemical industry supports the manufacturing of electric appliances all over the world.

The market share of Japan-originated companies in semiconductor materials market



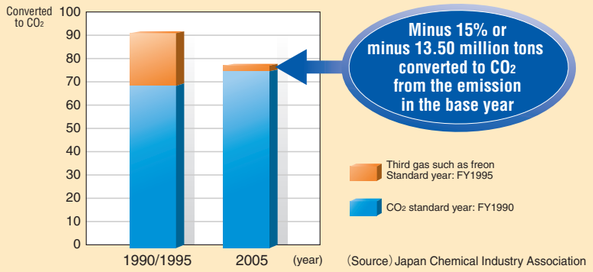
The market share of Japan-originated companies in liquid crystal display materials market



(Source) "2007 White Paper on Manufacturing" of Ministry of Economy, Trade and Industry (METI)
METI compiled the white paper based on "2006 Semiconductor Materials Data Book (Electronic Journal)" and "2006 Liquid Crystal-related Market - Current Situation and Future Prospect (Fuji Chimera Research Institute)".

Chemical Industry Is Actively Taking Steps to Preserve The Environment.

Grennhouse Gasses Emissions Under The Voluntary Action Plan of The Chemical Industry



(Source) Japan Chemical Industry Association

Chemical Industry and Technology and Social Needs

Chemical Industry Supports Our Living and Other Industries.

Raw Materials

- Water/air
- Salt
- Oil (Naphtha)
- Natural gas
- Coal
- Ore
- Animals and plants

Intermediates

- Hydrogen
- Nitrogen
- Oxygen
- Chlorine
- Carbonic acid gas
- Carbon oxide
- Inactive gas
- Caustic soda
- Soda ash
- Hydrochloric acid
- Nitric acid
- Sulfuric acid
- Phosphoric acid
- Methanol
- Ethanol
- Ethylene
- Propylene
- Butylenes
- Butadiene
- Benzene
- Toluene
- Xylene
- Styrene

Primary Products

- Pigments
- Dyes
- Surfactants
- Industrial gas
- Fertilizers
- Agricultural chemicals
- Printing ink
- Paints
- Petrochemicals
- Synthetic fiber
- Synthetic rubbers
- Plastics
- Cosmetics
- Tooth-powder
- Pharmaceuticals
- Solvents
- Fuel
- Sterilizer
- Bleach
- Adhesives
- Synthetic detergents
- Oil and fat products
- Photo-sensitive chemicals

Chemical Products, Technology and Activities That Meet The Needs of Various Fields

Housing
New materials to cope with "sick house" syndrome, Ultra light/ultra hard new materials, Fire retardant new materials, Heat-resist (heat accumulating) materials

Food
Plant breeding by biotechnology, Factorization of agriculture, Highly functional packaging film materials/systems, Super enzymes

Clothes
Allergy-free apparels, Waterproof and ventilation apparels, Form-memorizing apparels

Resources and Energy
Solar generation, Fuel cells, Use of biomass, High-level oil-chemicals technology

Environment
Green chemistry, Measures to cope with global warming, Water treatment/water production, Prevention ofatmospheric pollution (SOx, NOx, VOC, etc.), Biodegradable polymers,Measures to cope with environmental hormone issue

Transportation/ Telecommunication/ Electronics
Display materials (LCD, PDP, EL, etc.), Clean automobiles, Ultra lightweight automobiles, Cellular phone materials, Optical fiber

Medical Treatment/ Health
Biotechnology, Prevention of infection in hospitals, Genomic medicines

Nano Technology/ New Materials
Carbon nano-tube, Organic electroluminescence, CMP slurry

Information Disclosure
PRTR, Risk communications, MSDS

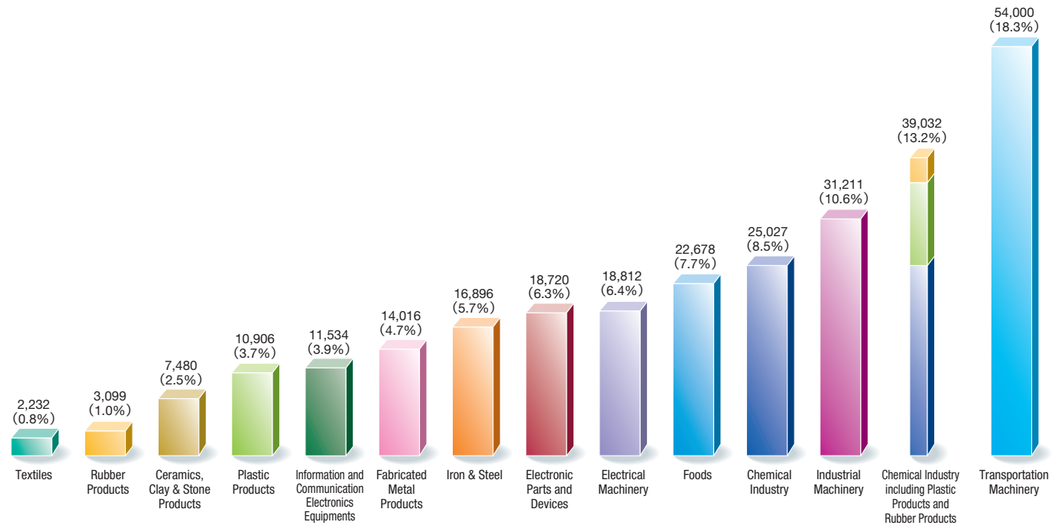
Global Activity
ICCA activity

1

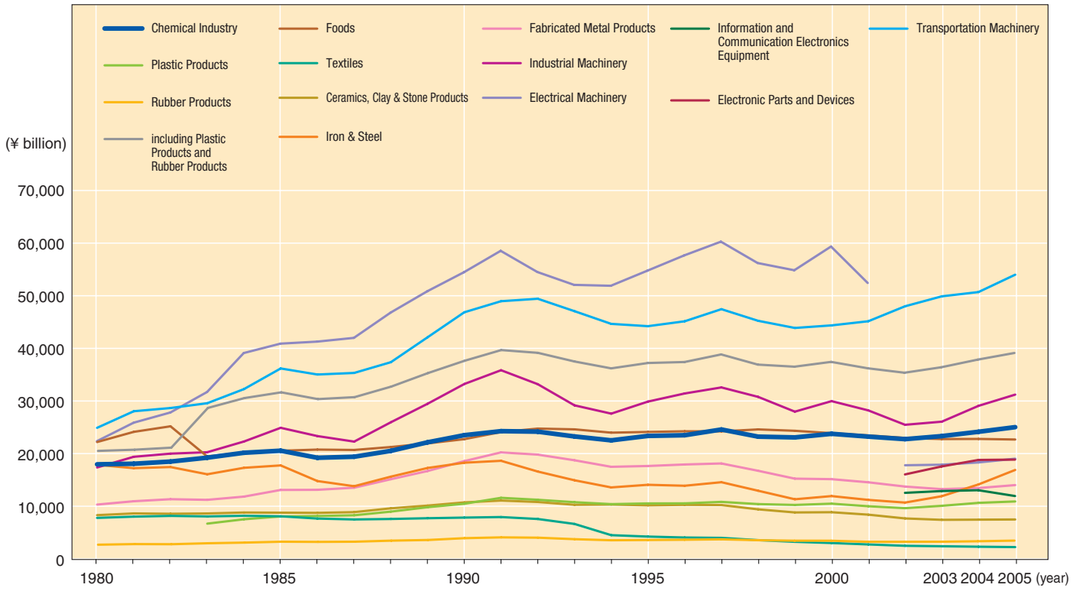
Total Production (Shipments) of Chemical Industry Amounts to Over Yen 25Trillion

Chemical industry's shipment value in 2005 amounted to 25 trillion yen,
accounting for 8.5% of entire manufacturing industry.

Shipment value of the chemical industry in the manufacturing industries in 2005 [¥ billion,%]



Trend in shipment value



Shipment value of the chemical industry in the manufacturing industries [¥ billion]

Year / Industry	Every 5th year					Recent three years			
	1980	1985	1990	1995	2000	2003	2004	2005	
Chemical Industry	17,961	20,552	23,503	23,363	23,762	23,327	24,149	25,027	8.5%
Plastic Products	— ※	8,052	10,466	10,530	10,486	10,079	10,636	10,906	3.7%
Rubber Products	2,464	3,008	3,656	3,275	3,107	2,898	2,982	3,099	1.0%
including PlasticProducts and Rubber Products	20,425	31,612	37,624	37,168	37,356	36,304	37,767	39,032	13.2%
Foods	22,196	20,542	22,748	24,117	23,888	22,762	22,789	22,678	7.7%
Textiles	7,781	8,087	7,838	4,230	3,008	2,394	2,305	2,232	0.8%
Ceramics, Clay & Stone Products	8,304	8,772	10,724	10,169	8,860	7,415	7,446	7,480	2.5%
Iron & Steel	17,864	17,754	18,269	14,073	11,927	11,903	14,141	16,896	5.7%
Fabricated Metal Products	10,311	13,094	18,574	17,646	15,143	13,243	13,454	14,016	4.7%
Industrial Machinery	17,361	24,190	33,225	29,884	29,972	26,068	29,074	31,211	10.6%
Electrical Machinery	22,160	40,842	54,529	54,831	59,449	17,890	18,120	18,812	6.4%
Information and Communication Electronics Equipments	—	—	—	—	—	12,712	12,622	11,534	3.9%
Electronic Parts and Devices	—	—	—	—	—	17,412	18,654	18,720	6.3%
Electrical Machinery including Information and Communication Electronics Equipment,Electronic Parts and Devices	22,160	40,842	54,529	54,831	59,449	48,014	49,396	49,067	16.6%
Transportation Machinery	24,897	36,179	46,858	44,215	44,367	49,887	50,700	54,000	18.3%
Others	60,825	64,246	72,984	69,697	66,509	55,745	56,895	59,189	20.0%
Total Manufacturing	212,124	265,321	323,373	306,030	300,478	273,734	283,967	295,800	100.0%

Electrical machinery was divided into electrical machinery, information and communication equipment, and electronic parts and devices in 2002.

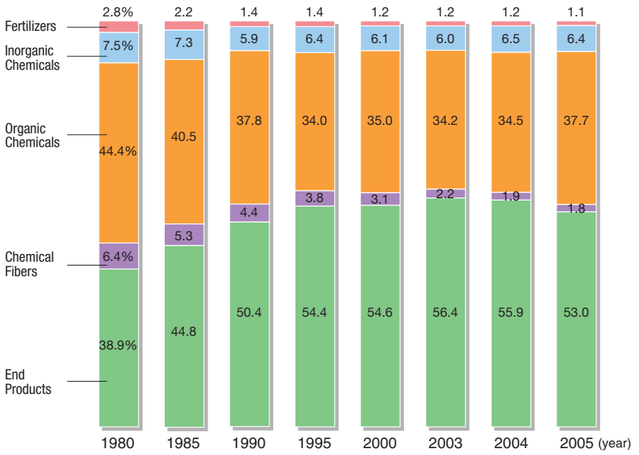
(Source) No data is available for plastic products before 1983.
(Note) Statistics of facilities with more than four employees

2

Chemical Products That Meet The Needs of Various Fields

Products that chemical industry produces are used as raw materials and intermediary products by other industries. At the same time, many end products include drugs & medicines, cosmetics, detergents, paints, film and other materials that help us enjoy a comfortable modern life.

Trend of shipment composition in chemical industry [%]



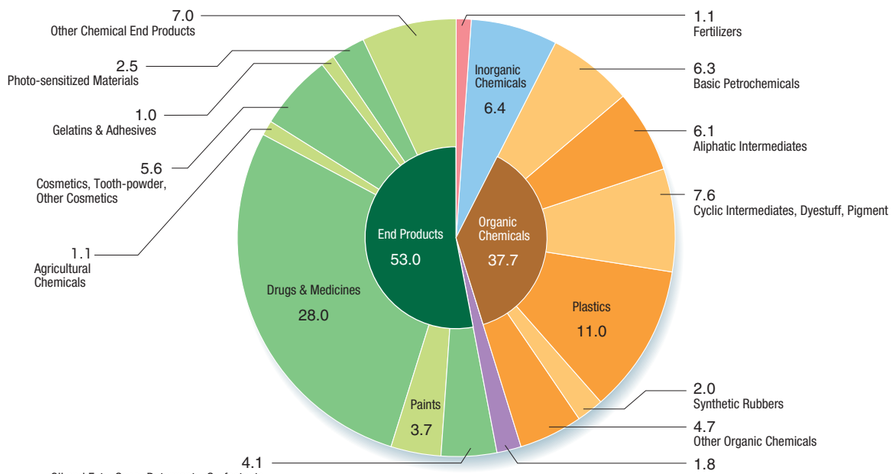
Trend of shipment composition in chemical industry [%]

Industry \ Year	Every 5th year					Recent three years		
	1980	1985	1990	1995	2000	2003	2004	2005
Fertilizers	2.8	2.2	1.4	1.4	1.2	1.2	1.2	1.1
Inorganic Chemicals	7.5	7.3	5.9	6.4	6.1	6.0	6.5	6.4
Organic Chemicals	44.4	40.5	37.8	34.0	35.0	34.2	34.5	37.7
▶ Basic Petrochemicals	10.9	6.2	5.1	2.6	2.9	4.1	5.0	6.3
▶ Aliphatic Intermediates	6.1	5.5	4.5	5.5	7.1	6.4	5.4	6.1
▶ Cyclic Intermediates, Dyestuff, Pigment	9.2	7.4	6.9	6.9	6.1	5.6	6.3	7.6
▶ Plastics	11.1	14.2	15.4	14.0	13.6	11.6	11.7	11.0
▶ Synthetic Rubbers	2.2	2.4	2.3	1.7	1.5	1.9	1.3	2.0
▶ Other Organic Chemicals	5.0	4.7	3.6	3.3	3.8	4.8	4.8	4.7
Chemical Fibers	6.4	5.3	4.4	3.8	3.1	2.2	1.9	1.8
End Products	38.9	44.8	50.4	54.4	54.6	56.4	55.9	53.0
▶ Oil and Fats, Soap, Detergents, Surfactants	3.5	3.8	4.1	4.0	3.5	4.3	4.2	4.1
▶ Paints	4.3	4.9	4.9	4.6	4.1	4.1	4.1	3.7
▶ Drugs & Medicines	16.1	18.6	21.9	25.7	27.0	30.2	29.9	28.0
▶ Agricultural Chemicals	2.0	2.2	1.6	1.6	1.4	1.2	1.1	1.1
▶ Cosmetics, Tooth-powder, Other Cosmetics	4.7	5.2	5.9	6.4	6.0	5.9	5.8	5.6
▶ Gelatins & Adhesives	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0
▶ Photo-sensitized Materials	2.7	3.6	4.1	4.6	4.4	3.3	3.4	2.5
▶ Other Chemical End Products	4.6	5.7	6.9	6.6	7.2	6.4	6.5	7.0
Chemical Industry	100	100	100	100	100	100	100	100.0
Chemical Industry	87.9	65.0	62.5	62.9	63.6	64.3	63.9	64.1
Plastic Products	— ※	25.5	27.8	28.3	28.1	27.8	28.2	27.9
Rubber Products	12.1	9.5	9.7	8.8	8.3	8.0	7.9	7.9
Chemical Industry including Plastic Products,etc.	100	100	100	100	100	100	100	100

http://www.meti.go.jp/statistics/index.html

(Source) Ministry of Economy, Trade and Industry [Census of Manufactures]
(Note) Statistics of facilities with more than four employees

Composition of chemical products shipped in 2005 [%]



The major chemical industry indices with breakdown by product in 2005

Industry \ Year					Compositon(%)			
	Number of establishments	Number of employees	Shipment (¥ billion)	Amount of value- added (¥ billion)	Number of establishments	Number of employees	Shipment	Amount of value- added
Fertilizers	158	4,632	269	90	3.2	1.4	1.1	0.8
Inorganic Chemicals	750	31,761	1,608	613	15.4	9.3	6.4	5.5
Organic Chemicals	689	77,734	9,435	3,067	14.1	22.7	37.7	27.4
▶ Basic Petrochemicals	11	3,133	1,580	318	0.2	0.9	6.3	2.8
▶ Aliphatic Intermediates	70	9,279	1,535	618	1.4	2.7	6.1	5.5
▶ Cyclic Intermediates, Dyestuff, Pigment	176	16,446	1,896	613	3.6	4.8	7.6	5.5
▶ Plastics	174	24,730	2,741	873	3.6	7.2	11.0	7.8
▶ Synthetic Rubbers	17	5,723	497	234	0.3	1.7	2.0	2.1
▶ Other Organic Chemicals	241	18,423	1,185	410	4.9	5.4	4.7	3.7
Chemical Fibers	57	8,966	454	157	1.2	2.6	1.8	1.4
End Products	3,228	219,388	13,262	7,247	66.1	64.1	53.0	64.9
▶ Oil and Fats, Soap, Detergents, Surfactants	293	15,346	1,032	554	6.0	4.5	4.1	5.0
▶ Paints	423	18,225	933	334	8.7	5.3	3.7	3.0
▶ Drugs & Medicines	910	93,094	7,001	4,378	18.6	27.2	28.0	39.2
▶ Agricultural Chemicals	76	4,670	279	97	1.6	1.4	1.1	0.9
▶ Cosmetics, Tooth-powder, Other Cosmetics	420	29,062	1,401	894	8.6	8.5	5.6	8.0
▶ Gelatins & Adhesives	157	5,310	246	90	3.2	1.6	1.0	0.8
▶ Photo-sensitized Materials	67	13,843	613	244	1.4	4.0	2.5	2.2
▶ Other Chemical End Products	882	39,838	1,756	656	18.1	11.6	7.0	5.9
Chemical Industry	4,882	342,481	25,027	11,173	100.0	100.0	100.0	100.0
Plastic Products	16,616	436,897	10,906	4,428				
Rubber Products	3,436	124,613	3,099	1,371				
Chemical Industry including Plastic Products,etc.	24,934	903,991	39,032	16,973				

http://www.meti.go.jp/statistics/index.html

(Source) Ministry of Economy, Trade and Industry [Census of Manufactures]
(Note) Statistics of facilities with more than four employees

3 Shipment by Prefecture

Chiba, Kanagawa and Osaka shipped more than yen 2 trillion each.

Shipment of chemical products by prefecture in 2005

Shipment of chemical products by prefecture in 2005

	Prefecture	Shipment (¥100million)	Increase/decrease from previous year(%)	Number of employees
1	Chiba	23,712	110.1	18,559
2	Kanagawa	23,464	107.7	27,495
3	Osaka	21,340	96.3	33,380
4	Yamaguchi	16,029	107.3	13,740
5	Saitama	13,860	100.9	20,456
6	Shizuoka	13,433	91.1	23,085
7	Hyogo	13,036	104.0	20,542
8	Ibaraki	12,237	100.6	12,303
9	Aichi	10,548	105.3	15,714
10	Okayama	10,280	108.9	9,845
11	Mie	9,219	107.9	11,604
12	Shiga	7,183	107.3	6,596
13	Tokyo	5,748	94.3	14,747
14	Tochigi	5,405	101.0	5,504
15	Toyama	5,378	107.9	10,844
16	Fukushima	5,269	93.3	8,231
17	Oita	4,771	117.9	2,181
18	Tokushima	4,709	109.5	8,004
19	Fukuoka	4,440	105.4	7,237
20	Gunma	4,391	107.9	6,271
21	Ehime	4,353	111.4	4,067
22	Niigata	4,034	108.6	6,654
23	Wakayama	3,551	100.1	4,507
24	Hiroshima	3,199	115.1	5,404

	Prefecture	Shipment (¥100million)	Increase/decrease from previous year(%)	Number of employees
25	Gifu	2,666	91.5	4,509
26	Fukui	2,502	104.1	3,863
27	Kyoto	1,840	94.2	5,353
28	Miyazaki	1,590	108.0	2,496
29	Yamagata	1,439	94.6	2,921
30	Hokkaido	1,363	102.0	3,510
31	Kumamoto	1,277	106.1	3,490
32	Ishikawa	1,203	113.0	1,473
33	Saga	1,041	98.9	1,665
34	Nagano	974	96.8	2,020
35	Kagawa	940	104.9	2,687
36	Miyagi	787	99.4	1,699
37	Nara	676	99.8	3,058
38	Yamanashi	664	130.3	1,302
39	Iwate	487	106.2	1,346
40	Aomori	317	98.6	535
41	Akita	314	81.2	1,034
42	Kagoshima	184	99.6	571
43	Shimane	153	117.9	460
44	Nagasaki	97	110.5	283
45	Okinawa	77	99.9	836
46	Kochi	70	181.5	298
47	Tottori	21	96.9	102
	Total	250,271	103.6	342,481

http://www.meti.go.jp/statistics/index.html

(Source) Ministry of Economy, Trade and Industry [Census of Manufactures]
(Note) Statistics of facilities with more than four employees

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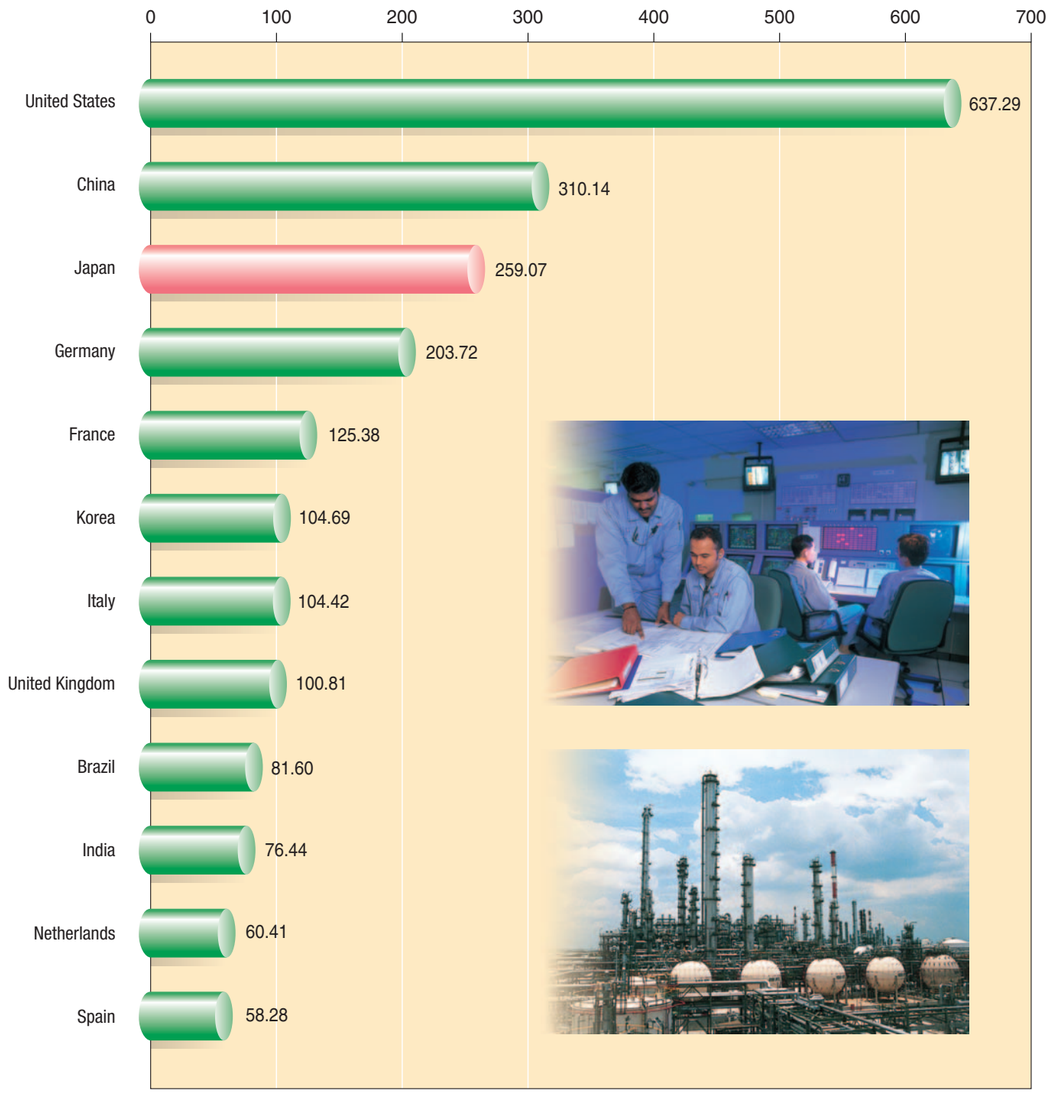
Japan's Chemical Industry, The World's Third Biggest in Shipments after The U.S.A, and China

Shipment of chemical products by country in 2006 [$ billion]



(Source) American Chemistry Council

The world's leading chemical companies in 2005

Ranking	Company	Chemical Sales [$ million]			Country	Chemical Operting Profits [$ million] (a)		
			Changes from 2004	Chemical Sales as of Total Sales			Changes from 2004	Operating Profit Margin
1	Dow Chemical	$46,307	15%	100%	U.S.	$5,413	57%	12%
2	BASF	43,682	14	82	Germany	5,107	17	12
3	Royal Dutch/Shell	34,996	19	11	U.K./Netherlands	1,219	31	4
4	Exxon Mobil (b)	31,186	12	12	U.S.	3,943	15	13
5	Total	27,794	11	16	France	1,679	24	6
6	DuPont (c)	25,330	−16	90	U.S.	na	—	—
7	China Petroleum & Chemical	21,121	25	21	China	1,746	−24	8
8	Bayer (d)	20,654	14	61	Germany	2,563	82	12
9	BP	20,627	−3	8	U.K.	−668	nm	def
10	SABIC	18,947	20	91	Saudi Arabia	8,213	57	43
11	Formosa Plastics (e)	18,747	19	59	Taiwan	2,392	−22	13
12	Lyondell Chemical (f)	18,606	212	100	U.S.	1,487	1,316	8
13	Mitsubishi Chemical	17,945	12	82	Japan	911	−17	5
14	Degussa	14,630	5	100	Germany	972	−8	7
15	Mitsui Chemicals	13,372	20	100	Japan	533	−27	4
16	Huntsman Corp.	12,962	13	100	U.S.	980	56	8
17	Ineos Group (g)	12,400	77	100	U.K.	na	—	—
18	Akzo Nobel	11,758	−1	73	Netherlands	867	−35	7
19	Sumitomo Chemical	11,458	18	81	Japan	674	26	6
20	Air liquide	11,388	6	88	France	1,951	10	17
21	Toray Industries	11,297	12	87	Japan	747	17	7
22	Chevron Phillips	10,707	16	100	U.S.	934	32	9
23	ICI	10,583	4	100	U.K.	1,002	15	10
24	Basell (h)	10,582	—	100	Netherlands	954	nm	9
25	Shin-etsu Chemical	10,244	17	100	Japan	1,683	22	16
26	DSM	10,202	6	100	Netherlands	1,006	65	10
27	Dainippon Ink & Chemicals	9,126	0	100	Japan	449	3	5
28	Lanxess	8,901	18	100	Germany	35	−62	0
29	BOC	8,385	19	100	U.K.	1,027	11	12
30	PPG Industries	7,964	9	78	U.S.	1,060	−1	13

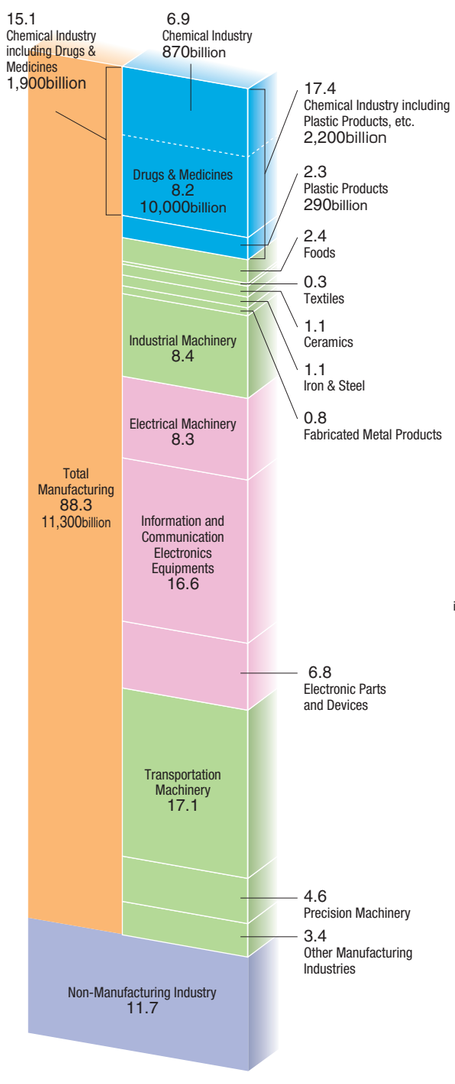
(Source) Chemical & Engineering News http://pubs.acs.org/cen/coverstory/84/pdf/8430globaltop50t1.pdf
(Note) Financial figures converted at the 2005 average exchange rates of $1.00 U.S. = 0.803 euros, 0.549 British pounds, 1.246 Swiss francs, 3.74 Saudi riyals, 110.11 Japanese yen, 32.131 Taiwanese dollars, 44.00 Indian rupees, 8.194 Chinese yuan, 6.361 South African rand, 6.441 Norwegian crowns, and 1.211 Canadian dollars.
(a) Operating profit is sales less administrative expenses and cost of sales.
(b) Profits and profitability ratios are after-tax.
(c) Sales include a significant amount of nonchemical products.
(d) Excludes lanxess.
(e) Includes group companies Formosa Plastics Corp., Nan Ya Plastics, Formosa Chemicals & Fibre, and Formosa Petrochemical.
(f) Reflects acquisition of Millennium Chemicals in december 2004 and integration of equistar joint venture.
(g) C&EN estimate.
(h) Shell/BASF joint venture became independent in 2005. def = deficit. na = not available. nm = not meaningful.
(Note) Drugs & medicines are excluded.

5

Yen 1,900 Billion Spent for Research And Development

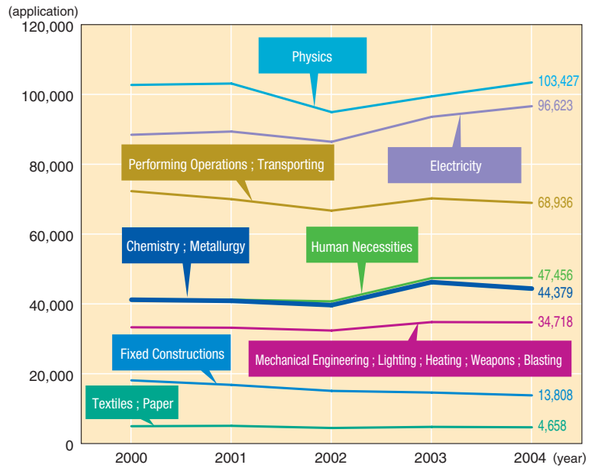
Research and development expenditures of chemical industry in FY 2005 (Apr.1, 2005-Mar.31, 2006) in Japan amounted to yen 1,900 billion, accounting for 15.1% of all industry R&D expenditures. The percentage of research expenditures to sales was 5.9%.

Ratio of R&D expenditures by industry in FY 2005 [%]



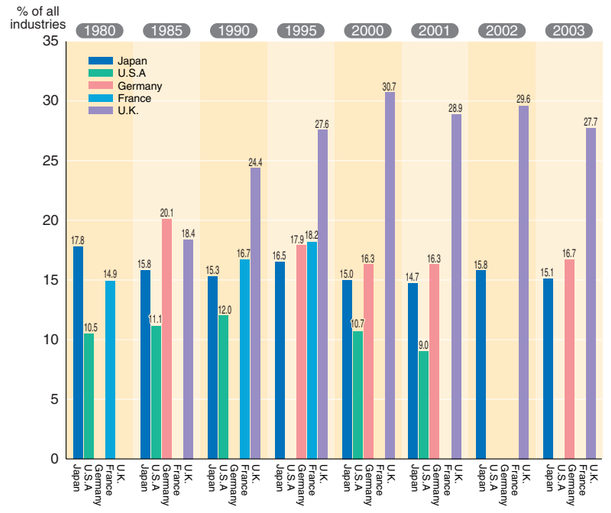
http://www.stat.go.jp/data/kagaku/2006/index.htm
(Source) Ministry of Internal Affairs and Communications
[Survey of Research and Development]

Trend of number of applications for patents by sector



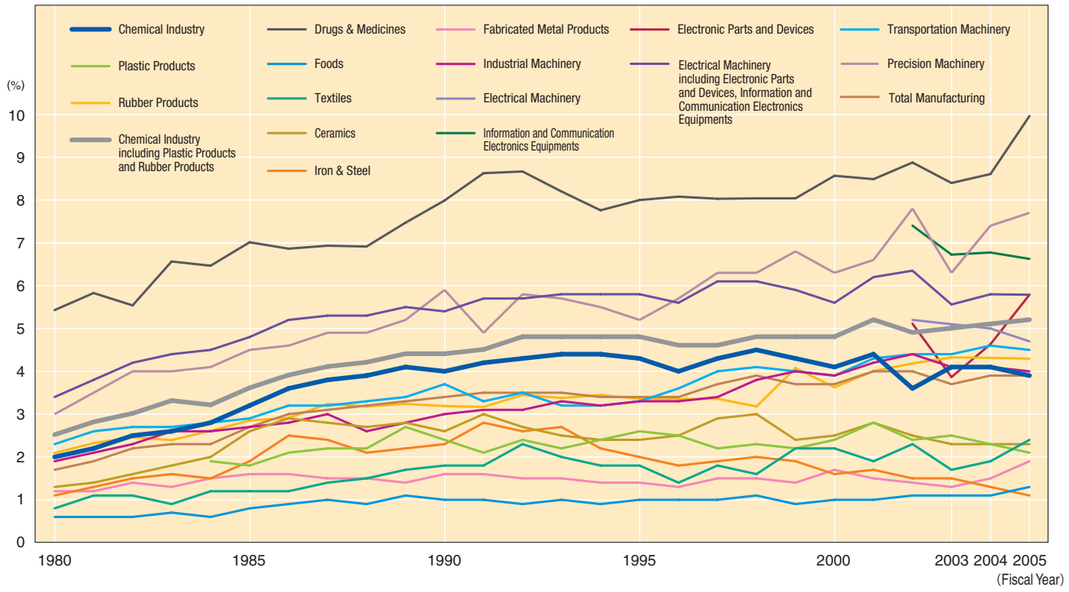
http://www.jpo.go.jp/shiryou/toushin/nenji/nenpou2006_index.htm
(Source) Japan Patent Office

Chemical industry R&D expenditures in major countries



(Source) Ministry of Education, Culture, Sports, Science and Technology
[Annual Report on the Promotion of Science and Technology]

Ratio of R&D expenditures to sales by industry



Ratio of R&D expenditures to sales by industry [%]

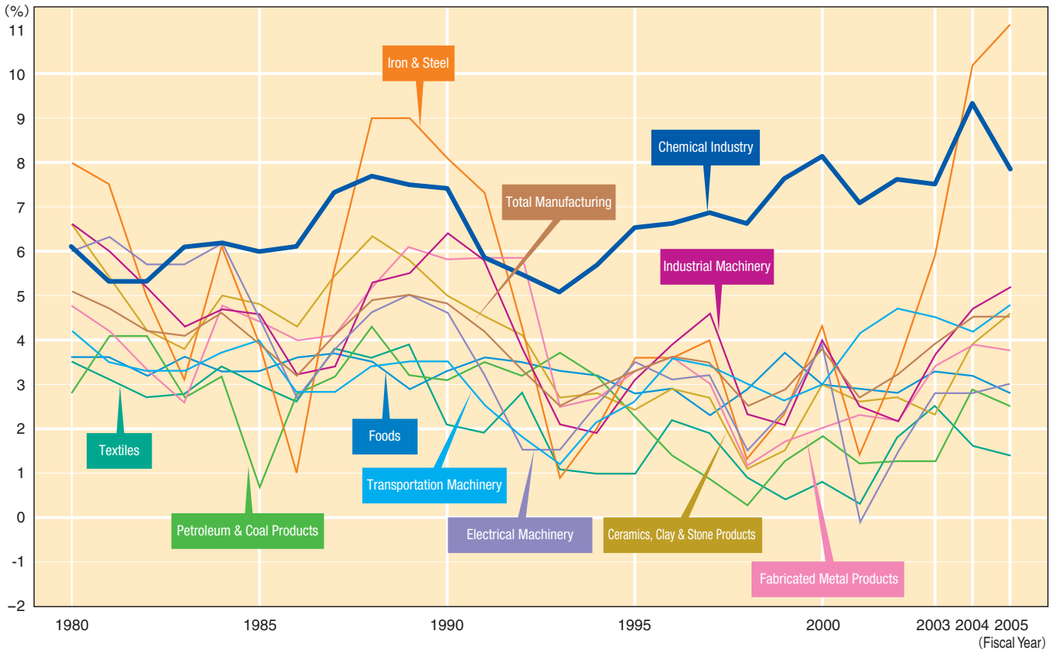
Year / Industry	Every 5th year					Recent three years		
	1980	1985	1990	1995	2000	2003	2004	2005
Chemical Industry	2.0	3.2	4.0	4.3	4.1	4.1	4.1	3.9
Drugs & Medicines	5.4	7.0	8.0	8.0	8.6	8.4	8.6	10.0
Plastic Products	—	1.8	2.4	2.6	2.4	2.5	2.3	2.1
Rubber Products	2.1	2.9	3.2	3.4	3.6	4.3	4.3	4.3
Chemical Industry including Plastic Products and Rubber Products	2.5	3.6	4.4	4.8	4.8	5.0	5.1	5.2
Foods	0.6	0.8	1.0	1.0	1.0	1.1	1.1	1.3
Textiles	0.8	1.2	1.8	1.8	2.2	1.7	1.9	2.4
Ceramics	1.3	2.6	2.6	2.4	2.5	2.3	2.3	2.3
Iron & Steel	1.1	1.9	2.3	2.0	1.6	1.5	1.3	1.1
Fabricated Metal Products	1.2	1.6	1.6	1.4	1.7	1.3	1.5	1.9
Industrial Machinery	1.9	2.7	3.0	3.3	3.9	4.1	4.1	4.0
Electrical Machinery	3.4	4.8	5.4	5.8	5.6	5.1	5.0	4.7
Information and Communication Electronics Equipments	—	—	—	—	—	6.7	6.8	6.7
Iectronic Parts and Devices	—	—	—	—	—	3.9	4.7	5.8
Electrical Machinery including Electronic Parts and Devices, Information and Communication Electronics Equipments	3.4	4.8	5.4	5.8	5.6	5.6	5.8	5.8
Transportation Machinery	2.3	2.9	3.7	3.3	3.9	4.4	4.6	4.5
Precision Machinery	3.0	4.5	5.9	5.2	6.3	6.3	7.4	7.7
Total Manufacturing	1.7	2.7	3.4	3.4	3.7	3.7	3.9	3.9

http://www.stat.go.jp/data/kagaku/2006/index.htm
(Note)Chemical industry does not include drugs and medicines. Electrical machinery was divided into electrical machinery, information and communication equipment, and electronic parts and devices.
(Source) Ministry of Internal Affairs and Communications [Survey of Research and Development]

6 Operating Profit Ratio

Operating profit ratio to sales remains high.

Trend of ratio of operating profits to sales by industry



Trend of ratio of operating profits to sales by industry [%]

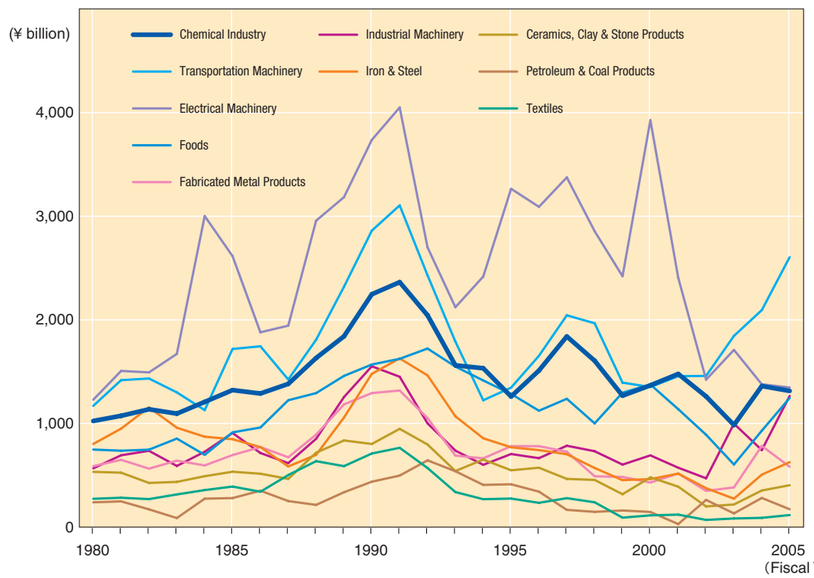
Industry \ Year	Every 5th year					Recent three years		
	1980	1985	1990	1995	2000	2003	2004	2005
Chemical industry	6.1	6.0	6.9	6.5	8.1	7.5	9.3	7.8
Foods	3.6	3.3	3.3	2.8	3.0	3.3	3.2	2.8
Textiles	3.5	3.0	2.1	1.0	0.8	2.5	1.6	1.4
Ceramics, Clay & Stone Products	2.8	0.7	3.1	2.3	1.8	1.3	2.9	2.5
Petroleum & Coal Products	6.6	4.8	5.0	2.4	3.0	2.3	3.9	4.6
Iron & Steel	8.0	3.9	8.1	3.6	4.3	5.9	10.2	11.1
Fabricated Metal Products	4.8	4.4	5.8	3.3	2.0	3.4	3.9	3.7
Industrial Machinery	6.6	4.6	6.4	3.1	4.0	3.7	4.7	5.2
Electrical Machinery	6.0	4.5	4.6	3.5	3.9	2.8	2.8	3.0
Transportation Machinery	4.2	4.0	3.5	2.6	3.0	4.5	4.2	4.8
Total Manufacturing	5.1	3.9	4.8	3.3	3.8	3.9	4.5	4.5

http://www.fabnet2.mof.go.jp/fsc/index.htm
(Source) Ministry of Finance [Financial Statements Statistics of Corporations by Industry]

7 Chemical Industry Ranks High in Plant Investment

Plant investment by the chemical industry accounted for 9.2% of all manufacturing industries.

Trend of plant investment by industry



Trend of plant investment by industry [¥ billion]

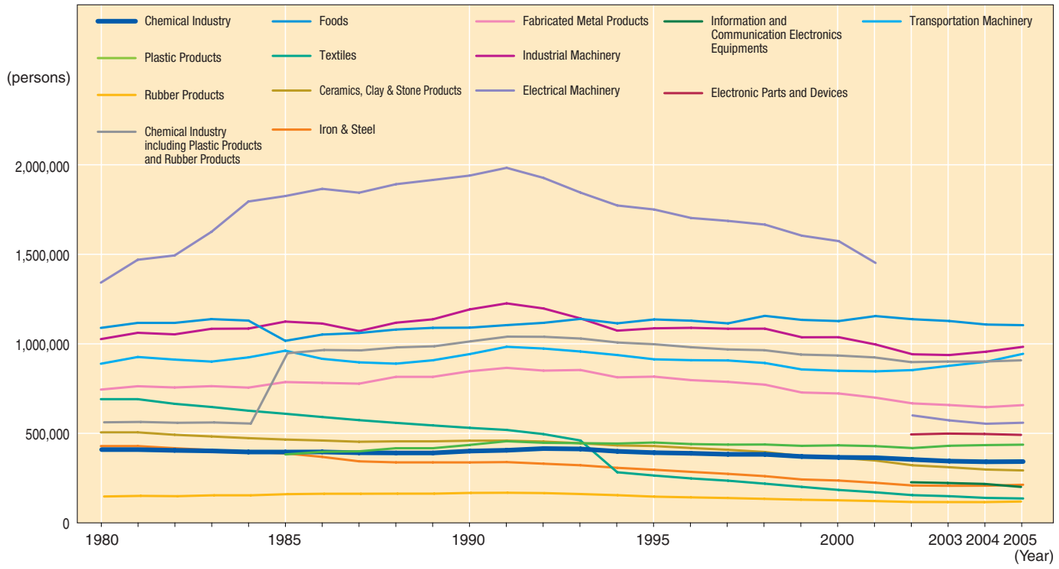
Industry \ Year	Every 5th year					Recent three years		
	1980	1985	1990	1995	2000	2003	2004	2005
Chemical industry	1,024	1,322	2,247	1,260	1,368	985	1,361	1,314	9.2%
Foods	748	914	1,569	1,285	1,376	604	930	1,246	8.7%
Textiles	273	391	710	275	113	83	89	166	1.2%
Ceramics, Clay & Stone Products	239	280	438	413	146	132	281	172	1.2%
Petroleum & Coal Products	533	534	802	548	480	218	353	404	2.8%
Iron & Steel	802	848	1,479	770	463	274	506	627	4.4%
Fabricated Metal Products	588	695	1,293	781	430	383	783	582	4.1%
Industrial Machinery	567	908	1,552	705	692	998	743	1,266	8.8%
Electrical Machinery	1,229	2,615	3,737	3,265	3,927	1,710	1,378	1,347	9.4%
Transportation Machinery	1,170	1,719	2,861	1,346	1,352	1,845	2,094	2,605	18.2%
Others	2,112	2,855	4,795	3,200	2,891	2,452	4,463	4,616	32.2%
Total Manufacturing	9,286	13,082	21,483	13,849	13,238	9,684	12,982	14,343	100.0%

http://www.fabnet2.mof.go.jp/fsc/index.htm
(Source) Ministry of Finance [Financial Statements Statistics of Corporations by Industry]

8 340,000 Workers Are Employed

The number of employees in the chemical industry accounted for 4.2% in entire manufacturing industry.

Changes in the number of employees by industry



Changes in the number of employees by industry [persons]

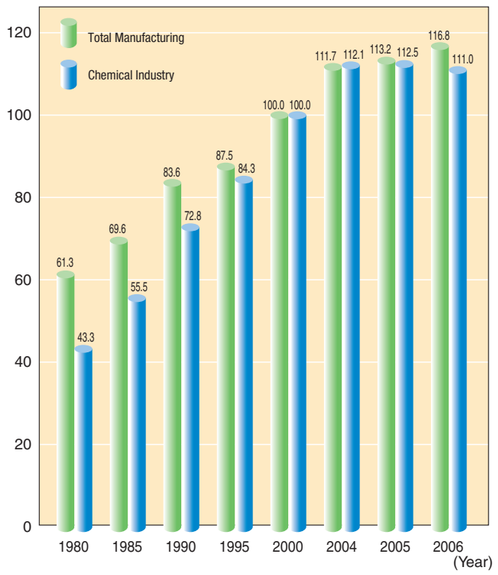
Industry \ Year	Every 5th year					Recent three years			
	1980	1985	1990	1995	2000	2003	2004	2005	
Chemical Industry	409,338	395,748	401,076	392,109	365,953	344,889	341,298	342,481	4.2%
Plastic Products	— ※	382,247	435,523	448,939	433,177	430,784	434,591	436,897	5.4%
Rubber Products	152,523	165,315	172,284	151,601	131,532	121,631	121,484	124,613	1.5%
Chemical Industry including Plastic Products and Rubber Products	561,861	943,310	1,008,883	992,649	930,662	897,304	897,373	903,991	11.1%
Foods	1,089,035	1,016,731	1,090,403	1,136,236	1,127,177	1,127,507	1,107,720	1,104,292	13.5%
Textiles	691,018	609,462	530,736	264,528	184,004	149,214	139,506	136,425	1.7%
Ceramics, Clay & Stone Products	505,585	465,483	459,040	429,023	363,997	310,950	298,011	293,013	3.6%
Iron & Steel	428,957	388,357	337,811	296,824	236,525	207,214	207,712	213,056	2.6%
Fabricated Metal Products	744,546	786,604	846,915	816,694	722,425	658,229	646,343	657,942	8.1%
Industrial Machinery	1,026,377	1,124,229	1,192,406	1,086,575	1,037,079	937,392	956,253	983,449	12.1%
Electrical Machinery	1,341,722	1,825,314	1,939,729	1,750,103	1,573,683	572,590	553,688	559,413	6.9%
Information and Communication Electronics Equipments	—	—	—	—	—	226,951	221,808	205,331	2.5%
Electronic Parts and Devices	—	—	—	—	—	499,581	497,358	492,512	6.0%
Electrical Machinery including Information and Communication Electronics Equipment,Electronic Parts and Devices	1,341,722	1,825,314	1,939,729	1,750,103	1,573,683	1,299,122	1,272,854	1,257,256	15.4%
Transportation Machinery	888,840	961,590	942,795	913,535	849,517	877,452	899,805	944,352	11.6%
Others	3,013,977	2,768,869	2,824,111	2,634,416	2,158,764	1,763,766	1,688,099	1,665,588	20.4%
Total Manufacturing	10,291,918	10,889,949	11,172,829	10,320,583	9,183,833	8,228,150	8,113,676	8,159,364	100.0%

http://www.meti.go.jp/statistics/index.html
No data is available for plastic products before 1983. Electrical machinery was divided into electrical machinery, information and communication equipment, and electronic parts and devices in 2002.
(Source) Ministry of Economy, Trade and Industry [Census of Manufactures]
(Note) Statistics of facilities with more than four employees

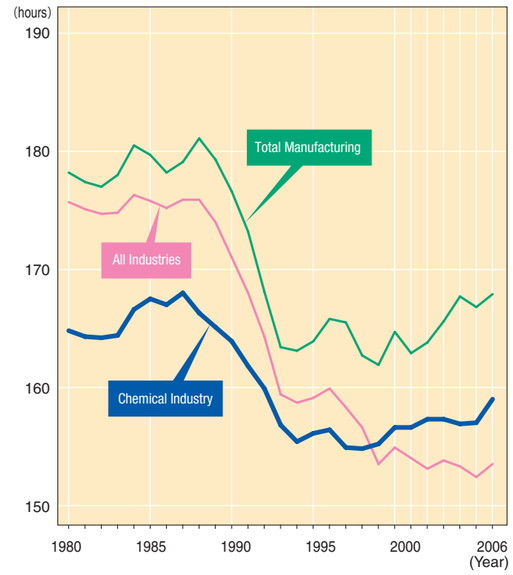
9 Labor Productivity / Working Hours

Labor Productivity of Chemical Industry Continues to Increase in General.

Indices of physical labor productivity [2000=100]



Working hours (monthly average of total net working hours)



Indices of physical labor productivity [2000=100]

Year \ Industry		Total Manufacturing		Chemical Industry	
		Indices	Increase rate %	Indices	Increase rate %
Every 5th year	1980	61.3	3.5	43.3	△0.2
	1985	69.6	2.8	55.5	3.5
	1990	83.6	2.7	72.8	4.6
	1995	87.5	4.4	84.3	8.1
	2000	100	6.3	100	2.6
Recent three years	2004	111.7	6.0	112.1	3.7
	2005	113.2	1.3	112.5	0.4
	2006	116.8	3.2	111.0	△1.3

(Source) Japan Productivity Center for Socio-Economic Development

Working hours (monthly average of total net working hours) [hours]

Year \ Industry		All Industries	Total Manufacturing	Chemical Industry
Every 5th year	1980	175.7	178.2	164.8
	1985	175.8	179.7	167.5
	1990	171.0	176.6	163.9
	1995	159.1	163.9	156.1
	2000	154.9	164.7	156.6
Recent three years	2004	153.3	167.7	156.9
	2005	152.4	166.8	157.0
	2006	153.5	167.9	159.0

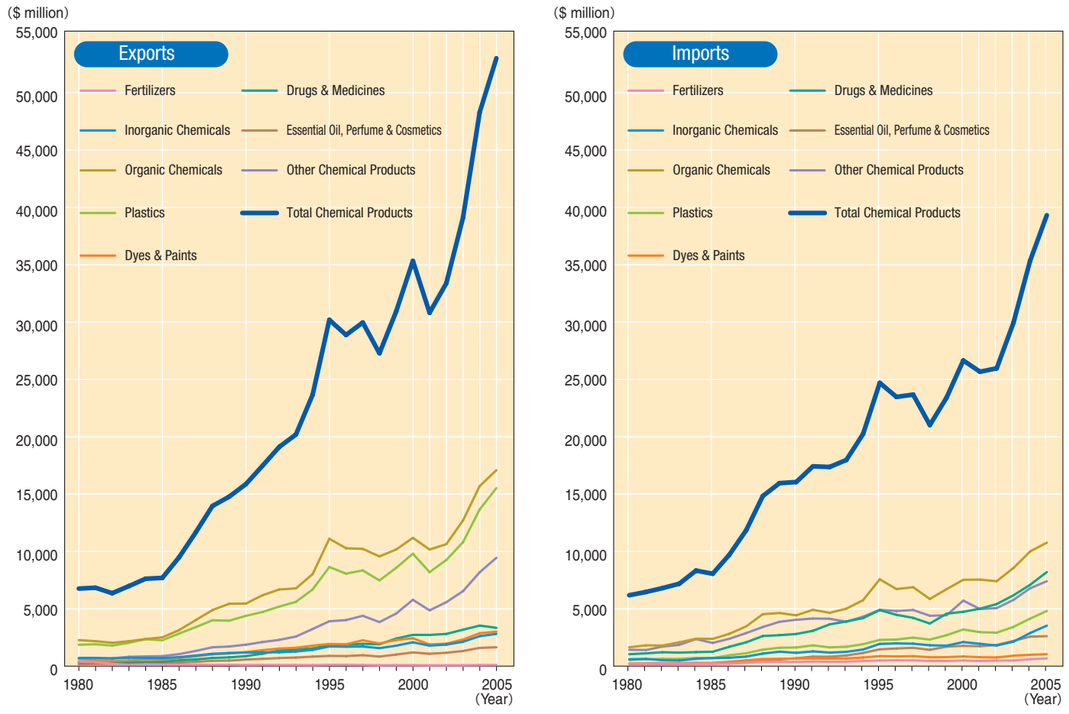
(Source) Ministry of Health, Labour and Welfare [Monthly Labour Survey]

10

Exports / Imports

The trade surplus continued to increase, amounting to $14 billion in 2005.
Both export and import to Asia showed a remarkable increase.

Exports and imports of chemical products

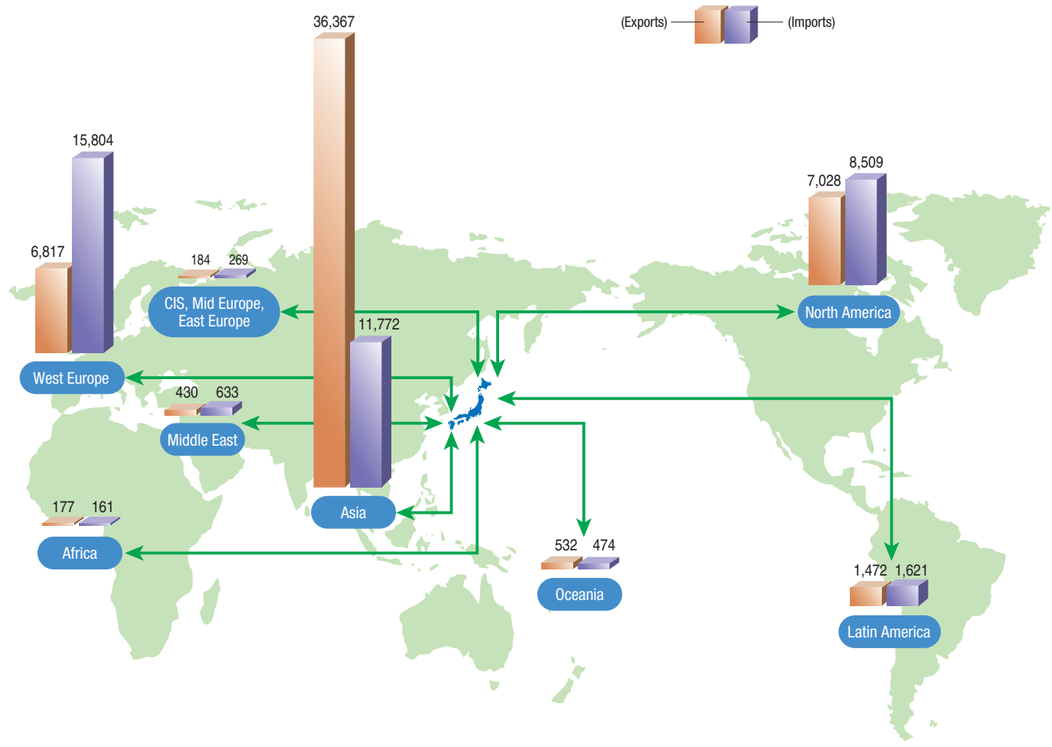


Exports and imports of chemical products [$ million]

Exports									List of articles item	Imports								
Every 5th year					Recent three years					Every 5th year					Recent three years			
1980	1985	1990	1995	2000	2003	2004	2005			1980	1985	1990	1995	2000	2003	2004	2005	
377	127	101	122	93	86	103	110	0.2%	Fertilizers	279	258	405	527	529	530	642	711	1.8%
719	708	1,188	1,720	2,084	2,128	2,620	2,815	5.3%	norganic Chemicals	642	742	1,194	1,974	2,131	2,164	2,916	3,563	9.1%
2,276	2,512	5,640	11,110	11,191	12,703	15,707	17,089	32.2%	Organic Chemicals	1,679	2,411	4,457	7,587	7,546	8,568	10,009	10,773	27.5%
1,867	2,261	4,386	8,649	9,810	10,812	13,671	15,535	29.3%	Plastics	563	744	1,660	2,321	3,226	3,451	4,169	4,839	12.3%
425	558	1,224	1,938	2,436	2,325	2,877	3,010	5.7%	Dyes & Paints	272	319	700	914	880	944	1,030	1,077	2.7%
295	391	879	1,843	2,733	3,180	3,541	3,346	6.3%	Drugs & Medicines	1,074	1,292	2,834	4,908	4,764	6,195	7,112	8,217	20.9%
174	263	579	897	1,198	1,326	1,595	1,650	3.1%	Essential Oil, Perfume & Cosmetics	231	252	725	1,502	1,803	2,231	2,604	2,643	6.7%
636	879	1,876	3,917	5,790	6,543	8,193	9,451	17.8%	Other Chemical Products	1,462	2,054	4,069	4,937	5,736	5,795	6,807	7,422	18.9%
6,767	7,698	15,872	30,196	35,336	39,104	48,306	53,007	100.0%	Total Chemical Products	6,202	8,073	16,045	24,670	26,615	29,878	35,288	39,244	100.0%

http://www.meti.go.jp/policy/trade_policy/trade_db/html/01.html
(Source) Ministry of Economy, Trade and Industry [White Paper on International Economy and Trade]
(Note)Chemical fiber is excluded from Chemical Industry in the data.

Exports and imports of chemical products in 2005 by region [$ million]



Exports and imports of chemical products in 2005 by region [$ million]

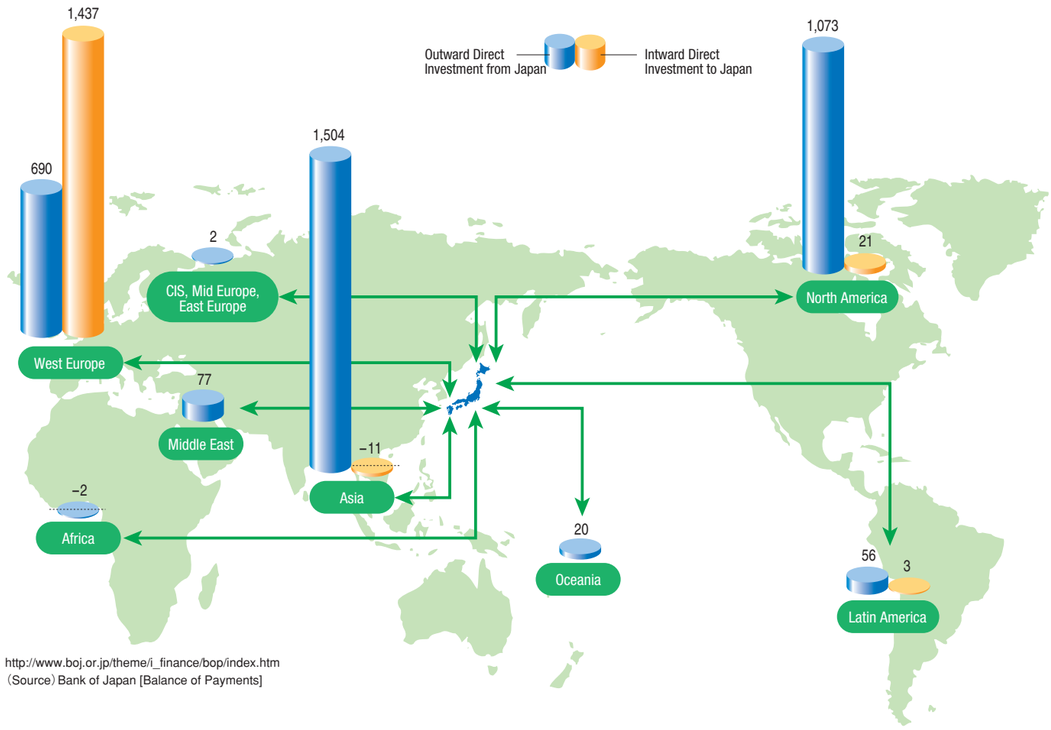
Exports									List of articles item	Imports								
Every 5th year					Recent three years					Every 5th year					Recent three years			
1980	1985	1990	1995	2000	2003	2004	2005			1980	1985	1990	1995	2000	2003	2004	2005	
3,024	3,161	8,641	18,376	21,123	24,290	31,939	36,367	68.6%	Asia	574	665	2,425	4,171	6,013	7,184	9,320	11,772	30.0%
257	169	283	243	264	318	361	430	0.8%	Middle East	28	153	602	611	490	527	566	633	1.6%
881	1,125	3,183	5,226	5,462	5,891	6,707	6,817	12.9%	West Europe	2,081	2,651	6,510	10,814	11,219	12,842	14,946	15,804	40.3%
845	1,532	2,605	4,945	6,563	6,642	7,080	7,028	13.3%	North America	2,730	3,667	5,500	7,511	7,630	7,417	8,193	8,509	21.7%
272	219	282	703	1,302	1,356	1,468	1,472	2.8%	Latin America	194	347	584	839	647	1,230	1,468	1,621	4.1%
158	114	138	152	151	130	143	177	0.3%	Africa	67	70	69	85	50	69	101	161	0.4%
302	286	384	480	393	379	472	532	1.0%	Oceania	240	99	202	481	430	440	486	474	1.2%
1,029	1,091	357	70	78	99	137	184	0.3%	CIS, Mid Europe, East Europe	288	420	153	157	136	168	208	269	0.7%
6,767	7,698	15,872	30,196	35,336	39,104	48,306	53,007	100.0%		6,202	8,073	16,045	24,670	26,615	29,878	35,288	39,244	100.0%

http://www.meti.go.jp/policy/trade_policy/trade_db/html/01.html
(Source) Ministry of Economy, Trade and Industry [White Paper on International Economy and Trade]
(Note)Chemical fiber is excluded from Chemical Industry in the data.

11

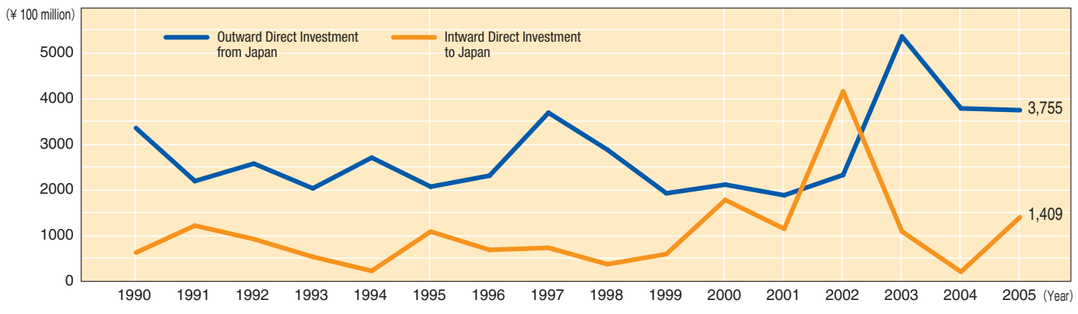
Outward Direct Investment Amounts to Yen 380 Billion, While Inward Direct Investment Amounts to Yen 140 Billion

Outward direct investment of the Japanese chemical industry and inward direct investment to the chemical industry in Japan in 2005 [¥ 100 million]



http://www.boj.or.jp/theme/i_finance/bop/index.htm
(Source) Bank of Japan [Balance of Payments]

Actual outward direct investment of the Japanese chemical industry and inward direct investment to the chemical industry in Japan



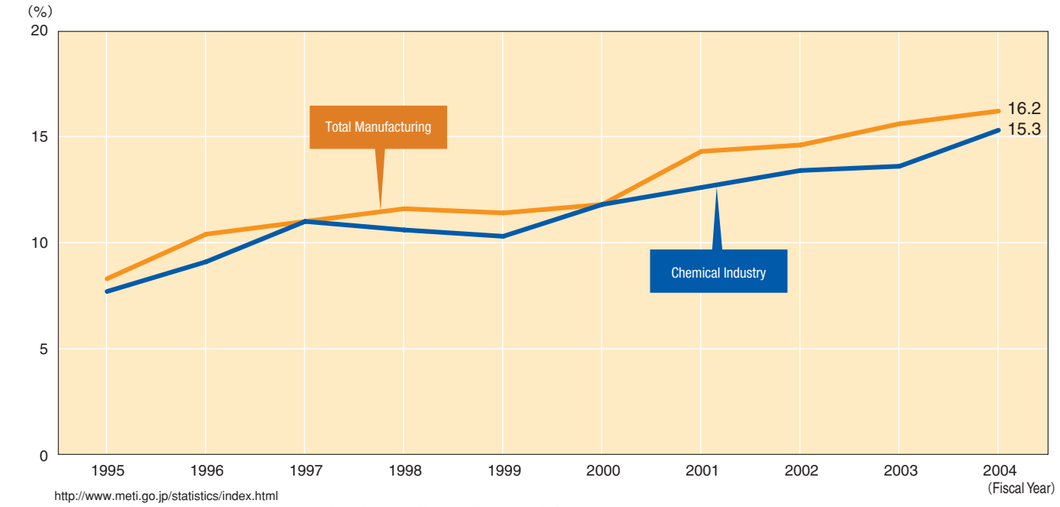
http://www.boj.or.jp/theme/i_finance/bop/index.htm
(Source) Bank of Japan [Balance of Payments] Fiscal years from 1990 to 2004 and calendar year for 2005

12

Overseas Business Activities

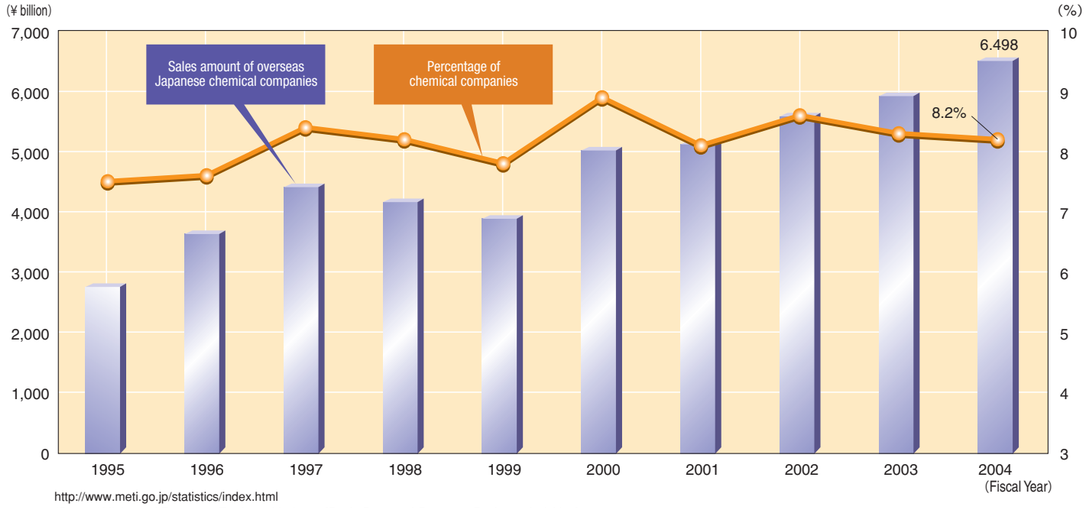
Overseas production of the Japanese chemical industry has amounted to over 15%.

Trend of overseas production of Japanese companies



http://www.meti.go.jp/statistics/index.html
(Source)Ministry of Economy, Trade and Industry [Basic Survey of Overseas Business Activities]
(Note)Chemical fiber is not included under the chemical industry in the data.

Sales of Japanese chemical companies based overseas and its percentage of all overseas Japanese manufacturing companies' sales



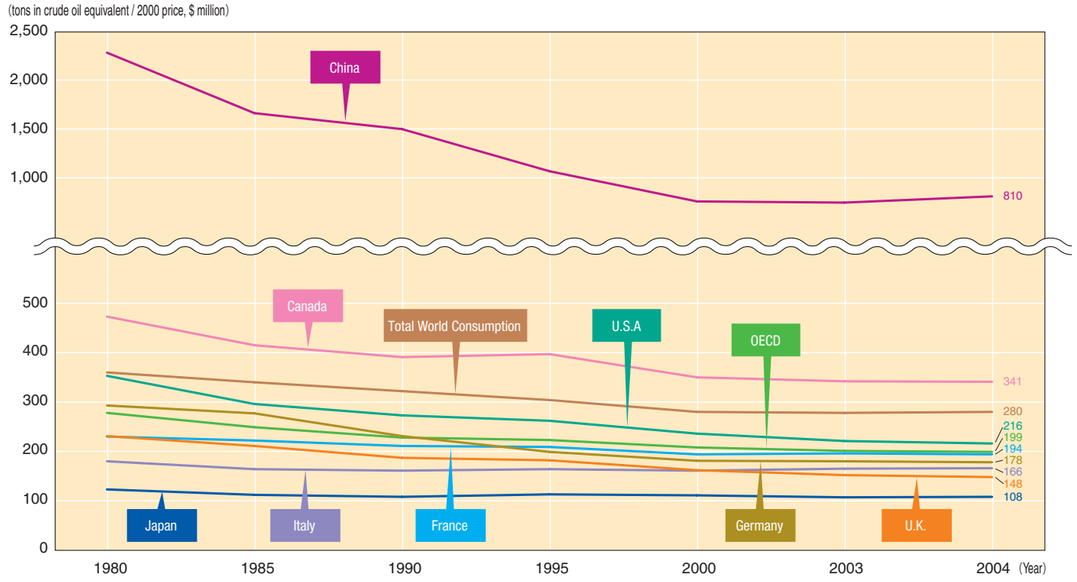
http://www.meti.go.jp/statistics/index.html
(Source)Ministry of Economy, Trade and Industry [Basic Survey of Overseas Business Activities]
(Note)Chemical fiber is not included under the chemical industry in the data.

13

Japan Is An Energy-Saving Superpower

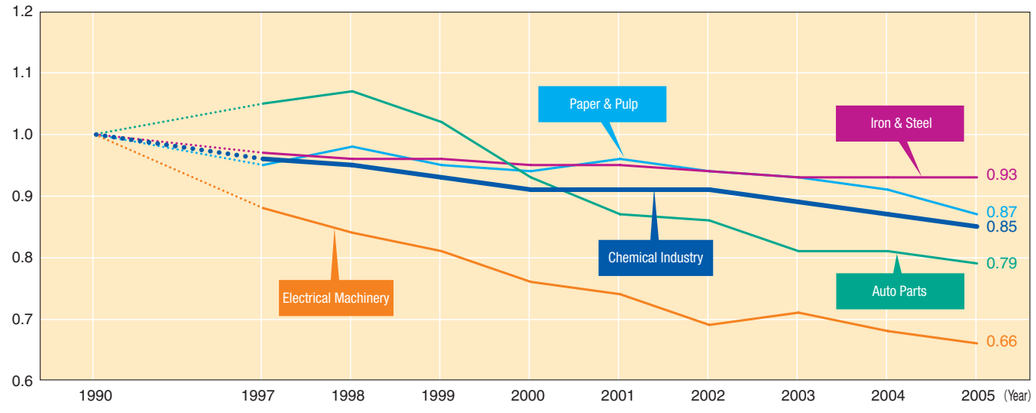
Japan uses the least energy per GDP of all advanced countries.

World's primary energy consumption per GDP



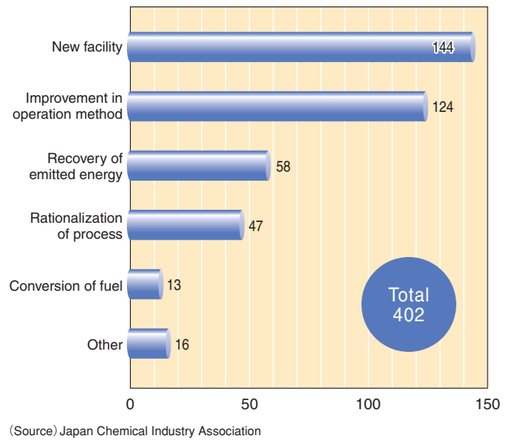
(Source) The Energy Conservation Center, Japan, [Handbook of Energy & Economic Statistics in Japan]

Energy consumption per unit of major industries in Japan [1990=1.0]



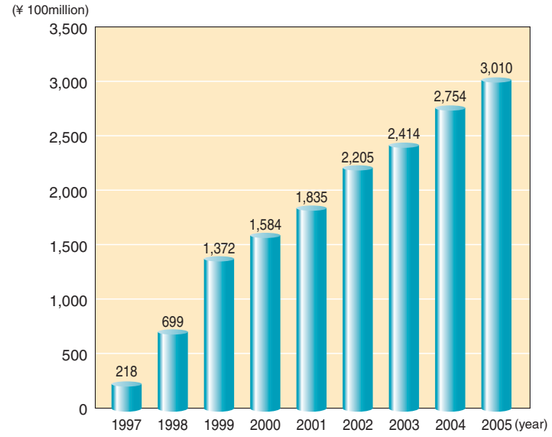
(Source) Nippon Keidanren [Results of the Fiscal 2006 Follow-up to the Keidanren Voluntary Action Plan on the Environment Section on Global Warming Measures]

Energy Conservation Capital Investment



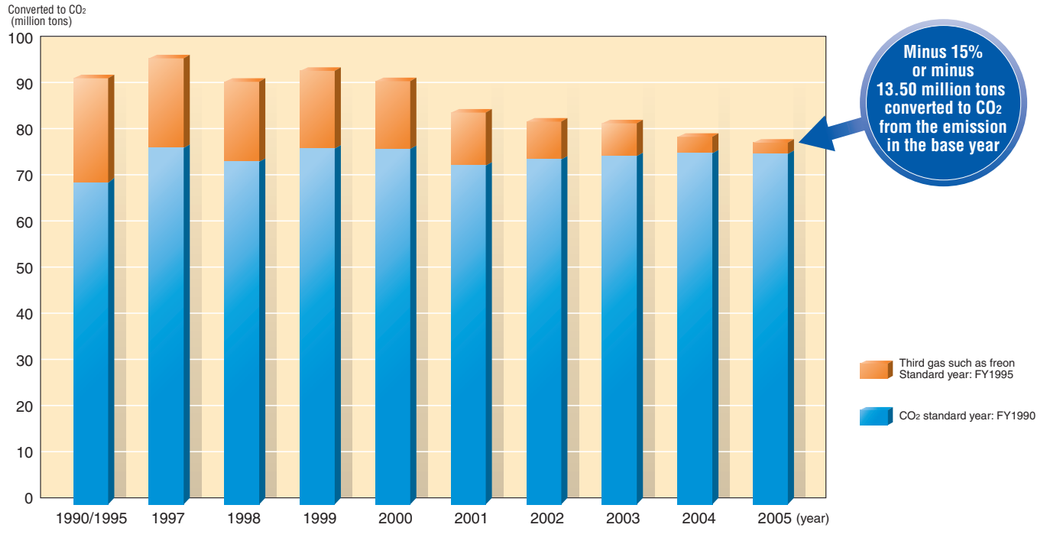
(Source) Japan Chemical Industry Association

Energy Conservation Capital Investment (Cumulative)



(Source) Japan Chemical Industry Association

Greenhouse Gases Emissions Under the Voluntary Action Plan of the Chemical Industry



(Source) Japan Chemical Industry Association

Do You Know Responsible Care? Efforts of Chemical Industry to Preserve Health,Safety and Environment

Responsible Care Logotype

The logotype used to promote Responsible Care is authorized by the International Council of Chemical Associations (ICCA) as an international trademark for use by companies and organizations that implement Responsible Care programs.
Permission to use the logotype is granted to member companies of chemical industry associations recognized by the ICCA.
In Japan, the Japan Chemical Industries Association (JCIA), the Japan Responsible Care Council (JRCC), and member companies of the JRCC are exclusively authorized to use the logotype.

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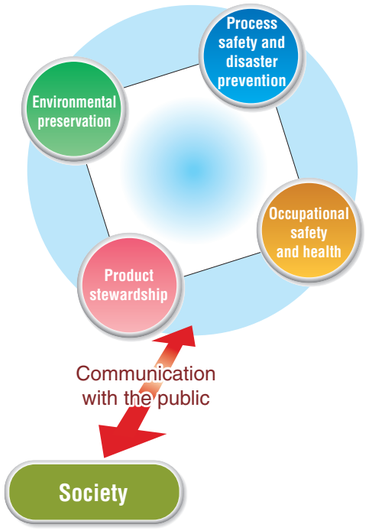
Main Actives of Responsible Care

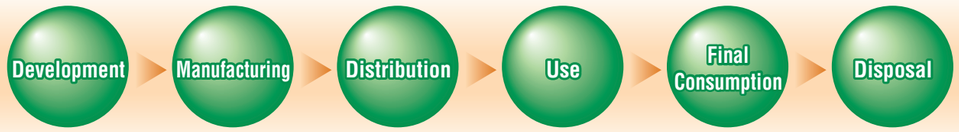
Responsible Care is a Voluntary Initiative with company's commitment to improve all aspects of Environment, Health and Safety and to communicate with the public about activities and achievement to ensure transparency on the following five considerations.

RC is a set of voluntary activities based on a public commitment by companies engaged in the manufacture or handling of chemical substances.
RC covers all aspects of performance related to the manufacture and handling of chemical substances.

- Environmental preservation(Protecting human health and preserving the natural environment)
- Process safety and disaster prevention(Preventing disasters at facilities and minimizing damage in case of disaster)
- Occupational safety and health (Protecting the safety and health of workers)
- Product stewardship (Providing information relating to the properties and handling procedures of chemical products to protect the safety and health of all people handling the products and the environment)

RC requires companies to publicize their performance and maintain dialogue with the public; the approach aims to promote communications with the public and foster a better understanding of the role of companies that manufacture and handle chemical substances.
RC is a set of activities aimed at preserving the environment and ensuring safety and health in all stages of chemical substance life cycles from development and manufacturing to distribution, use, final consumption, and disposal. (product stewardship)



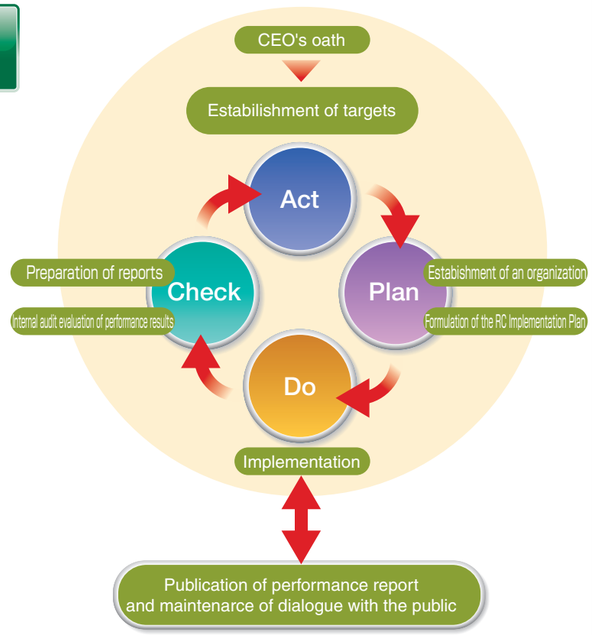


Procedures for Implementing RC

Member companies implement RC in accordance with the Codes and Guidelines for the Implementation of Responsible Care.

RC should be implemented in accordance with the Plan-Do-Check-Act (PDCA) cycle.

Member companies should present their implementation plans and performance results to the JRCC annually by submitting a Responsible Care Implementation Plan, a Responsible Care Implementation Report, and a Responsible Care Internal Audit Certificate.



What is Responsible Care?

Chemical substances-necessary and important to modern daily life. However, sometimes these substances can turn dangerous, becoming hazardous to human health and safety and the environment when handled improperly.
The task of preserving the environment and ensuring the health and safety of humans has increased in step with the rise of global environmental problems and the rapid industrialization of developing countries. Adding to this situation the potential hazards linked to advanced technology has made it difficult to ensure the ecological soundness and safety of chemical operations and products simply by imposing laws and regulations. Thus, it is increasingly more important for companies that deal with chemical substances to undertake voluntary measures to ensure environmental preservation and human safety and health.
Reflecting this trend, the world chemical industry started an initiative that promotes a voluntary management system aimed at preserving the environment against and ensuring the safety from chemical substances throughout the product's life cycle, from development through disposal. This initiative has been named "Responsible Care" (RC)

As a representative of the Japanese chemical industry and an important member of the global chemical industry, the JCIA promotes Responsible Care initiatives in cooperation with the ICCA. In 1990, the JCIA drew up "The Guiding Principles for the Improvement of Environmental, Health, and Safety Conditions." With the objective of promoting the implementation of the program in Japan, the JCIA established the Japan Responsible Care Council (JRCC) in 1995.

See http://www.nikkakyo.org/organizations/jrcc/top_e.html