

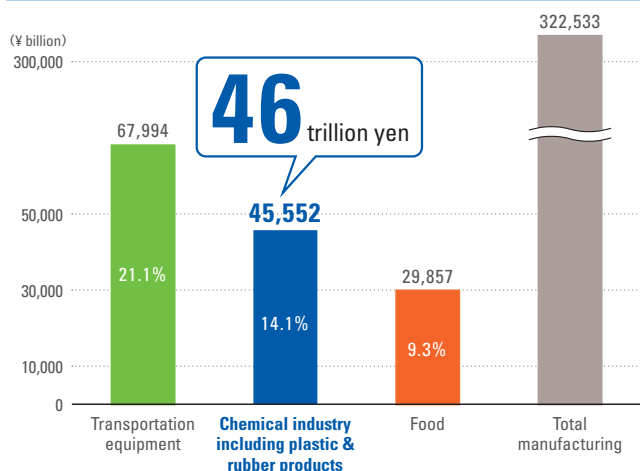
CHEMICAL INDUSTRY OF JAPAN 2021



Japan's chemical industry viewed by figures and graphs

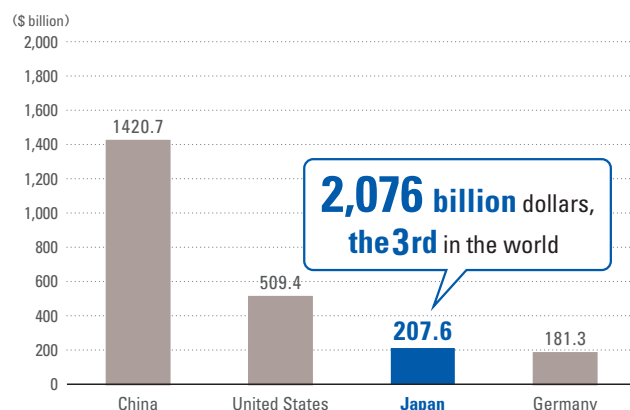
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Value of shipments (2019) Source: METI [Census of Manufacture]

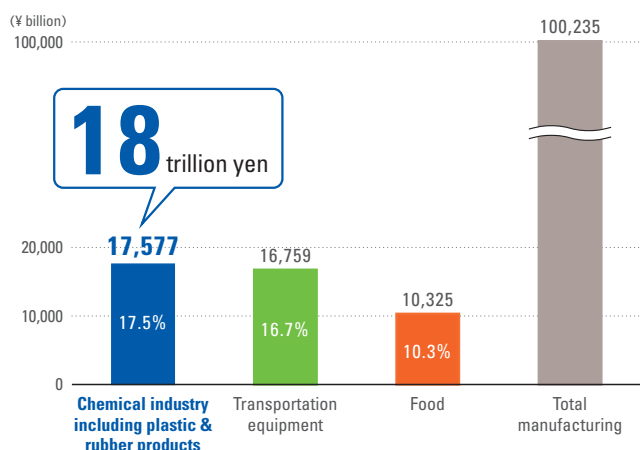


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Shipments by country/region (2019) Source: American Chemistry Council

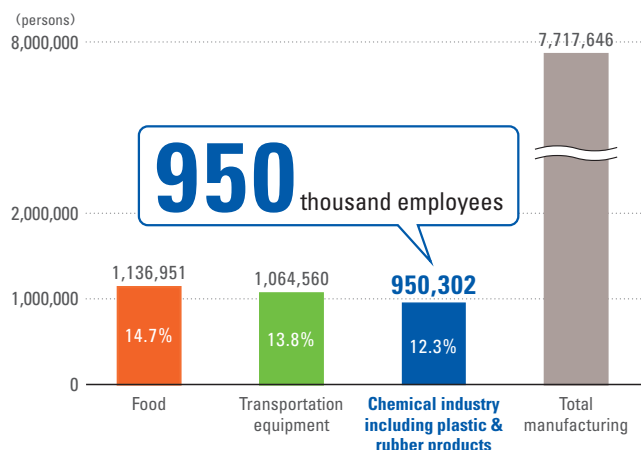


Amount of value added (2019) Source: METI [Census of Manufacture]



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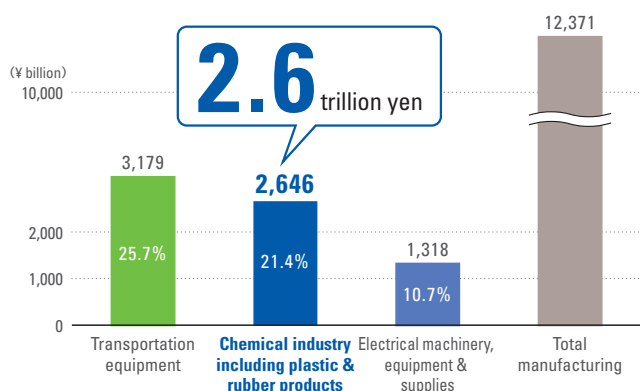
Number of employees (2019) Source: METI [Census of Manufacture]



Note: Value added = Production amount – Cost for using raw materials – Domestic consumption tax – Depreciation cost, etc

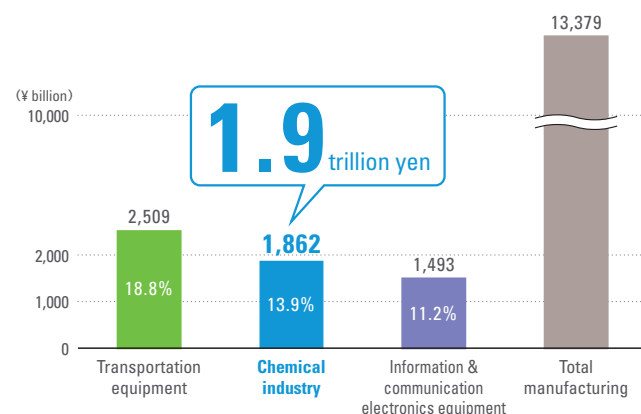
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R&D expenditures (2019) Source: MIC [Survey of Research and Development]



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Capital investment (2020) Source: MOF [Financial Statements Statistics of Corporations by Industry]



Japan's chemical industry supports people's lives and other industries

Japan's chemical industry supports innovation across entire industries by supplying materials which offer a wide range of functionality as basic ingredients for many different types of industry. The products which are then generated bring about improvements in people's lives in every realm, the purification of water and the environment, better utilization of renewable energy, energy saving and resource saving, development of an information-based society, the advancement of medical care, a stable food supply, and the recycling of waste. They also make a significant contribution in terms of sustainable development. Such a diversified contribution is a distinctive feature of the chemical industry, one that is never seen in other industries, and one that demonstrates the infinite potential of chemistry.

The total shipments and amount of value added of "chemical industry including plastic and rubber products" amounted to Yen 46 trillion and Yen 18 trillion, respectively, in 2019, ranking those as the second and first scales in the manufacturing industry. The number of employees is about 950,000. Thus, the industry significantly supports the people's lives also in employment. Although it may be difficult for people to understand overall chemical industry because it manufactures diverse products*, we introduce the industry with data and graphs in this "Chemical Industry of Japan".

*Since the chemical industry is vast, with wide range and scope of work, content may vary depending on different classifications. Therefore, in this brochure, we have conformed to Japan Standard Industrial Classification (major group: manufacture of chemical and allied products). Detail of content is described on Page 5. When the standard differs, we have provided footnotes.



C O N T E N T S

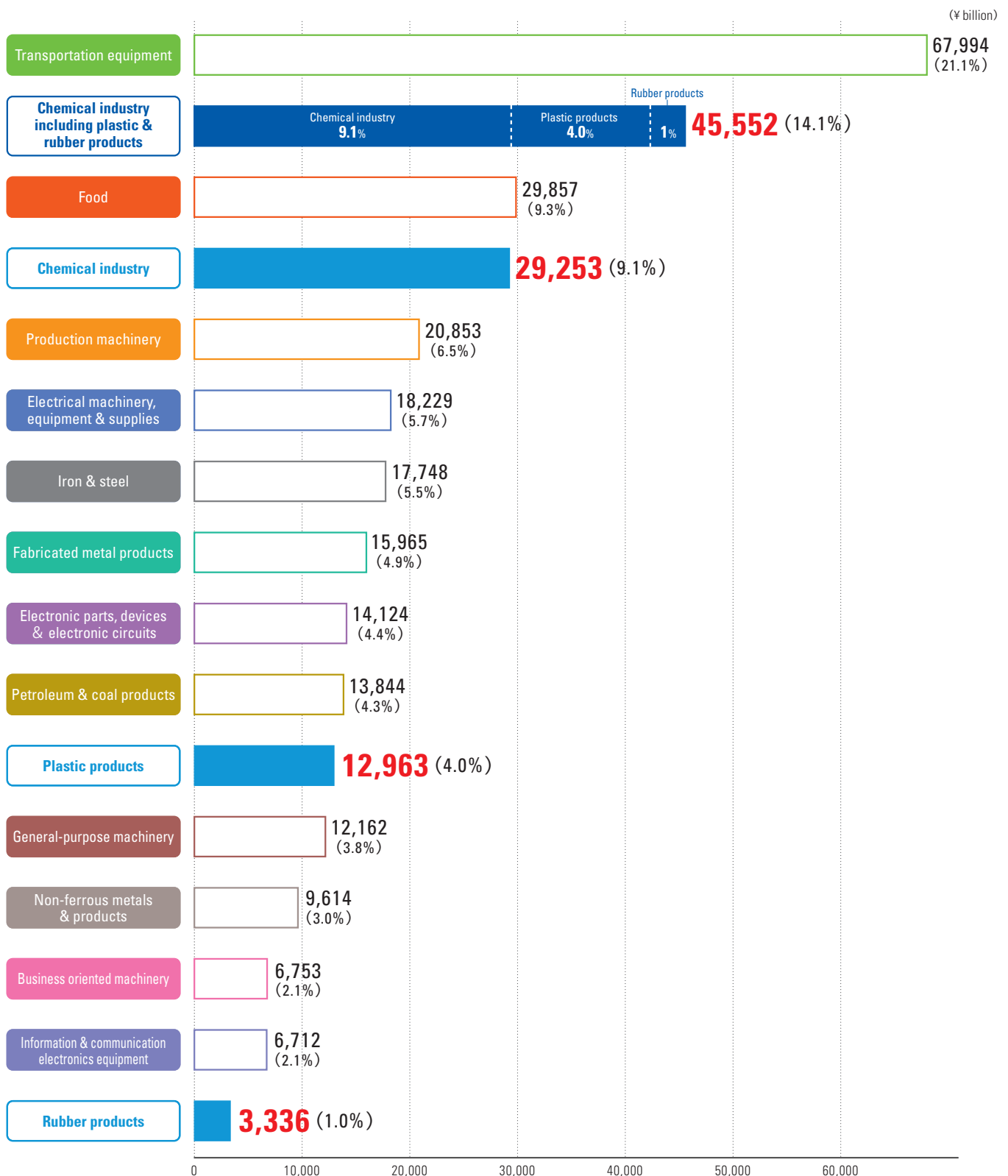
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Shipments

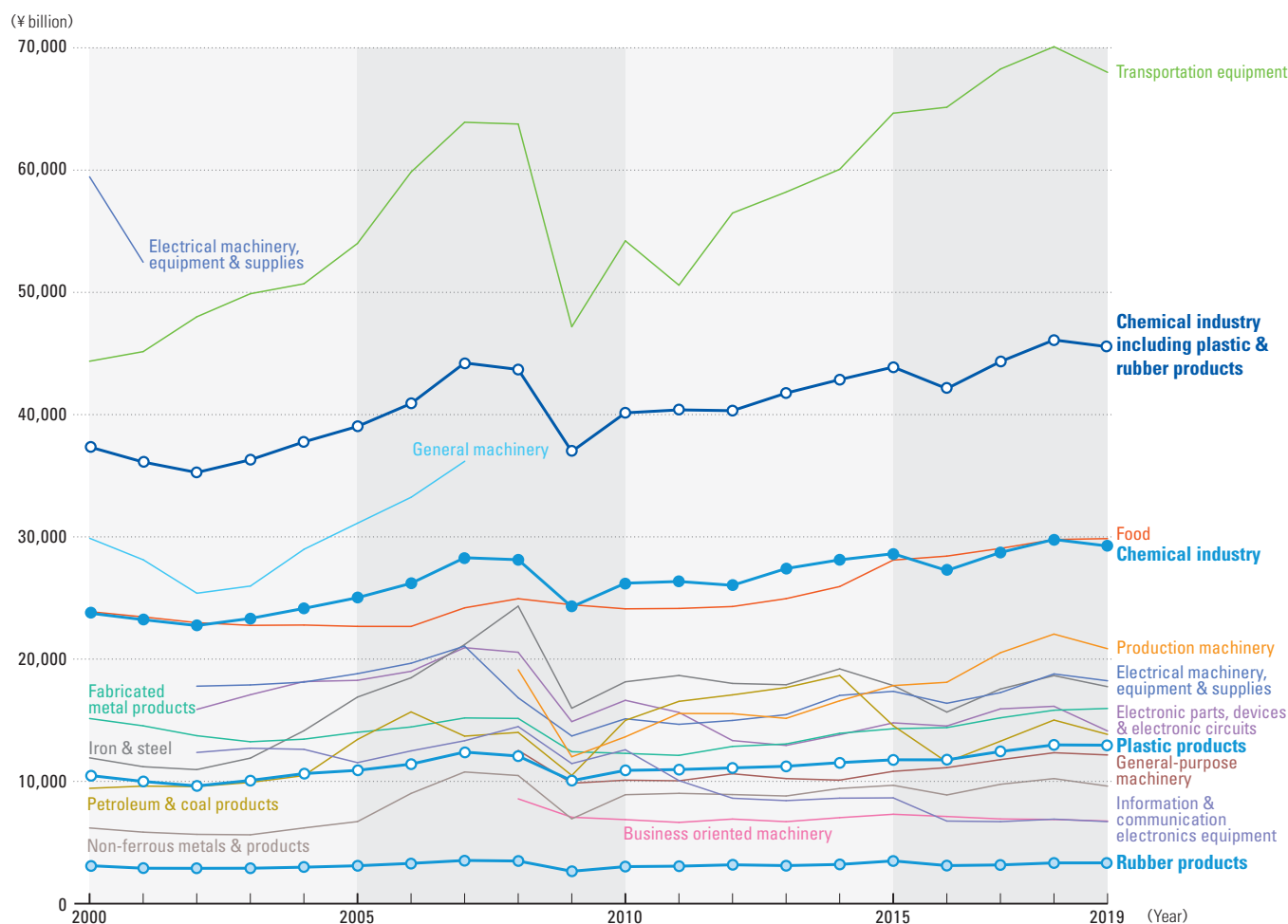
Total shipment value of chemical industry ranks 2nd in manufacturing industries amounting to 46 trillion yen.

Value of shipments by manufacturing industry in 2019



(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged)

Trend in shipment value (2000-2019)



(¥ billion)

Industry	Year	Every 5th year				Recent three years			
		2000	2005	2010	2015	2017	2018	2019	
Chemical industry		23,762	25,027	26,212	28,622	28,724	29,788	29,253	9.1%
Plastic products		10,486	10,906	10,903	11,767	12,443	12,986	12,963	4.0%
Rubber products		3,107	3,099	3,029	3,499	3,168	3,333	3,336	1.0%
Chemical industry including plastic & rubber products		37,356	39,032	40,144	43,889	44,335	46,106	45,552	14.1%
Food		23,888	22,678	24,114	28,102	29,056	29,782	29,857	9.3%
Petroleum & coal products		9,434	13,429	14,992	14,555	13,287	15,016	13,844	4.3%
Iron & steel		11,927	16,896	18,146	17,842	17,556	18,652	17,748	5.5%
Non-ferrous metals & products		6,191	6,712	8,911	9,680	9,762	10,229	9,614	3.0%
Fabricated metal products		15,143	14,016	12,292	14,306	15,199	15,822	15,965	4.9%
General machinery		29,972	31,211	-	-	-	-	-	-
General-purpose machinery		-	-	10,100	10,823	11,780	12,345	12,162	3.8%
Production machinery		-	-	13,646	17,837	20,521	22,048	20,853	6.5%
Business oriented machinery		-	-	6,873	7,311	6,927	6,887	6,753	2.1%
Electronic parts, devices & electronic circuits		-	18,265	16,633	14,788	15,930	16,143	14,124	4.4%
Electrical machinery, equipment & supplies		59,449	18,812	15,120	17,366	17,259	18,790	18,229	5.7%
Information & communication electronics equipment		-	11,534	12,585	8,652	6,707	6,910	6,712	2.1%
Transportation equipment		44,367	54,000	54,214	64,654	68,263	70,091	67,994	21.1%
Others		62,752	48,760	41,338	43,324	42,454	42,989	43,126	13.4%
Total manufacturing		300,478	295,346	289,108	313,129	319,036	331,809	322,533	100.0%

(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged)

(Note) Electrical machinery was divided into electronic parts & devices, electrical machinery, and information & communication electronics equipment in 2002.

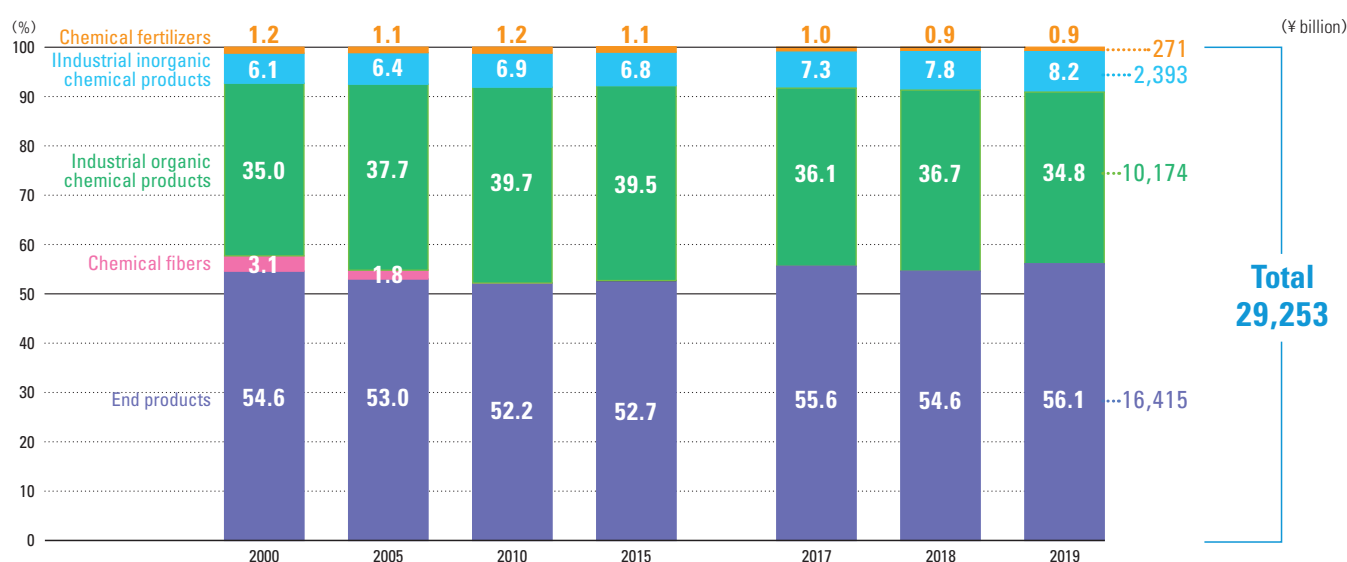
General machinery was divided into general-purpose machinery, production machinery, and business oriented machinery in 2008.

Electronic circuits have been added to electronic parts & devices since 2011.

Shipment by products/Major indices

Chemical products meet the needs of various fields.

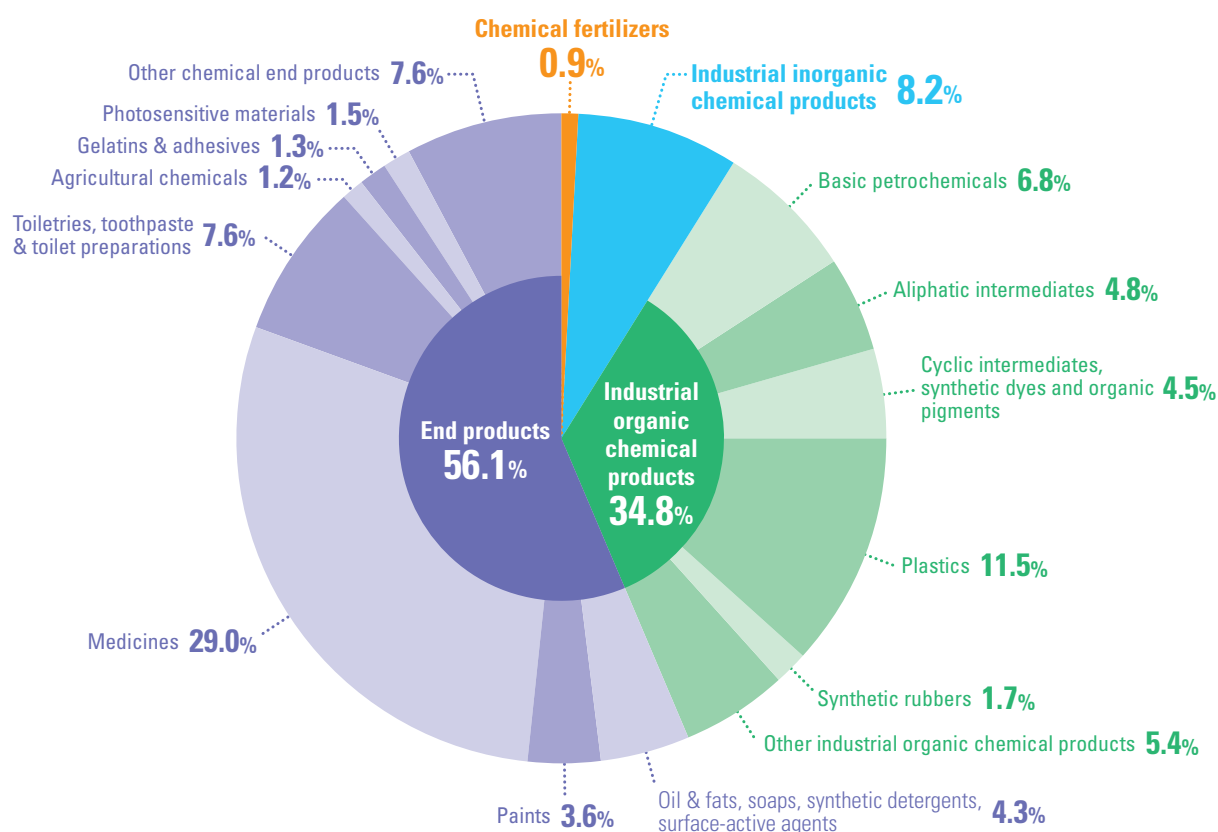
Trend of shipments composition in chemical industry (2000-2019)



Industry	Year	Every 5th year				Recent three years		
		2000	2005	2010	2015	2017	2018	2019
Chemical fertilizers		1.2	1.1	1.2	1.1	1.0	0.9	0.9
Industrial inorganic chemical products		6.1	6.4	6.9	6.8	7.3	7.8	8.2
Industrial organic chemical products		35.0	37.7	39.7	39.5	36.1	36.7	34.8
▶ Basic petrochemicals		2.9	6.3	6.6	5.9	6.9	6.6	6.8
▶ Aliphatic intermediates		7.1	6.1	5.9	5.4	4.5	6.1	4.8
▶ Cyclic intermediates, synthetic dyes and organic pigments		6.1	7.6	6.8	7.4	5.4	5.4	4.5
▶ Plastics		13.6	11.0	13.2	12.8	12.4	11.7	11.5
▶ Synthetic rubbers		1.5	2.0	1.6	1.9	1.9	1.8	1.7
▶ Other industrial organic chemical products		3.8	4.7	5.5	6.0	5.0	5.0	5.4
Chemical fibers		3.1	1.8	-	-	-	-	-
End products		54.6	53.0	52.2	52.7	55.6	54.6	56.1
▶ Oil & fats, soaps, synthetic detergents, surface-active agents		3.5	4.1	4.2	3.9	4.1	4.3	4.3
▶ Paints		4.1	3.7	4.0	3.5	3.7	3.7	3.6
▶ Medicines		27.0	28.0	28.1	29.2	29.6	28.5	29.0
▶ Toiletries, toothpaste & toilet preparations		6.0	5.6	5.3	5.4	6.9	7.2	7.6
▶ Agricultural chemicals		1.4	1.1	1.0	1.2	1.3	1.2	1.2
▶ Gelatins & adhesives		1.0	1.0	1.2	1.2	1.3	1.3	1.3
▶ Photosensitive materials		4.4	2.5	1.7	1.2	1.2	1.2	1.5
▶ Other chemical end products		7.2	7.0	6.8	7.2	7.5	7.3	7.6
Chemical industry		100.0	100.0	100.0	100.0	100.0	100.0	100.0
Chemical industry		63.6	64.1	65.3	65.2	64.8	64.6	64.2
Plastic products		28.1	27.9	27.2	26.8	28.1	28.2	28.5
Rubber products		8.3	7.9	7.5	8.0	7.1	7.2	7.3
Chemical industry including plastic & rubber products		100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged)
 (Note) Chemical fibers have been moved to textile industry since 2008.

Composition of chemical products shipped in 2019



(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged)

Major chemical industry indices with breakdown by product in 2019

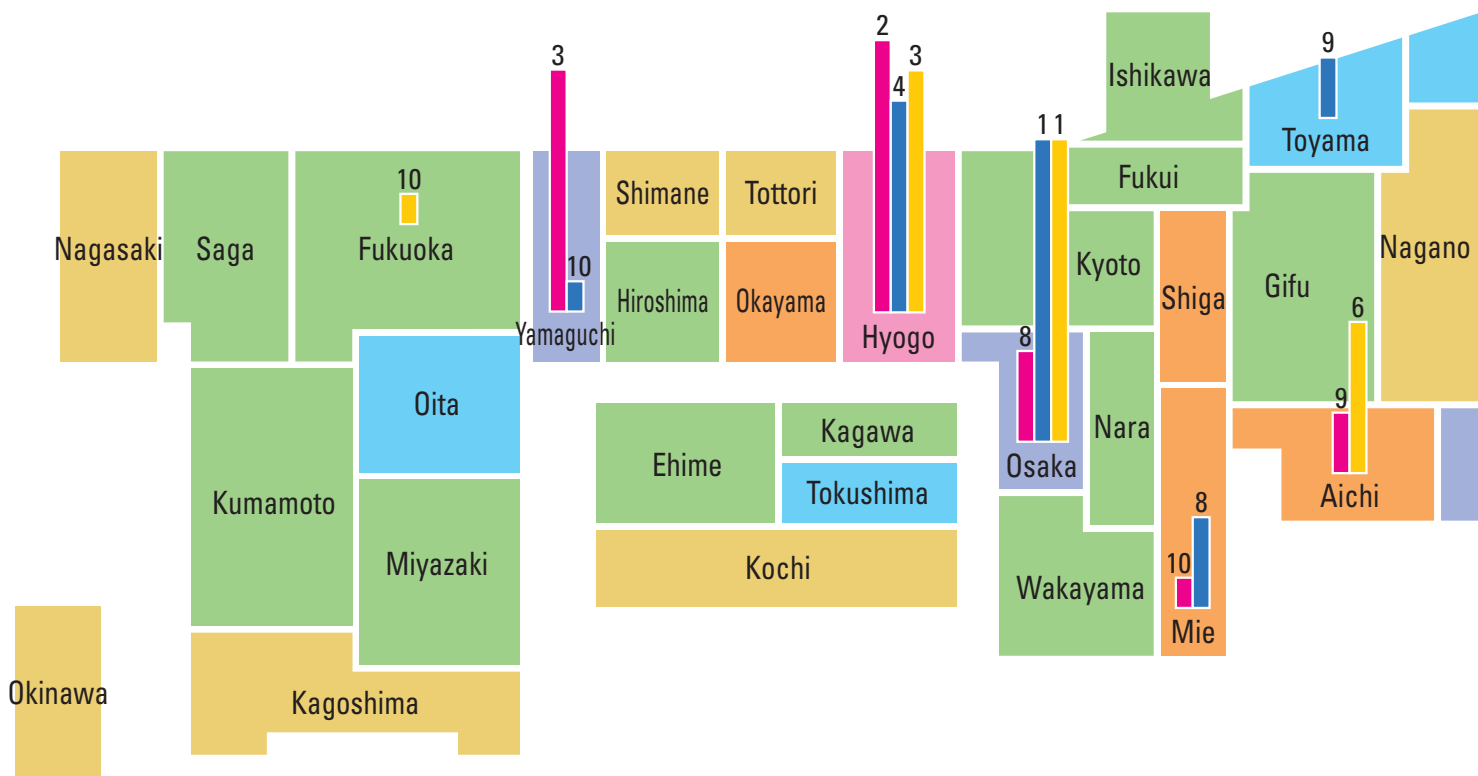
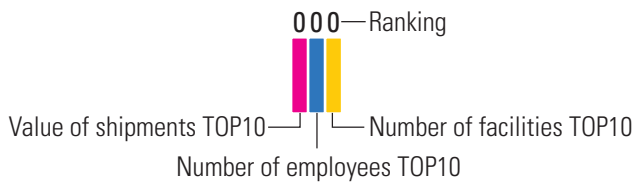
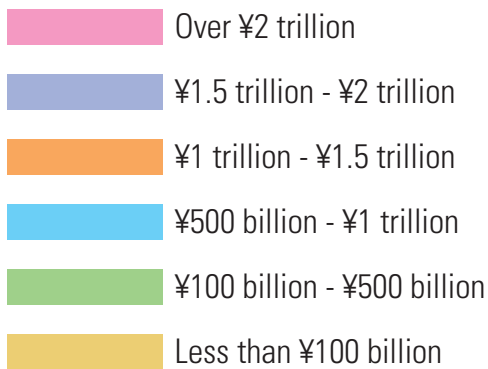
Industry	Major indices, Composition							
	Number of facilities		Number of employees		Value of shipments		Amount of value added	
		%	(Persons)	%	(¥ billion)	%	(¥ billion)	%
Chemical fertilizers	144	3.1	3,893	1.0	271	0.9	71	0.6
Industrial inorganic chemical products	777	16.7	36,702	9.6	2,393	8.2	769	6.7
Industrial organic chemical products	773	16.6	99,283	26.0	10,174	34.8	2,780	24.1
▶ Basic petrochemicals	10	0.2	5,513	1.4	1,980	6.8	228	2.0
▶ Aliphatic intermediates	61	1.3	11,508	3.0	1,400	4.8	503	4.4
▶ Cyclic intermediates, synthetic dyes and organic pigments	137	2.9	13,802	3.6	1,330	4.5	331	2.9
▶ Plastics	252	5.4	35,020	9.2	3,360	11.5	982	8.5
▶ Synthetic rubbers	17	0.4	6,791	1.8	511	1.7	186	1.6
▶ Other organic chemicals	296	6.4	26,649	7.0	1,593	5.4	551	4.8
End products	2,956	63.6	241,381	63.3	16,415	56.1	7,896	68.6
▶ Oil & fats, soaps, synthetic detergents, surface-active agents	272	5.8	15,391	4.0	1,254	4.3	603	5.2
▶ Paints	373	8.0	17,131	4.5	1,067	3.6	419	3.6
▶ Medicines	750	16.1	101,080	26.5	8,480	29.0	4,446	38.6
▶ Toiletries, toothpaste & toilet preparations	524	11.3	46,889	12.3	2,211	7.6	1,181	10.3
▶ Agricultural chemicals	75	1.6	4,887	1.3	353	1.2	142	1.2
▶ Gelatins & adhesives	141	3.0	6,449	1.7	381	1.3	118	1.0
▶ Photosensitive materials	41	0.9	8,095	2.1	443	1.5	196	1.7
▶ Other chemical end products	780	16.8	41,459	10.9	2,228	7.6	792	6.9
Chemical industry	4,650	100.0	381,259	100.0	29,253	100.0	11,516	100.0
Chemical industry	4,650	24.4	381,259	40.1	29,253	64.2	11,516	65.5
Plastic products	12,119	63.7	451,650	47.5	12,963	28.5	4,655	26.5
Rubber products	2,256	11.9	117,393	12.4	3,336	7.3	1,406	8.0
Chemical industry including plastic & rubber products	19,025	100.0	950,302	100.0	45,552	100.0	17,577	100.0

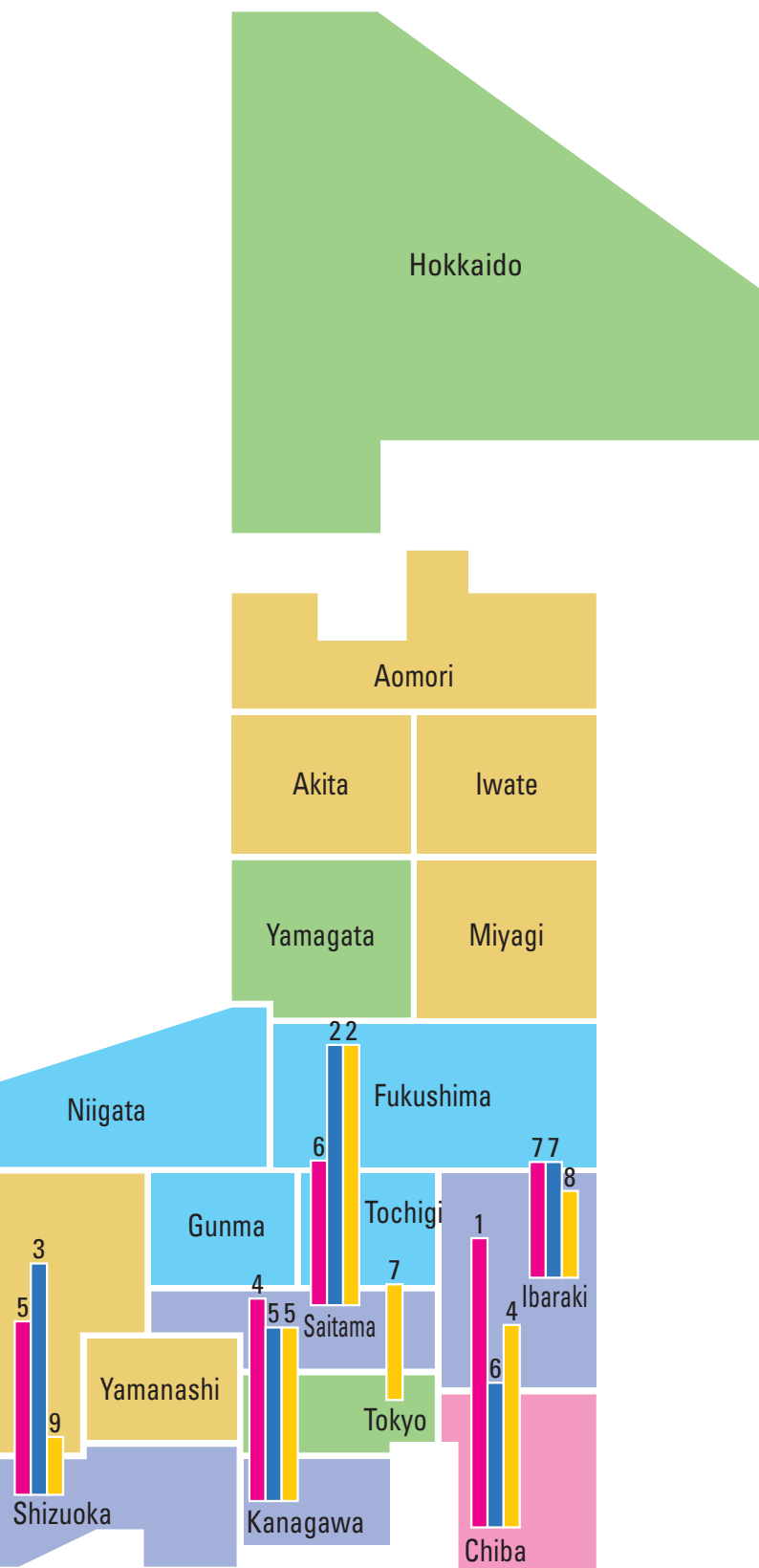
(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged)
 (Note) The number of establishments and employees is as of June 1, 2020.

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Shipment, number of employed workers and number of facilities by prefecture

Shipment, number of employed workers and number of facilities by prefecture in 2019





Prefecture	Value of shipments (¥100million)	Change from 2018	Number of employees	Number of facilities
1 Chiba	22,009	93.6%	22,430	247
2 Hyogo	21,578	97.2%	23,715	287
3 Yamaguchi	19,783	102.6%	15,264	88
4 Kanagawa	19,654	98.6%	22,685	245
5 Shizuoka	19,023	100.4%	23,960	185
6 Saitama	17,356	100.5%	25,130	355
7 Ibaraki	16,796	100.0%	16,787	197
8 Osaka	16,570	87.9%	30,793	523
9 Aichi	13,127	101.5%	15,040	226
10 Mie	12,879	101.3%	16,075	120
11 Okayama	11,018	88.9%	12,041	112
12 Shiga	10,365	98.7%	7,417	102
13 Toyama	7,777	104.6%	15,830	116
14 Gunma	7,749	109.1%	10,521	85
15 Tochigi	6,977	101.0%	7,495	90
16 Niigata	6,392	97.3%	8,237	71
17 Tokushima	6,295	111.8%	6,977	45
18 Oita	5,496	83.1%	3,041	34
19 Fukushima	5,449	102.7%	8,883	101
20 Fukuoka	4,982	95.9%	8,468	138
21 Hiroshima	4,343	98.0%	6,616	91
22 Tokyo	3,830	99.8%	10,713	199
23 Wakayama	3,805	100.6%	5,944	74
24 Ehime	3,439	98.3%	4,388	49
25 Gifu	2,814	100.8%	6,108	92
26 Yamagata	2,679	102.4%	3,525	33
27 Fukui	2,468	98.8%	4,129	52
28 Kyoto	2,106	94.7%	5,595	106
29 Hokkaido	1,886	104.2%	3,497	93
30 Ishikawa	1,744	90.2%	2,496	33
31 Kagawa	1,673	107.5%	3,753	43
32 Saga	1,600	89.8%	2,627	36
33 Miyazaki	1,521	86.6%	1,940	21
34 Kumamoto	1,328	105.1%	3,753	40
35 Nara	1,205	103.7%	3,616	72
36 Nagano	948	93.1%	1,967	48
37 Miyagi	841	99.3%	1,607	42
38 Akita	604	120.1%	1,853	15
39 Iwate	527	90.5%	1,522	21
40 Yamanashi	488	105.7%	1,196	19
41 Aomori	358	100.8%	545	12
42 Shimane	333	98.6%	1,009	9
43 Kagoshima	252	94.4%	436	20
44 Nagasaki	220	90.9%	437	16
45 Kochi	108	117.9%	297	14
46 Okinawa	80	103.4%	694	27
47 Tottori	52	118.8%	207	6
Total	292,528	98.2%	381,259	4,650

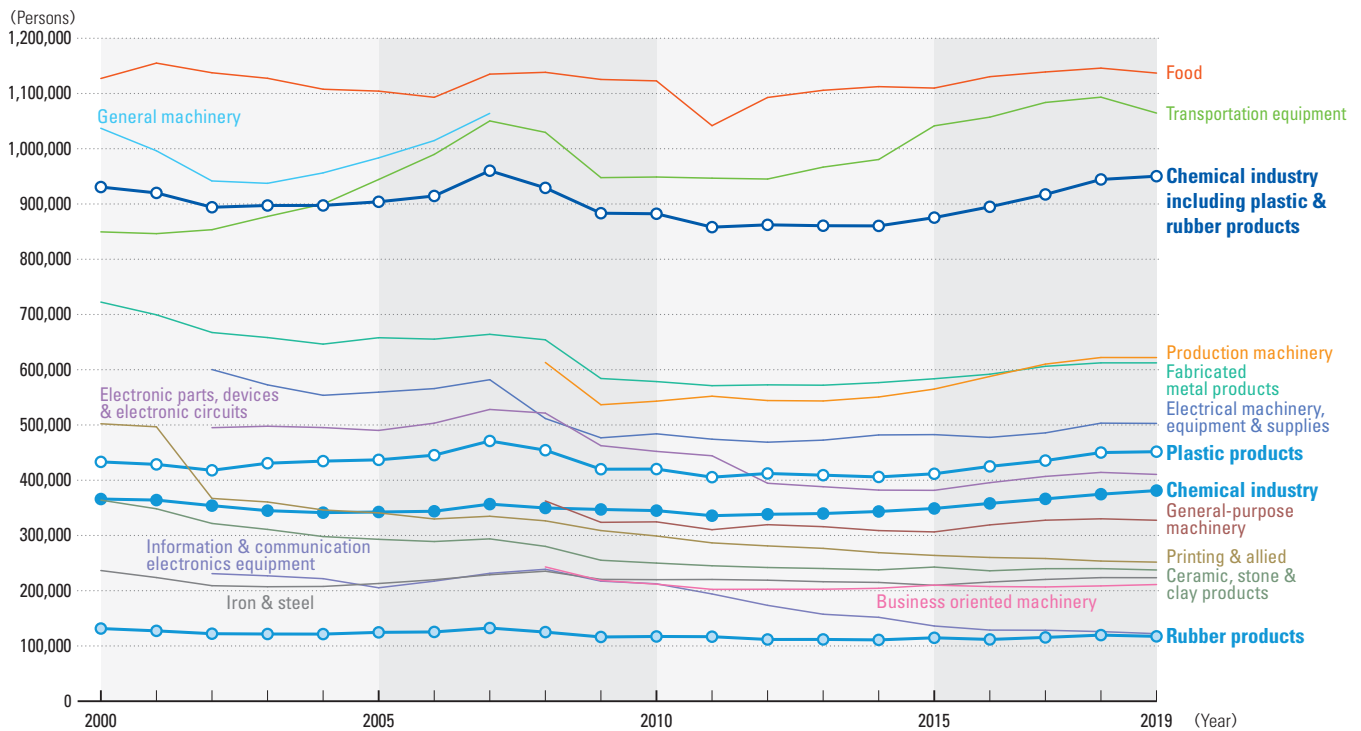
(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged.)
 (Note) The number of establishments and employees is as of June 1, 2020.

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Number of employed workers

About 950,000 workers are employed making the industry to rank 3rd among manufacturing industries.

Changes in the number of employees by manufacturing industry (2000-2019)



Industry	Year	Every 5th year				Recent three years			(Persons)
		2000	2005	2010	2015	2017	2018	2019	
Chemical industry		365,953	342,481	344,968	348,895	366,260	374,699	381,259	4.9%
Plastic products		433,177	436,897	420,179	411,676	435,564	450,072	451,650	5.9%
Rubber products		131,532	124,613	117,176	114,775	115,472	119,643	117,393	1.5%
Chemical industry including plastic & rubber products		930,662	903,991	882,323	875,346	917,296	944,414	950,302	12.3%
Food		1,127,177	1,104,292	1,122,817	1,109,819	1,138,973	1,145,915	1,136,951	14.7%
Printing & allied		502,184	340,890	299,038	263,891	258,298	253,665	251,733	3.3%
Ceramic, stone & clay products		363,997	293,013	250,001	242,816	239,873	239,975	237,550	3.1%
Iron & steel		236,525	213,056	219,983	209,748	220,408	223,717	223,524	2.9%
Fabricated metal products		722,425	657,942	578,559	583,664	606,216	612,442	612,427	7.9%
General machinery		1,037,079	983,449	-	-	-	-	-	-
General-purpose machinery		-	-	324,636	306,415	327,617	330,182	327,541	4.2%
Production machinery		-	-	543,070	564,958	610,154	622,124	622,006	8.1%
Business oriented machinery		-	-	211,834	210,084	206,822	208,683	211,175	2.7%
Electronic parts, devices & electronic circuits		-	490,140	452,169	381,686	406,874	414,153	410,504	5.3%
Electrical machinery, equipment & supplies		1,573,683	559,413	483,979	482,552	485,679	503,300	502,824	6.5%
Information & communication electronics equipment		-	205,331	212,466	136,141	128,446	125,998	122,202	1.6%
Transportation equipment		849,517	944,352	948,824	1,041,452	1,083,760	1,093,367	1,064,560	13.8%
Others		1,840,584	1,461,123	1,134,148	1,089,220	1,066,905	1,060,189	1,044,347	13.5%
Total manufacturing		9,183,833	8,156,992	7,663,847	7,497,792	7,697,321	7,778,124	7,717,646	100.0%

(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged)

(Note) 1 Electrical machinery was divided into electronic parts & devices, electrical machinery, and information & communication electronics equipment in 2002.

General machinery was divided into general-purpose machinery, production machinery, and business oriented machinery in 2008.

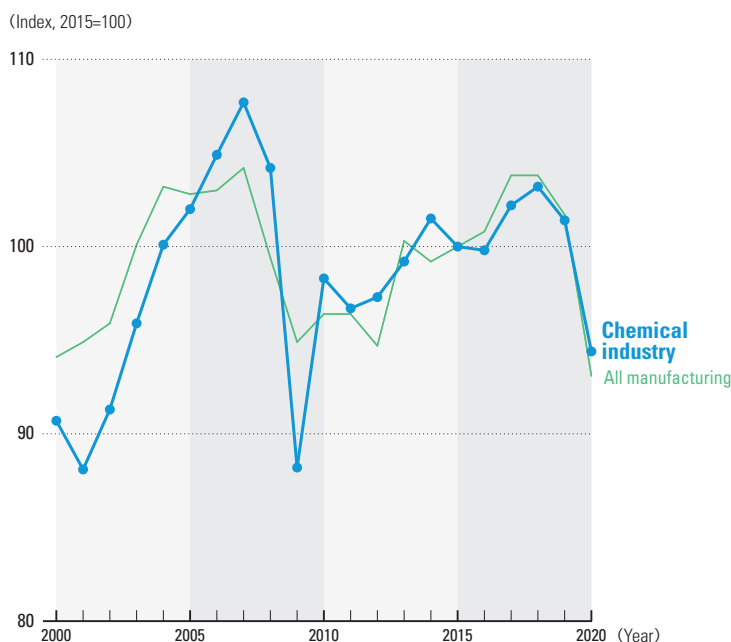
Electronic circuits have been added to electronic parts & devices since 2011.

2 Since 2015, the number of employees is as of June 1, the following year.

5

Labor productivity/Working hours

Index of labor productivity (2000-2020)



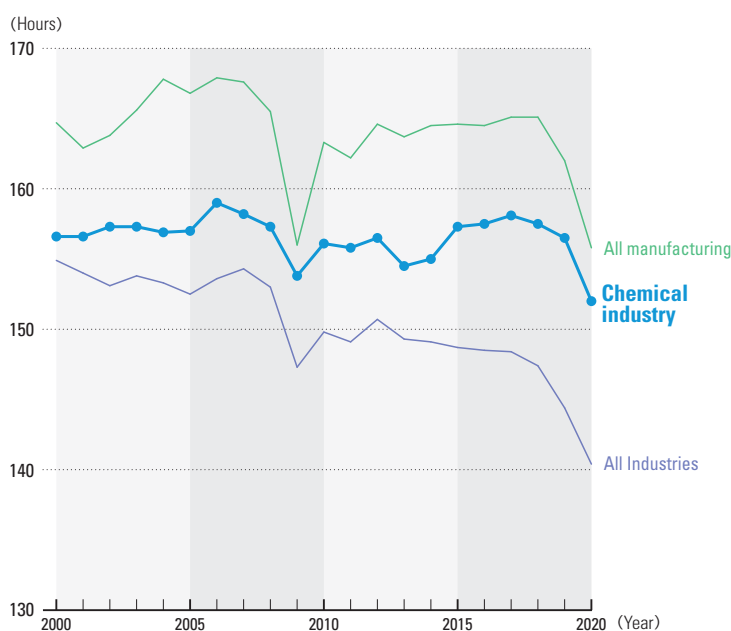
(Index, 2015=100)

Industry		All manufacturing		Chemical industry	
		Index	Increase rate	Index	Increase rate
Every 5th year	2000	90.7	6.7%	94.1	2.4%
	2005	102.0	1.9%	102.8	▲0.4%
	2010	98.3	11.5%	96.4	1.6%
	2015	100.0	▲1.5%	100.0	0.8%
Recent three years	2018	103.2	1.0%	103.8	0.0%
	2019	101.4	▲1.7%	101.7	▲2.0%
	2020	94.4	▲6.9%	93.1	▲8.5%

(Source) Japan Productivity Center

(Note) Petroleum & coal products manufacturing industry is included in the chemical industry.

Working hours (monthly average of total net working hours) (2000-2020)



(Hours)

Industry		All industries	All manufacturing	Chemical industry
Every 5th year	2000	154.9	164.7	156.6
	2005	152.5	166.8	157.0
	2010	149.8	163.3	156.1
	2015	148.7	164.6	157.3
Recent three years	2018	147.4	165.1	157.5
	2019	144.4	162.0	156.5
	2020	140.4	155.8	152.0

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

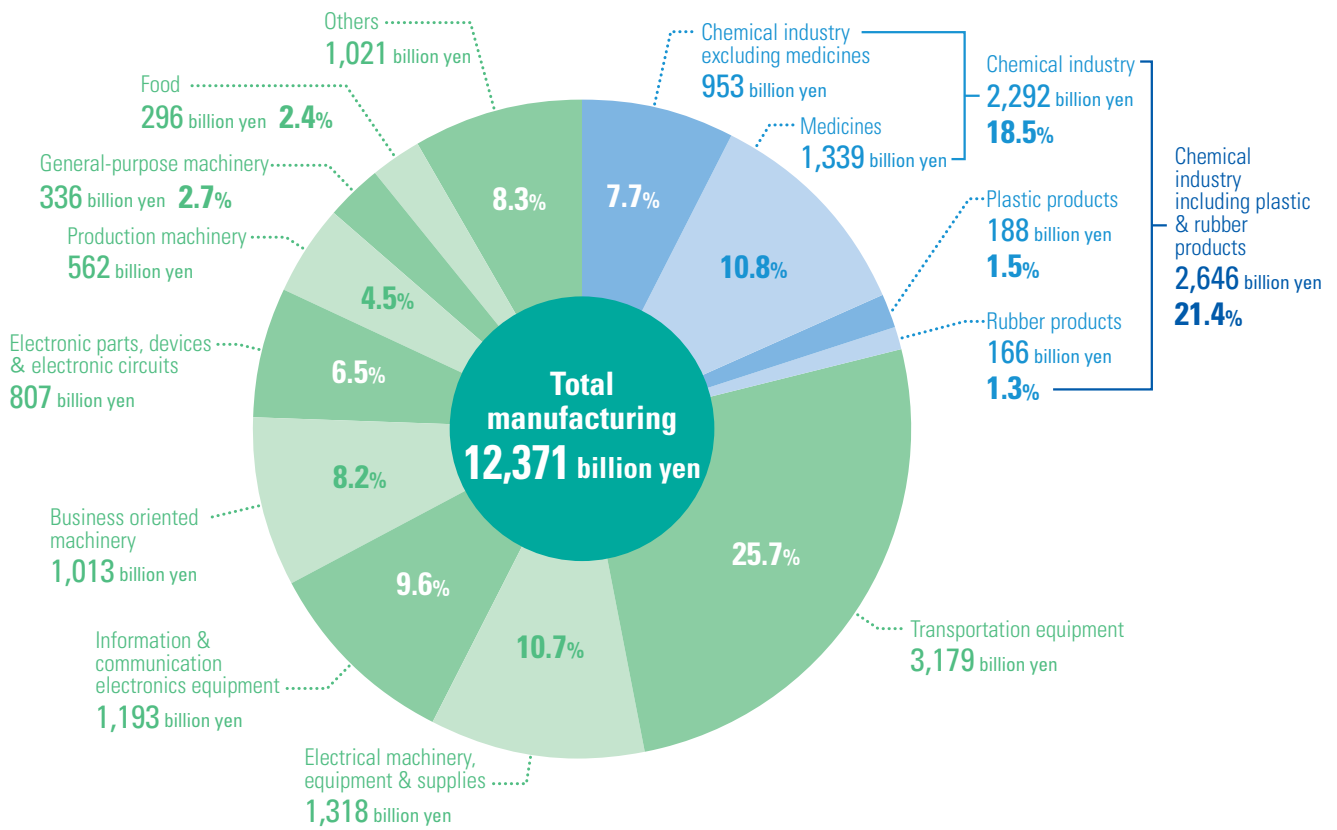
(Note) Petroleum & coal products manufacturing industry is included in the chemical industry.

6

Research and development expenditures

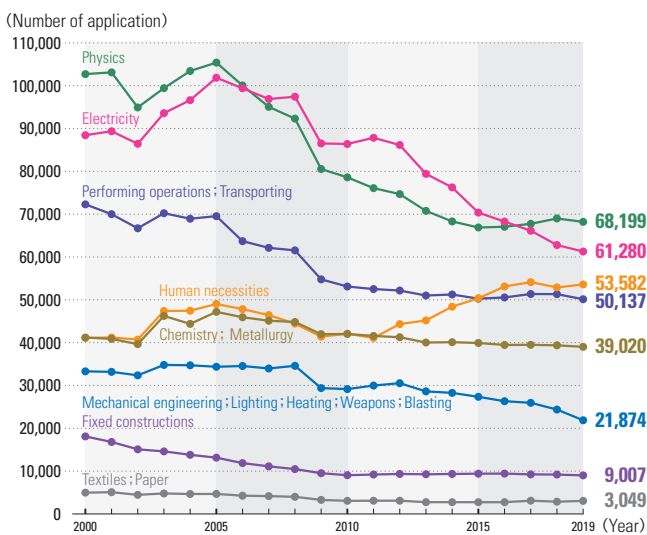
R&D expenditures of chemical industry amounted to 2.6 trillion yen.

Ratio of R&D expenditures by manufacturing industry in FY2019



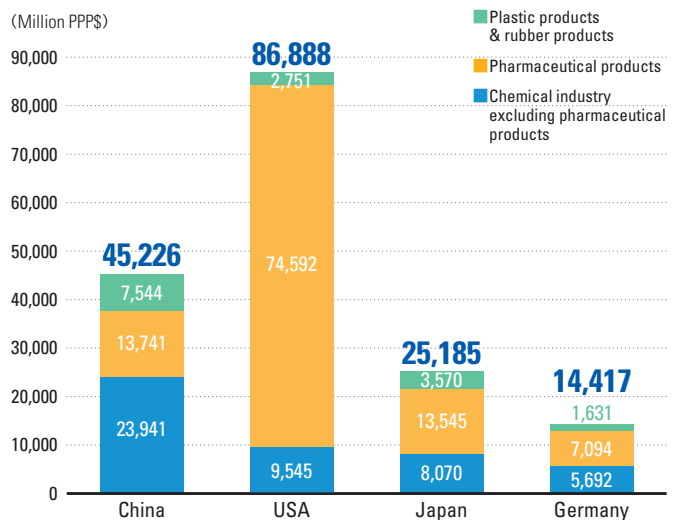
(Source) Ministry of Internal Affairs and Communications [Survey of Research and Development]

Trend of number of applications for patents by classification (2000-2019)



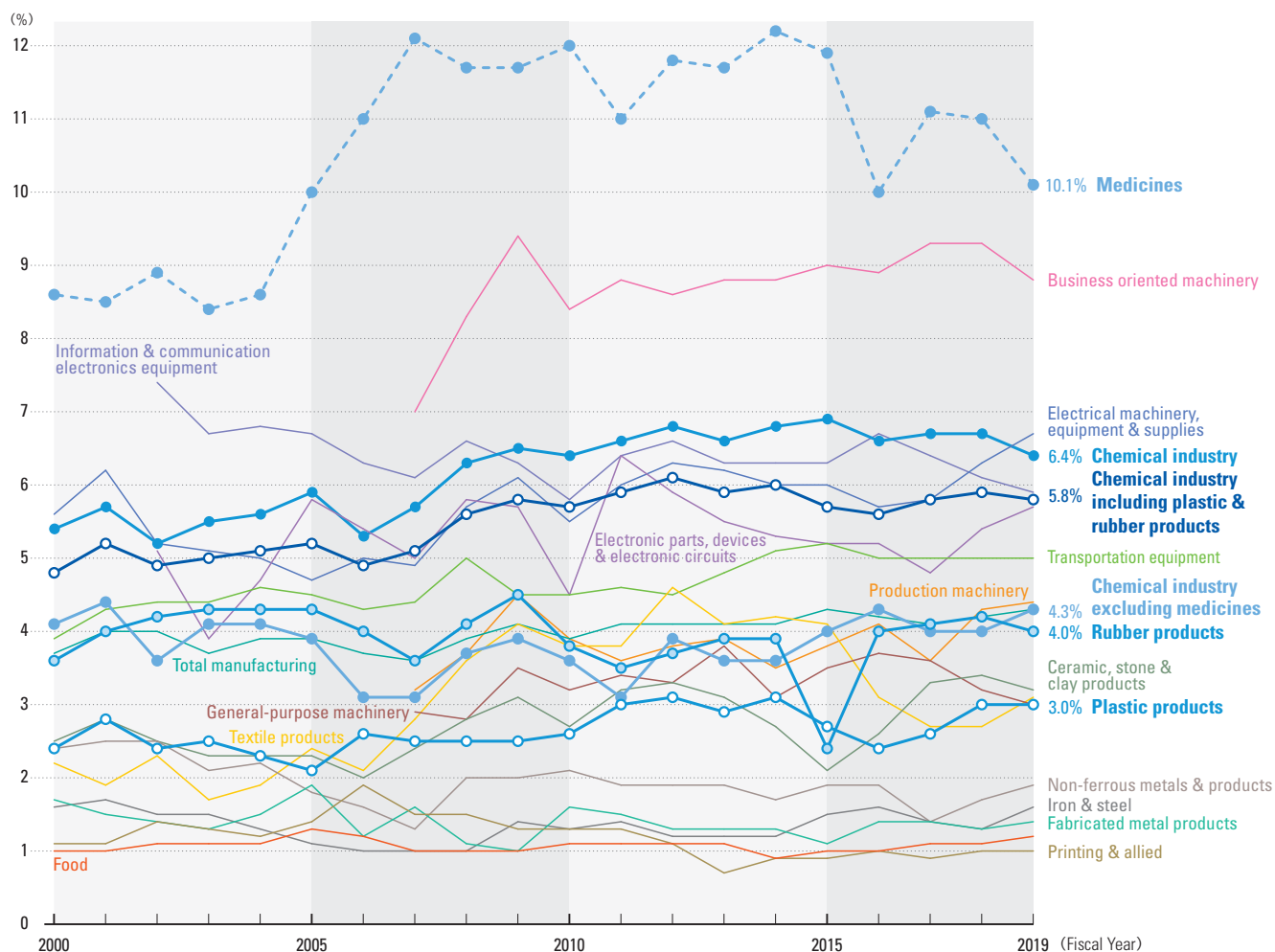
(Source) Japan Patent Office [Japan Patent Office Annual Report 2021]

R&D expenditures of chemical industry in the top four countries in shipment (2018)



(Source) OECD, Stat Extracts
(Note) PPP: Purchasing Power Parity

Ratio of R&D expenditures to sales by manufacturing industry (FY2000-FY2019)



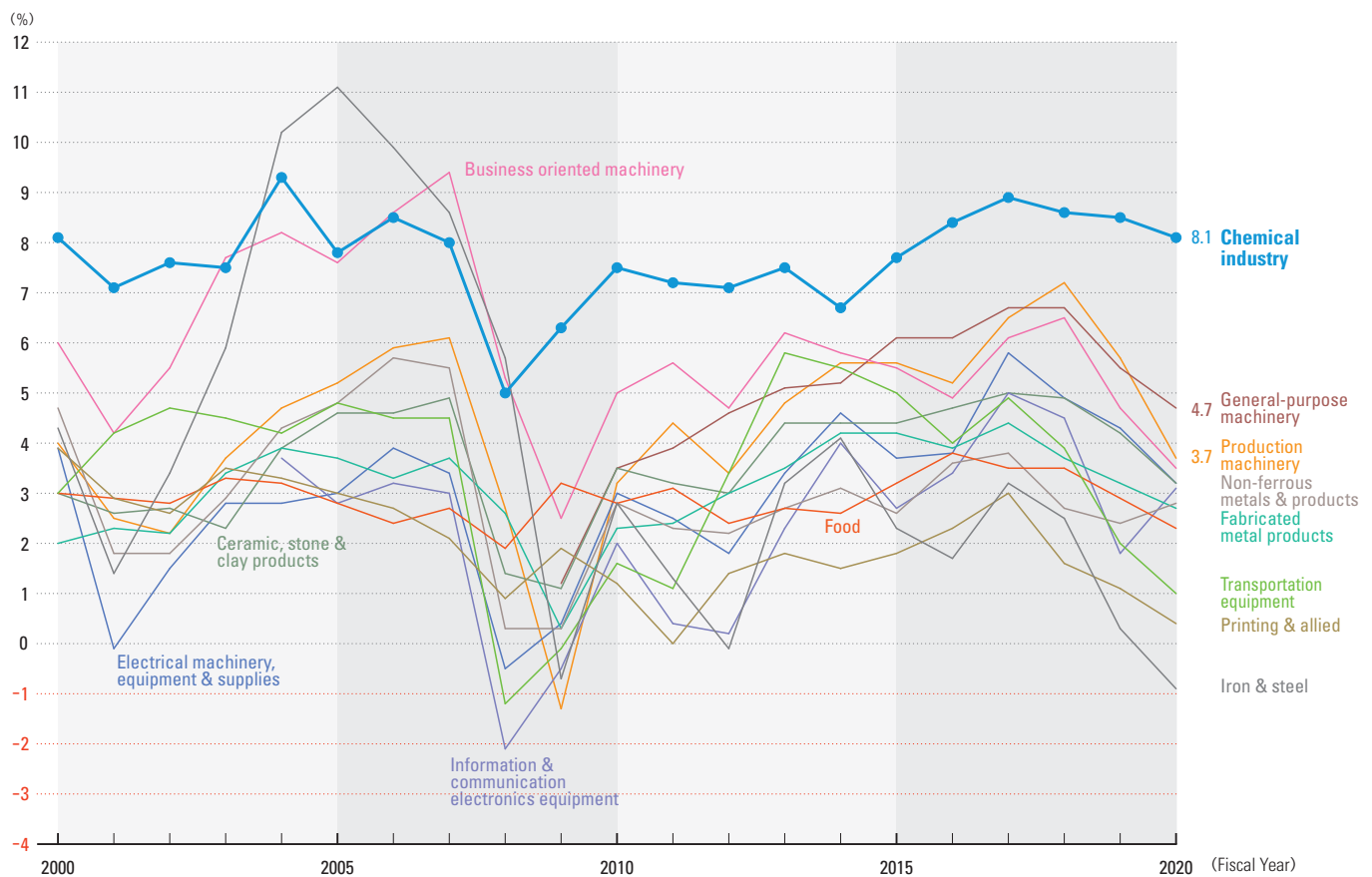
Industry	Fiscal year	Every 5th year				Recent three years		
		2000	2005	2010	2015	2017	2018	2019
Chemical industry		5.4	5.9	6.4	6.9	6.7	6.7	6.4
Chemical industry excluding medicines		4.1	3.9	3.6	4.0	4.0	4.0	4.3
Medicines		8.6	10.0	12.0	11.9	11.1	11.0	10.1
Plastic products		2.4	2.1	2.6	2.7	2.6	3.0	3.0
Rubber products		3.6	4.3	3.8	2.4	4.1	4.2	4.0
Chemical industry including plastic & rubber products		4.8	5.2	5.7	5.7	5.8	5.9	5.8
Food		1.0	1.3	1.1	1.0	1.1	1.1	1.2
Textile products		2.2	2.4	3.8	4.1	2.7	2.7	3.1
Printing & allied		1.1	1.4	1.3	0.9	0.9	1.0	1.0
Ceramic, stone & clay products		2.5	2.3	2.7	2.1	3.3	3.4	3.2
Iron & steel		1.6	1.1	1.3	1.5	1.4	1.3	1.6
Non-ferrous metals & products		2.4	1.8	2.1	1.9	1.4	1.7	1.9
Fabricated metal products		1.7	1.9	1.6	1.1	1.4	1.3	1.4
General-purpose machinery		–	–	3.2	3.5	3.6	3.2	3.0
Production machinery		–	–	3.9	3.8	3.6	4.3	4.4
Business oriented machinery		–	–	8.4	9.0	9.3	9.3	8.8
Electronic parts, devices & electronic circuits		–	5.8	4.5	5.2	4.8	5.4	5.7
Electrical machinery, equipment & supplies		5.6	4.7	5.5	6.0	5.8	6.3	6.7
Information & communication electronics equipment		–	6.7	5.8	6.3	6.4	6.1	5.9
Transportation equipment		3.9	4.5	4.5	5.2	5.0	5.0	5.0
Total manufacturing		3.7	3.9	3.9	4.3	4.1	4.2	4.3

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

7 Operating profit margin

Chemical industry is the No. 1 in operating profit margin.

Trend of operating profit margin by manufacturing industry (FY2000-FY2020)



Industry	Fiscal year	Every 5th year				Recent three years		
		2000	2005	2010	2015	2018	2019	2020
Chemical industry		8.1	7.8	7.5	7.7	8.6	8.5	8.1
Food		3.0	2.8	2.8	3.2	3.5	2.9	2.3
Printing & allied		3.9	3.0	1.2	1.8	1.6	1.1	0.4
Ceramic, stone & clay products		3.0	4.6	3.5	4.4	4.9	4.2	3.2
Iron & steel		4.3	11.1	2.8	2.3	2.5	0.3	-0.9
Non-ferrous metals & products		4.7	4.8	2.8	2.6	2.7	2.4	2.8
Fabricated metal products		2.0	3.7	2.3	4.2	3.7	3.2	2.7
General-purpose machinery		-	-	3.5	6.1	6.7	5.5	4.7
Production machinery		4.0	5.2	3.2	5.6	7.2	5.7	3.7
Business oriented machinery		6.0	7.6	5.0	5.5	6.5	4.7	3.5
Electrical machinery, equipment & supplies		3.9	3.0	3.0	3.7	4.9	4.3	3.2
Information & communication electronics equipment		-	2.8	2.0	2.7	4.5	1.8	3.1
Transportation equipment		3.0	4.8	1.6	5.0	3.9	2.0	1.0
Total manufacturing		3.8	4.5	3.2	4.3	4.6	3.5	3.1

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

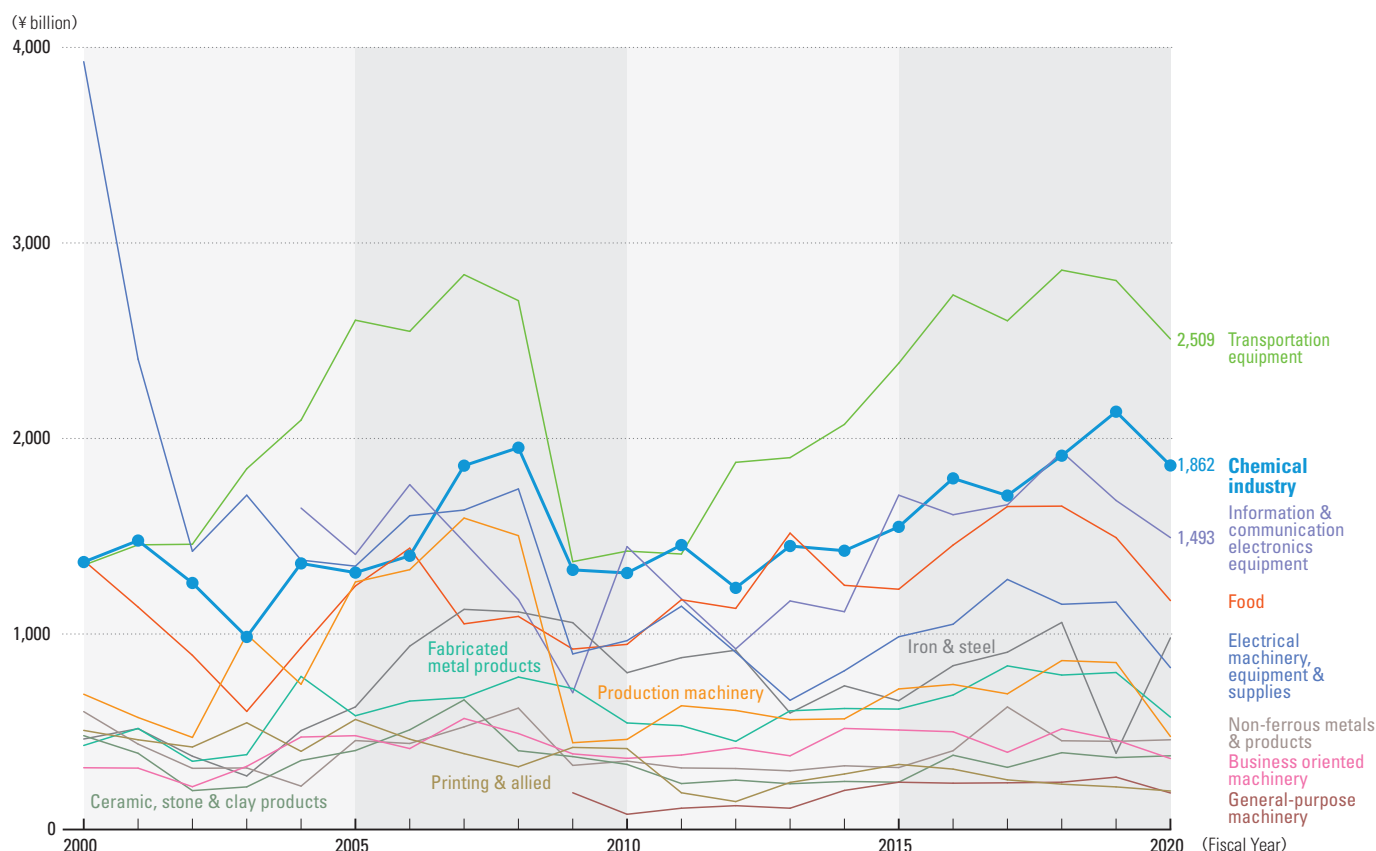
(Note) Information & communication electronic equipment was newly established in 2004, and general-purpose machinery was newly established in 2009.

8

Amount of capital investment

Capital investment of chemical industry amounted to 1.9 trillion yen making it ranked 2nd in manufacturing industries.

Trend of capital investment by manufacturing industry (FY2000-FY2020)



Industry	Fiscal year	Every 5th year				Recent three years			%
		2000	2005	2010	2015	2018	2019	2020	
Chemical industry		1,368	1,314	1,312	1,548	1,912	2,137	1,862	13.9%
Food		1,376	1,246	947	1,229	1,654	1,493	1,171	8.8%
Printing & allied		507	563	414	333	232	218	197	1.5%
Ceramic, stone & clay products		480	404	333	242	393	368	377	2.8%
Iron & steel		463	627	802	659	1,059	390	980	7.3%
Non-ferrous metals & products		603	455	350	317	454	451	459	3.4%
Fabricated metal products		430	582	545	616	790	803	575	4.3%
General-purpose machinery		—	—	78	242	242	268	187	1.4%
Production machinery		692	1,266	461	719	864	854	476	3.6%
Business oriented machinery		316	480	364	509	515	458	363	2.7%
Electrical machinery, equipment & supplies		3,927	1,347	966	986	1,152	1,163	828	6.2%
Information & communication electronics equipment		—	1,407	1,447	1,710	1,932	1,683	1,493	11.2%
Transportation equipment		1,352	2,605	1,424	2,385	2,861	2,808	2,509	18.8%
Others		1,724	2,049	1,828	1,857	1,937	2,078	1,901	14.2%
Total manufacturing		13,238	14,343	11,272	13,351	15,998	15,173	13,379	100.0%

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

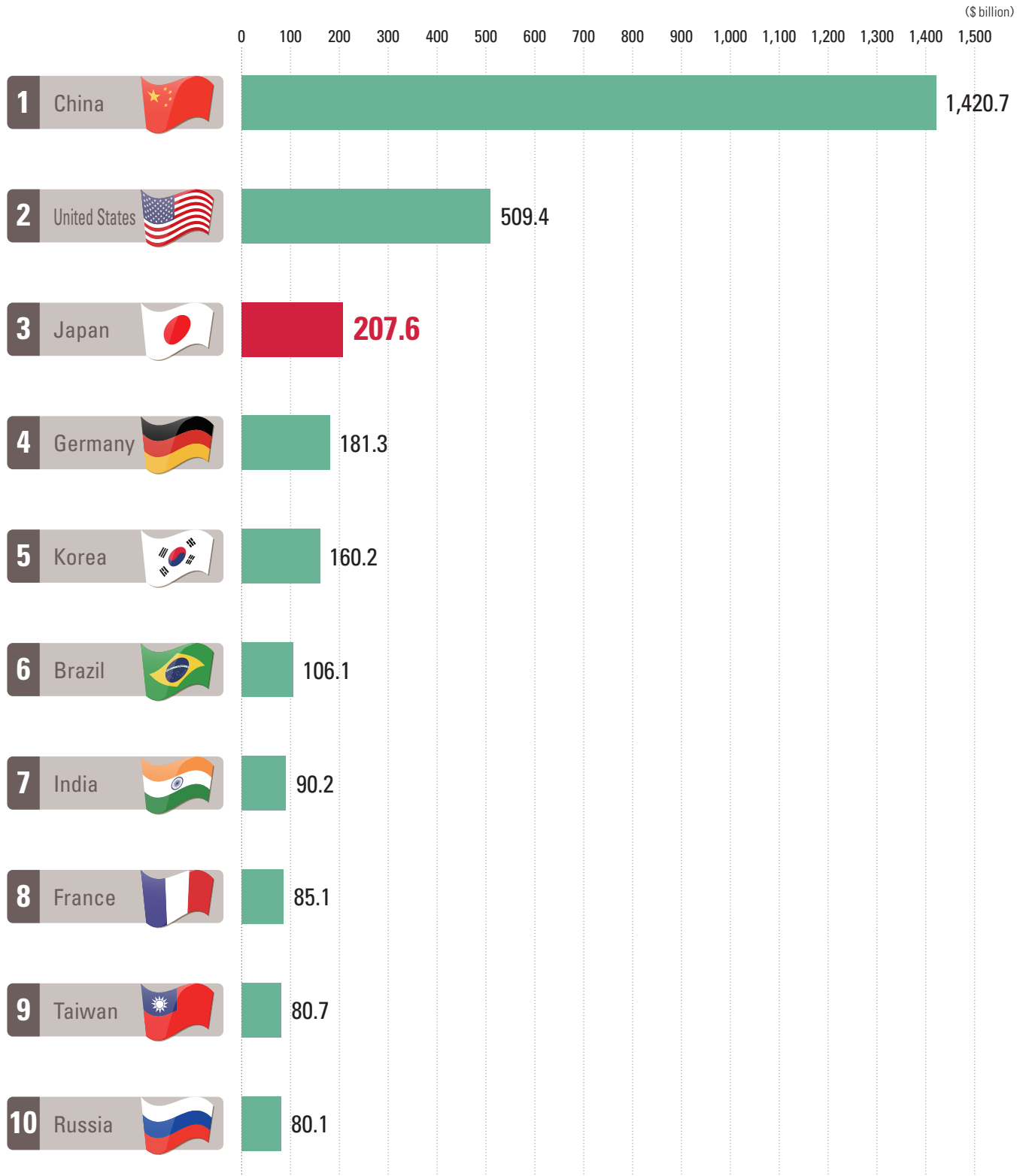
(Note) Information & communication electronic equipment was newly established in 2004, and general-purpose machinery was newly established in 2009.

9

Shipments by Country/Region

Japan is the 3rd largest in the world.

Chemical Shipments by Country/Region in 2019



(Source) American Chemistry Council
(Note) Pharmaceuticals is excluded.

10

The world's 30 leading chemical companies

Five Japanese companies are included among the world's leading chemical companies.

The world's 30 leading chemical companies in 2019

Ranking	Company	Country/Region	Chemical sales			Chemical operating profits		
			2019 (\$ million)	Change from 2018 (%)	Chemical sales as of total sales (%)	2019 (\$ million)	Change from 2018 (%)	Operating profit margin (%)
1	BASF	Germany	66,401	-5.4	100.0	5,457	-22.8	8.2
2	Sinopec	China	61,596	-7.0	14.7	2,402	-36.1	3.9
3	Dow	US	42,951	-13.4	100.0	3,520	-35.8	8.2
4	Sabir	Saudi Arabia	34,420	-18.3	92.4	4,277	-55.1	12.4
5	Ineos	UK	32,009	-8.6	100.0	2,477	-39.0	7.7
6	Formosa Plastics	Taiwan	31,425	-16.5	66.7	N/A	N/A	N/A
7	ExxonMobil Chemical	US	27,416	-15.5	10.7	955	-77.1	3.5
8	Mitsubishi Chemical	Japan	27,353	-6.0	83.3	1,659	-31.2	6.1
9	LyondellBasell Industries	US	27,128	-11.9	78.1	4,613	-17.8	17.0
10	Linde plc	UK	25,429	76.9	90.1	4,898	65.4	19.3
11	LG Chem	South Korea	24,554	1.6	100.0	768	-60.1	3.1
12	Air Liquide	France	24,171	4.9	98.5	2,260	0.3	9.4
13	PetroChina	China	22,733	-4.4	6.2	496	-56.2	2.2
14	DuPont	US	21,512	-4.8	100.0	2,788	29.7	13.0
15	Reliance Industries	India	20,640	-15.6	22.0	3,630	-20.6	17.6
16	Toray Industries	Japan	17,344	-8.2	85.4	1,288	-7.7	7.4
17	Sumitomo Chemical	Japan	15,231	-6.5	76.3	569	-52.5	3.7
18	Evonik Industries	Germany	14,674	-12.8	100.0	1,330	-32.4	9.1
19	Shin-Etsu Chemical	Japan	14,158	-3.2	100.0	3,724	0.6	26.3
20	Covestro	Germany	13,895	-15.1	100.0	824	-70.8	5.9
21	Braskem	Brazil	13,267	-9.8	100.0	555	-71.7	4.2
22	Lotte Chemical	South Korea	12,973	-8.6	100.0	950	-43.7	7.3
23	Yara	Norway	12,858	-0.5	100.0	989	146.0	7.7
24	Solvay	Belgium	12,568	-0.6	100.0	1,488	-2.2	11.8
25	Mitsui Chemicals	Japan	12,282	-9.7	100.0	657	-23.3	5.4
26	Hengli Petrochemical	China	11,839	67.8	81.2	N/A	N/A	N/A
27	Bayer	Germany	11,482	15.3	23.6	N/A	N/A	N/A
28	Indorama	Thailand	11,362	1.6	100.0	294	-68.7	2.6
29	Syngenta	Switzerland	10,588	1.7	78.0	2,199	8.8	20.8
30	DSM	Netherlands	10,086	-2.8	100.0	1,025	-25.2	10.2

(Source) Chemical and Engineering News

(Note) 1 Pharmaceuticals is excluded.

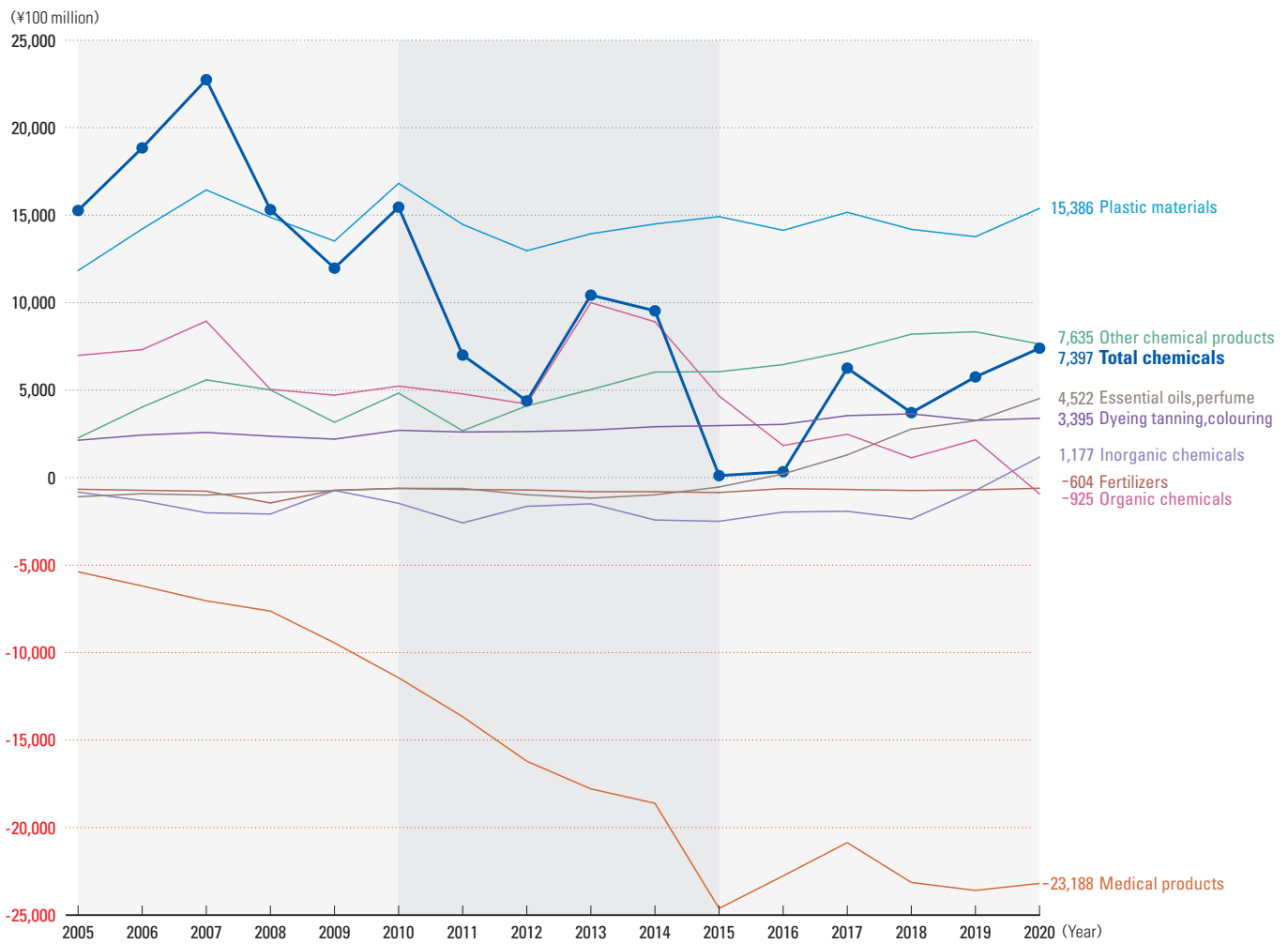
2 N/A means not available.

11

Trade balance

Trade surplus in 2020 amounts to 7,397 hundred million yen.

Trade balance of chemicals by product (2005-2020)



Exports and imports of chemicals (2005-2020)

(¥100 million)

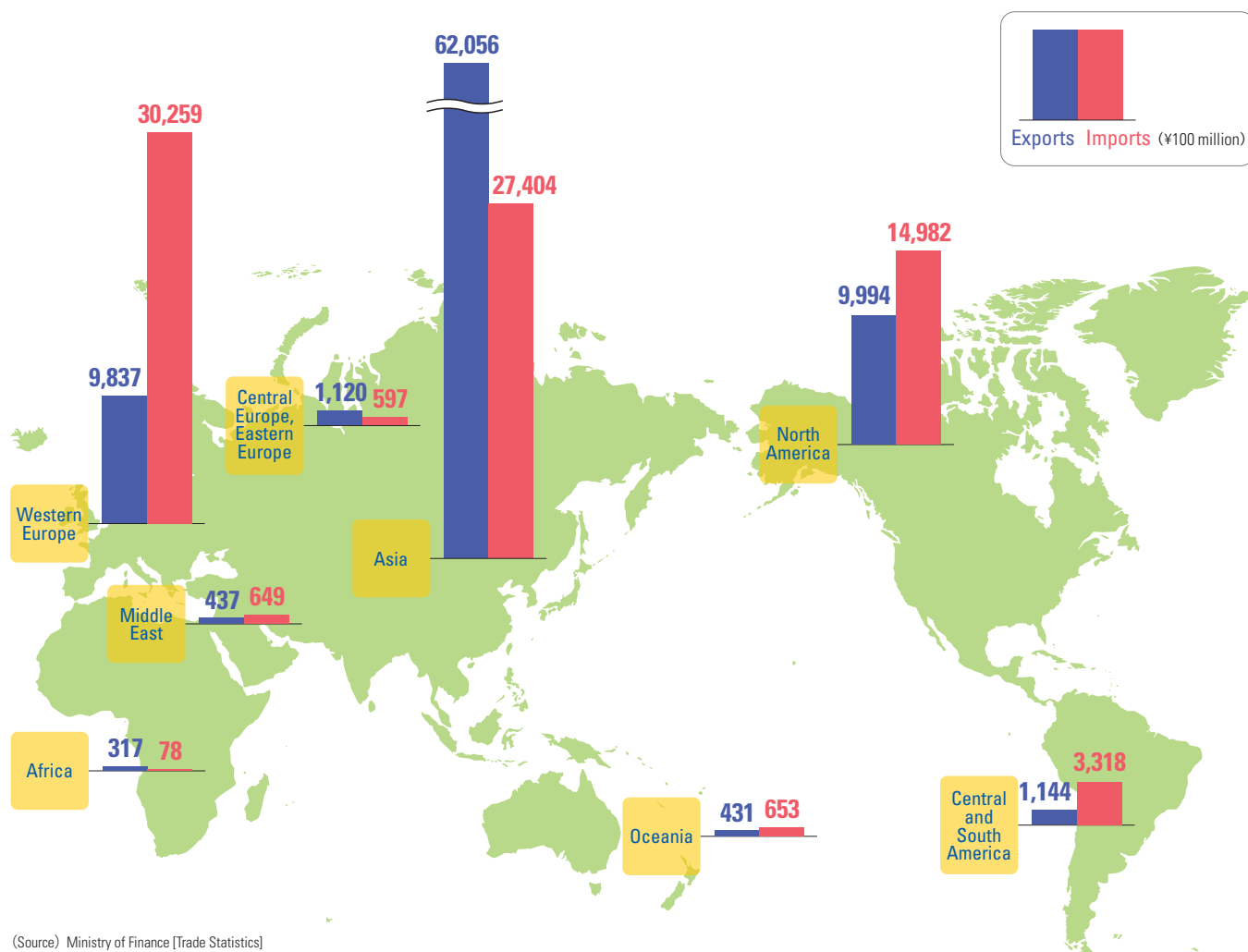
Exports						Articles	Imports					
Every 5th year			Recent three years				Every 5th year			Recent three years		
2005	2010	2015	2018	2019	2020		2005	2010	2015	2018	2019	2020
121	128	142	135	141	127	Fertilizers	783	745	990	868	840	731
3,109	3,772	4,034	6,163	6,575	7,043	Inorganic chemicals	3,935	5,237	6,529	8,527	7,310	5,866
18,832	18,728	21,166	20,513	19,071	15,556	Organic chemicals	11,843	13,496	16,499	19,379	16,911	16,481
17,157	23,360	24,441	25,574	24,297	24,198	Plastic materials	5,324	6,542	9,523	11,383	10,529	8,812
3,323	4,048	4,629	5,338	4,896	4,787	Dyeing tanning,colouring	1,187	1,343	1,655	1,692	1,627	1,392
3,677	3,787	4,623	6,487	7,331	8,360	Medical products	9,060	15,226	29,241	29,622	30,919	31,548
1,820	2,479	3,676	7,533	8,176	9,141	Essential oils,perfume	2,909	3,087	4,213	4,757	4,928	4,619
10,442	12,950	14,883	17,473	16,904	16,125	Other chemical products	8,172	8,119	8,828	9,271	8,570	8,490
58,480	69,253	77,594	89,215	87,391	85,336	Total chemicals	43,212	53,794	77,479	85,500	81,635	77,939

(Source) Ministry of Finance [Trade Statistics]

12

Exports and imports of chemicals by region

Exports and imports of chemicals by region in 2020



(Source) Ministry of Finance [Trade Statistics]

Exports and imports of chemicals by region (2005-2020)

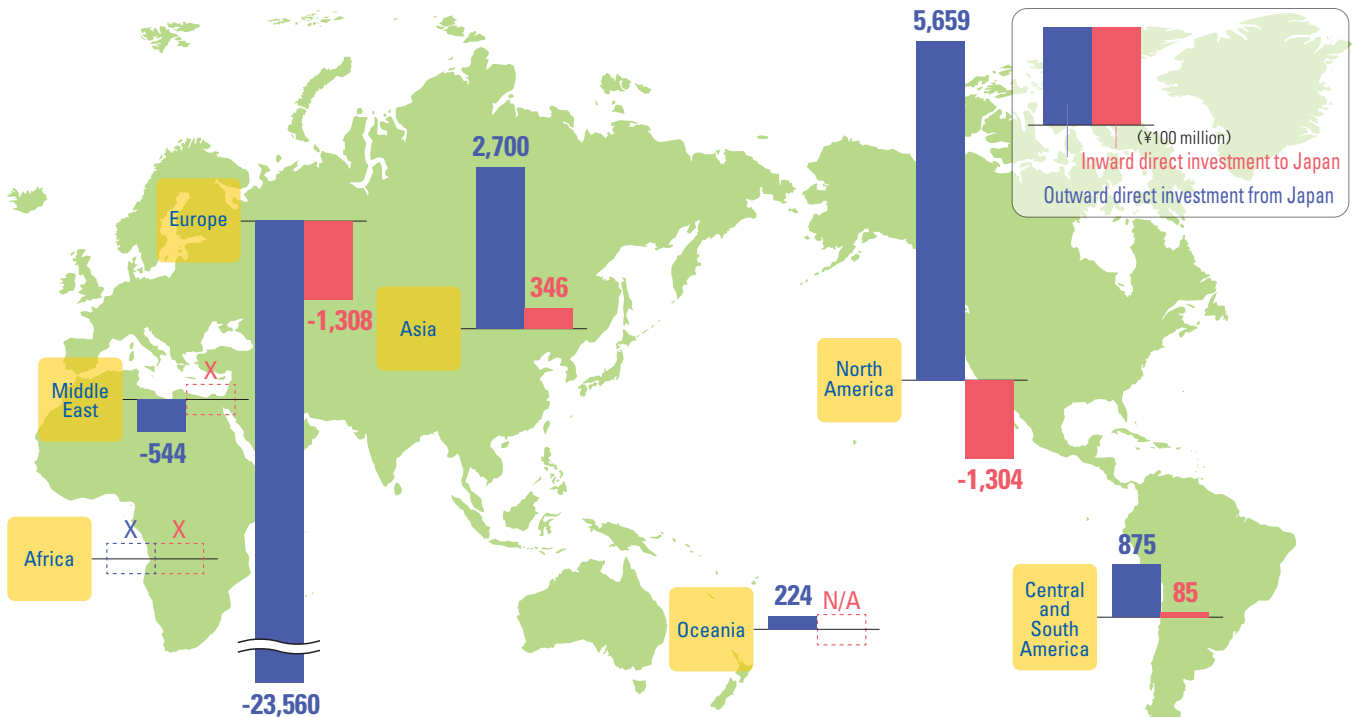
(¥100 million)

Exports						Region	Imports					
Every 5th year			Recent three years				Every 5th year			Recent three years		
2005	2010	2015	2018	2019	2020		2005	2010	2015	2018	2019	2020
40,150	51,799	57,502	66,410	64,146	62,056	Asia	12,974	17,474	26,428	32,501	29,711	27,404
586	494	460	481	426	431	Oceania	520	595	803	700	666	653
7,743	6,824	9,048	10,347	10,925	9,994	North America	9,364	11,190	14,194	15,705	15,006	14,982
1,629	1,819	1,488	1,242	1,224	1,144	Central and South America	1,790	2,013	3,082	3,457	3,549	3,318
7,609	7,084	7,689	9,183	8,877	9,837	Western Europe	17,398	21,413	31,367	31,093	31,073	30,259
204	374	425	549	894	1,120	Central Europe, Eastern Europe	298	330	541	573	643	597
364	580	693	630	539	437	Middle East	692	652	880	1,351	875	649
196	278	288	375	359	317	Africa	177	128	183	120	112	78
58,480	69,253	77,594	89,215	87,391	85,336	Total	43,212	53,794	77,479	85,500	81,635	77,939

(Source) Ministry of Finance [Trade Statistics]

13 Outward/inward direct investments

Outward direct investment of Japanese chemical industry and inward direct investment to chemical industry in Japan in 2020



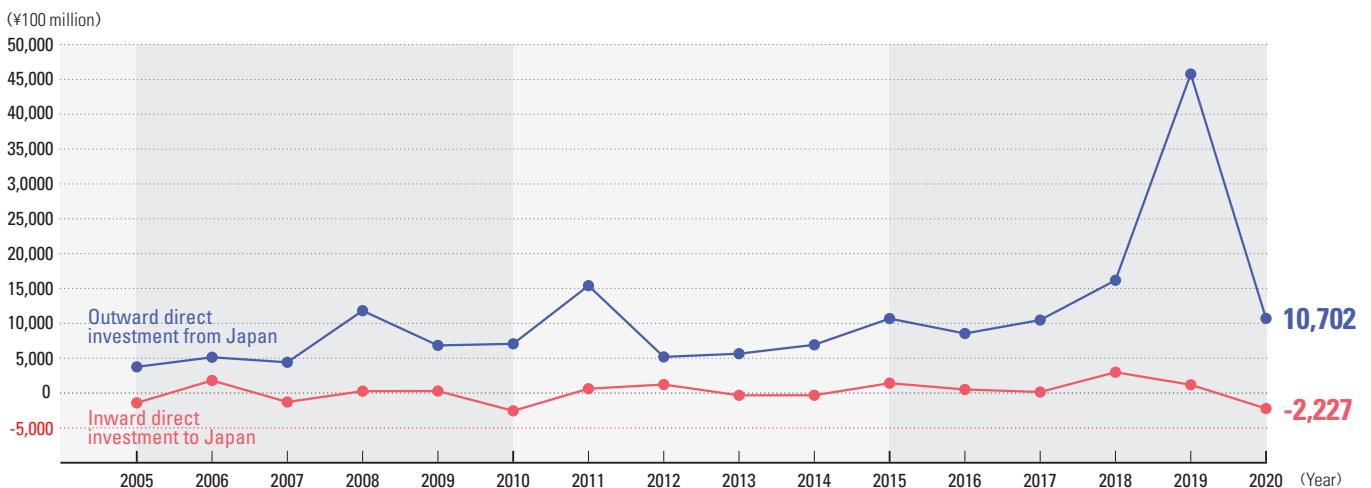
(Source) Bank of Japan [Balance of Payments]

(Note) 1 Outward direct investment from Japan is the investment that domestic companies perform for foreign countries, and Inward direct investment to Japan is the investment that overseas companies perform for Japan, and it shows minus in case of withdrawal and collection of the investment.

2 Data items with few reports are indicated as "X" for confidentiality.

3 When there are no reports, it is indicated as "N/A".

Actual outward direct investment of Japanese chemical industry and inward direct investment to chemical industry in Japan (2005-2020)



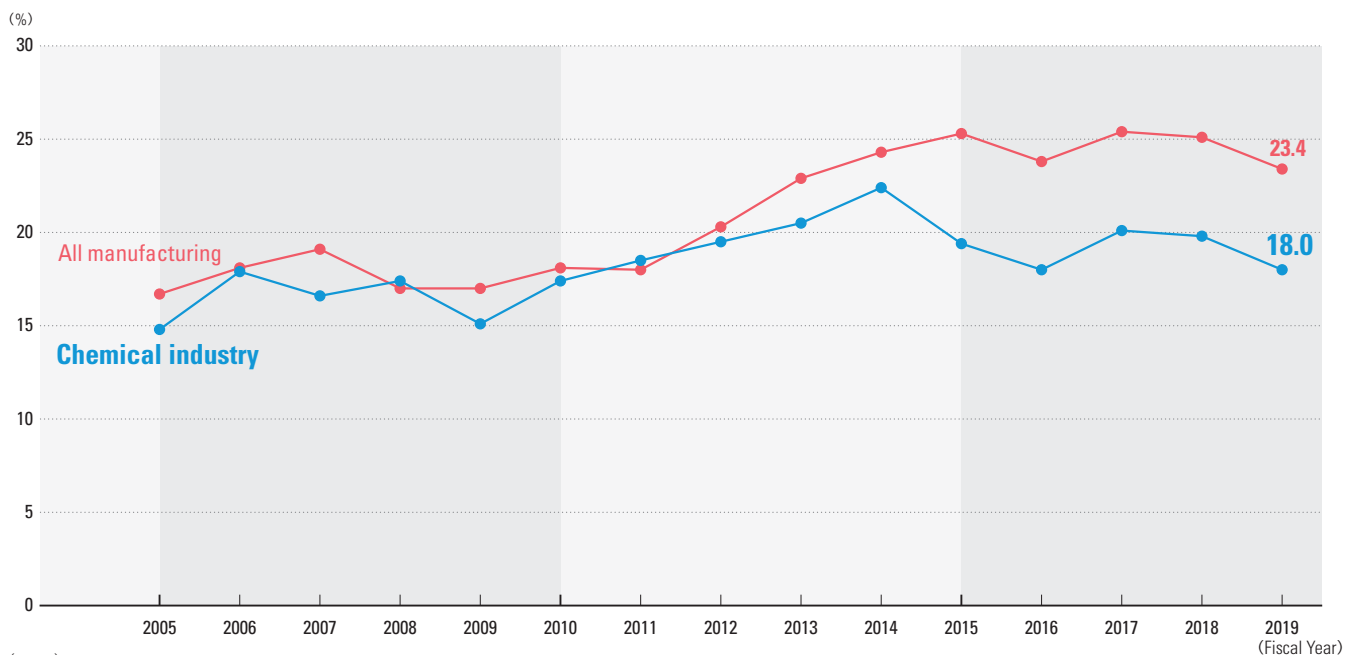
(Source) Bank of Japan [Balance of Payments]

(Note) Outward direct investment from Japan is the investment that domestic companies perform for foreign countries, and Inward direct investment to Japan is the investment that overseas companies perform for Japan, and it shows minus in case of withdrawal and collection of the investment.

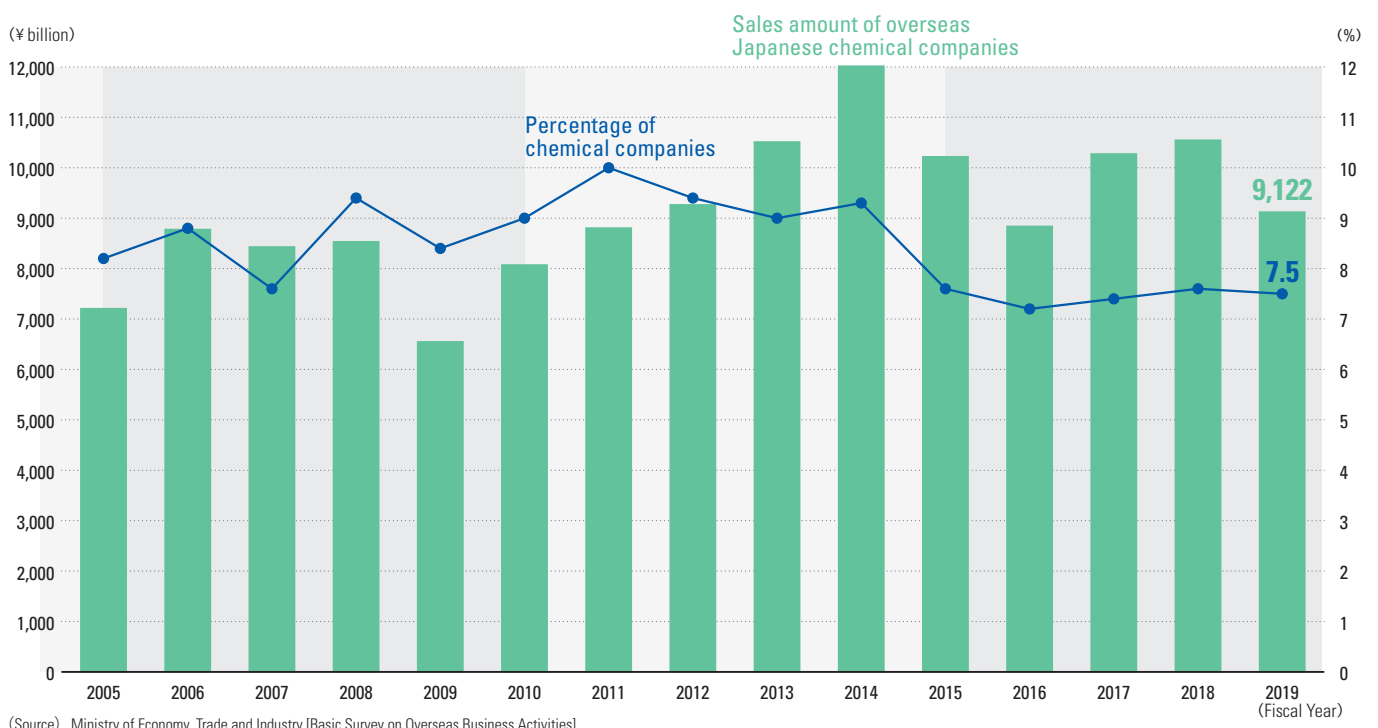
14

Ratio of overseas production/Sales of overseas subsidiary companies

Trend of overseas production of Japanese companies (FY2000-FY2019)



Sales of Japanese chemical companies based overseas and its percentage of all overseas Japanese manufacturing companies' sales (FY2000-FY2019)

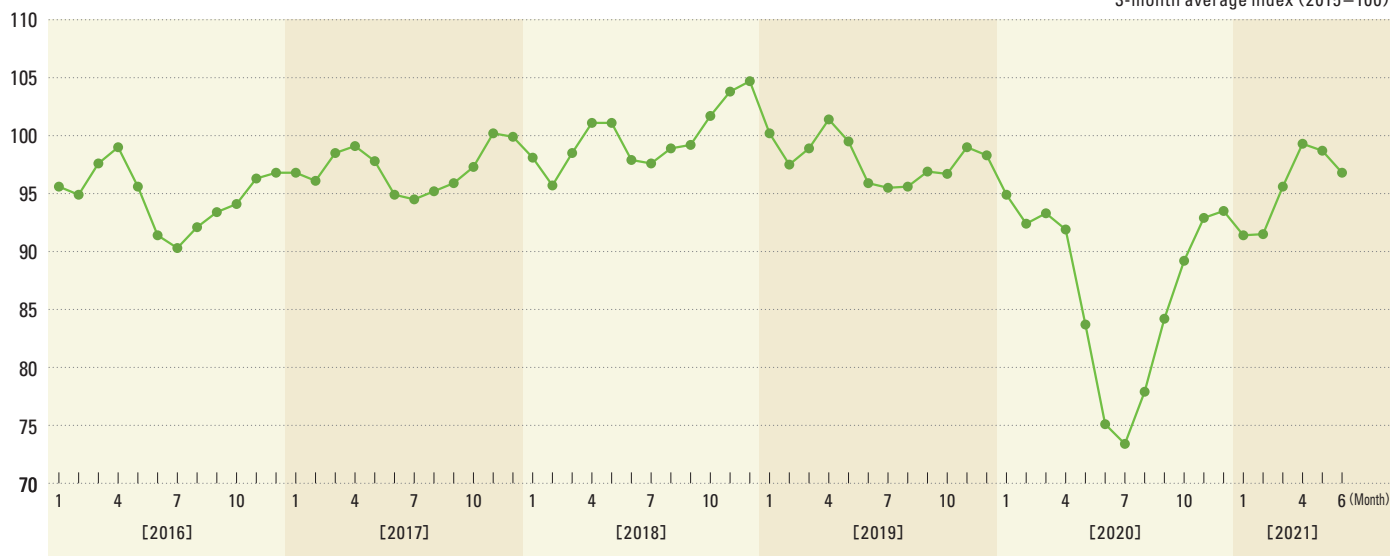


JCIA Index that shows “the current state” of Japanese chemical industry

1 Shipping index of Main Chemicals

This index shows the current status of Japanese chemical industry

3-month average index (2015=100)

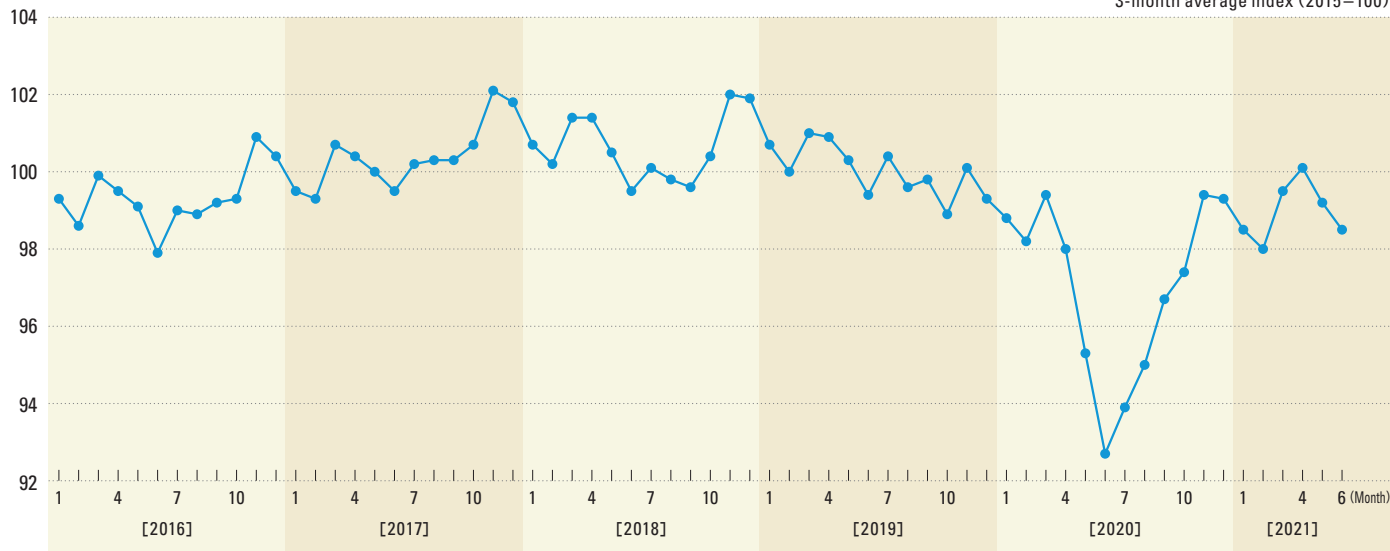


This index is based on the “Current Survey of Production” published by the Ministry of Economy, Trade and Industry. JCIA selected 33 items closely related to the chemical industry in nine fields (plastic, plasticizer, synthetic fiber raw material, synthetic rubber, paint, surfactant, synthetic dye / pigment, chemical fertilizer, inorganic) and an index was created based on the domestic total shipment value excluding the impact of the inventory of major chemical products.

2 Production index Key User Customer Industries

You can read the relationship with production trends of the key user customer industries in Japan by reading together with the Shipping index of Main Chemicals.

3-month average index (2015=100)



The total production value of major products in domestic each industry based on data published by customer association of chemical industry (such as automobiles, electrical, electronics, plastic products, rubber, chemical fibers) is reflected to the index in view of the impact of each industry on the chemical industry.

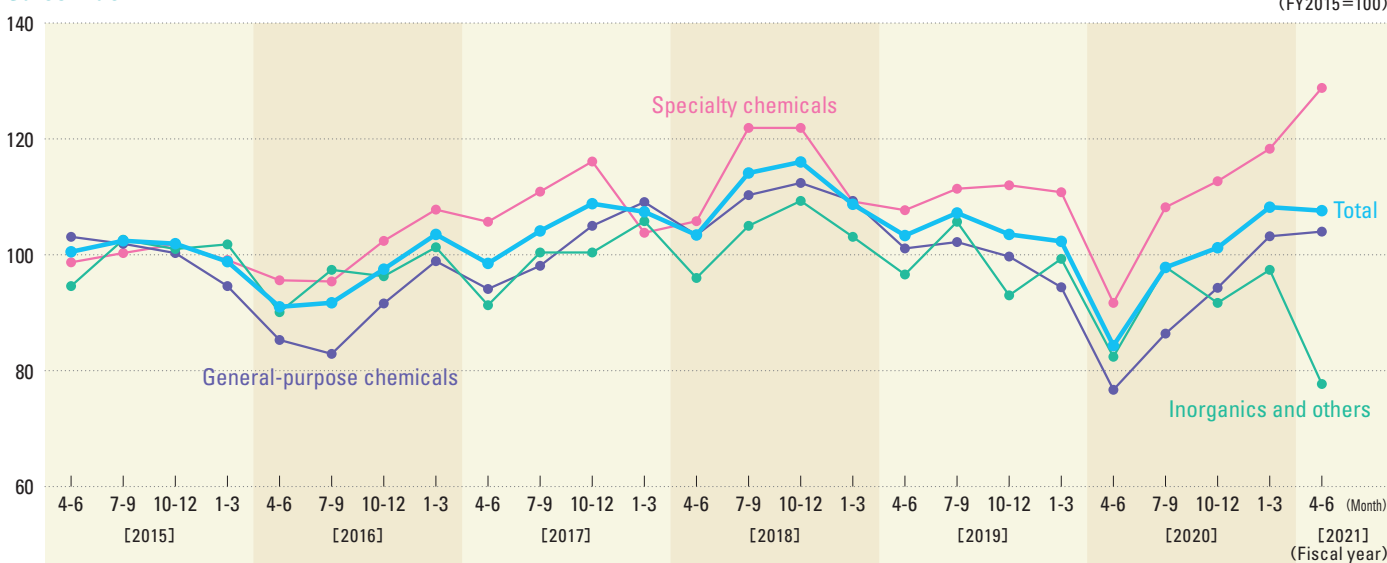
The chemical industry covers a wide range of fields, including petrochemicals, synthetic fibers, synthetic rubber, paints, and pharmaceuticals. So far, we have been able to explain the management status of individual chemical companies to society, however there were no published figures showing the current state of Japanese chemical industry as a whole. Therefore JCIA created the JCIA Index and published in 2017 as an indicator of showing the current status of the entire Japanese chemical industry, so that everyone in society became able to recognize

about the current status of Japanese chemical industry. This index consists of the "Shipping index of Main Chemicals" indicating the shipment status of major chemical products in domestic chemical industry, the "Production index Key User Customer Industries" indicating the production status of customers in domestic chemical industry, and the "Corporate earnings index" indicating the consolidated performance of chemical companies. The latest JCIA Index is made public with the base table for the index on the JCIA website every month, so anyone can see it.

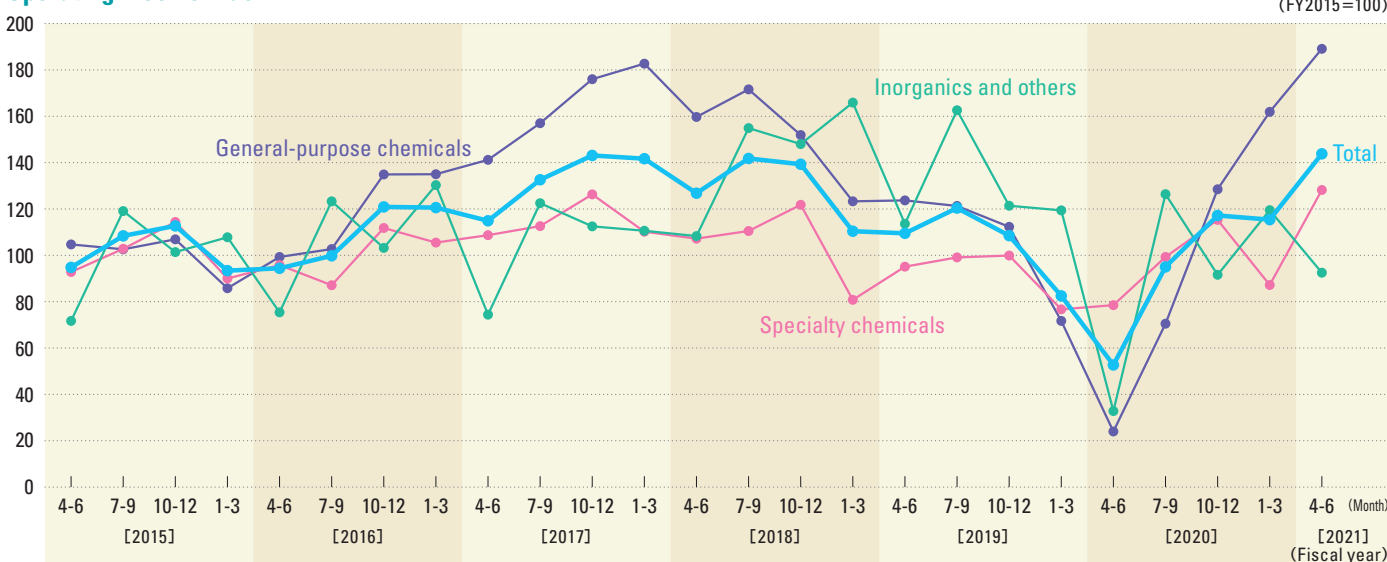
3 Corporate earnings index

You can read the relationship with the consolidated performance of chemical companies by reading together with the Shipping index of Main Chemicals.

Sales Index



Operating Income Index



This index is categorized as "General-purpose chemicals", "Specialty chemicals" and "Inorganics and others" based on summary of quarterly consolidated financial statements of 29 major chemical companies.

<https://www.nikkakyo.org/english/data-report/report>

JCIA web page

DATA&REPORT

JCIA Index Report



JCIA index is also available on the website



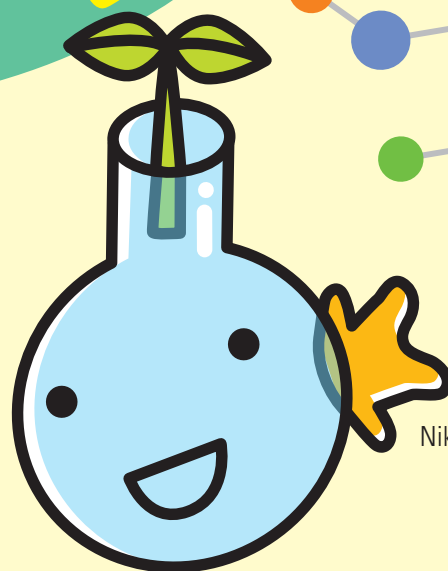
10/23 Chemistry Day

What is
Chemistry
Day?

The four associations, namely, the Chemical Society of Japan (CSJ), the Society of Chemical Engineers, Japan (SCEJ), Japan Association for Chemical Innovation (JACI), and Japan Chemical Industry Association (JCIA) have instituted that October 23rd is the “Chemistry Day”, in association with the **Avogadro’s Number** (6.02×10^{23}), which is a basic measuring unit in chemistry. Chemistry Day was created as a way to foster interest in chemistry.



Doctor Mole



Nikka-chan

1 mol
 6.02×10^{23}



Japan Chemical Industry Association

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