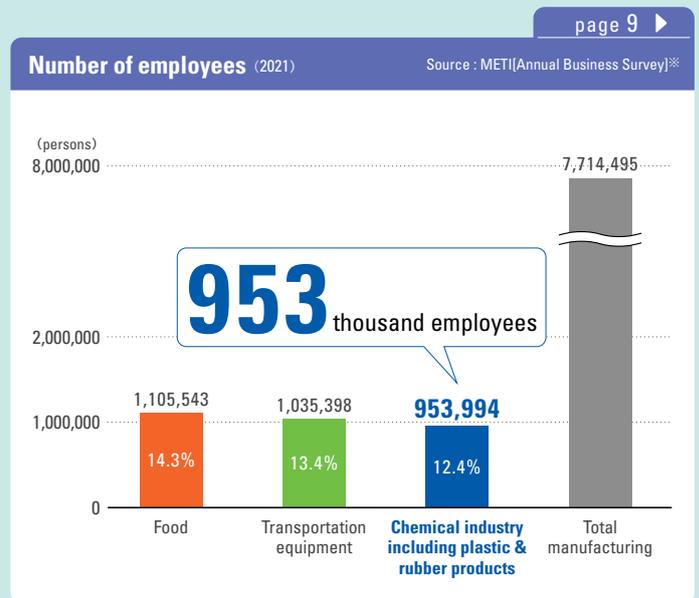
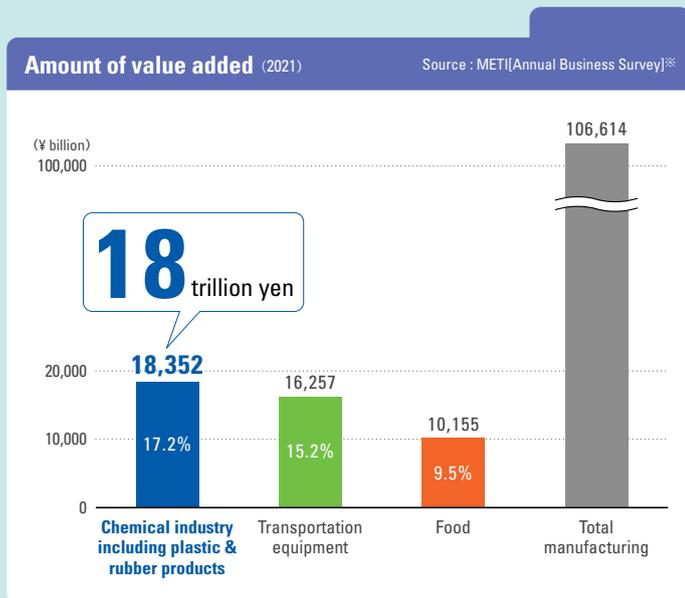
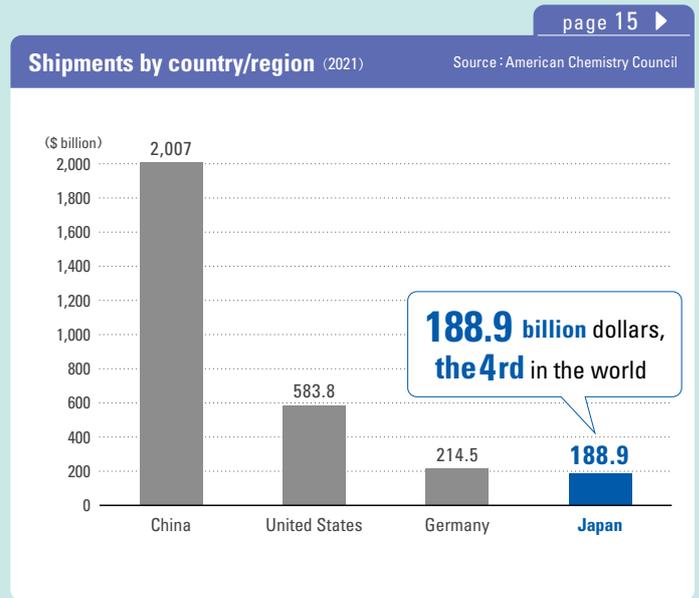
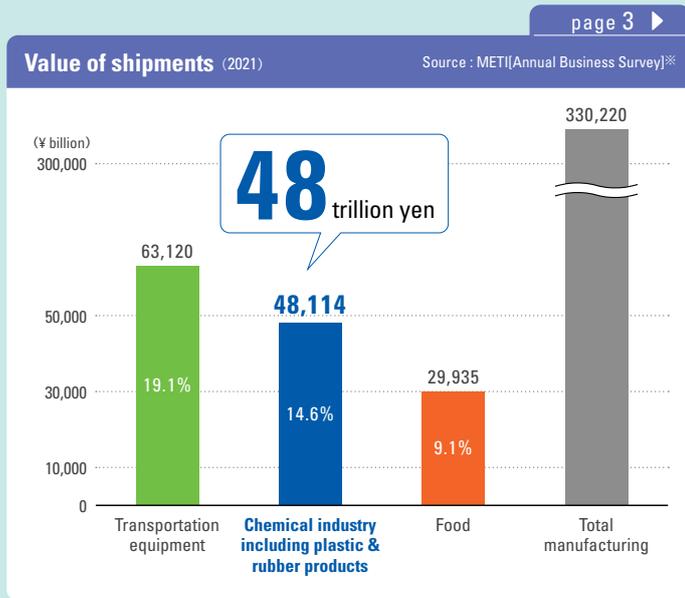


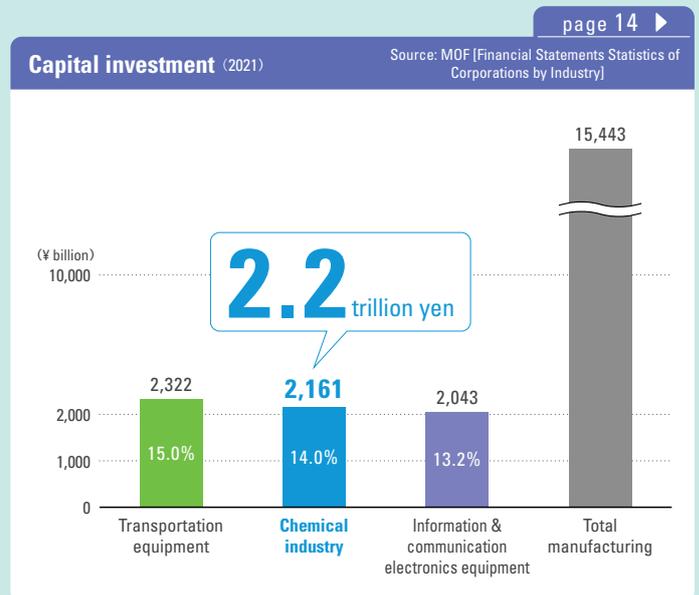
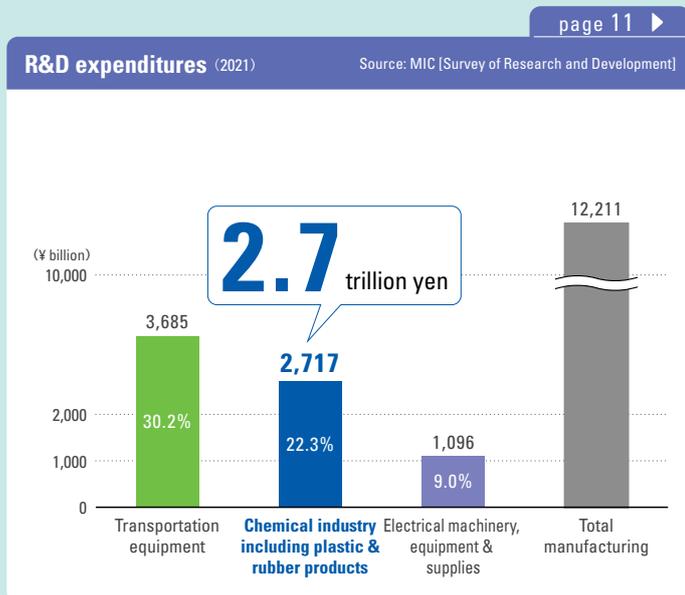
CHEMICAL
INDUSTRY OF
J A P A N
2023



Japan's chemical industry viewed by figures and graphs



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



** Annual Business Survey (Excludes private management)

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 48 trillion and Yen 18 trillion, respectively, in 2021, 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

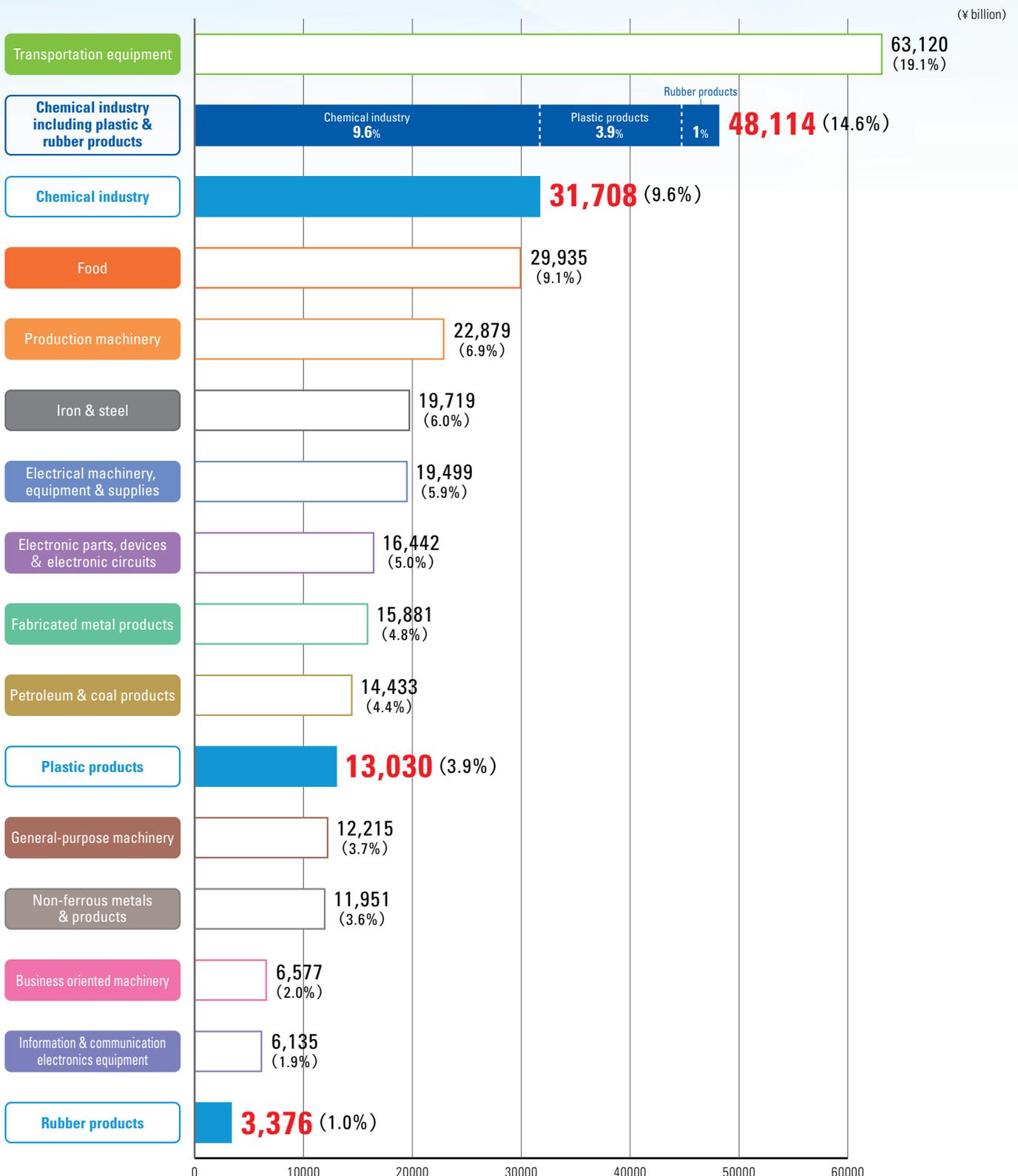
Japan's chemical industry viewed by figures and graphs	1	8 Amount of capital investment	14
Japan's chemical industry supports people's lives and other industries ...	2	9 Shipments by Country/Region	15
1 Shipments	3	10 The world's 30 leading chemical companies	16
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5 Labor productivity/Working hours	10	14 Ratio of overseas production/Sales of overseas subsidiary companies ...	20
6 Research and development expenditures	11	JCIA Index that shows "the current state" of Japanese chemical industry ...	21
7 Operating profit margin	13		

1

Shipments

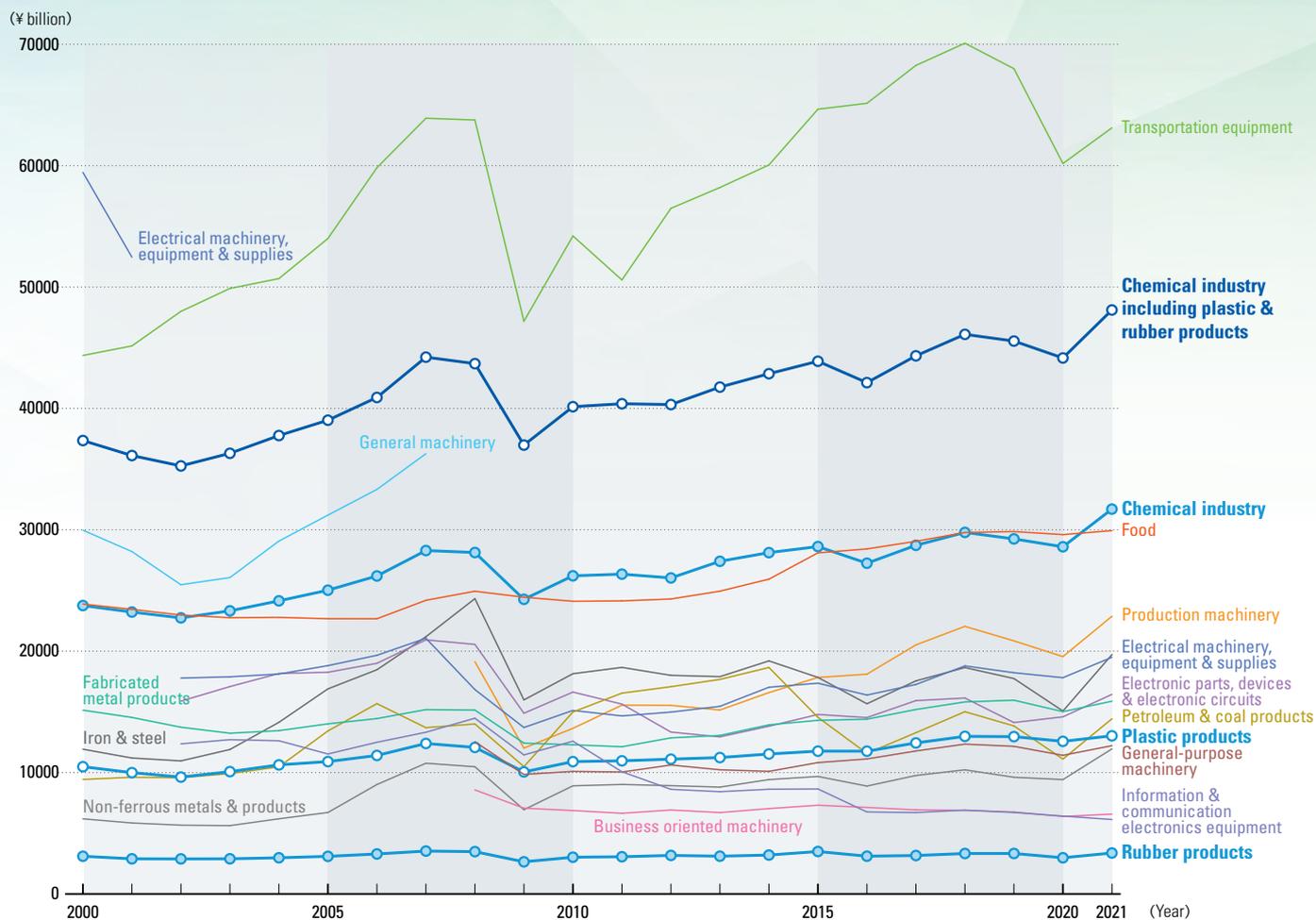
Total shipment value of chemical industry ranks 2nd in manufacturing industries amounting to 48 trillion yen.

Value of shipments by manufacturing industry in 2021



(Source) Ministry of Economy, Trade and Industry [Annual Business Survey (Excludes private management)]

Trend in shipment value (2000-2021)



(¥ billion)

Industry	Year	Every 5th year				Recent three years			
		2000	2005	2010	2015	2019	2020	2021	
Chemical industry		23,762	25,027	26,212	28,622	29,253	28,603	31,708	9.6%
Plastic products		10,486	10,906	10,903	11,767	12,963	12,574	13,030	3.9%
Rubber products		3,107	3,099	3,029	3,499	3,336	2,982	3,376	1.0%
Chemical industry including plastic & rubber products		37,356	39,032	40,144	43,889	45,552	44,159	48,114	14.6%
Food		23,888	22,678	24,114	28,102	29,857	29,606	29,935	9.1%
Petroleum & coal products		9,434	13,429	14,992	14,555	13,844	11,114	14,433	4.4%
Iron & steel		11,927	16,896	18,146	17,842	17,748	15,072	19,719	6.0%
Non-ferrous metals & products		6,191	6,712	8,911	9,680	9,614	9,424	11,951	3.6%
Fabricated metal products		15,143	14,016	12,292	14,306	15,965	15,020	15,881	4.8%
General machinery		29,972	31,211	—	—	—	—	—	—
General-purpose machinery		—	—	10,100	10,823	12,162	11,424	12,215	3.7%
Production machinery		—	—	13,646	17,837	20,853	19,554	22,879	6.9%
Business oriented machinery		—	—	6,873	7,311	6,753	6,387	6,577	2.0%
Electronic parts, devices & electronic circuits		—	18,265	16,633	14,788	14,124	14,593	16,442	5.0%
Electrical machinery, equipment & supplies		59,449	18,812	15,120	17,366	18,229	17,819	19,499	5.9%
Information & communication electronics equipment		—	11,534	12,585	8,652	6,712	6,417	6,135	1.9%
Transportation equipment		44,367	54,000	54,214	64,654	67,994	60,178	63,120	19.1%
Others		62,752	48,760	41,338	43,324	43,126	41,236	43,320	13.1%
Total manufacturing		300,478	295,346	289,108	313,129	322,533	302,003	330,220	100.0%

(Source) Ministry of Economy, Trade and Industry [Annual Business Survey (Excludes private management)]

(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.

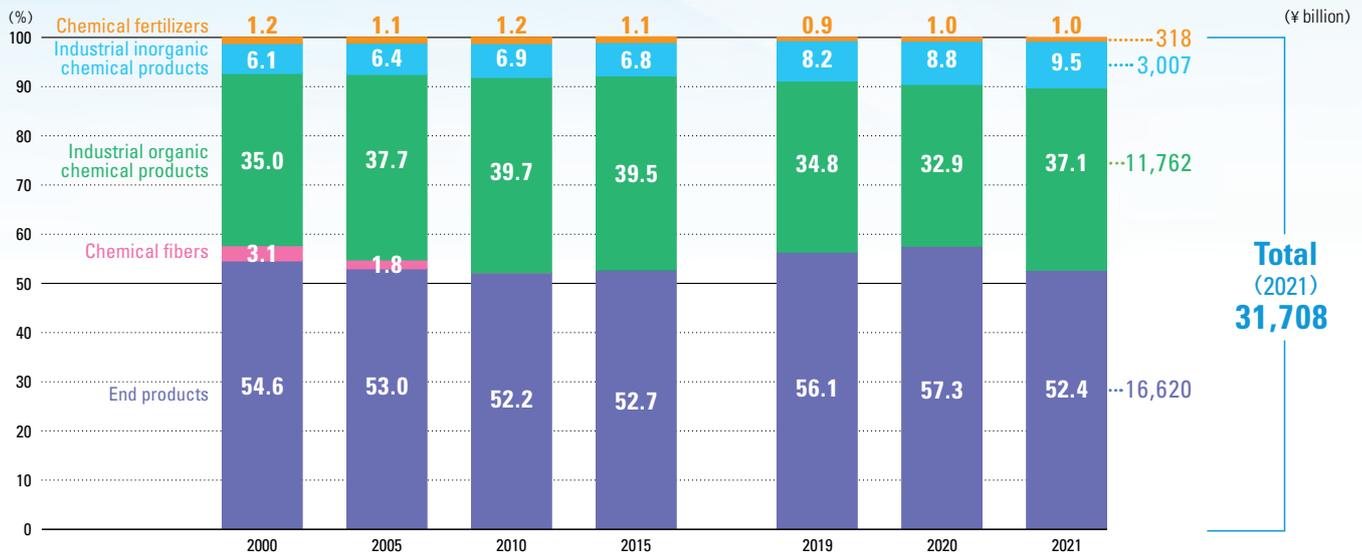
Electronic circuits have been added to electronic parts & devices since 2011.

2

Shipment by products/Major indices

Chemical products meet the needs of various fields.

Trend of shipments composition in chemical industry (2000-2021)

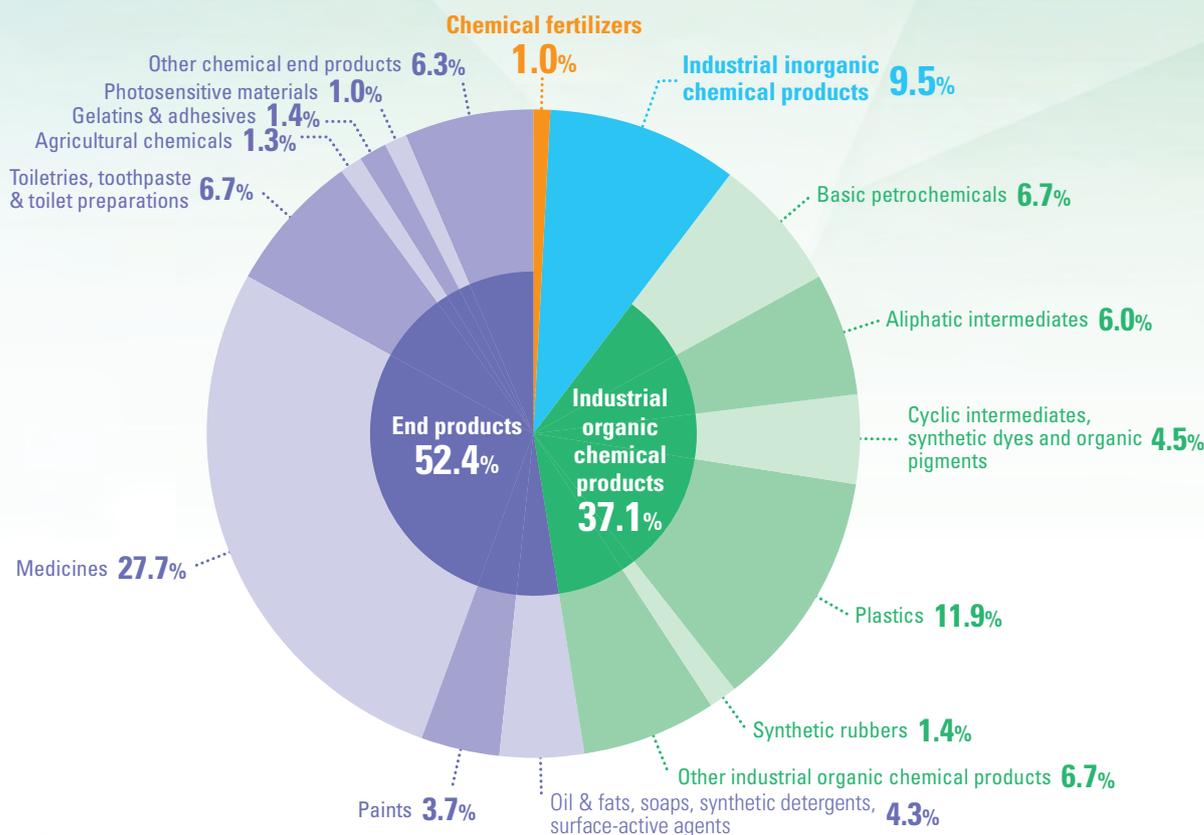


Industry	Year	Every 5th year				Recent three years		
		2000	2005	2010	2015	2019	2020	2021
Chemical fertilizers		1.2	1.1	1.2	1.1	0.9	1.0	1.0
Industrial inorganic chemical products		6.1	6.4	6.9	6.8	8.2	8.8	9.5
Industrial organic chemical products		35.0	37.7	39.7	39.5	34.8	32.9	37.1
▶ Basic petrochemicals		2.9	6.3	6.6	5.9	6.8	5.6	6.7
▶ Aliphatic intermediates		7.1	6.1	5.9	5.4	4.8	4.8	6.0
▶ Cyclic intermediates, synthetic dyes and organic pigments		6.1	7.6	6.8	7.4	4.5	3.5	4.5
▶ Plastics		13.6	11.0	13.2	12.8	11.5	11.3	11.9
▶ Synthetic rubbers		1.5	2.0	1.6	1.9	1.7	1.4	1.4
▶ Other industrial organic chemical products		3.8	4.7	5.5	6.0	5.4	6.3	6.7
Chemical fibers		3.1	1.8	-	-	-	-	-
End products		54.6	53.0	52.2	52.7	56.1	57.3	52.4
▶ Oil & fats, soaps, synthetic detergents, surface-active agents		3.5	4.1	4.2	3.9	4.3	4.5	4.3
▶ Paints		4.1	3.7	4.0	3.5	3.6	3.5	3.7
▶ Medicines		27.0	28.0	28.1	29.2	29.0	31.0	27.7
▶ Toiletries, toothpaste & toilet preparations		6.0	5.6	5.3	5.4	7.6	7.3	6.7
▶ Agricultural chemicals		1.4	1.1	1.0	1.2	1.2	1.3	1.3
▶ Gelatins & adhesives		1.0	1.0	1.2	1.2	1.3	1.4	1.4
▶ Photosensitive materials		4.4	2.5	1.7	1.2	1.5	1.0	1.0
▶ Other chemical end products		7.2	7.0	6.8	7.2	7.6	7.3	6.3
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	64.2	64.8	65.9
Plastic products		28.1	27.9	27.2	26.8	28.5	28.5	27.1
Rubber products		8.3	7.9	7.5	8.0	7.3	6.8	7.0
Chemical industry including plastic & rubber products		100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source) Ministry of Economy, Trade and Industry [Annual Business Survey (Excludes private management)]

(Note) Chemical fibers have been moved to textile industry since 2008.

Composition of chemical products shipped in 2021



(Source) Ministry of Economy, Trade and Industry [Annual Business Survey (Excludes private management)]

Major chemical industry indices with breakdown by product in 2021

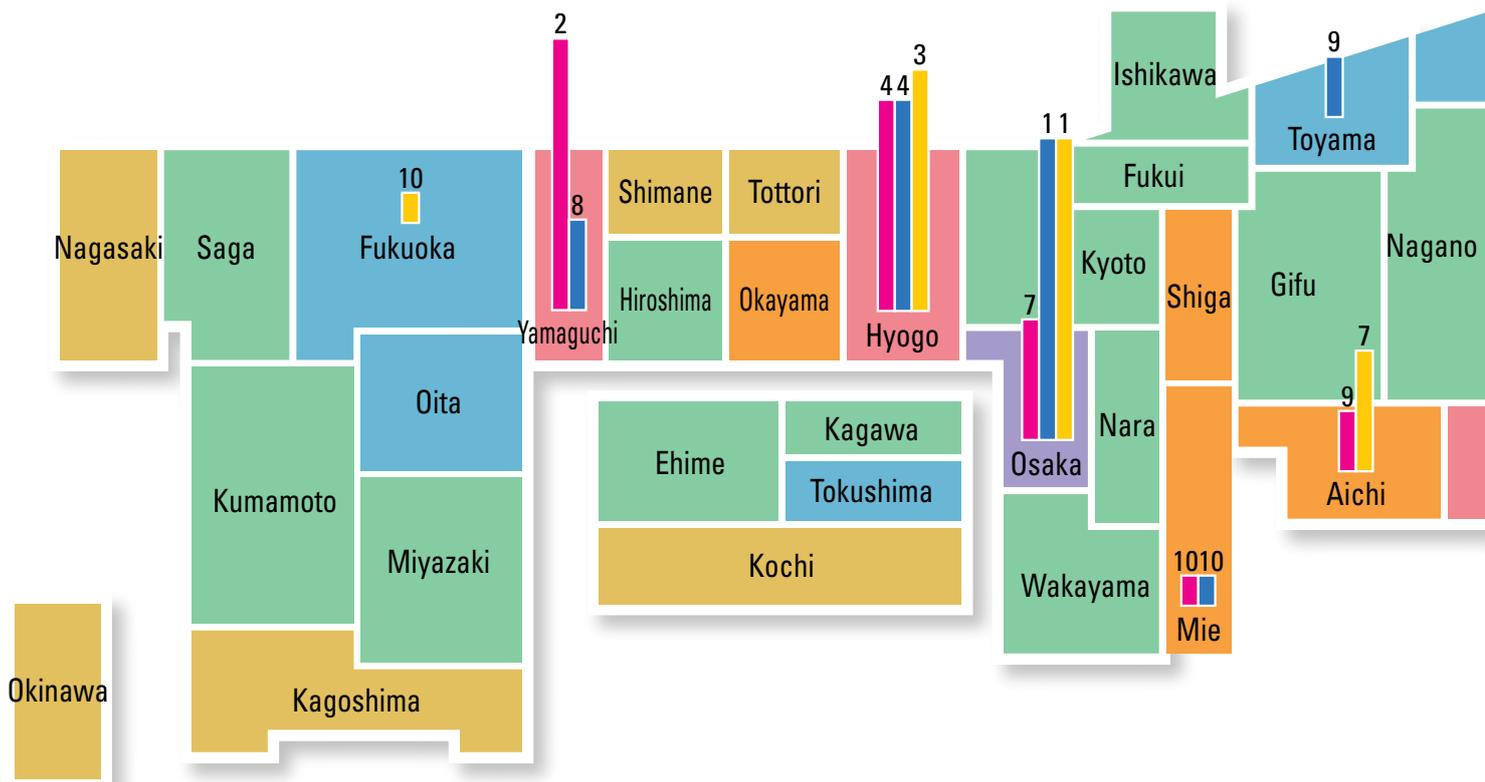
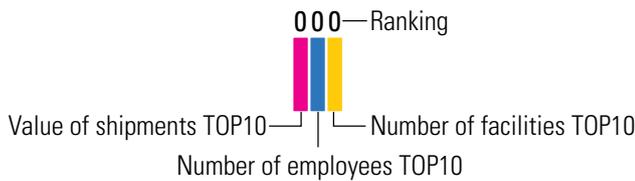
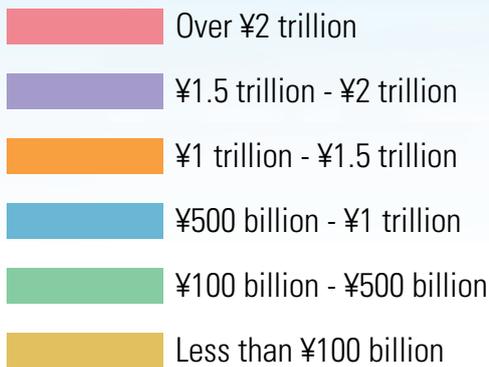
Industry	Major indices, Composition							
	Number of facilities		Number of employees		Value of shipments		Amount of value added	
		%	(Persons)	%	(¥ billion)	%	(¥ billion)	%
Chemical fertilizers	212	3.8	4,533	1.2	318	1.0	79	0.7
Industrial inorganic chemical products	975	17.3	36,248	9.3	3,007	9.5	904	7.6
Industrial organic chemical products	879	15.6	106,147	27.2	11,762	37.1	3,306	27.6
▶ Basic petrochemicals	10	0.2	4,842	1.2	2,111	6.7	206	1.7
▶ Aliphatic intermediates	76	1.4	14,498	3.7	1,905	6.0	658	5.5
▶ Cyclic intermediates, synthetic dyes and organic pigments	134	2.4	14,968	3.8	1,412	4.5	428	3.6
▶ Plastics	290	5.2	37,179	9.5	3,764	11.9	1,158	9.7
▶ Synthetic rubbers	19	0.3	6,422	1.6	458	1.4	130	1.1
▶ Other industrial organic chemical products	350	6.2	28,238	7.2	2,112	6.7	725	6.1
End products	3,557	63.3	243,990	62.4	16,620	52.4	7,677	64.2
▶ Oil & fats, soaps, synthetic detergents, surface-active agents	341	6.1	16,412	4.2	1,367	4.3	624	5.2
▶ Paints	457	8.1	16,893	4.3	1,180	3.7	473	4.0
▶ Medicines	807	14.4	102,718	26.3	8,787	27.7	4,272	35.7
▶ Toiletries, toothpaste & toilet preparations	684	12.2	50,013	12.8	2,115	6.7	1,116	9.3
▶ Agricultural chemicals	91	1.6	5,228	1.3	408	1.3	148	1.2
▶ Gelatins & adhesives	151	2.7	7,129	1.8	450	1.4	141	1.2
▶ Photosensitive materials	37	0.7	6,533	1.7	318	1.0	136	1.1
▶ Other chemical end products	989	17.6	39,064	10.0	1,996	6.3	768	6.4
Chemical industry	5,623	100.0	390,918	100.0	31,708	100.0	11,965	100.0
Chemical industry	5,623	25.9	390,918	41.0	31,708	65.9	11,965	65.2
Plastic products	13,719	63.2	449,270	47.1	13,030	27.1	4,900	26.7
Rubber products	2,378	10.9	113,806	11.9	3,376	7.0	1,487	8.1
Chemical industry including plastic & rubber products	21,720	100.0	953,994	100.0	48,114	100.0	18,352	100.0

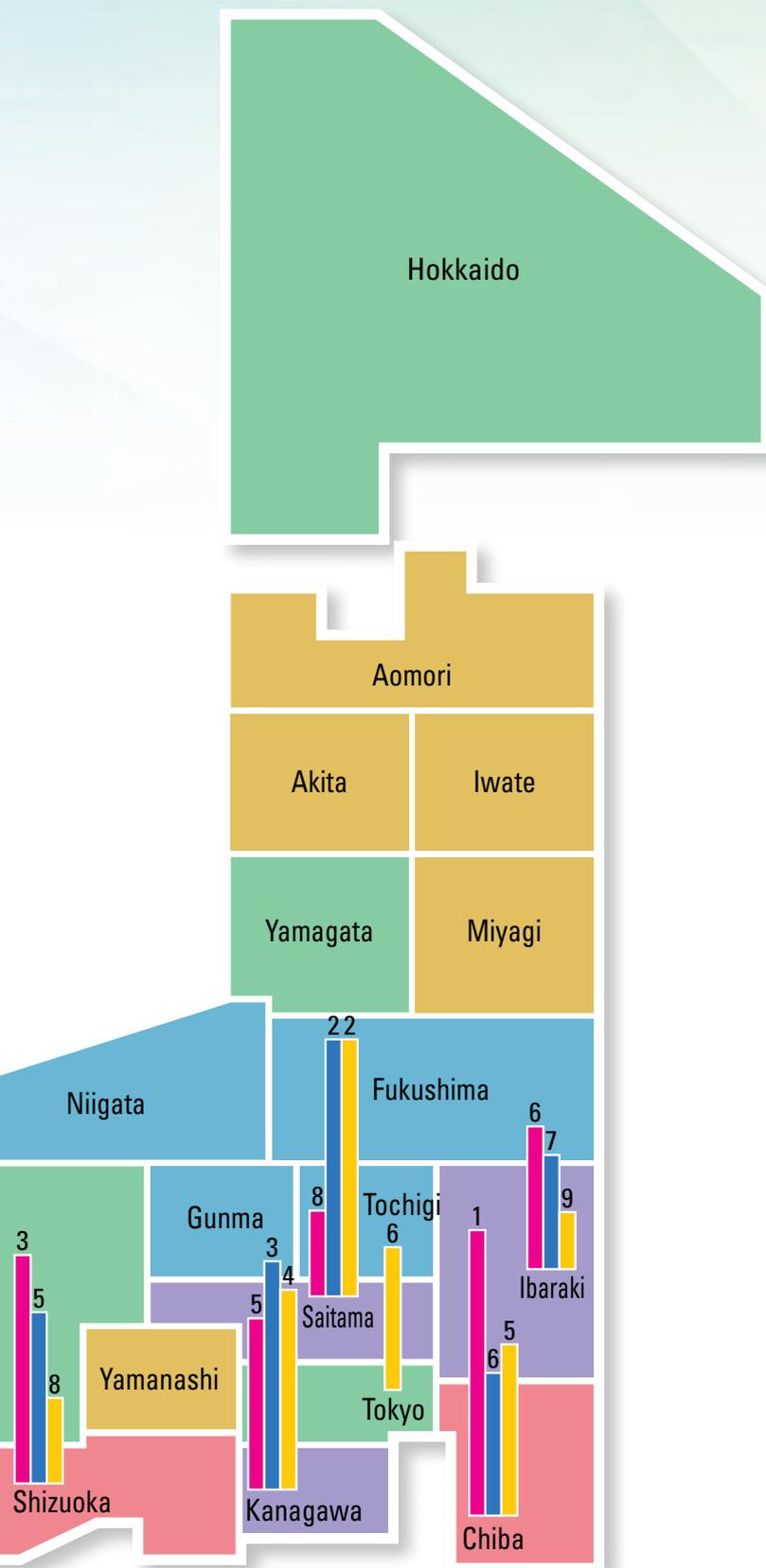
(Source) Ministry of Economy, Trade and Industry [Annual Business Survey (Excludes private management)]
 (Note) The number of establishments and employees is as of June 1, 2022.

3

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

Shipment, number of employed workers and number of facilities by prefecture in 2021





Prefecture	Value of shipments (¥100million)	Change from 2020	Number of employees	Number of facilities
1 Chiba	24,564	120.3%	21,904	294
2 Yamaguchi	22,817	126.5%	16,581	108
3 Shizuoka	22,715	108.7%	22,286	220
4 Hyogo	21,779	105.7%	24,108	341
5 Kanagawa	19,203	104.1%	24,138	311
6 Ibaraki	18,824	118.7%	17,130	210
7 Osaka	17,773	108.1%	31,880	644
8 Saitama	17,140	106.5%	24,960	409
9 Aichi	13,959	118.5%	15,598	286
10 Mie	13,484	108.5%	15,840	145
11 Okayama	12,743	120.9%	12,135	129
12 Shiga	12,652	111.7%	8,866	121
13 Niigata	7,971	118.2%	8,075	80
14 Tokushima	7,365	120.5%	7,146	47
15 Gunma	7,270	98.1%	10,959	102
16 Toyama	7,232	92.4%	16,275	128
17 Tochigi	6,747	93.6%	7,767	92
18 Fukushima	6,664	108.5%	9,380	103
19 Oita	5,855	117.0%	3,118	44
20 Fukuoka	5,683	113.2%	9,420	161
21 Wakayama	4,406	98.7%	6,123	90
22 Tokyo	4,342	107.4%	10,999	287
23 Hiroshima	3,833	100.2%	6,211	111
24 Ehime	3,758	124.9%	4,666	52
25 Gifu	3,156	116.5%	5,871	112
26 Yamagata	2,942	96.1%	3,839	37
27 Fukui	2,332	115.0%	3,944	67
28 Kyoto	2,330	111.4%	5,967	140
29 Kumamoto	1,989	105.9%	5,029	53
30 Hokkaido	1,907	90.4%	3,662	127
31 Miyazaki	1,885	147.7%	2,190	40
32 Saga	1,761	107.7%	2,887	43
33 Kagawa	1,671	108.7%	4,111	58
34 Ishikawa	1,602	102.6%	2,445	35
35 Nagano	1,376	100.2%	2,126	57
36 Nara	1,215	100.2%	3,453	74
37 Miyagi	982	110.4%	1,528	48
38 Akita	676	105.1%	2,082	20
39 Iwate	592	102.0%	1,559	23
40 Yamanashi	505	93.4%	1,193	26
41 Shimane	381	141.0%	1,068	14
42 Aomori	371	108.5%	387	19
43 Kagoshima	240	97.0%	446	29
44 Nagasaki	141	111.8%	401	22
45 Kochi	119	110.8%	365	18
46 Okinawa	80	105.5%	593	37
47 Tottori	53	113.8%	207	9
Total	317,082	110.9%	390,918	5,623

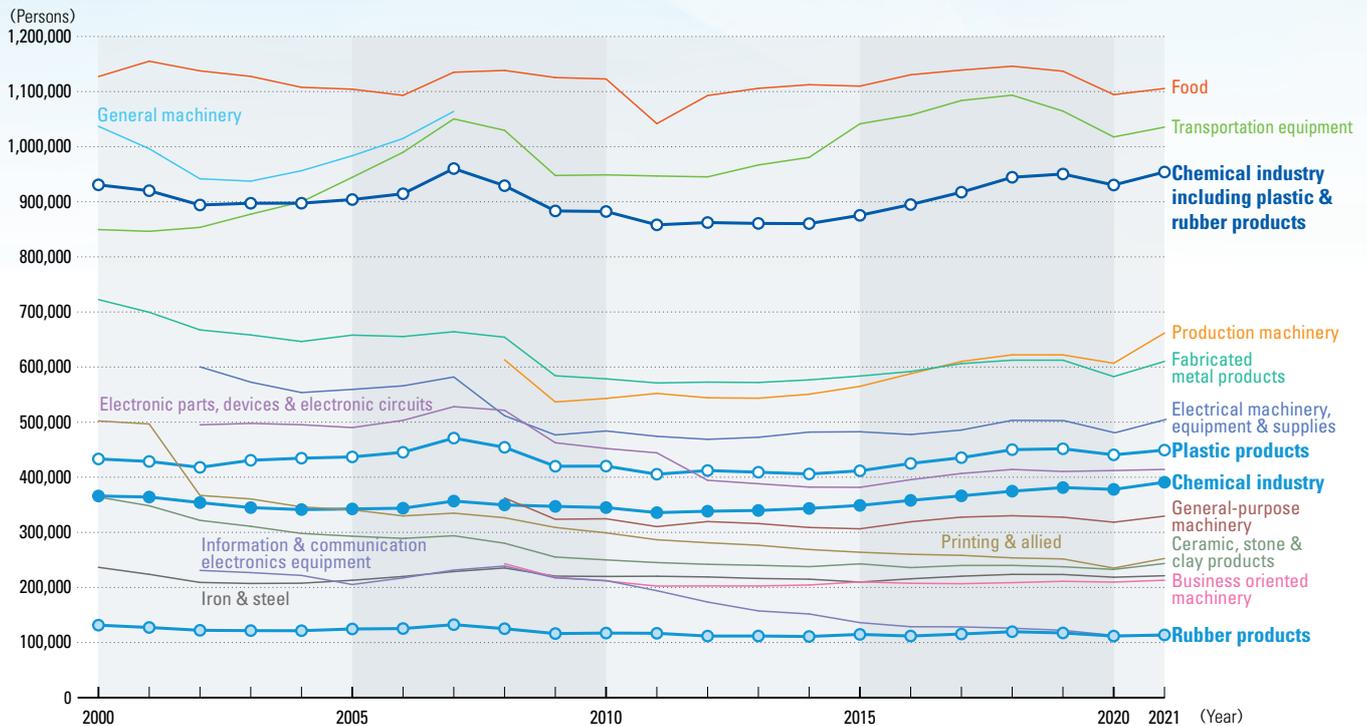
(Source) Ministry of Economy, Trade and Industry [Annual Business Survey (Excludes private management)]
 (Note) The number of establishments and employees is as of June 1, 2022.

4

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 (2000-2021)



Industry	Year	Every 5th year				Recent three years			(Persons)
		2000	2005	2010	2015	2019	2020	2021	
Chemical industry		365,953	342,481	344,968	348,895	381,259	377,971	390,918	5.1%
Plastic products		433,177	436,897	420,179	411,676	451,650	440,660	449,270	5.8%
Rubber products		131,532	124,613	117,176	114,775	117,393	111,724	113,806	1.5%
Chemical industry including plastic & rubber products		930,662	903,991	882,323	875,346	950,302	930,355	953,994	12.4%
Food		1,127,177	1,104,292	1,122,817	1,109,819	1,136,951	1,094,454	1,105,543	14.3%
Printing & allied		502,184	340,890	299,038	263,891	251,733	235,105	252,593	3.3%
Ceramic, stone & clay products		363,997	293,013	250,001	242,816	237,550	232,706	243,516	3.2%
Iron & steel		236,525	213,056	219,983	209,748	223,524	218,553	221,240	2.9%
Fabricated metal products		722,425	657,942	578,559	583,664	612,427	582,642	610,218	7.9%
General machinery		1,037,079	983,449	-	-	-	-	-	-
General-purpose machinery		-	-	324,636	306,415	327,541	318,401	329,433	4.3%
Production machinery		-	-	543,070	564,958	622,006	606,843	661,660	8.6%
Business oriented machinery		-	-	211,834	210,084	211,175	209,694	213,168	2.8%
Electronic parts, devices & electronic circuits		-	490,140	452,169	381,686	410,504	412,146	414,194	5.4%
Electrical machinery, equipment & supplies		1,573,683	559,413	483,979	482,552	502,824	480,830	504,943	6.5%
Information & communication electronics equipment		-	205,331	212,466	136,141	122,202	112,986	112,178	1.5%
Transportation equipment		849,517	944,352	948,824	1,041,452	1,064,560	1,017,610	1,035,398	13.4%
Others		1,840,584	1,461,123	1,134,148	1,089,220	1,044,347	1,013,231	1,056,417	13.7%
Total manufacturing		9,183,833	8,156,992	7,663,847	7,497,792	7,717,646	7,465,556	7,714,495	100.0%

(Source) Ministry of Economy, Trade and Industry [Annual Business Survey (Excludes private management)]

(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.

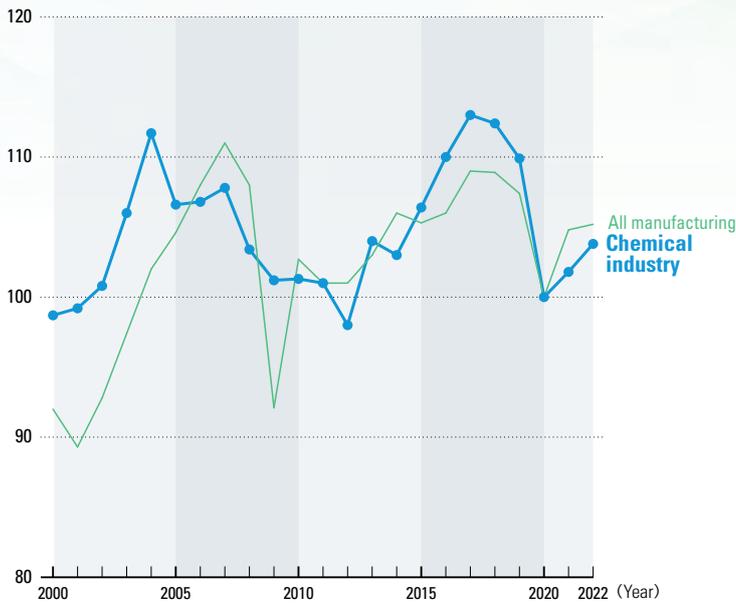
2 Since 2015, the number of employees is as of June 1, the following year.

5

Labor productivity/Working hours

Index of labor productivity (2000-2022)

(Index, 2020=100)



(Index, 2020=100)

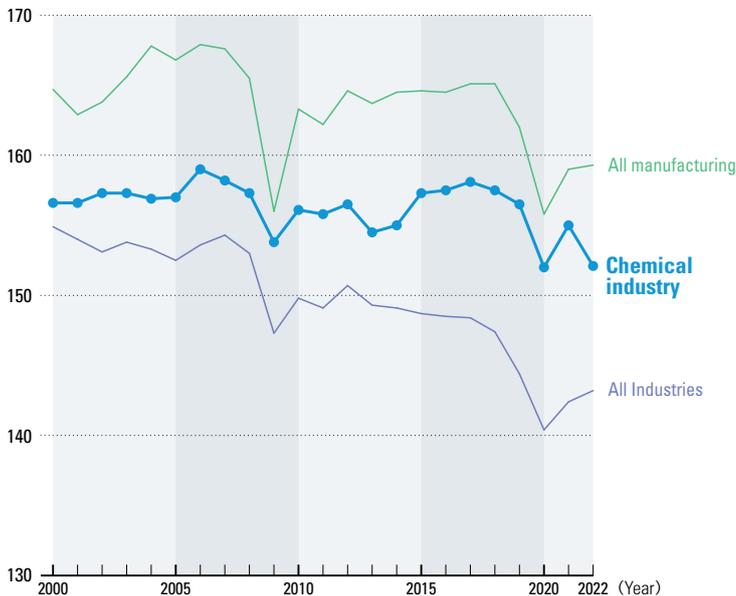
Year	Industry	All manufacturing		Chemical industry	
		Index	Increase rate	Index	Increase rate
Every 5th year	2000	92	6.9%	98.7	1.8%
	2005	104.6	2.2%	106.6	▲4.6%
	2010	102.7	11.5%	101.3	0.1%
	2015	105.3	▲0.4%	106.4	3.5%
Recent three years	2020	100.0	▲6.9%	100.0	▲9.0%
	2021	104.8	4.8%	101.8	1.8%
	2022	105.2	0.4%	103.8	2.0%

(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) (2000-2022)

(Hours)



(Hours)

Year	Industry	All industries	All manufacturing	Chemical industry
		2000	154.9	164.7
Every 5th year	2005	152.5	166.8	157.0
	2010	149.8	163.3	156.1
	2015	148.7	164.6	157.3
	2019	140.4	155.8	152.0
Recent three years	2020	142.4	159.0	155.0
	2021	143.2	159.3	152.1

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

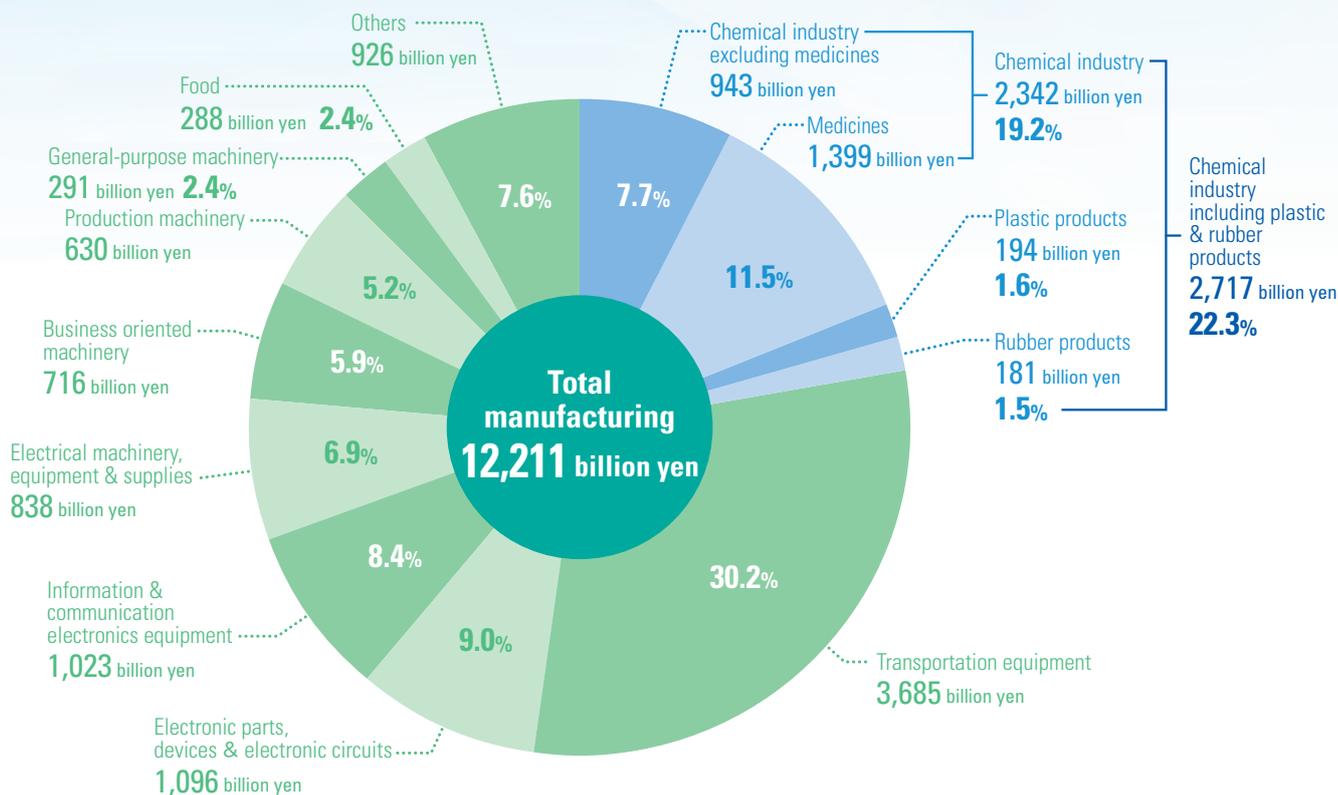
(Note) Petroleum & coal products manufacturing industry is included in the chemical industry.

6

Research and development expenditures

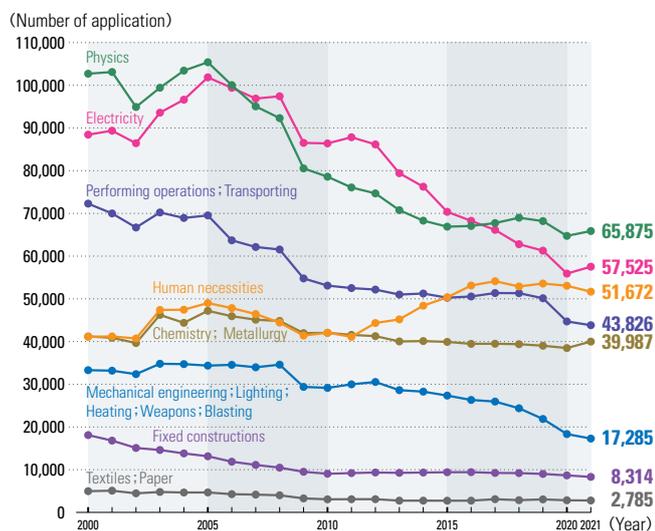
R&D expenditures of chemical industry amounted to 2.7 trillion yen.

Ratio of R&D expenditures by manufacturing industry in FY2021



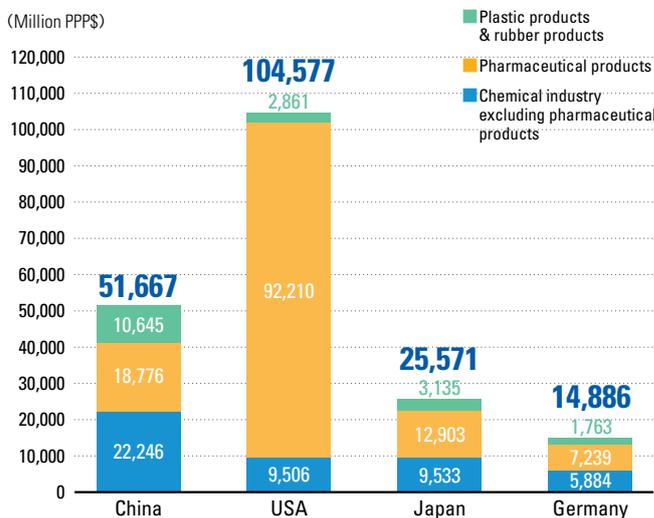
(Source) Ministry of Internal Affairs and Communications [Survey of Research and Development]

Trend of number of applications for patents by classification (2000-2021)



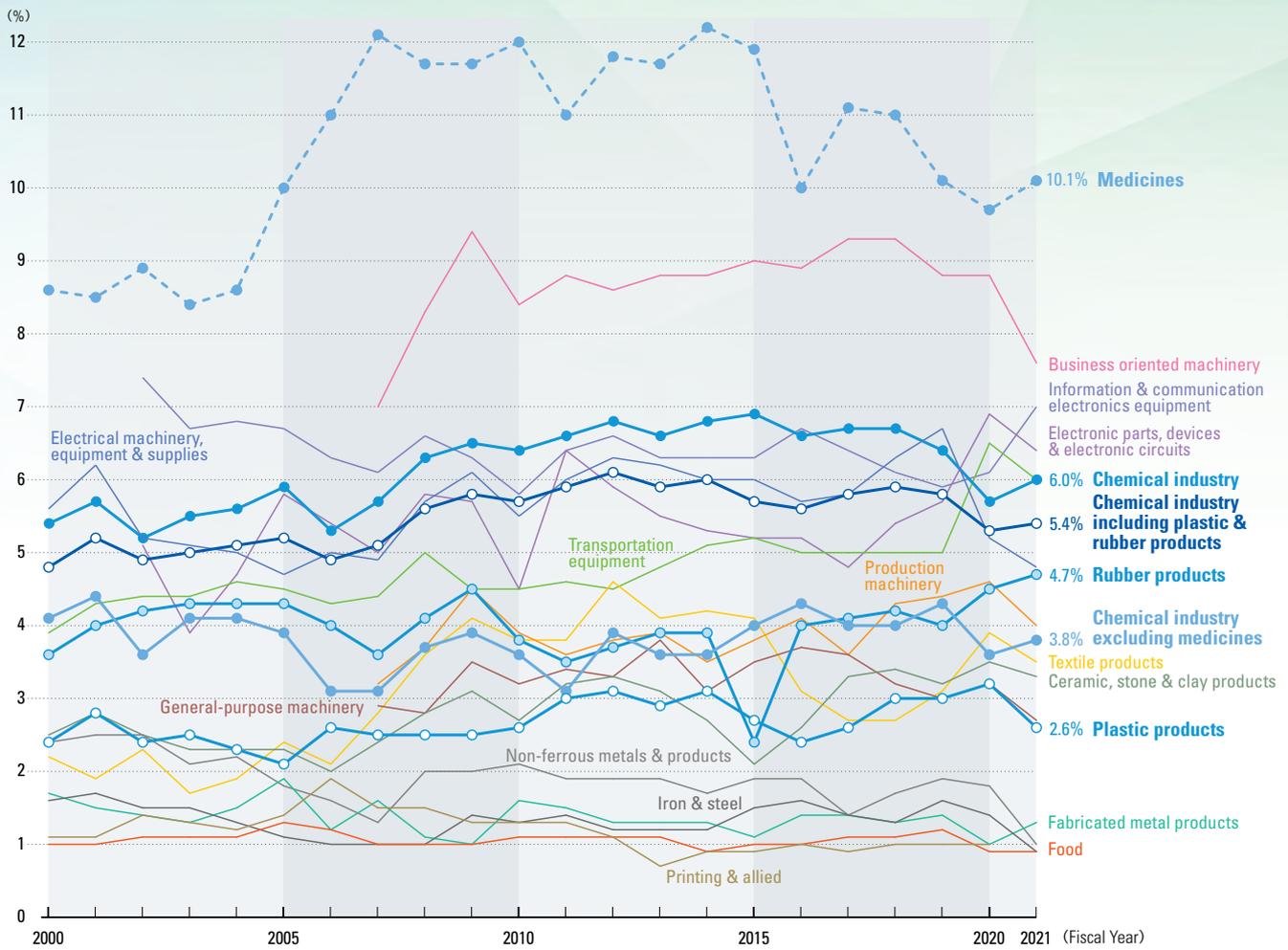
(Source) Japan Patent Office [Japan Patent Office Annual Report 2022]

R&D expenditures of chemical industry in the top four countries in shipment (2020)



(Source) OECD Ddata Explorer
(Note) PPP: Purchasing Power Parity

Ratio of R&D expenditures to sales by manufacturing industry (FY2000-FY2021)

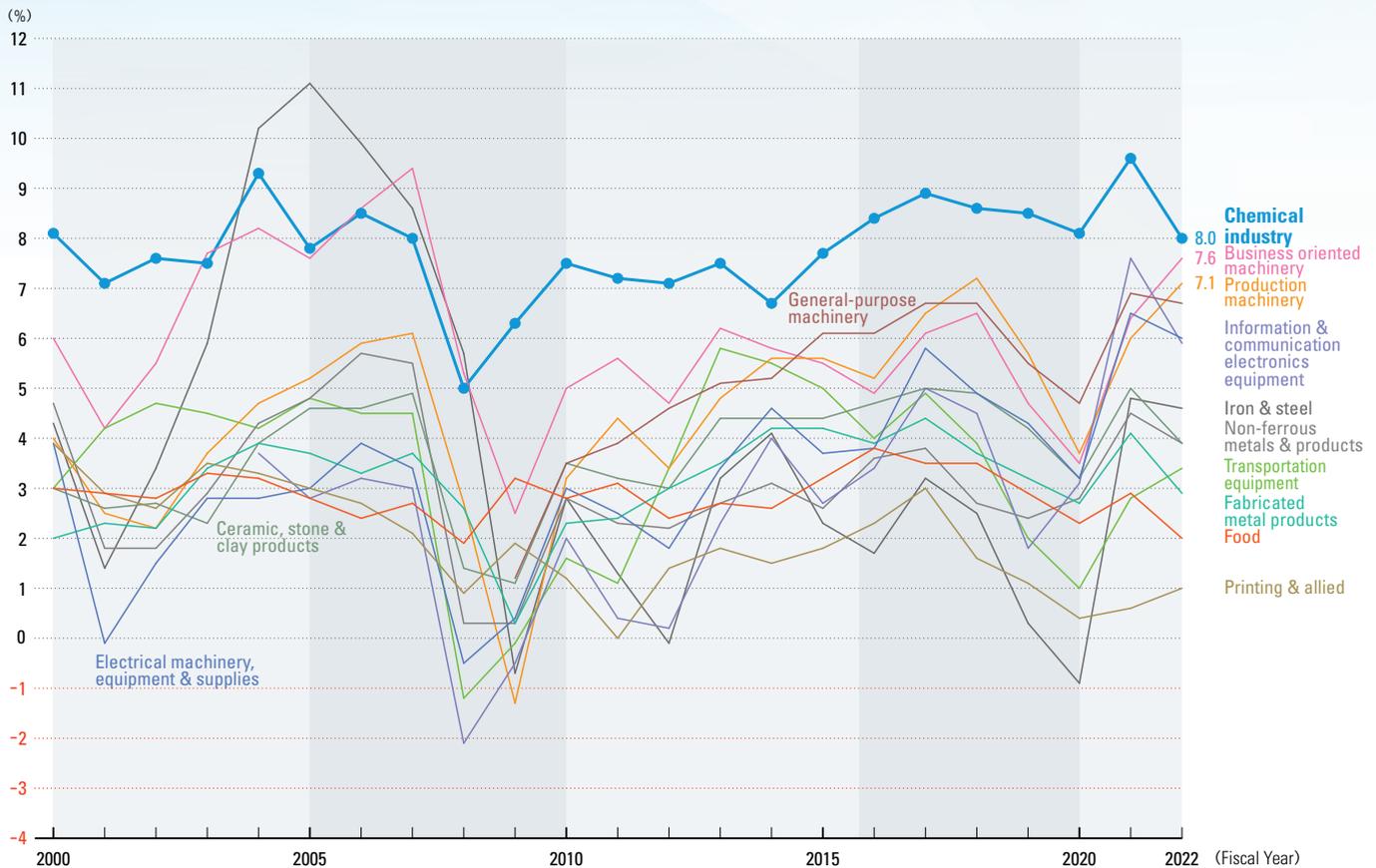


7

Operating profit margin

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

Trend of operating profit margin by manufacturing industry (FY2000-FY2022)



Industry	Fiscal year	Every 5th year				Recent three years		
		2000	2005	2010	2015	2020	2021	2022
Chemical industry		8.1	7.8	7.5	7.7	8.1	9.6	8.0
Food		3.0	2.8	2.8	3.2	2.3	2.9	2.0
Printing & allied		3.9	3.0	1.2	1.8	0.4	0.6	1.0
Ceramic, stone & clay products		3.0	4.6	3.5	4.4	3.2	5.0	3.9
Iron & steel		4.3	11.1	2.8	2.3	-0.9	4.8	4.6
Non-ferrous metals & products		4.7	4.8	2.8	2.6	2.8	4.5	3.9
Fabricated metal products		2.0	3.7	2.3	4.2	2.7	4.1	2.9
General-purpose machinery		—	—	3.5	6.1	4.7	6.9	6.7
Production machinery		4.0	5.2	3.2	5.6	3.7	6.0	7.1
Business oriented machinery		6.0	7.6	5.0	5.5	3.5	6.4	7.6
Electrical machinery, equipment & supplies		3.9	3.0	3.0	3.7	3.2	6.5	6.0
Information & communication electronics equipment		—	2.8	2.0	2.7	3.1	7.6	5.9
Transportation equipment		3.0	4.8	1.6	5.0	1.0	2.8	3.4
Total manufacturing		3.8	4.5	3.2	4.3	3.1	5.2	4.5

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

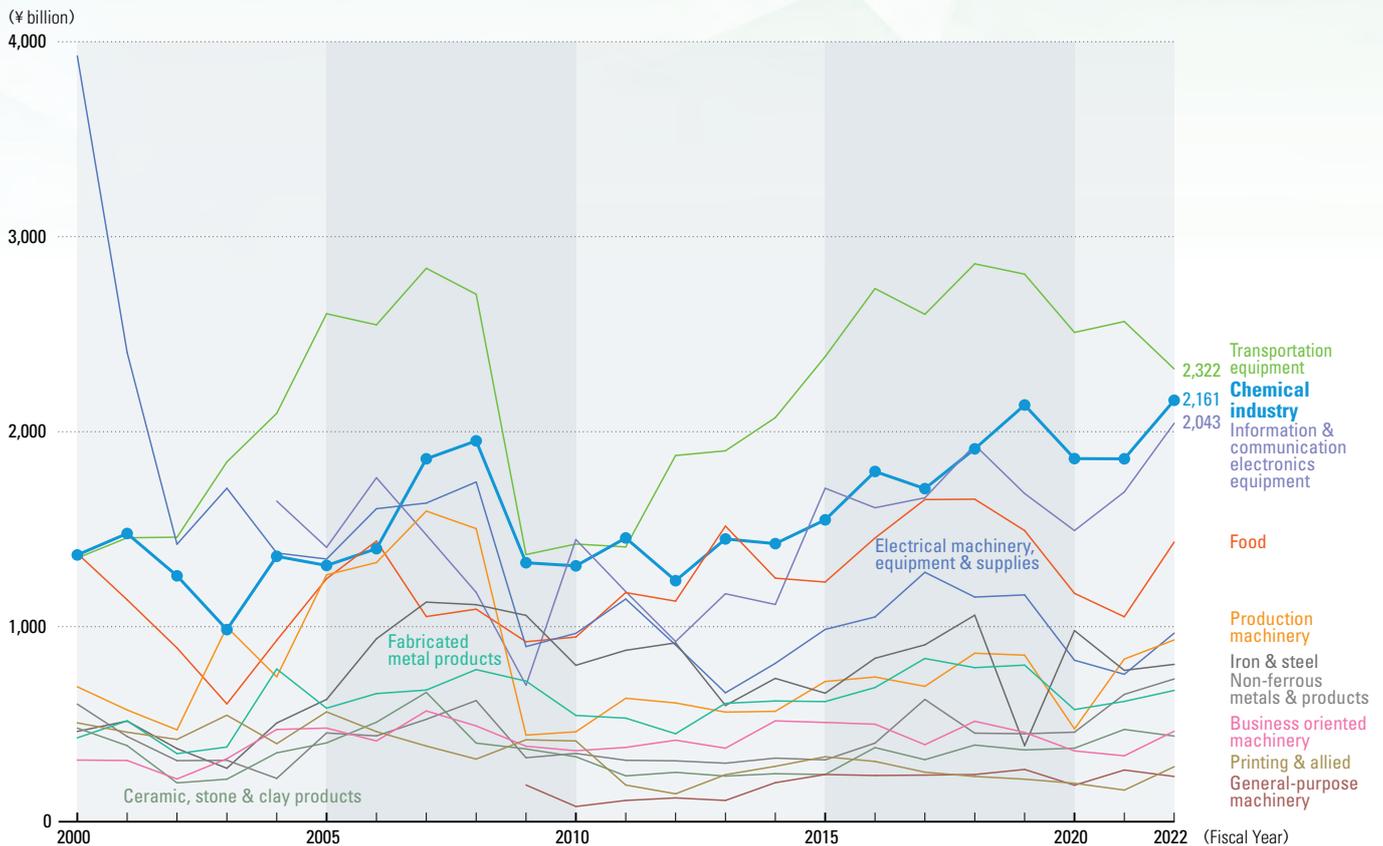
(Note) Information & communication electronic equipment was newly established in 2004, and general-purpose machinery was newly established in 2009.

8

Amount of capital investment

Capital investment of chemical industry amounted to 2.2 trillion yen making it ranked 2nd in manufacturing industries.

Trend of capital investment by manufacturing industry (FY2000-FY2022)



Industry	Fiscal year	Every 5th year				Recent three years			%
		2000	2005	2010	2015	2020	2021	2022	
Chemical industry		1,368	1,314	1,312	1,548	1,862	1,861	2,161	14.0%
Food		1,376	1,246	947	1,229	1,171	1,051	1,434	9.3%
Printing & allied		507	563	414	333	197	162	282	1.8%
Ceramic, stone & clay products		480	404	333	242	377	473	439	2.8%
Iron & steel		463	627	802	659	980	776	807	5.2%
Non-ferrous metals & products		603	455	350	317	459	653	732	4.7%
Fabricated metal products		430	582	545	616	575	617	673	4.4%
General-purpose machinery		-	-	78	242	187	265	232	1.5%
Production machinery		692	1,266	461	719	476	834	932	6.0%
Business oriented machinery		316	480	364	509	363	338	464	3.0%
Electrical machinery, equipment & supplies		3,927	1,347	966	986	828	756	967	6.3%
Information & communication electronics equipment		-	1,407	1,447	1,710	1,493	1,691	2,043	13.2%
Transportation equipment		1,352	2,605	1,424	2,385	2,509	2,565	2,322	15.0%
Others		1,724	2,049	1,828	1,857	1,901	1,929	1,954	12.7%
Total manufacturing		13,238	14,343	11,272	13,351	13,379	13,972	15,443	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.

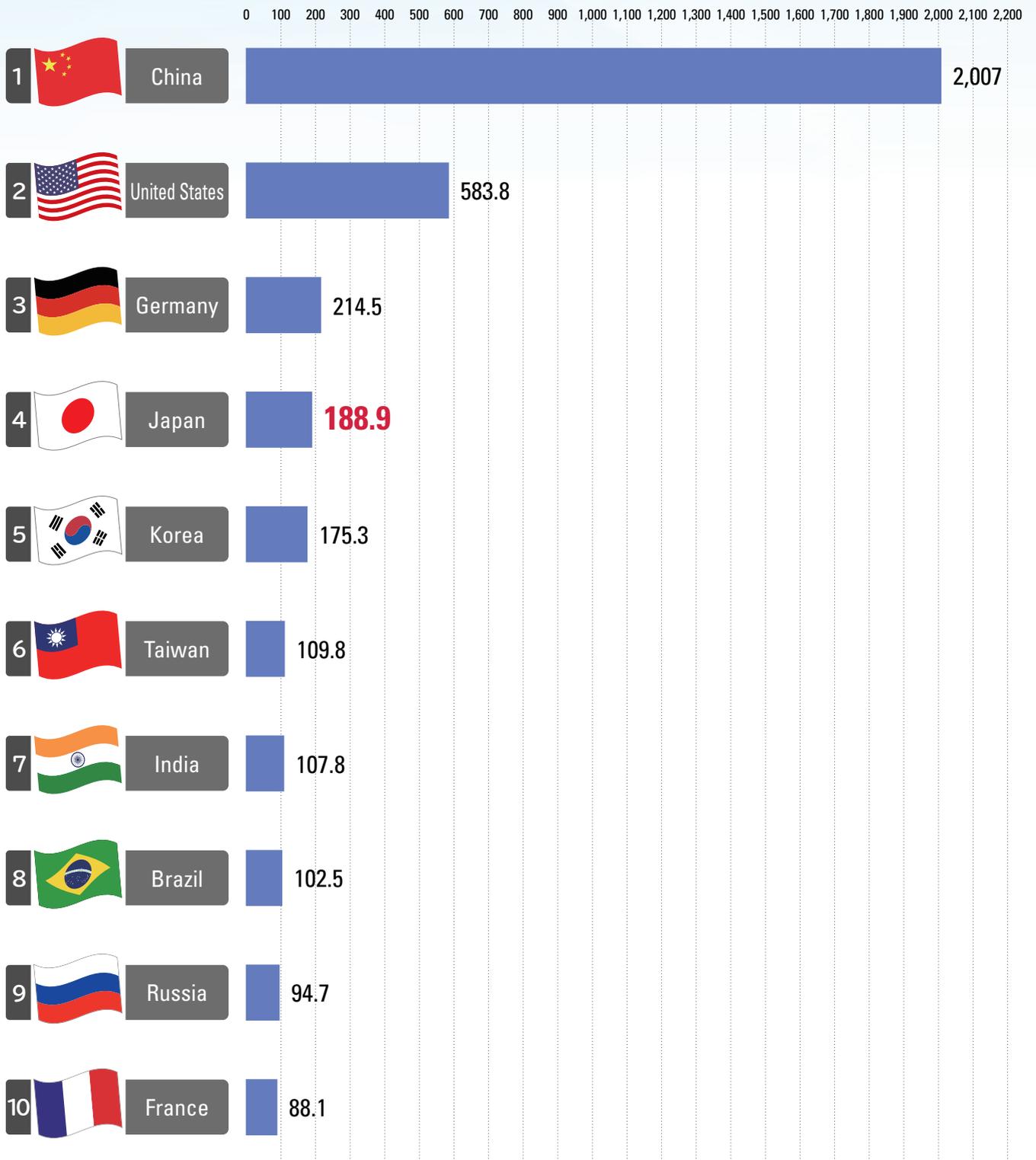
9

Shipments by Country/Region

Japan is the 4th largest in the world.

Chemical Shipments by Country/Region in 2021

(\$ billion)



(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 2021

Ranking	Company	Country/Region	Chemical sales			Chemical operating profits		
			2021 (\$ million)	Change from 2020 (%)	Chemical sales as of total sales (%)	2021 (\$ million)	Change from 2020 (%)	Operating profit margin (%)
1	BASF	Germany	92,982	32.9	100.0	9,179	80.5	9.9
2	Sinopec	China	65,848	31.9	15.9	1,761	9.5	2.7
3	Dow	US	54,968	42.6	100.0	7,887	208.6	14.3
4	Sabco	Saudi Arabia	43,230	50.1	92.7	8,779	445.8	20.3
5	Formosa Plastics	Taiwan	43,173	47.8	72.2	N/A	N/A	N/A
6	Ineos	UK	39,937	121.2	100.0	5,370	344.2	13.4
7	PetroChina	China	39,693	41.7	9.8	1,862	9.5	4.7
8	LyondellBasell Industries	US	38,995	66.6	84.5	8,009	172.6	20.5
9	LG Chem	South Korea	37,257	41.8	100.0	4,389	179.5	11.8
10	ExxonMobil	US	36,858	59.6	13.3	9,960	272.3	27.0
11	Mitsubishi Chemical	Japan	30,719	24.8	84.8	2,547	74.3	8.3
12	Hengli Petrochemical	China	27,961	31.9	91.1	N/A	N/A	N/A
13	Linde	UK	27,926	14.5	90.7	6,703	25.0	24.0
14	Air Liquide	France	27,148	13.4	98.3	2,779	16.3	10.2
15	Syngenta Group	Switzerland	24,900	20.9	81.1	N/A	N/A	N/A
16	Reliance Industries	India	22,583	65.6	21.1	N/A	N/A	N/A
17	Wanhua Chemical	China	22,561	98.2	100.0	4,978	142.1	22.1
18	Braskem	Brazil	19,575	80.4	100.0	5,038	278.0	25.7
19	Sumitomo Chemical	Japan	19,176	24.7	76.2	1,581	118.3	8.2
20	Shin-Etsu Chemical	Japan	18,885	38.6	100.0	6,157	72.4	32.6
21	Covestro	Germany	18,813	48.5	100.0	2,655	206.6	14.1
22	Toray Industries	Japan	17,856	20.9	88.0	1,227	40.3	6.9
23	Evonik Industries	Germany	17,692	22.6	100.0	1,541	39.7	8.7
24	Shell	UK	16,993	45.0	6.5	1,390	72.0	8.2
25	DuPont	US	16,653	-18.4	100.0	2,652	59.7	15.9
26	Yara	Norway	16,617	43.4	100.0	1,068	-9.2	6.4
27	Rongsheng Petrochemical	China	16,001	59.6	58.3	N/A	N/A	N/A
28	Lotte Chemical	South Korea	15,827	48.2	100.0	1,341	330.3	8.5
29	Mitsui Chemicals	Japan	14,681	33.1	100.0	1,269	70.3	8.6
30	Indorama Ventures	Thailand	14,626	41.2	100.0	1,315	339.6	9.0

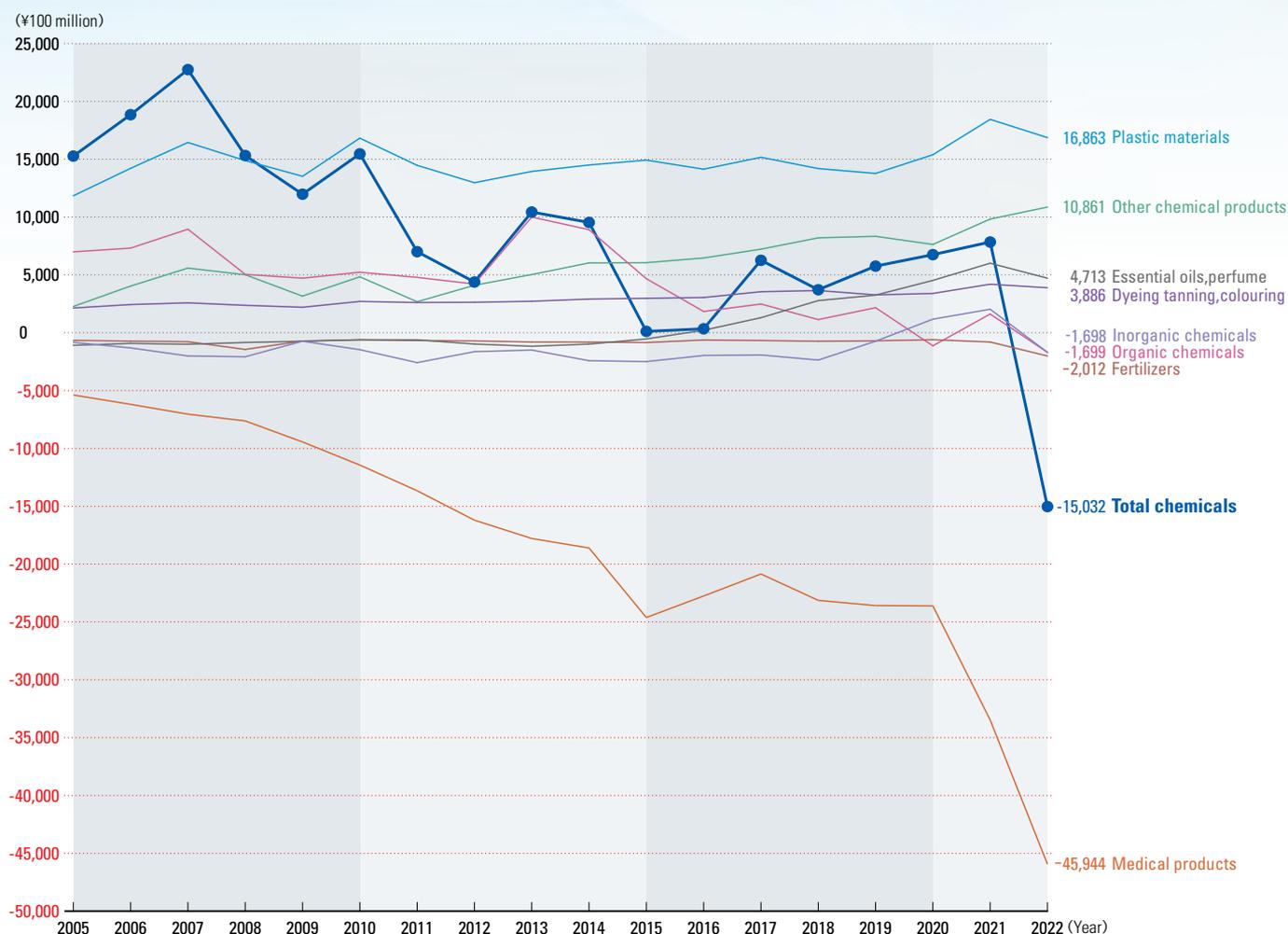
(Source) Chemical and Engineering News

(Note) 1 Pharmaceuticals is excluded.

2 N/A means not available.

11 Trade balance

Trade balance of chemicals by product (2005-2022)



Exports and imports of chemicals (2005-2022)

(¥100 million)

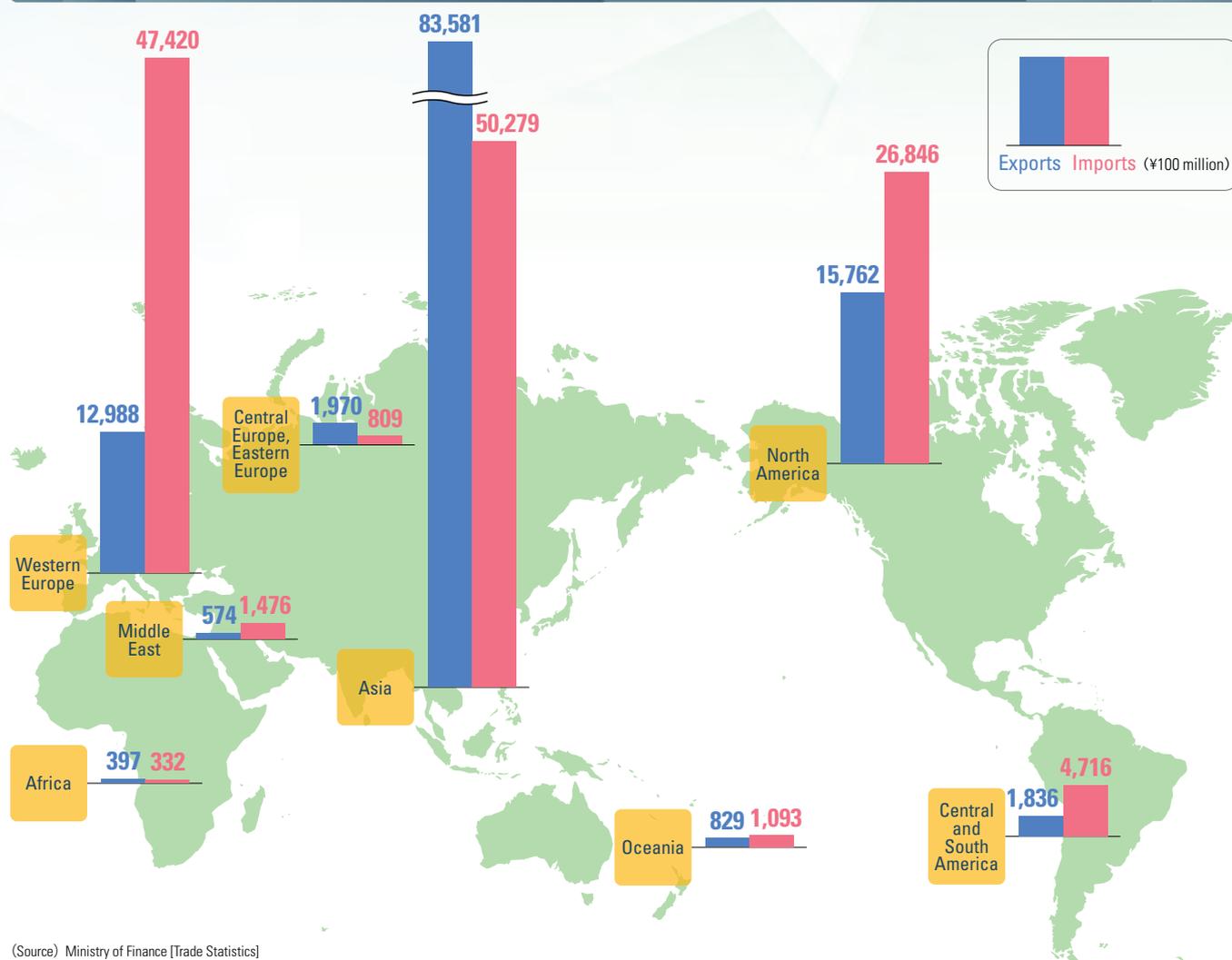
Exports						Articles	Imports					
Every 5th year			Recent three years				Every 5th year			Recent three years		
2005	2010	2015	2020	2021	2022		2005	2010	2015	2020	2021	2022
121	128	142	127	186	246	Fertilizers	783	745	990	731	988	2,258
3,109	3,772	4,034	7,043	10,076	13,217	Inorganic chemicals	3,935	5,237	6,529	5,875	8,044	14,915
18,832	18,728	21,166	15,556	19,819	22,086	Organic chemicals	11,843	13,496	16,499	16,688	18,204	23,786
17,157	23,360	24,441	24,198	29,765	31,545	Plastic materials	5,324	6,542	9,523	8,814	11,323	14,683
3,323	4,048	4,629	4,787	5,807	5,824	Dyeing tanning, colouring	1,187	1,343	1,655	1,393	1,611	1,938
3,677	3,787	4,623	8,360	8,611	11,428	Medical products	9,060	15,226	29,241	31,973	42,085	57,373
1,820	2,479	3,676	9,141	10,954	10,695	Essential oils, perfume	2,909	3,087	4,213	4,619	4,946	5,982
10,442	12,950	14,883	16,125	20,307	22,896	Other chemical products	8,172	8,119	8,828	8,495	10,484	12,036
58,480	69,253	77,594	85,336	105,524	117,938	Total chemicals	43,212	53,794	77,479	78,588	97,686	132,969

(Source) Ministry of Finance [Trade Statistics]

12

Exports and imports of chemicals by region

Exports and imports of chemicals by region in 2022



(Source) Ministry of Finance [Trade Statistics]

Exports and imports of chemicals by region (2005-2022)

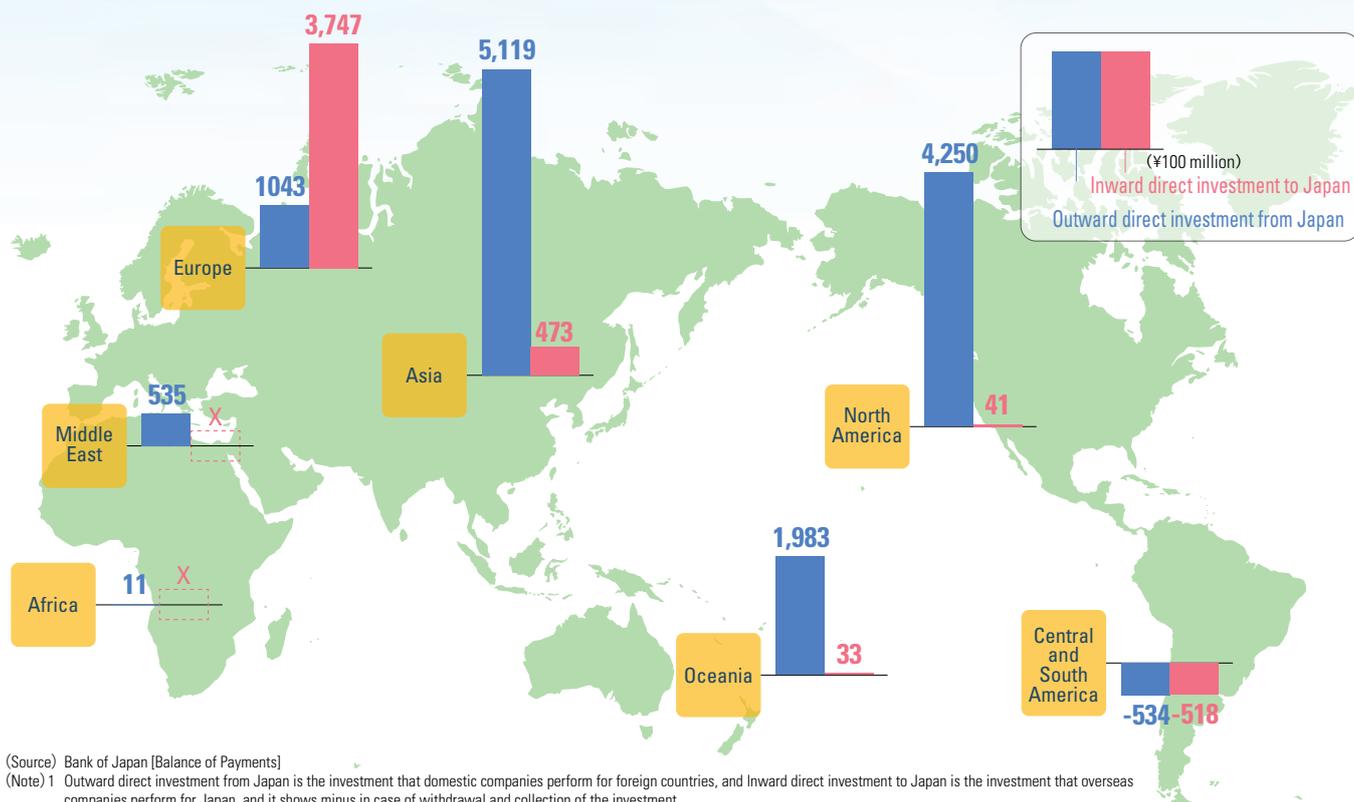
(¥100 million)

Exports						Region	Imports					
Every 5th year			Recent three years				Every 5th year			Recent three years		
2005	2010	2015	2020	2021	2022		2005	2010	2015	2020	2021	2022
40,150	51,799	57,502	62,056	77,739	83,581	Asia	12,974	17,474	26,428	27,422	34,978	50,279
586	494	460	431	565	829	Oceania	520	595	803	653	810	1,093
7,743	6,824	9,048	9,994	11,756	15,762	North America	9,364	11,190	14,194	15,176	19,202	26,846
1,629	1,819	1,488	1,144	1,567	1,836	Central and South America	1,790	2,013	3,082	3,324	3,316	4,716
7,609	7,084	7,689	9,837	11,422	12,988	Western Europe	17,398	21,413	31,367	30,689	37,611	47,420
204	374	425	1,120	1,558	1,970	Central Europe, Eastern Europe	298	330	541	597	685	809
364	580	693	437	535	574	Middle East	692	652	880	649	980	1,476
196	278	288	317	383	397	Africa	177	128	183	78	102	332
58,480	69,253	77,594	85,336	105,524	117,938	Total	43,212	53,794	77,479	78,588	97,686	132,969

(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 2022



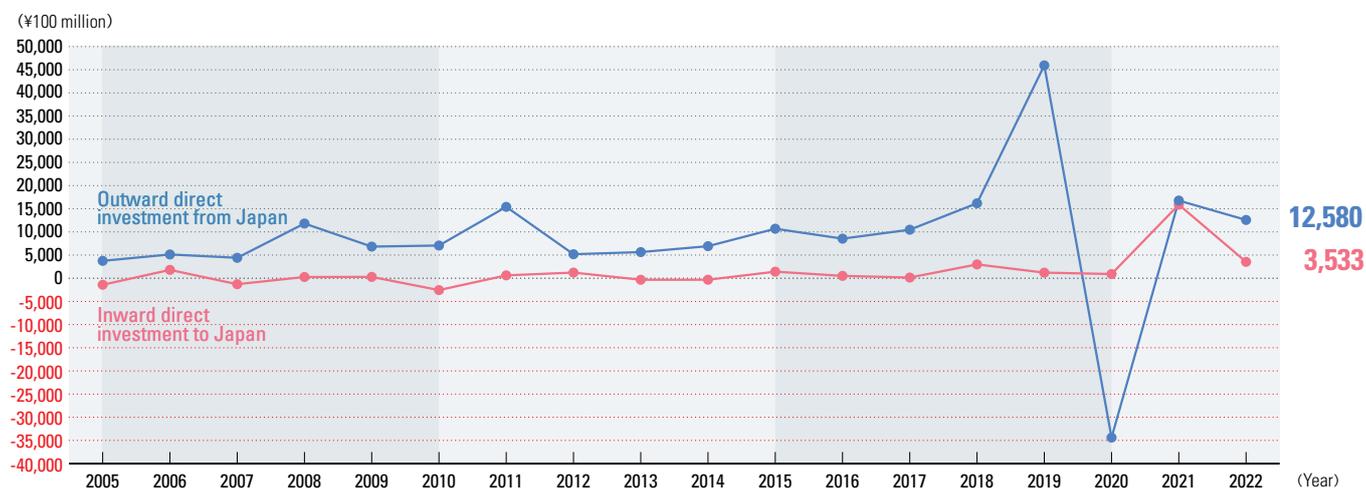
(Source) Bank of Japan [Balance of Payments]

(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 (2005-2022)



(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

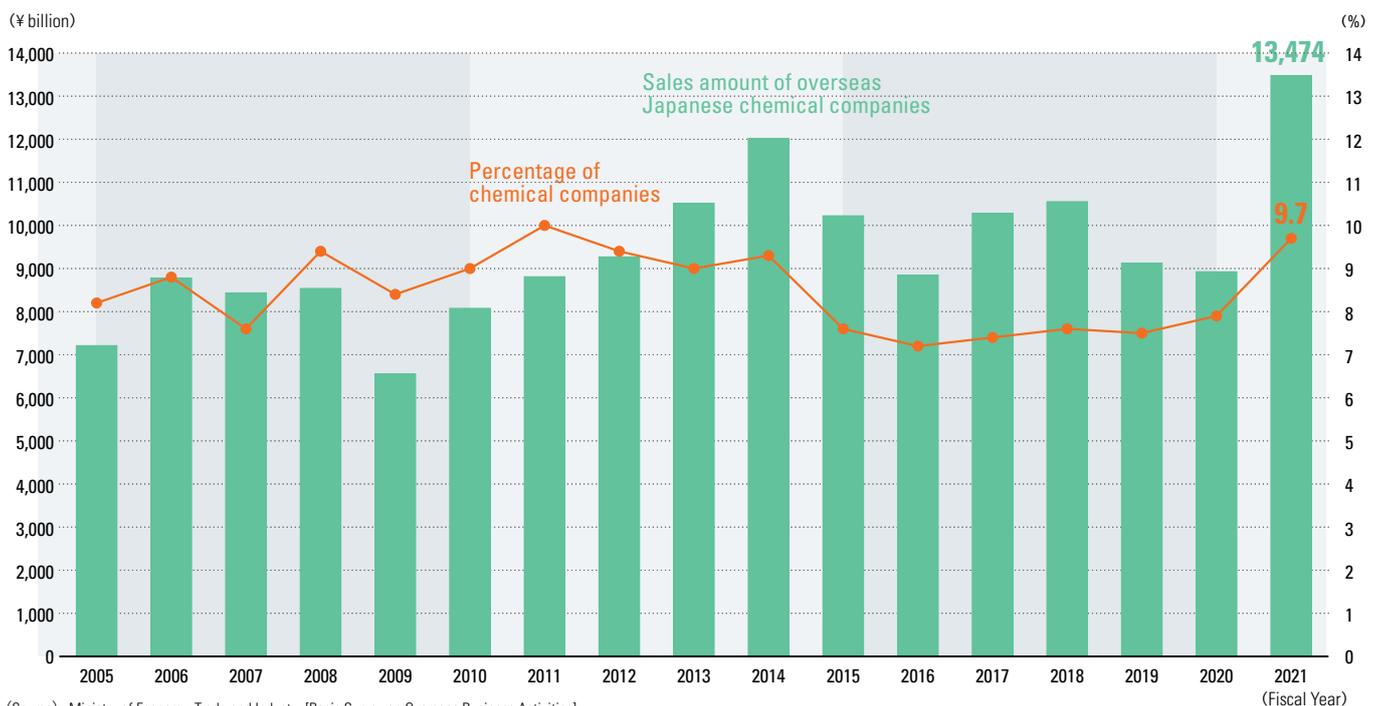
Ratio of overseas production/Sales of overseas subsidiary companies

Trend of overseas production of Japanese companies (FY2005-FY2021)



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

Sales of Japanese chemical companies based overseas and its percentage of all overseas Japanese manufacturing companies' sales (FY2005-FY2021)



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

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

1 Shipping index of Main Chemicals

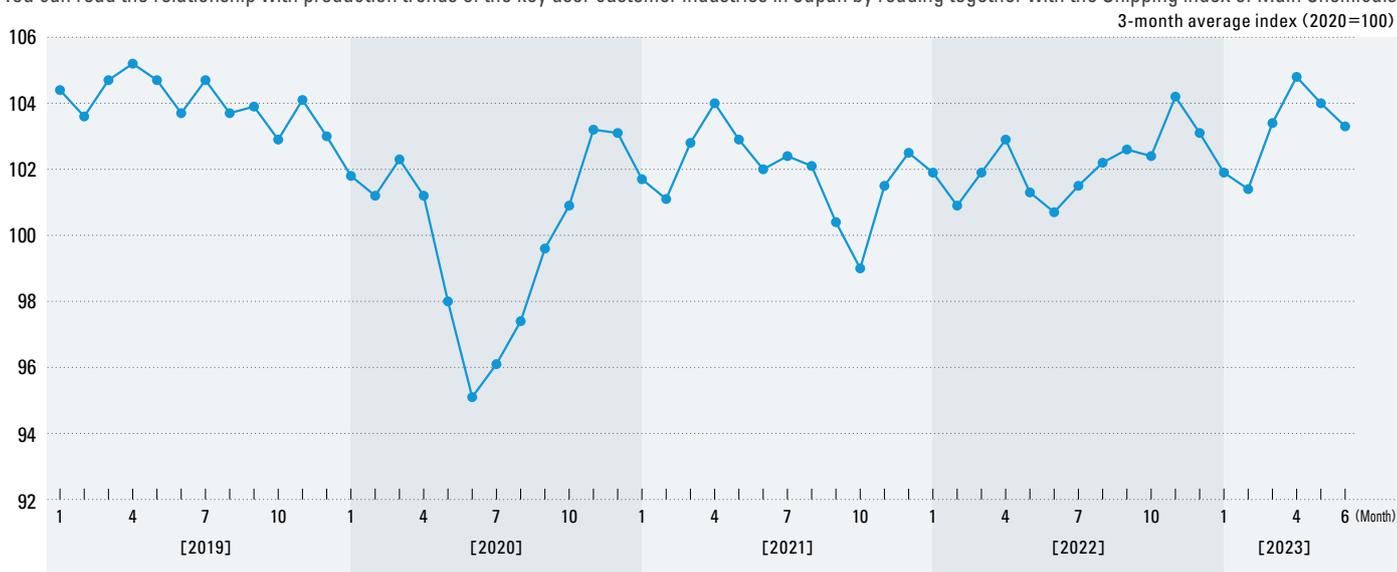
This index shows the current status of Japanese chemical industry



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.



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.

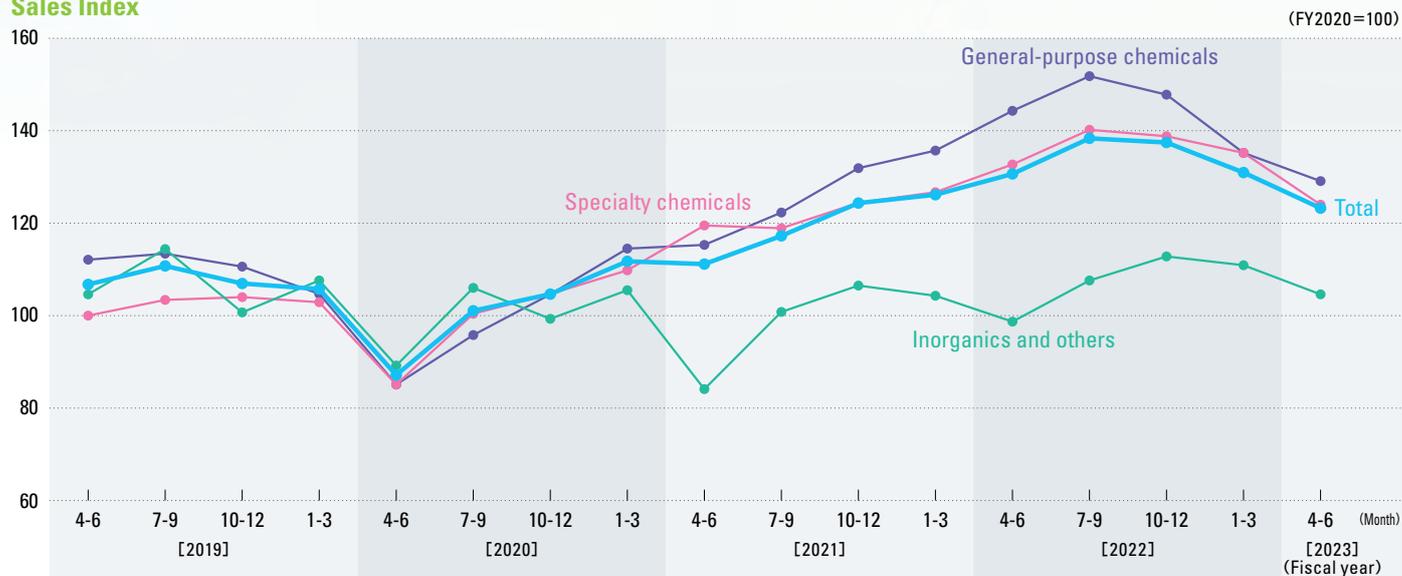
The chemical industry covers a wide range of fields, including petrochemicals, synthetic fibers, synthetic rubber, paints, and pharmaceuticals. So far, we have been able to explain the management status of individual chemical companies to society, however there were no published figures showing the current state of Japanese chemical industry as a whole. Therefore J CIA created the J CIA 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 to be able to recog-

nize 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 J CIA Index is made public with the base table for the index on the J CIA website every month, so anyone can see it.

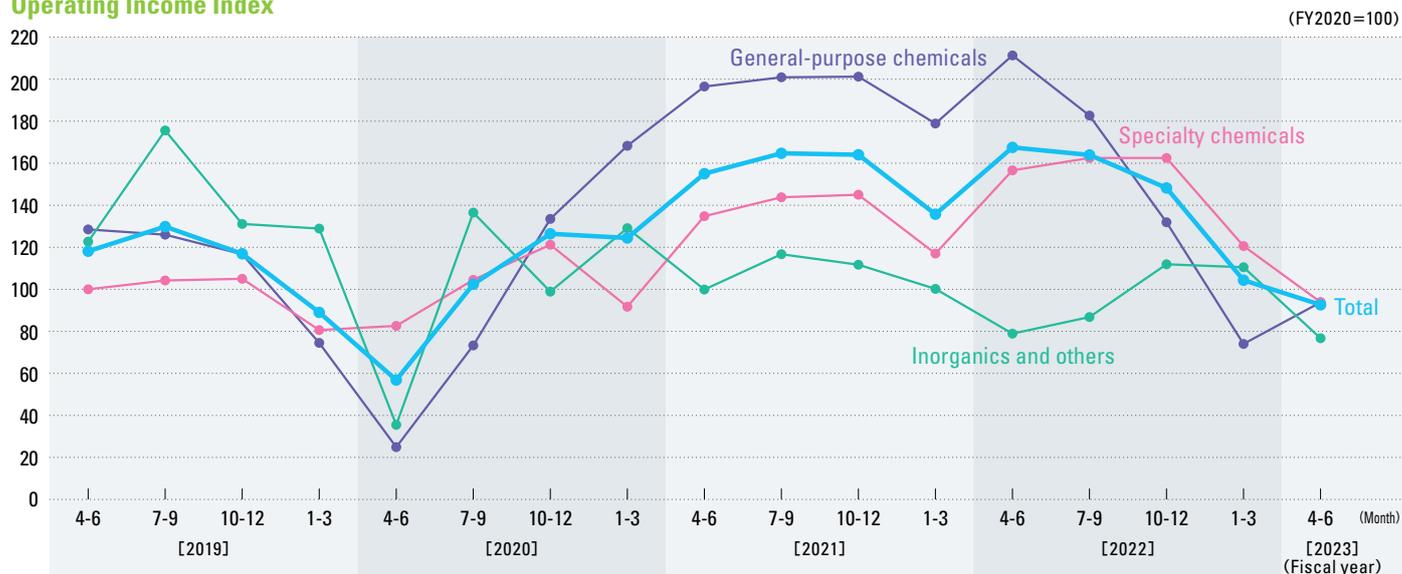
3 Corporate earnings index

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.

J CIA index is also available on the website

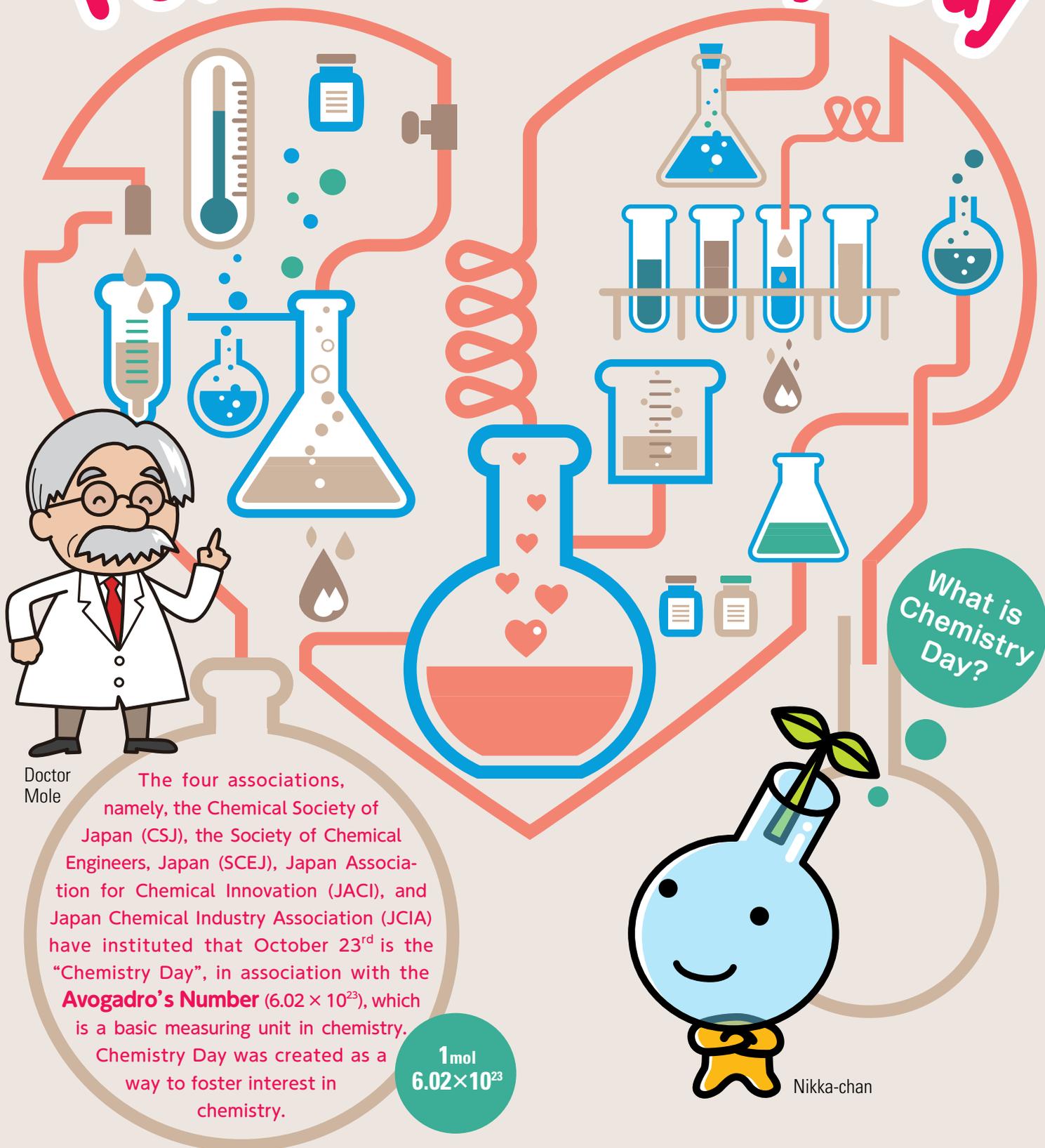
J CIA Index >>>

<https://www2.nikkakyo.org/english/data-report/report>



In this report, J CIA is an abbreviated term for the Japan Chemical Industry Association which is our official name.

10/23 Chemistry Day



Doctor Mole

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.

1 mol
 6.02×10^{23}

What is Chemistry Day?

Nikka-chan