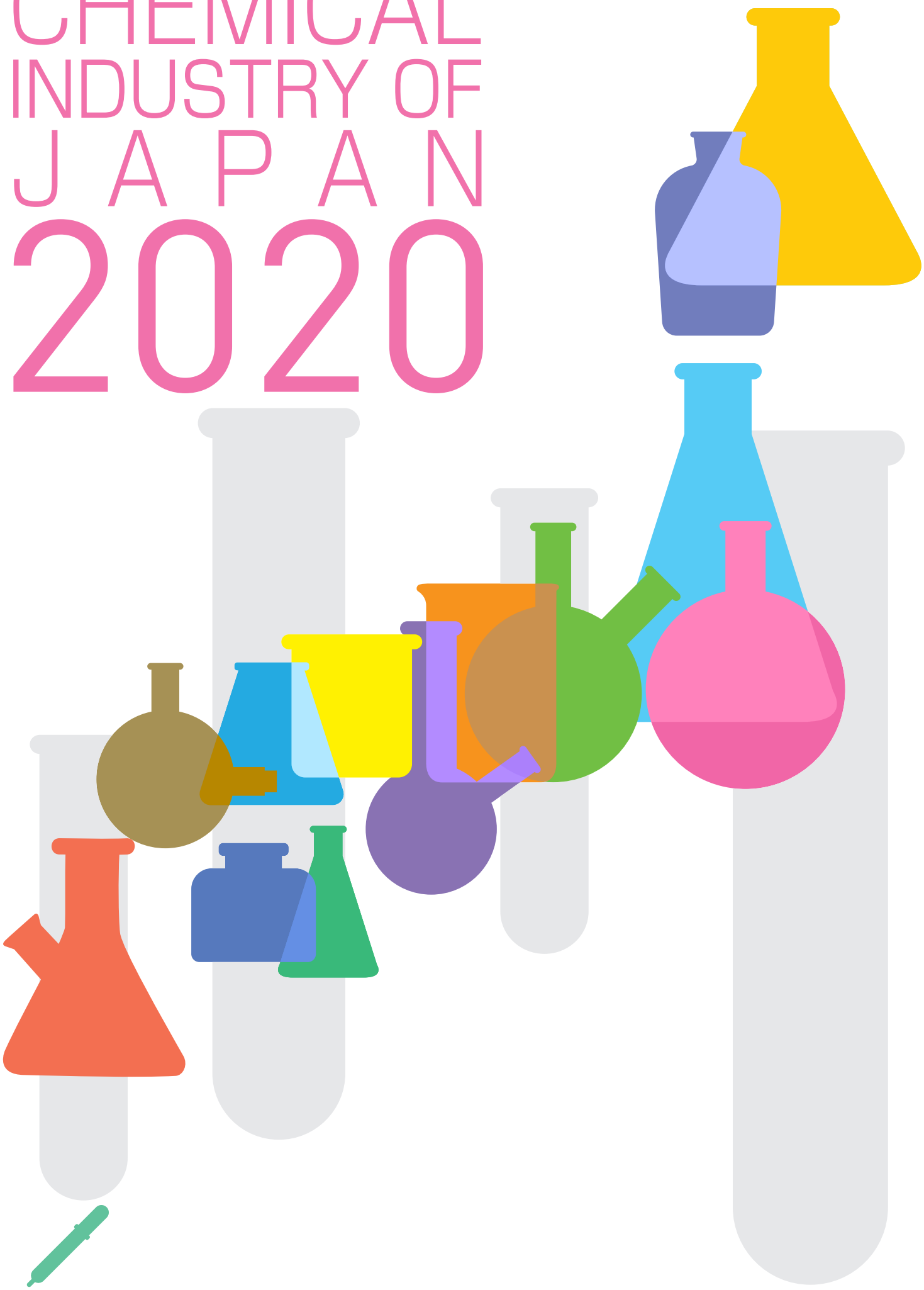
CHEMICAL INDUSTRY OF JAPAN 2020



Japan's chemical industry viewed by figures and graphs

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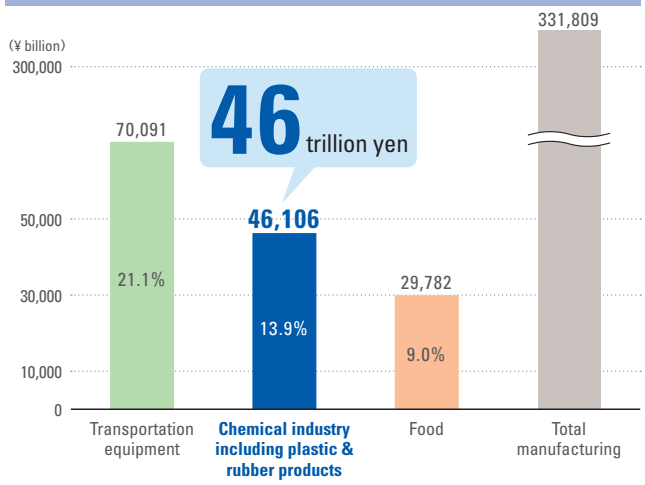
Value of shipments (2018)

Source: METI [Census of Manufacture]



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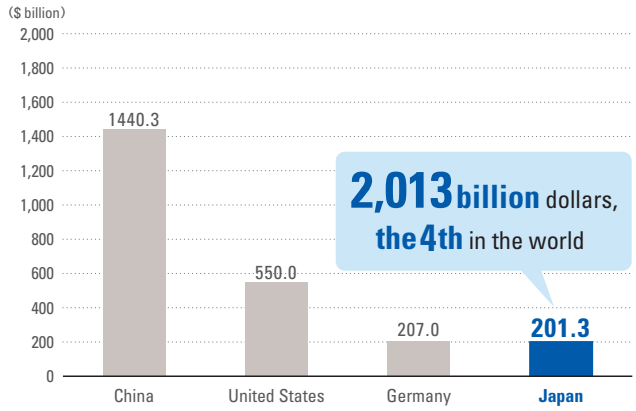
Shipments by country/region (2018)

Source : American Chemistry Council



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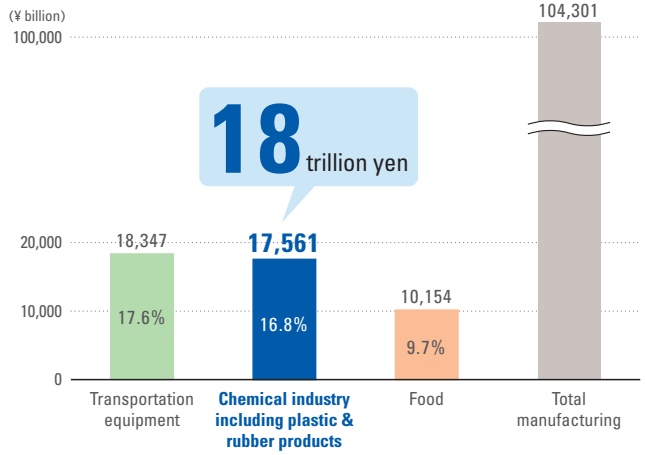
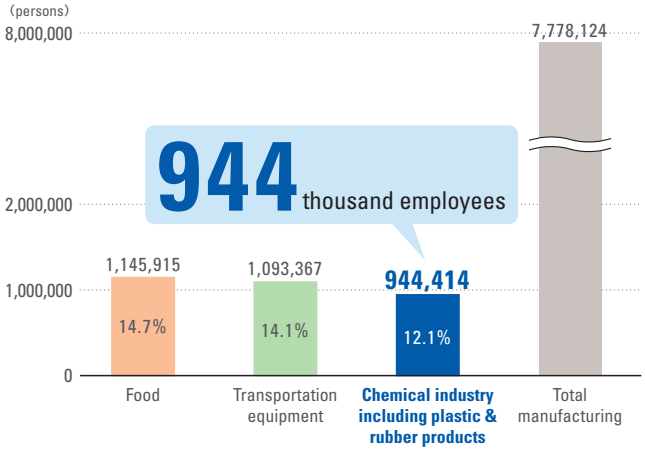
Amount of value added (2018)

Source: METI [Census of Manufacture]



Number of employees (2018)

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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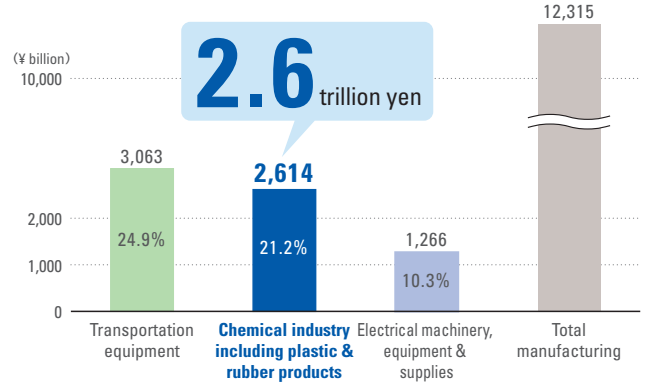
R&D expenditures (2018)

Source: MIC [Survey of Research and Development]



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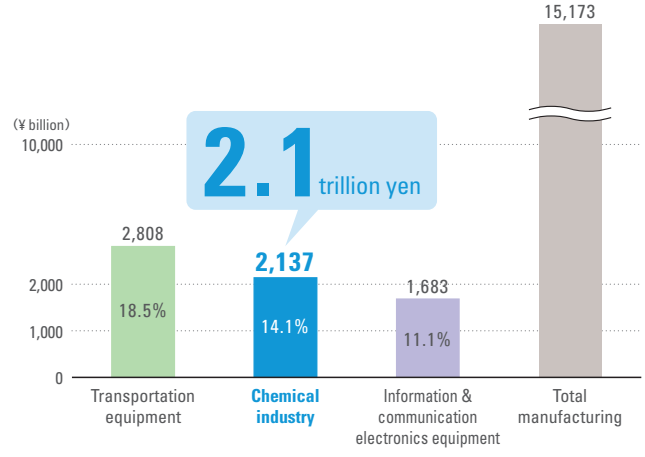
Capital investment (2019)

Source: MOF [Financial Statements Statistics of Corporations by Industry]

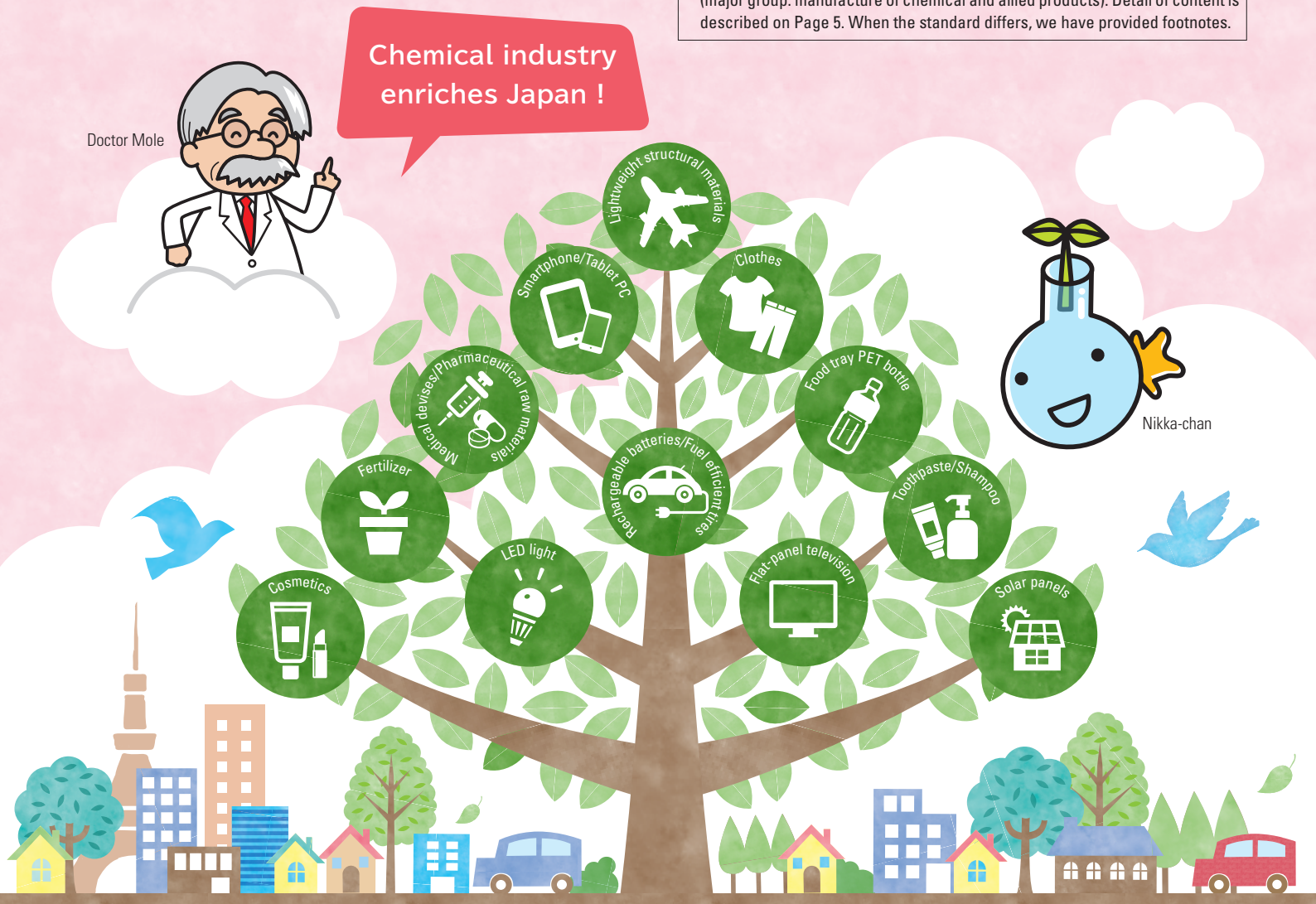


Japan's chemical industry supports people's lives and other industries

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 2018, ranking those as the second biggest industry that contributes to the Japanese economy following the transportation machinery. The number of employees is about 940,000. 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.



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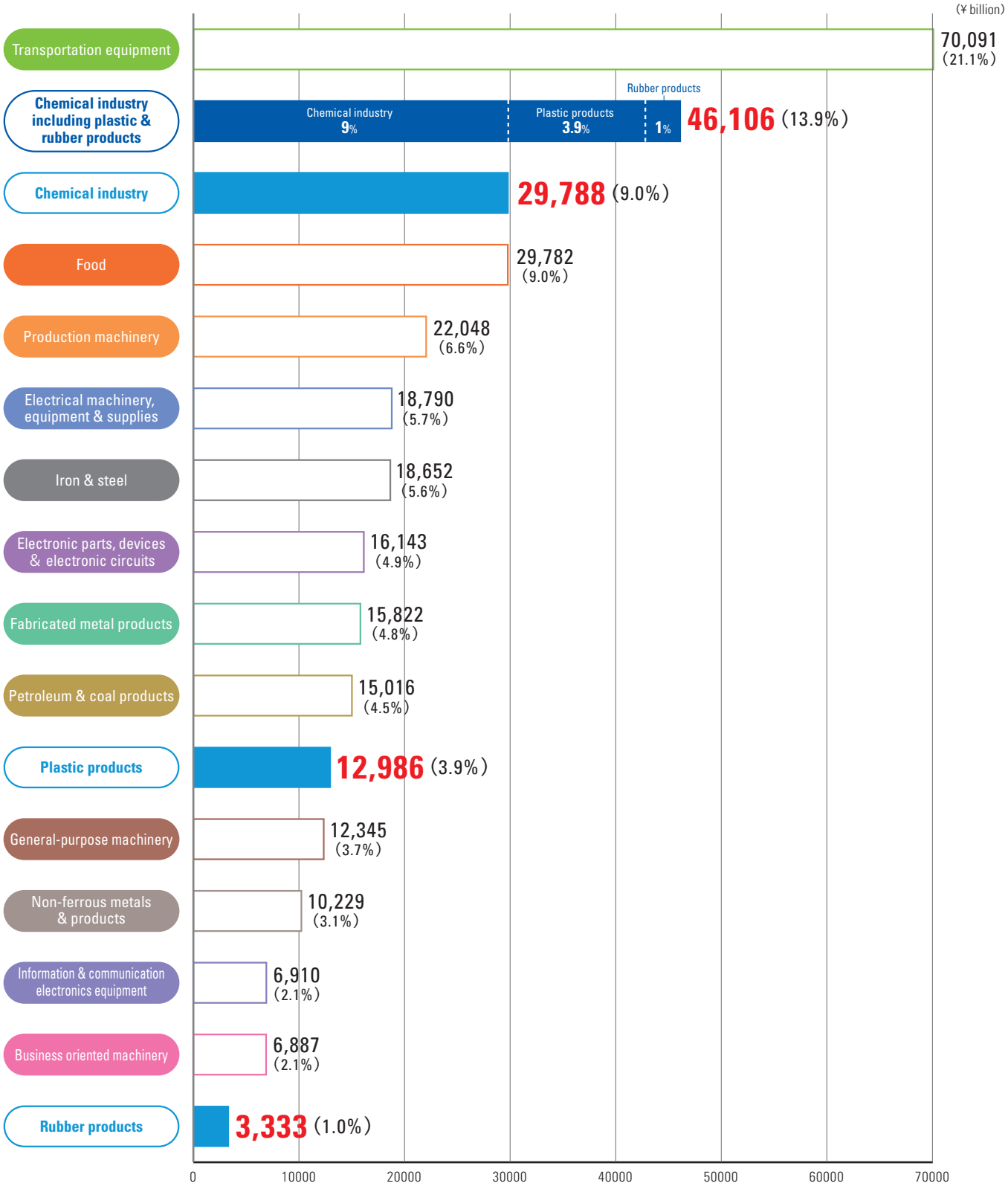
Shipments

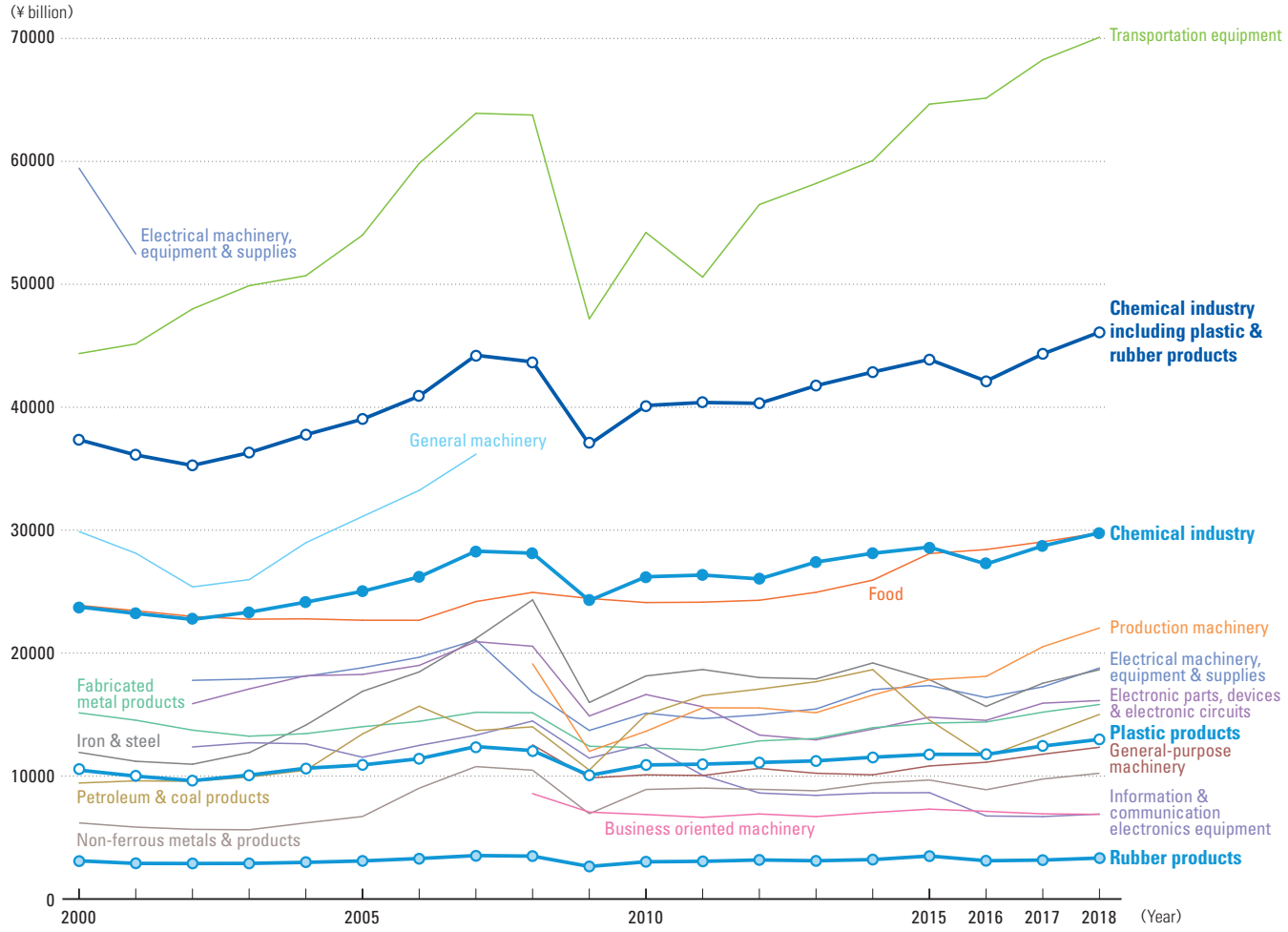
Total shipment value of chemical industry ranks 2nd in manufacturing industries amounting to 46 trillion yen.

Value of shipments by manufacturing industry in 2018



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

Trend in shipment value (2000-2018)



(¥ billion)

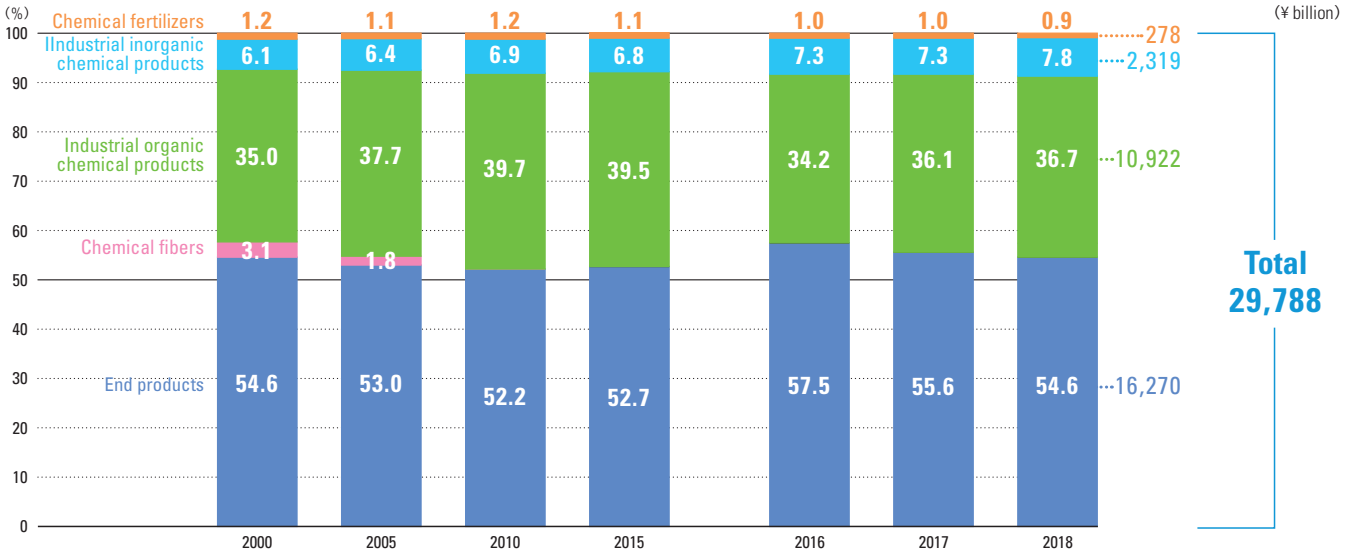
Industry \ Year	Every 5th year				Recent three years			
	2000	2005	2010	2015	2016	2017	2018	
Chemical industry	23,762	25,027	26,212	28,622	27,250	28,724	29,788	9.0%
Plastic products	10,486	10,906	10,903	11,767	11,764	12,443	12,986	3.9%
Rubber products	3,107	3,099	3,029	3,499	3,113	3,168	3,333	1.0%
Chemical industry including plastic & rubber products	**37,356**	**39,032**	**40,144**	**43,889**	**42,127**	**44,335**	**46,106**	**13.9%**
Food	23,888	22,678	24,114	28,102	28,426	29,056	29,782	9.0%
Petroleum & coal products	9,434	13,429	14,992	14,555	11,580	13,287	15,016	4.5%
Iron & steel	11,927	16,896	18,146	17,842	15,669	17,556	18,652	5.6%
Non-ferrous metals & products	6,191	6,712	8,911	9,680	8,889	9,762	10,229	3.1%
Fabricated metal products	15,143	14,016	12,292	14,306	14,399	15,199	15,822	4.8%
General machinery	29,972	31,211	–	–	–	–	–	–
General-purpose machinery	–	–	10,100	10,823	11,125	11,780	12,345	3.7%
Production machinery	–	–	13,646	17,837	18,107	20,521	22,048	6.6%
Business oriented machinery	–	–	6,873	7,311	7,130	6,927	6,887	2.1%
Electronic parts, devices & electronic circuits	–	18,265	16,633	14,788	14,532	15,930	16,143	4.9%
Electrical machinery, equipment & supplies	59,449	18,812	15,120	17,366	16,388	17,259	18,790	5.7%
Information & communication electronics equipment	–	11,534	12,585	8,652	6,755	6,707	6,910	2.1%
Transportation equipment	44,367	54,000	54,214	64,654	65,141	68,263	70,091	21.1%
Others	62,752	48,760	41,338	43,324	41,917	42,454	42,989	13.0%
Total manufacturing	300,478	295,346	289,108	313,129	302,185	319,036	331,809	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.

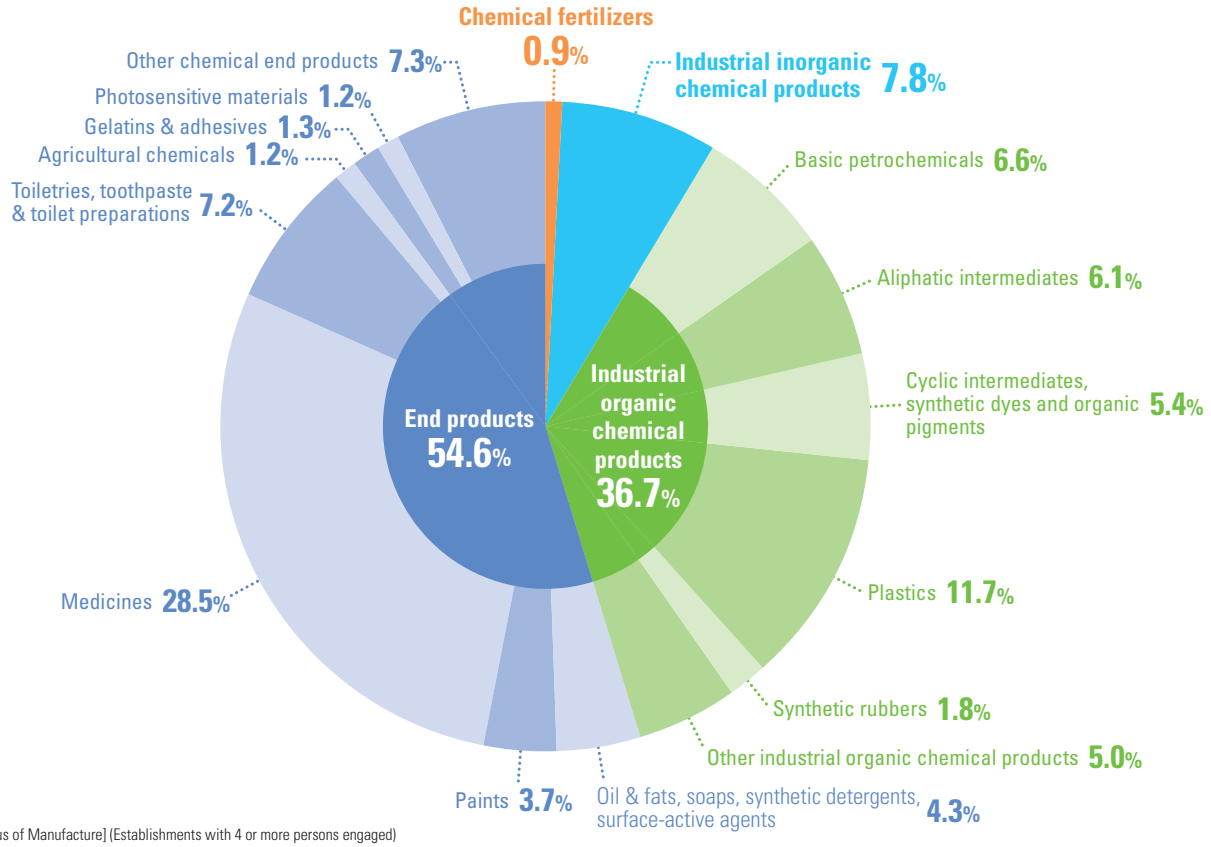
Trend of shipments composition in chemical industry (2000-2018)



Industry \ Year	Every 5th year				Recent three years		
	2000	2005	2010	2015	2016	2017	2018
Chemical fertilizers	1.2	1.1	1.2	1.1	1.0	1.0	0.9
Industrial inorganic chemical products	6.1	6.4	6.9	6.8	7.3	7.3	7.8
Industrial organic chemical products	35.0	37.7	39.7	39.5	34.2	36.1	36.7
▶Basic petrochemicals	2.9	6.3	6.6	5.9	6.4	6.9	6.6
▶Aliphatic intermediates	7.1	6.1	5.9	5.4	4.7	4.5	6.1
▶Cyclic intermediates, synthetic dyes and organic pigments	6.1	7.6	6.8	7.4	4.9	5.4	5.4
▶Plastics	13.6	11.0	13.2	12.8	11.3	12.4	11.7
▶Synthetic rubbers	1.5	2.0	1.6	1.9	1.8	1.9	1.8
▶Other industrial organic chemical products	3.8	4.7	5.5	6.0	5.2	5.0	5.0
Chemical fibers	3.1	1.8	–	–	–	–	–
End products	54.6	53.0	52.2	52.7	57.5	55.6	54.6
▶Oil & fats, soaps, synthetic detergents, surface-active agents	3.5	4.1	4.2	3.9	4.2	4.1	4.3
▶Paints	4.1	3.7	4.0	3.5	3.8	3.7	3.7
▶Medicines	27.0	28.0	28.1	29.2	31.1	29.6	28.5
▶Toiletries, toothpaste & toilet preparations	6.0	5.6	5.3	5.4	6.6	6.9	7.2
▶Agricultural chemicals	1.4	1.1	1.0	1.2	1.3	1.3	1.2
▶Gelatins & adhesives	1.0	1.0	1.2	1.2	1.4	1.3	1.3
▶Photosensitive materials	4.4	2.5	1.7	1.2	1.3	1.2	1.2
▶Other chemical end products	7.2	7.0	6.8	7.2	7.7	7.5	7.3
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	64.7	64.8	64.6
Plastic products	28.1	27.9	27.2	26.8	27.9	28.1	28.2
Rubber products	8.3	7.9	7.5	8.0	7.4	7.1	7.2
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 2018



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

Major chemical industry indices with breakdown by product in 2018

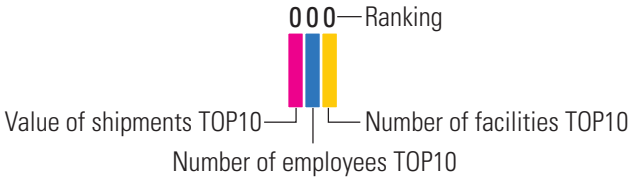
Industry	Major indices, Composition							
	Number of facilities		Number of employees		Value of shipments		Amount of value added	
		%	(Persons)	%	(¥ billion)	%	(¥ billion)	%
Chemical fertilizers	146	3.2	3,902	1.0	278	0.9	75	0.6
Industrial inorganic chemical products	775	16.8	36,378	9.7	2,319	7.8	773	6.7
Industrial organic chemical products	758	16.4	97,685	26.1	10,922	36.7	2,897	25.2
▶Basic petrochemicals	9	0.2	4,717	1.3	1,973	6.6	210	1.8
▶Aliphatic intermediates	64	1.4	12,564	3.4	1,820	6.1	433	3.8
▶Cyclic intermediates, synthetic dyes and organic pigments	132	2.9	15,373	4.1	1,620	5.4	533	4.6
▶Plastics	244	5.3	33,220	8.9	3,488	11.7	1,036	9.0
▶Synthetic rubbers	17	0.4	6,500	1.7	536	1.8	187	1.6
▶Other organic chemicals	292	6.3	25,311	6.8	1,483	5.0	498	4.3
End products	2,934	63.6	236,734	63.2	16,270	54.6	7,758	67.4
▶Oil & fats, soaps, synthetic detergents, surface-active agents	273	5.9	15,373	4.1	1,282	4.3	600	5.2
▶Paints	375	8.1	17,330	4.6	1,100	3.7	448	3.9
▶Medicines	757	16.4	98,633	26.3	8,476	28.5	4,382	38.1
▶Toiletries, toothpaste & toilet preparations	492	10.7	45,807	12.2	2,145	7.2	1,152	10.0
▶Agricultural chemicals	73	1.6	4,781	1.3	357	1.2	144	1.3
▶Gelatins & adhesives	144	3.1	6,769	1.8	391	1.3	119	1.0
▶Photosensitive materials	41	0.9	7,378	2.0	354	1.2	151	1.3
▶Other chemical end products	779	16.9	40,663	10.9	2,164	7.3	762	6.6
Chemical industry	4,613	100.0	374,699	100.0	29,788	100.0	11,503	100.0
Chemical industry	4,613	24.1	374,699	39.7	29,788	64.6	11,503	65.5
Plastic products	12,201	63.9	450,072	47.7	12,986	28.2	4,654	26.5
Rubber products	2,294	12.0	119,643	12.7	3,333	7.2	1,404	8.0
Chemical industry including plastic & rubber products	19,108	100.0	944,414	100.0	46,106	100.0	17,561	100.0

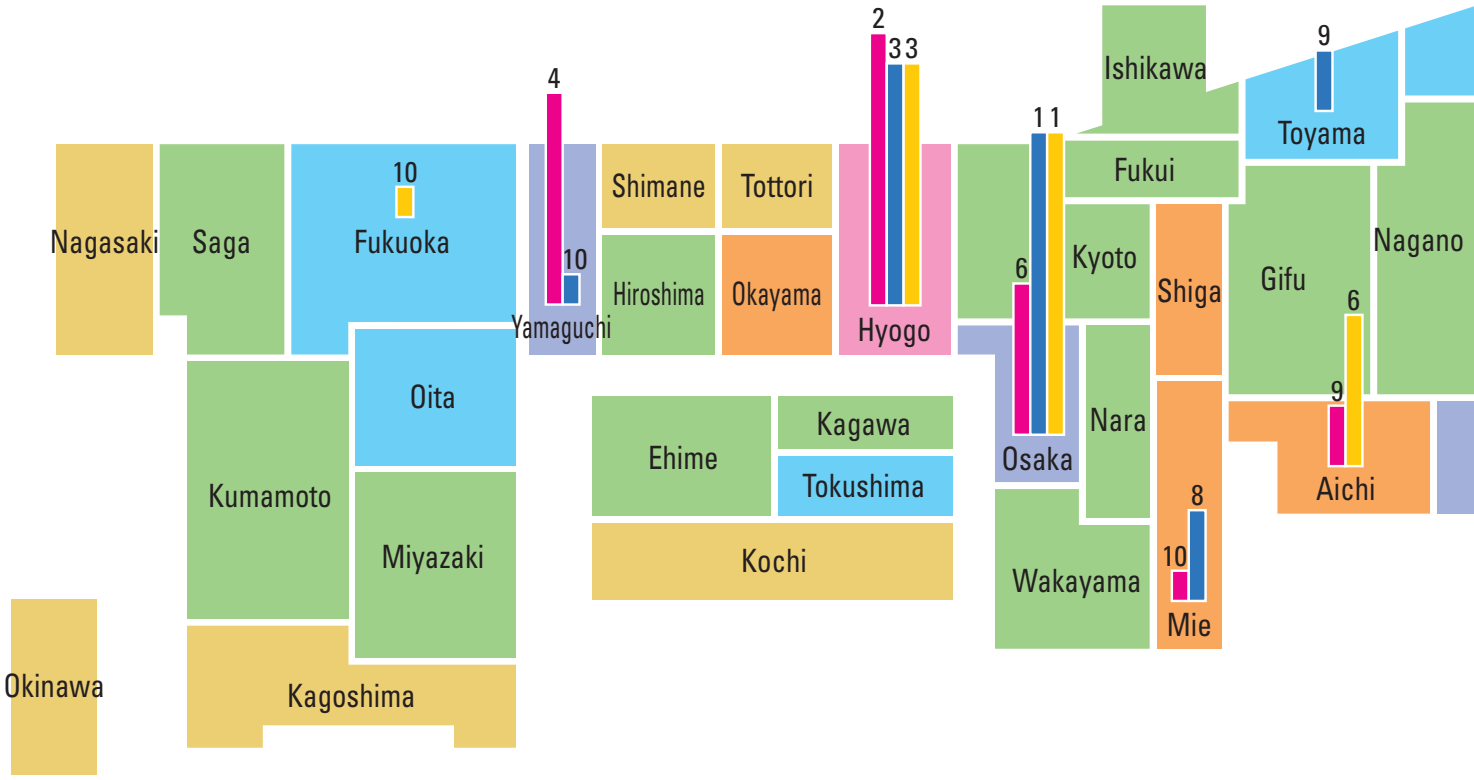
(Source) METI [Census of Manufacture] (Establishments with 4 or more persons engaged)
(Note) The number of establishments and employees is as of June 1, 2019.

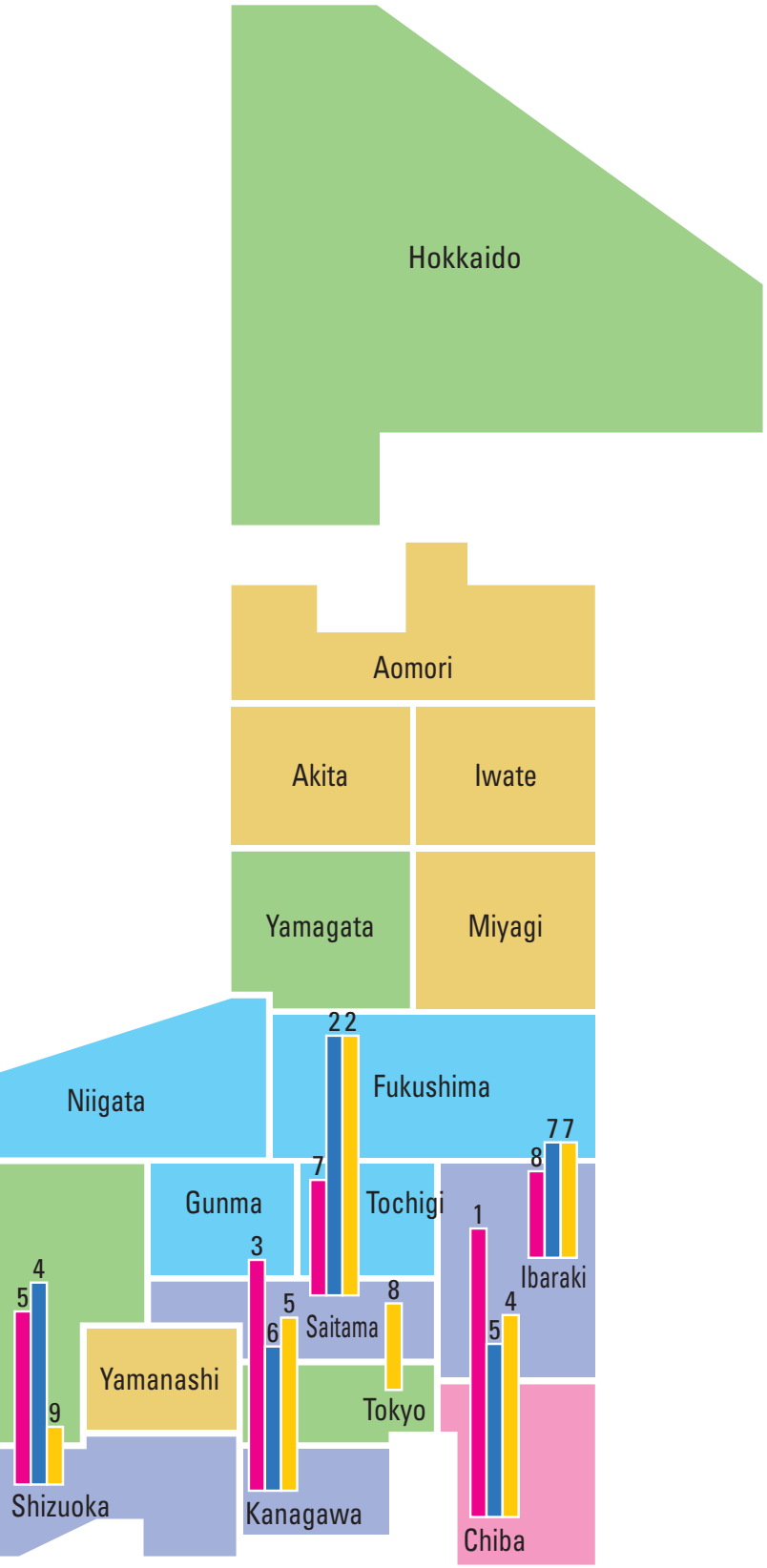
Shipment, number of employed workers and number of facilities by prefecture

Shipment, number of employed workers and number of facilities by prefecture in 2018

- Over ¥2 trillion
- ¥1.5 trillion - ¥2 trillion
- ¥1 trillion - ¥1.5 trillion
- ¥500 billion - ¥1 trillion
- ¥100 billion - ¥500 billion
- Less than ¥100 billion







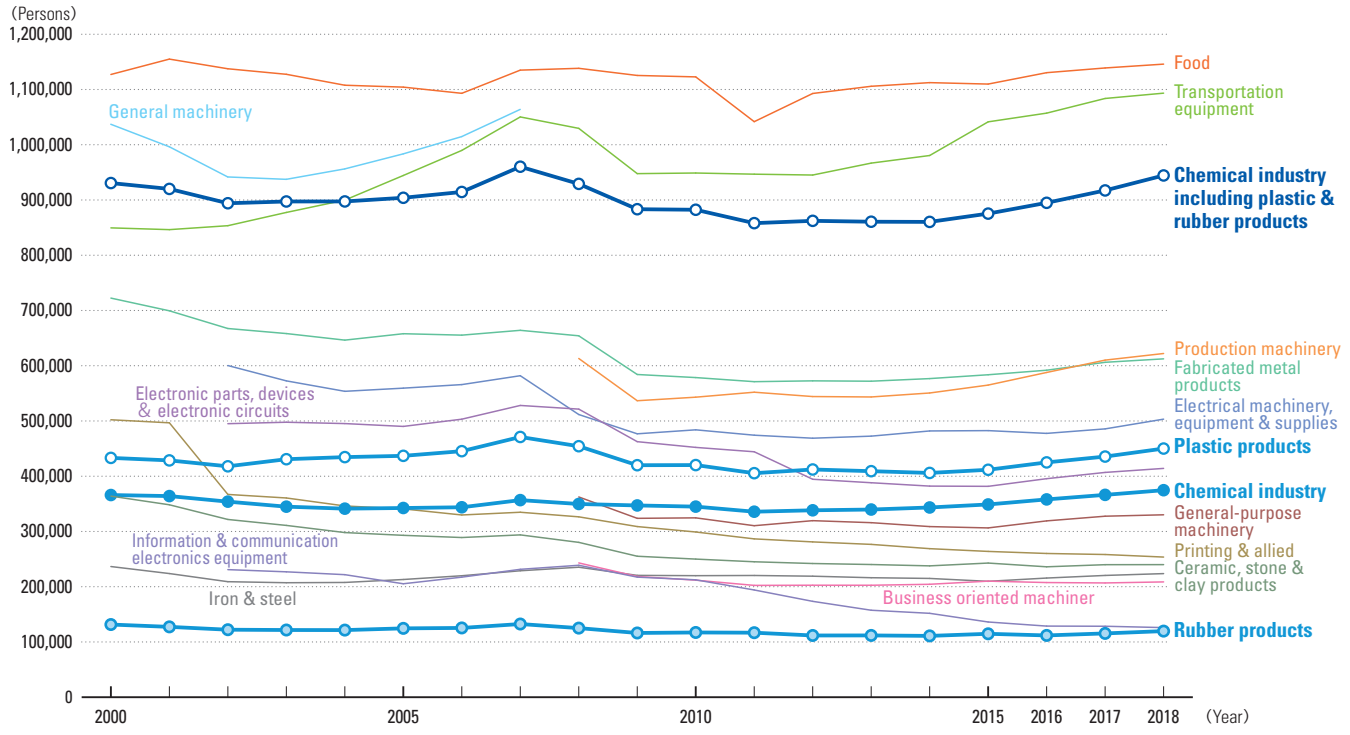
	Prefecture	Value of shipments (¥100million)	Change from 2017	Number of employees	Number of facilities
1	Chiba	23,509	101.2%	22,734	249
2	Hyogo	22,210	108.2%	23,663	278
3	Kanagawa	19,929	102.9%	22,023	243
4	Yamaguchi	19,276	102.9%	14,767	86
5	Shizuoka	18,954	103.9%	23,040	184
6	Osaka	18,844	97.1%	31,193	523
7	Saitama	17,275	102.3%	24,842	360
8	Ibaraki	16,800	104.8%	16,265	200
9	Aichi	12,938	105.9%	14,525	218
10	Mie	12,712	107.1%	15,245	117
11	Okayama	12,398	116.3%	11,936	109
12	Shiga	10,498	98.8%	7,515	105
13	Toyama	7,438	101.4%	15,209	120
14	Gunma	7,106	110.5%	10,418	86
15	Tochigi	6,907	101.6%	6,645	85
16	Oita	6,616	114.7%	3,072	34
17	Niigata	6,572	105.3%	7,856	72
18	Tokushima	5,632	100.5%	7,043	43
19	Fukushima	5,305	102.7%	8,564	98
20	Fukuoka	5,195	114.8%	8,842	141
21	Hiroshima	4,430	100.4%	6,502	89
22	Tokyo	3,839	106.3%	10,802	194
23	Wakayama	3,783	101.5%	5,729	75
24	Ehime	3,499	112.0%	4,114	45
25	Gifu	2,792	90.8%	5,917	85
26	Yamagata	2,616	91.6%	3,528	34
27	Fukui	2,497	106.8%	4,040	53
28	Kyoto	2,224	107.8%	5,688	110
29	Ishikawa	1,933	114.0%	2,391	33
30	Hokkaido	1,811	98.7%	3,432	89
31	Saga	1,782	100.1%	2,692	35
32	Miyazaki	1,756	104.8%	1,801	19
33	Kagawa	1,556	96.8%	3,424	41
34	Kumamoto	1,263	78.1%	3,722	41
35	Nara	1,161	92.7%	3,508	71
36	Nagano	1,018	92.5%	2,010	46
37	Miyagi	847	108.7%	1,818	41
38	Iwate	582	99.9%	1,622	23
39	Akita	503	62.4%	1,733	15
40	Yamanashi	462	127.9%	1,279	19
41	Aomori	355	92.5%	550	13
42	Shimane	338	105.5%	925	9
43	Kagoshima	267	99.3%	462	21
44	Nagasaki	242	193.6%	417	15
45	Kochi	92	109.8%	292	14
46	Okinawa	77	97.7%	722	28
47	Tottori	43	302.8%	182	4
	Total	297,880	103.7%	374,699	4,613

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

4 Number of employed workers

About 940,000 workers are employed making the industry to rank 3rd among manufacturing industries.

Changes in the number of employees by manufacturing industry (2000-2018)



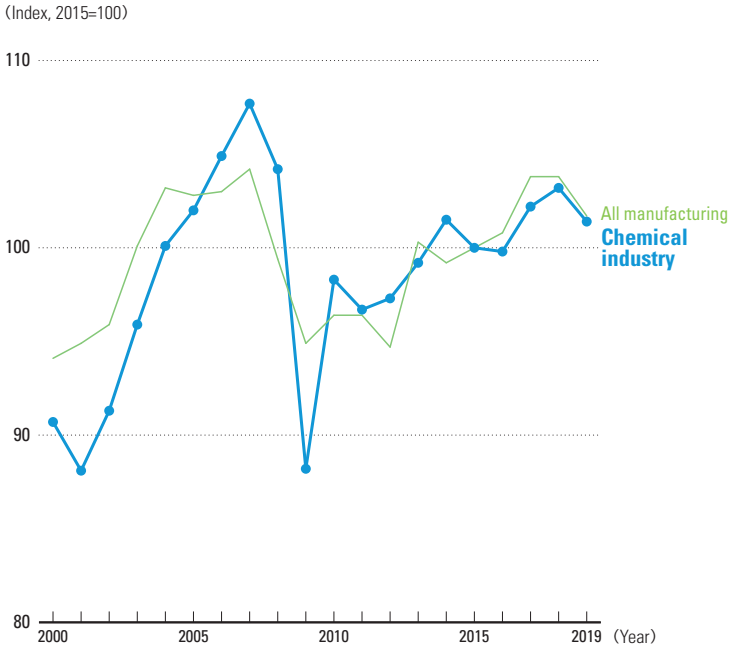
(Persons)

Industry \ Year	Every 5th year				Recent three years			
	2000	2005	2010	2015	2016	2017	2018	
Chemical industry	365,953	342,481	344,968	348,895	358,027	366,260	374,699	4.8%
Plastic products	433,177	436,897	420,179	411,676	425,035	435,564	450,072	5.8%
Rubber products	131532	124,613	117,176	114,775	111,825	115,472	119,643	1.5%
Chemical industry including plastic & rubber products	**930,662**	**903,991**	**882,323**	**875,346**	**894,887**	**917,296**	**944,414**	**12.1%**
Food	1,127,177	1,104,292	1,122,817	1,109,819	1,130,444	1,138,973	1,145,915	14.7%
Printing & allied	502,184	340,890	299,038	263,891	260,164	258,298	253,665	3.3%
Ceramic, stone & clay products	363,997	293,013	250,001	242,816	236,031	239,873	239,975	3.1%
Iron & steel	236,525	213,056	219,983	209,748	215,684	220,408	223,717	2.9%
Fabricated metal products	722,425	657,942	578,559	583,664	591,865	606,216	612,442	7.9%
General machinery	1,037,079	983,449	–	–	–	–	–	–
General-purpose machinery	–	–	324,636	306,415	319,153	327,617	330,182	4.2%
Production machinery	–	–	543,070	564,958	587,805	610,154	622,124	8.0%
Business oriented machinery	–	–	211,834	210,084	207,537	206,822	208,683	2.7%
Electronic parts, devices & electronic circuits	–	490,140	452,169	381,686	395,551	406,874	414,153	5.3%
Electrical machinery, equipment & supplies	1,573,683	559,413	483,979	482,552	477,529	485,679	503,300	6.5%
Information & communication electronics equipment	–	205,331	212,466	136,141	128,715	128,446	125,998	1.6%
Transportation equipment	849,517	944,352	948,824	1,041,452	1,057,212	1,083,760	1,093,367	14.1%
Others	1,840,584	1,461,123	1,134,148	1,089,220	1,068,792	1,066,905	1,060,189	13.6%
Total manufacturing	9,183,833	8,156,992	7,663,847	7,497,792	7,571,369	7,697,321	7,778,124	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.
2 Electronic circuits have been added to electronic parts & devices since 2011.
3 Since 2015, the number of employees is as of June 1, the following year.

5 Labor productivity/ Working hours

Index of labor productivity (2000-2019)

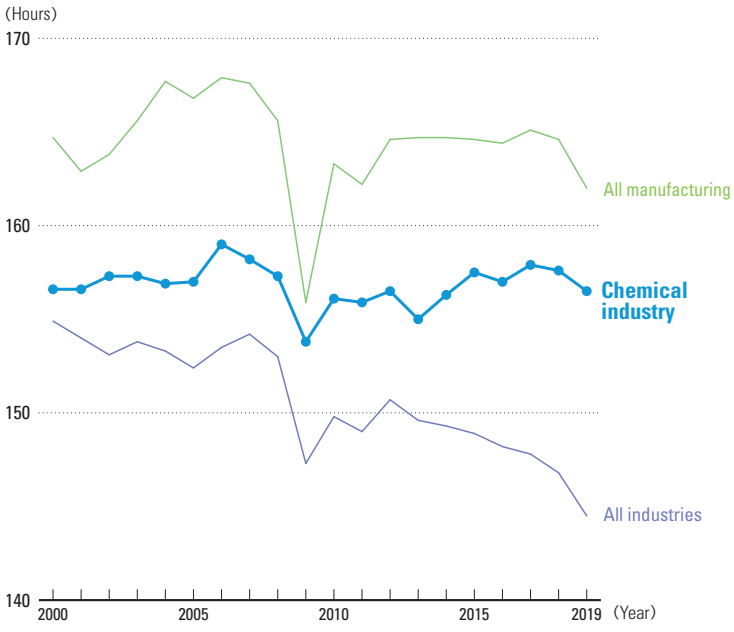


(Index, 2015=100)

Year		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	2017	102.2	2.4%	103.8	3.0%
	2018	103.2	1.0%	103.8	0.0%
	2019	101.4	▲1.7%	101.7	▲2.0%

(Source) Japan Productivity Center
(Note) Petroleum and coal products manufacturing industry is included in the chemical industry.

Working hours (monthly average of total net working hours) (2000-2019)



(Hours)

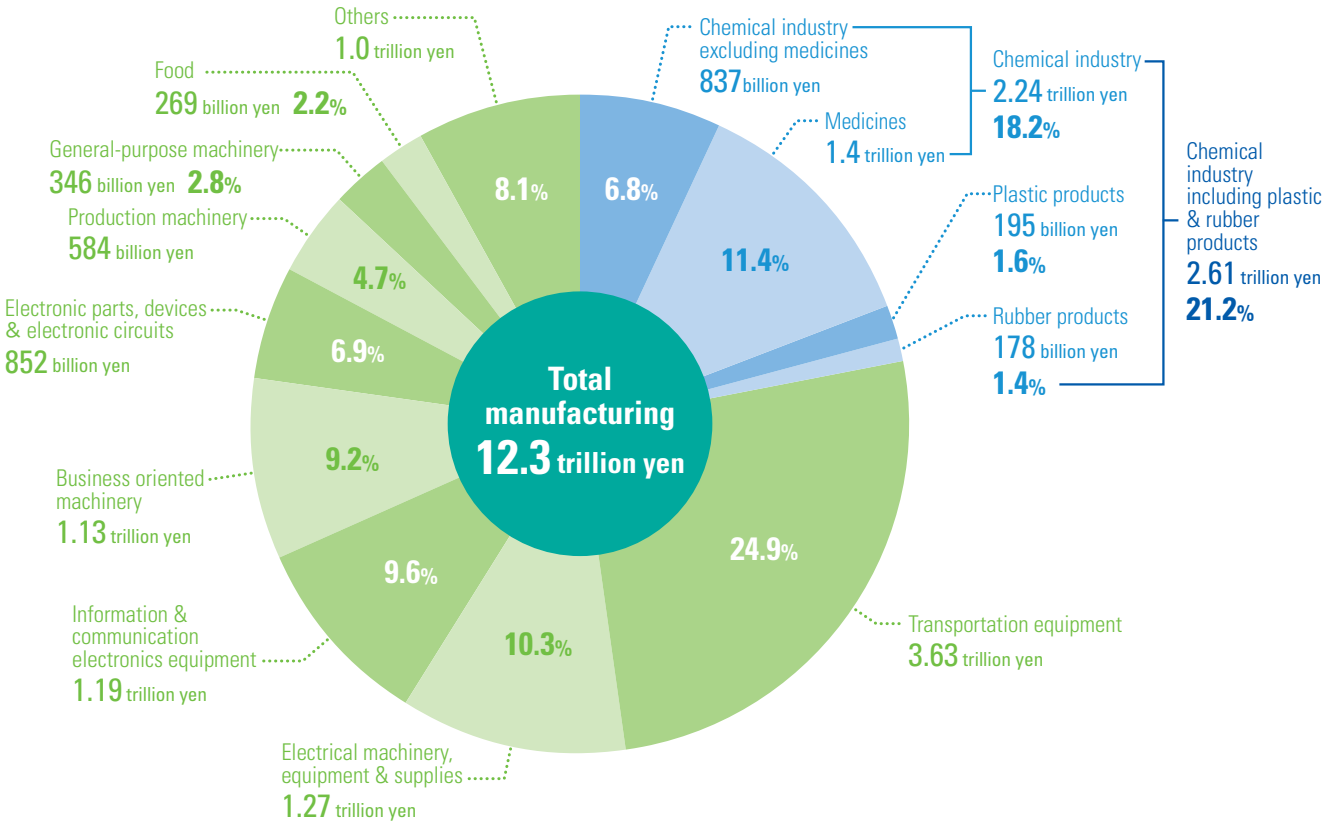
Year		All industries	All manufacturing	Chemical industry
Every 5th year	2000	154.9	164.7	156.6
	2005	152.4	166.8	157.0
	2010	149.8	163.3	156.1
	2015	148.9	164.6	157.5
Recent three years	2017	147.8	165.1	157.9
	2018	146.8	164.6	157.6
	2019	144.5	162.0	156.5

(Source) Ministry of Health, Labour and Welfare [Monthly Labour Survey]
(Note) Petroleum and coal products manufacturing industry is included in the chemical industry.

6 Research and development expenditures

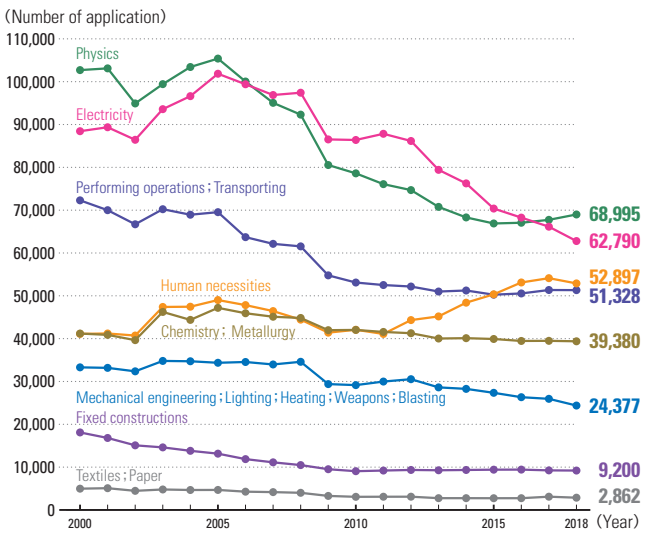
R&D expenditures of chemical industry amounted to 2.6 trillion yen.

Ratio of R&D expenditures by manufacturing industry in FY2018



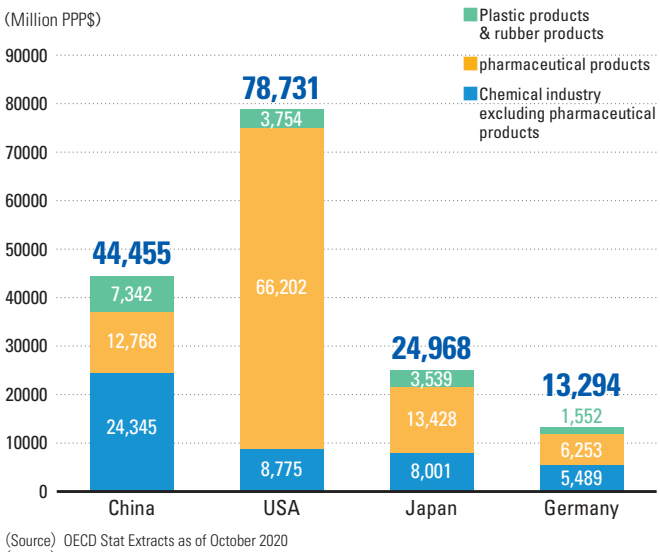
(Source) Ministry of Internal Affairs and Communications [Survey of Research and Development]

Trend of number of applications for patents by classification (2000-2018)



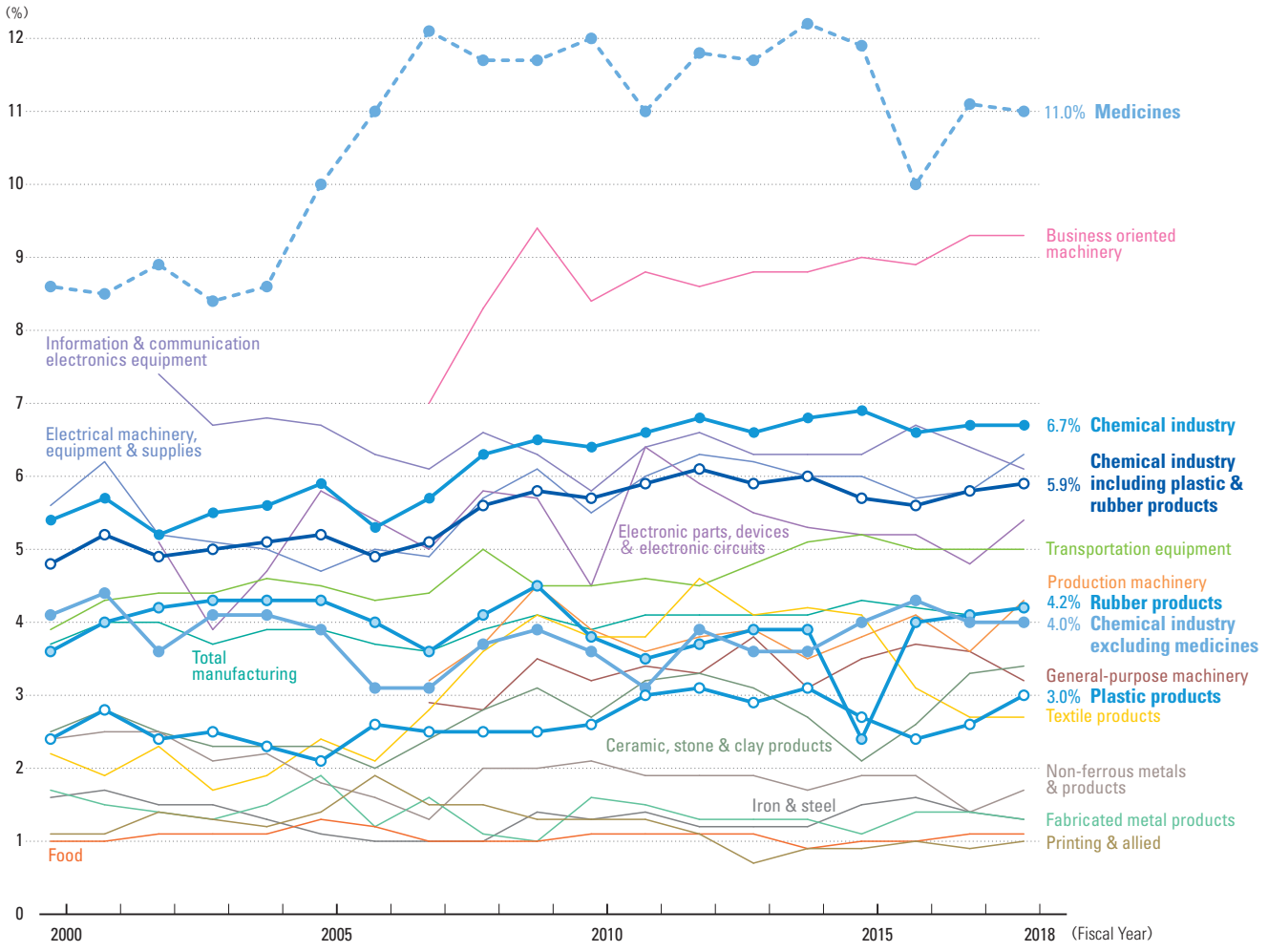
(Source) Japan Patent Office [Japan Patent Office Annual Report 2020]

R&D expenditures of chemical industry in the top four countries in shipment (2017)



(Source) OECD Stat Extracts as of October 2020
(Note) PPP: Purchasing Power Parity

Ratio of R&D expenditures to sales by manufacturing industry (FY2000-FY2018)



(%)

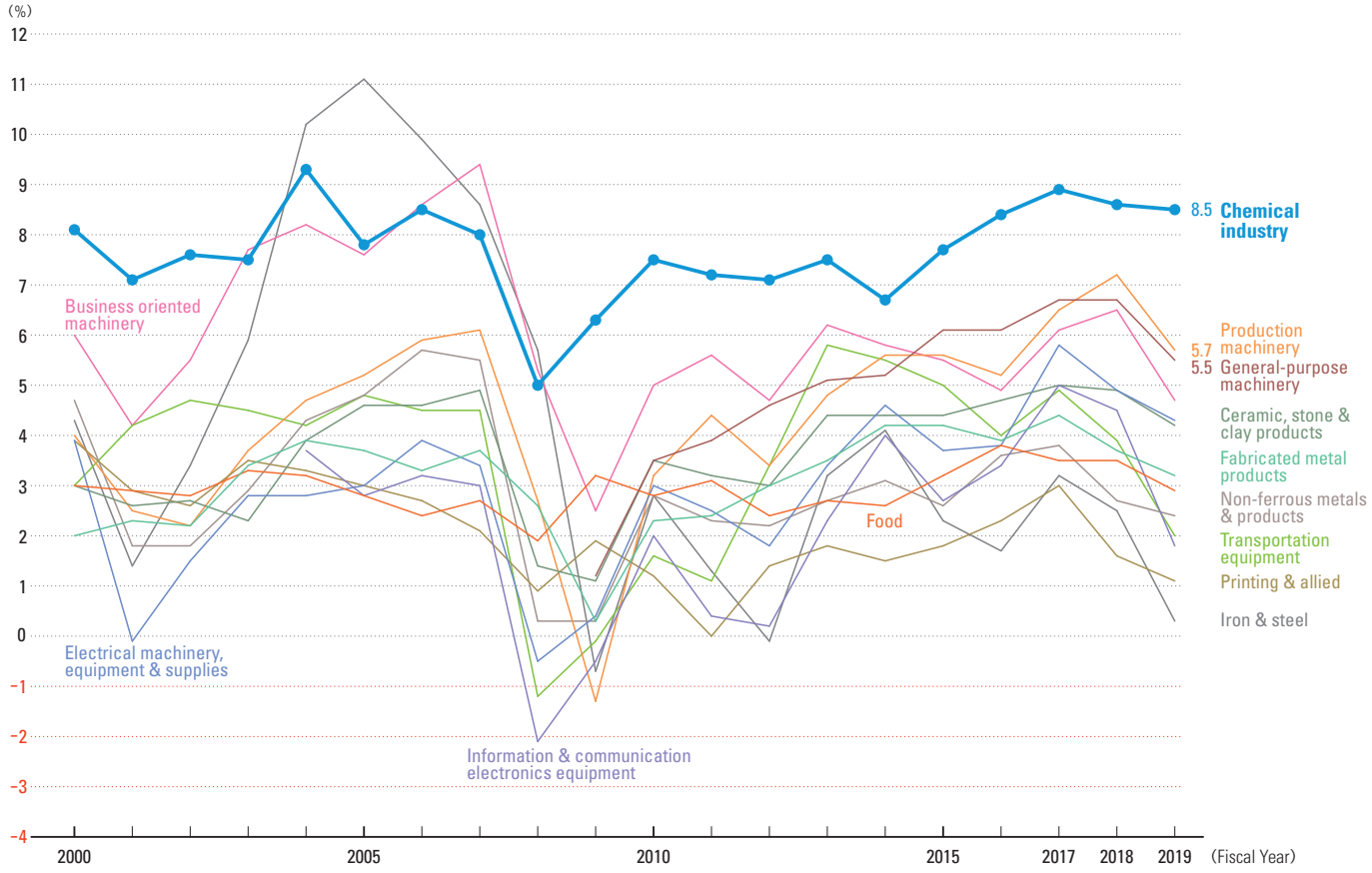
Industry \ Fiscal year	Every 5th year				Recent three years		
	2000	2005	2010	2015	2016	2017	2018
Chemical industry	5.4	5.9	6.4	6.9	6.6	6.7	6.7
Chemical industry excluding medicines	4.1	3.9	3.6	4.0	4.3	4.0	4.0
Medicines	8.6	10.0	12.0	11.9	10.0	11.1	11.0
Plastic products	2.4	2.1	2.6	2.7	2.4	2.6	3.0
Rubber products	3.6	4.3	3.8	2.4	4.0	4.1	4.2
Chemical industry including plastic & rubber products	4.8	5.2	5.7	5.7	5.6	5.8	5.9
Food	1.0	1.3	1.1	1.0	1.0	1.1	1.1
Textile products	2.2	2.4	3.8	4.1	3.1	2.7	2.7
Printing & allied	1.1	1.4	1.3	0.9	1.0	0.9	1.0
Ceramic, stone & clay products	2.5	2.3	2.7	2.1	2.6	3.3	3.4
Iron & steel	1.6	1.1	1.3	1.5	1.6	1.4	1.3
Non-ferrous metals & products	2.4	1.8	2.1	1.9	1.9	1.4	1.7
Fabricated metal products	1.7	1.9	1.6	1.1	1.4	1.4	1.3
General-purpose machinery	–	–	3.2	3.5	3.7	3.6	3.2
Production machinery	–	–	3.9	3.8	4.1	3.6	4.3
Business oriented machinery	–	–	8.4	9.0	8.9	9.3	9.3
Electronic parts, devices & electronic circuits	–	5.8	4.5	5.2	5.2	4.8	5.4
Electrical machinery, equipment & supplies	5.6	4.7	5.5	6.0	5.7	5.8	6.3
Information & communication electronics equipment	–	6.7	5.8	6.3	6.7	6.4	6.1
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	4.2	4.1	4.2

(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-FY2019)



(%)

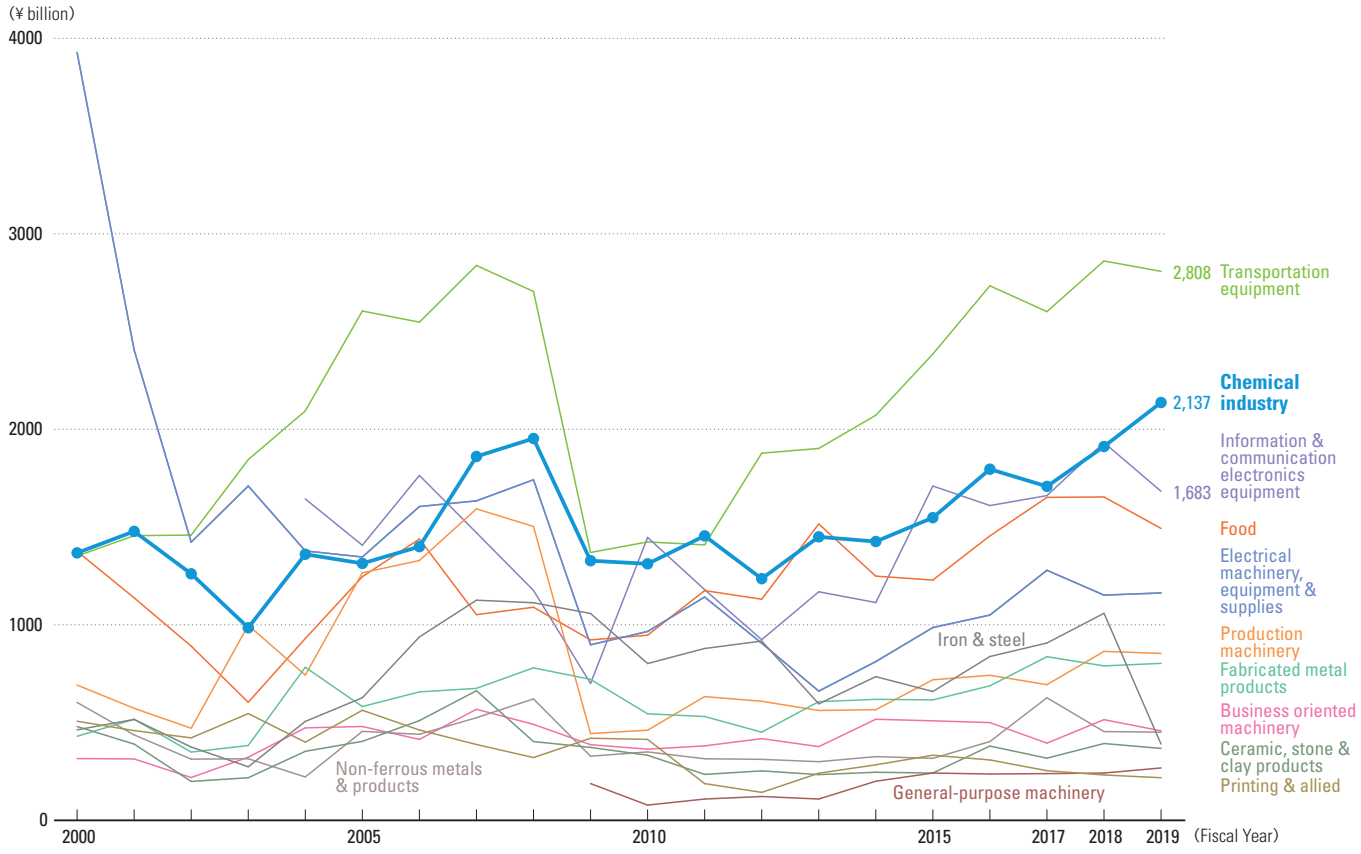
Industry \ Fiscal year	Every 5th year				Recent three years		
	2000	2005	2010	2015	2017	2018	2019
Chemical industry	**8.1**	**7.8**	**7.5**	**7.7**	**8.9**	**8.6**	**8.5**
Food	3.0	2.8	2.8	3.2	3.5	3.5	2.9
Printing & allied	3.9	3.0	1.2	1.8	3.0	1.6	1.1
Ceramic, stone & clay products	3.0	4.6	3.5	4.4	5.0	4.9	4.2
Iron & steel	4.3	11.1	2.8	2.3	3.2	2.5	0.3
Non-ferrous metals & products	4.7	4.8	2.8	2.6	3.8	2.7	2.4
Fabricated metal products	2.0	3.7	2.3	4.2	4.4	3.7	3.2
General-purpose machinery	–	–	3.5	6.1	6.7	6.7	5.5
Production machinery	4.0	5.2	3.2	5.6	6.5	7.2	5.7
Business oriented machinery	6.0	7.6	5.0	5.5	6.1	6.5	4.7
Electrical machinery, equipment & supplies	3.9	3.0	3.0	3.7	5.8	4.9	4.3
Information & communication electronics equipment	–	2.8	2.0	2.7	5.0	4.5	1.8
Transportation equipment	3.0	4.8	1.6	5.0	4.9	3.9	2.0
Total manufacturing	3.8	4.5	3.2	4.3	5.1	4.6	3.5

(Source) Ministry of Finance [Financial Statements Statistics of Corporations by Industry]
(Note) Information and 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 2.1 trillion yen making it ranked 2nd in manufacturing industries.

Trend of capital investment by manufacturing industry (FY2000-FY2019)



(¥ billion)

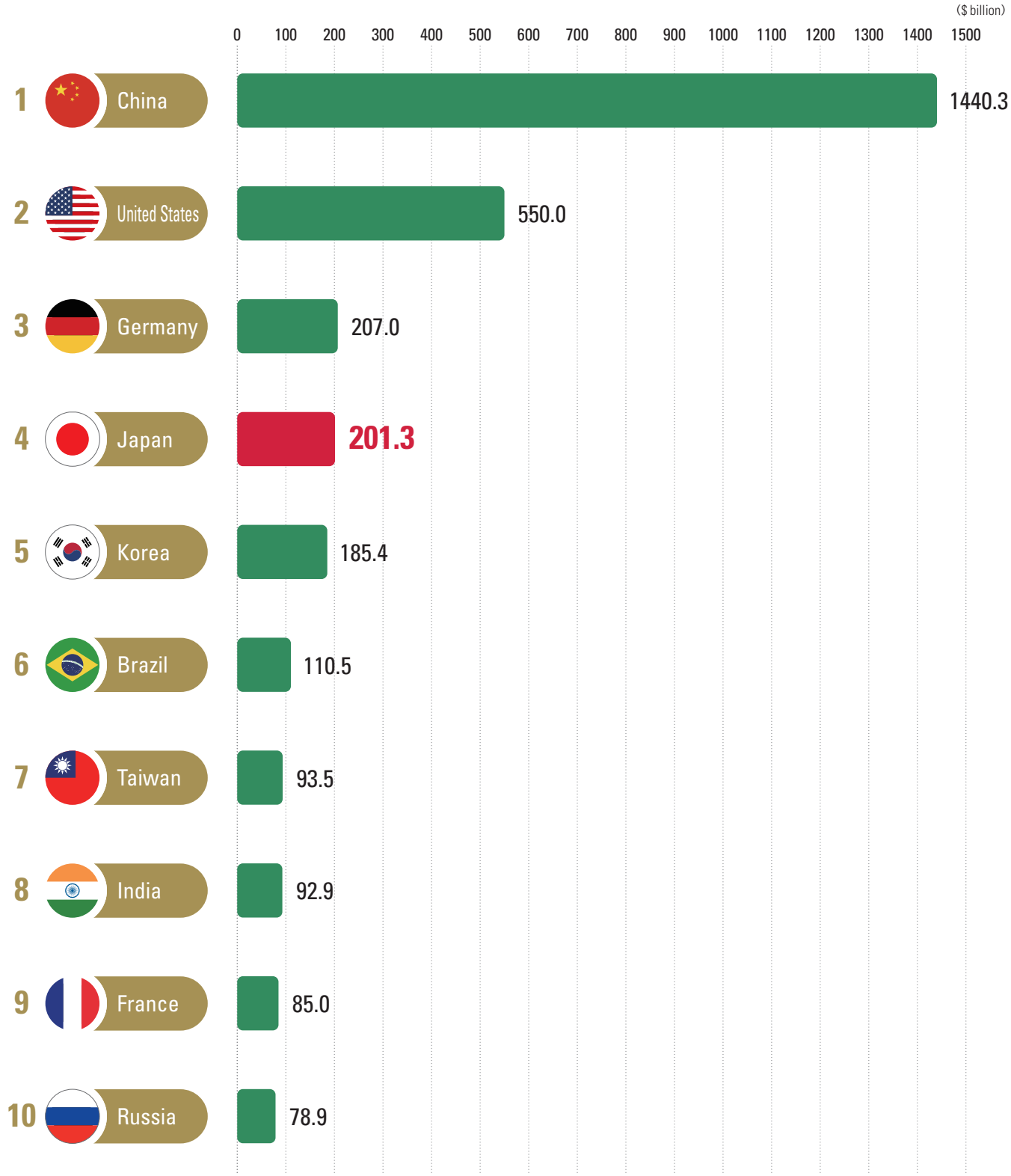
Industry \ Fiscal year	Every 5th year				Recent three years			
	2000	2005	2010	2015	2017	2018	2019	
Chemical industry	**1,368**	**1,314**	**1,312**	**1,548**	**1,708**	**1,912**	**2,137**	**14.1%**
Food	1,376	1,246	947	1,229	1,652	1,654	1,493	9.8%
Printing and allied	507	563	414	333	254	232	218	1.4%
Ceramic, stone & clay products	480	404	333	242	318	393	368	2.4%
Iron & steel	463	627	802	659	907	1,059	390	2.6%
Non-ferrous metals & products	603	455	350	317	627	454	451	3.0%
Fabricated metal products	430	582	545	616	837	790	803	5.3%
General-purpose machinery	–	–	78	242	239	242	268	1.8%
Production machinery	692	1,266	461	719	694	864	854	5.6%
Business oriented machinery	316	480	364	509	395	515	458	3.0%
Electrical machinery, equipment & supplies	3,927	1,347	966	986	1,279	1,152	1,163	7.7%
Information & communication electronics equipment	–	1,407	1,447	1,710	1,661	1,932	1,683	11.1%
Transportation equipment	1,352	2,605	1,424	2,385	2,602	2,861	2,808	18.5%
Others	1,724	2,049	1,828	1,857	1,887	1,937	2,078	13.7%
Total manufacturing	13,238	14,343	11,272	13,351	15,060	15,998	15,173	100.0%

(Source) Ministry of Finance [Financial Statements Statistics of Corporations by Industry]
(Note) Information and 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 in2018



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

10

The world's 30 leading chemical companies

Six Japanese companies are ranked in.

The world's 30 leading chemical companies in 2018

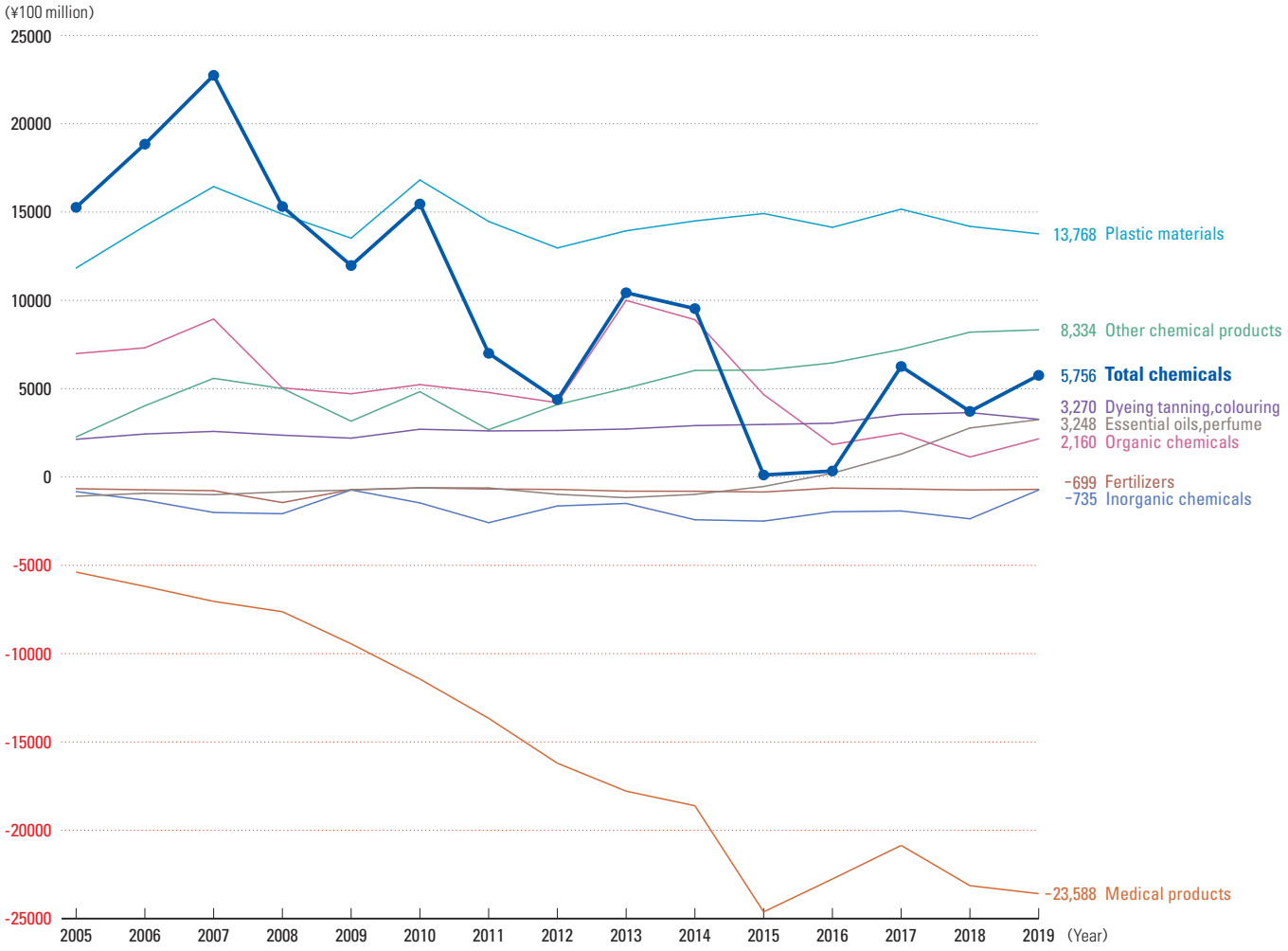
Ranking	Company	Country/Region	Chemical sales			Chemical operating profits		
			2018 ($ million)	Change from 2017 (%)	Chemical sales as of total sales (%)	2018 ($ million)	Change from 2017 (%)	Operating profit margin (%)
1	DowDuPont	US	85,977	37.6	100.0	8,412	56.2	9.8
2	BASF	Germany	74,066	2.4	100.0	7,462	–23.7	10.1
3	Sinopec	China	69,210	22.4	16.2	3,929	13.9	5.7
4	Sabic	Saudi Arabia	42,120	12.0	93.4	9,518	16.8	22.6
5	Ineos	UK	36,970	2.1	100.0	4,289	–9.3	11.6
6	Formosa Plastics	Taiwan	36,891	13.8	63.9	4,022	–17.5	10.9
7	ExxonMobil Chemical	US	32,443	13.1	11.6	4,162	–24.9	12.8
8	LyondellBasell Industries	Netherlands	30,783	8.7	78.9	5,615	–6.1	18.2
9	Mitsubishi Chemical Holdings	Japan	28,747	7.1	80.9	2,382	–12.1	8.3
10	LG Chem	South Korea	25,637	9.7	100.0	2,043	–23.3	8.0
11	Reliance Industries	India	25,167	37.3	22.3	4,706	51.9	18.7
12	PetroChina	China	24,849	N/A	7.0	1,184	5.9	4.8
13	Air Liquide	France	24,322	2.8	98.0	2,379	5.9	9.8
14	Toray Industries	Japan	18,651	8.7	86.2	1,378	–7.5	7.4
15	Evonik Industries	Germany	17,755	4.2	100.0	2,078	10.2	11.7
16	Covestro	Germany	17,273	3.4	100.0	2,982	–7.3	17.3
17	Bayer	Germany	16,859	49.0	36.0	3,708	154.1	22.0
18	Sumitomo Chemical	Japan	16,081	8.7	76.6	1,182	–23.3	7.4
19	Braskem	Brazil	15,885	17.7	100.0	2,250	–16.2	14.2
20	Lotte Chemical	South Korea	15,051	4.2	100.0	1,790	–32.8	11.9
21	Linde plc	UK	14,900	30.3	100.0	2,244	–10.2	15.1
22	Shin-Etsu Chemical	Japan	14,439	10.6	100.0	3,657	19.9	25.3
23	Mitsui Chemicals	Japan	13,432	11.6	100.0	846	–9.7	6.3
24	Solvay	Belgium	13,353	3.7	100.0	1,606	0.0	12.0
25	Yara	Norway	12,928	13.8	100.0	402	–12.0	3.1
26	Chevron Phillips Chemical	US	11,310	24.8	100.0	N/A	N/A	N/A
27	DSM	Netherlands	10,951	7.4	100.0	1,446	43.3	13.2
28	Indorama	Thailand	10,747	21.2	100.0	903	35.6	8.4
29	Asahi Kasei	Japan	10,654	8.1	54.2	1,174	6.3	11.0
30	Arkema	France	10,418	5.9	100.0	1,171	10.5	11.2

(Source) Chemical and Engineering News
(Note) 1 Pharmaceuticals is excluded.
2 N/A means not available.

11 Trade balance

Trade surplus in 2019 amounts to 5,756 hundred million yen.

Trade balance of chemicals by product (2005-2019)



(Source) Ministry of Finance [Trade Statistics]

Exports and imports of chemicals (2005-2019)

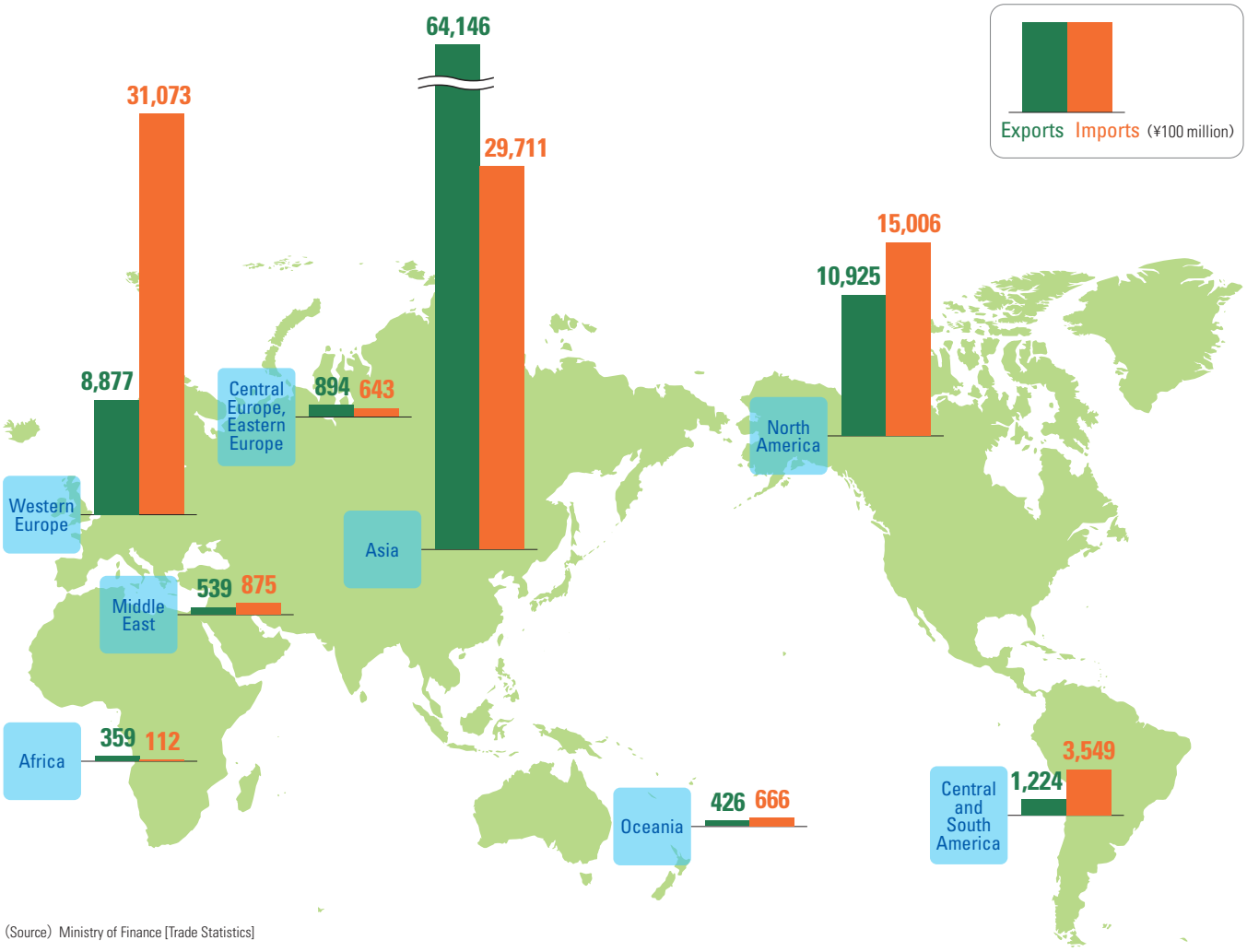
(¥100 million)

Exports						Articles	Imports					
Every 5th year			Recent three years				Every 5th year			Recent three years		
2005	2010	2015	2017	2018	2019		2005	2010	2015	2017	2018	2019
121	128	142	140	135	141	Fertilizers	783	745	990	814	868	840
3,109	3,772	4,034	4,966	6,163	6,575	Inorganic chemicals	3,935	5,237	6,529	6,888	8,527	7,310
18,832	18,728	21,166	19,566	20,513	19,071	Organic chemicals	11,843	13,496	16,499	17,085	19,379	16,911
17,157	23,360	24,441	25,112	25,574	24,297	Plastic materials	5,324	6,542	9,523	9,949	11,383	10,529
3,323	4,048	4,629	5,125	5,338	4,896	Dyeing tanning,colouring	1,187	1,343	1,655	1,581	1,692	1,627
3,677	3,787	4,623	5,593	6,487	7,331	Medical products	9,060	15,226	29,241	26,449	29,622	30,919
1,820	2,479	3,676	5,738	7,533	8,176	Essential oils,perfume	2,909	3,087	4,213	4,439	4,757	4,928
10,442	12,950	14,883	15,684	17,473	16,904	Other chemical products	8,172	8,119	8,828	8,462	9,271	8,570
58,480	**69,253**	**77,594**	**81,924**	**89,215**	**87,391**	**Total chemicals**	**43,212**	**53,794**	**77,479**	**75,666**	**85,500**	**81,635**

(Source) Ministry of Finance [Trade Statistics]

12 Exports and imports of chemicals by region

Exports and imports of chemicals by region in 2019



(Source) Ministry of Finance [Trade Statistics]

Exports and imports of chemicals by region (2005-2019)

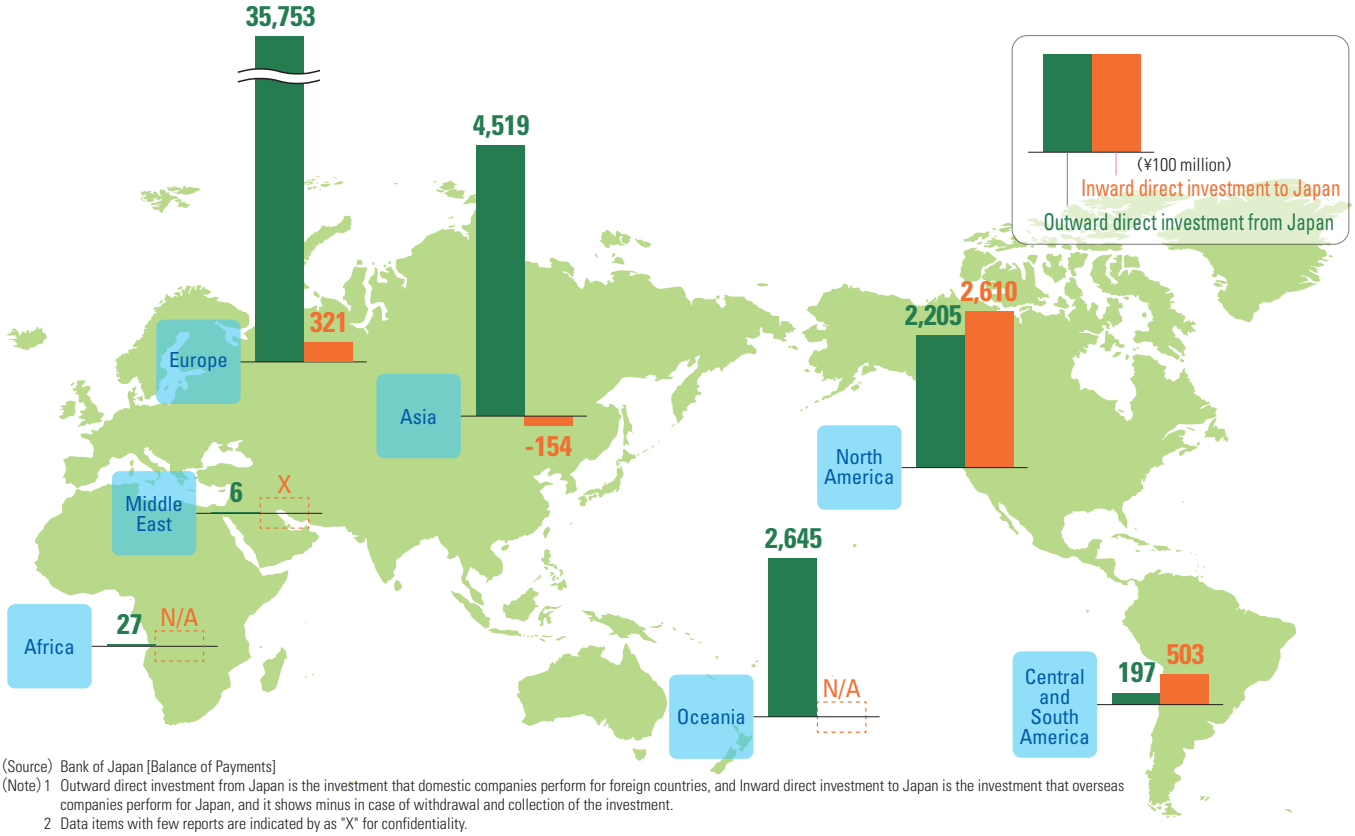
(¥100 million)

Exports						Region	Imports					
Every 5th year			Recent three years				Every 5th year			Recent three years		
2005	2010	2015	2017	2018	2019		2005	2010	2015	2017	2018	2019
40,150	51,799	57,502	61,561	66,410	64,146	Asia	12,974	17,474	26,428	27,475	32,501	29,711
586	494	460	452	481	426	Oceania	520	595	803	664	700	666
7,743	6,824	9,048	9,080	10,347	10,925	North America	9,364	11,190	14,194	14,272	15,705	15,006
1,629	1,819	1,488	1,194	1,242	1,224	Central and South America	1,790	2,013	3,082	3,097	3,457	3,549
7,609	7,084	7,689	8,169	9,183	8,877	Western Europe	17,398	21,413	31,367	28,621	31,093	31,073
204	374	425	494	549	894	Central Europe,Eastern Europe	298	330	541	529	573	643
364	580	693	608	630	539	Middle East	692	652	880	921	1,351	875
196	278	288	367	375	359	Africa	177	128	183	86	120	112
58,480	69,253	77,594	81,924	89,215	87,391	Total	43,212	53,794	77,479	75,666	85,500	81,635

(Source) Ministry of Finance [Trade Statistics]

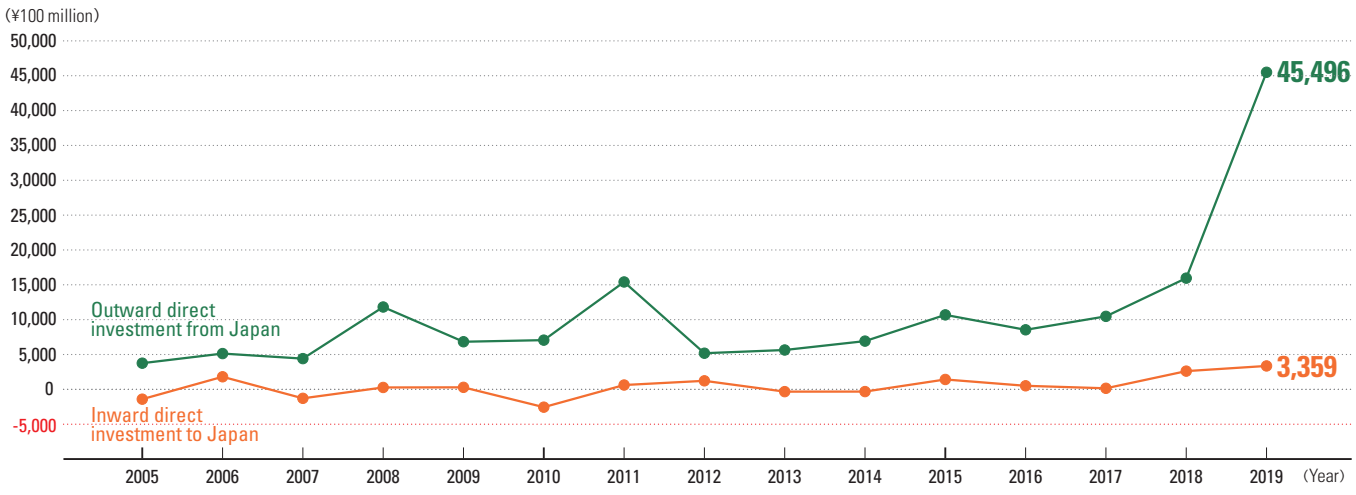
13 Outward/inward direct investments

Outward direct investment of Japanese chemical industry and inward direct investment to chemical industry in Japan in 2019



(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 by as "X" for confidentiality.
3 When there are no reports, it is indicated as "N/A".

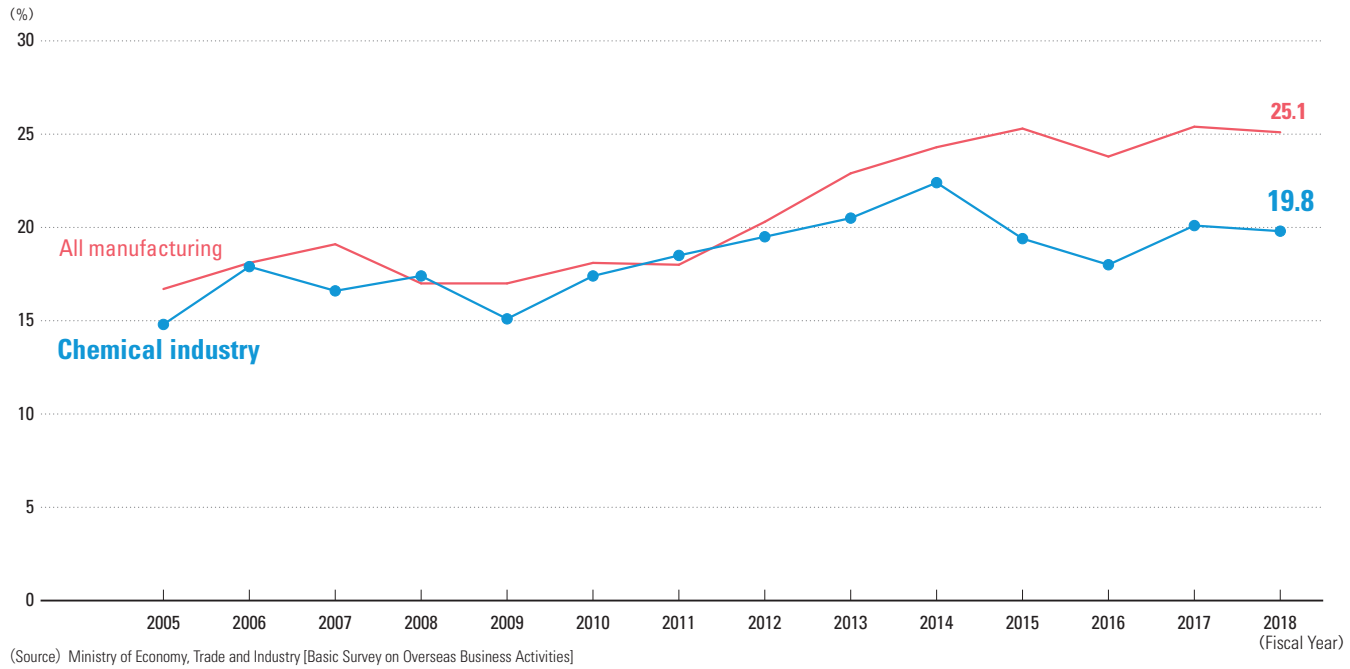
Actual outward direct investment of Japanese chemical industry and inward direct investment to chemical industry in Japan (2005-2019)



(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.

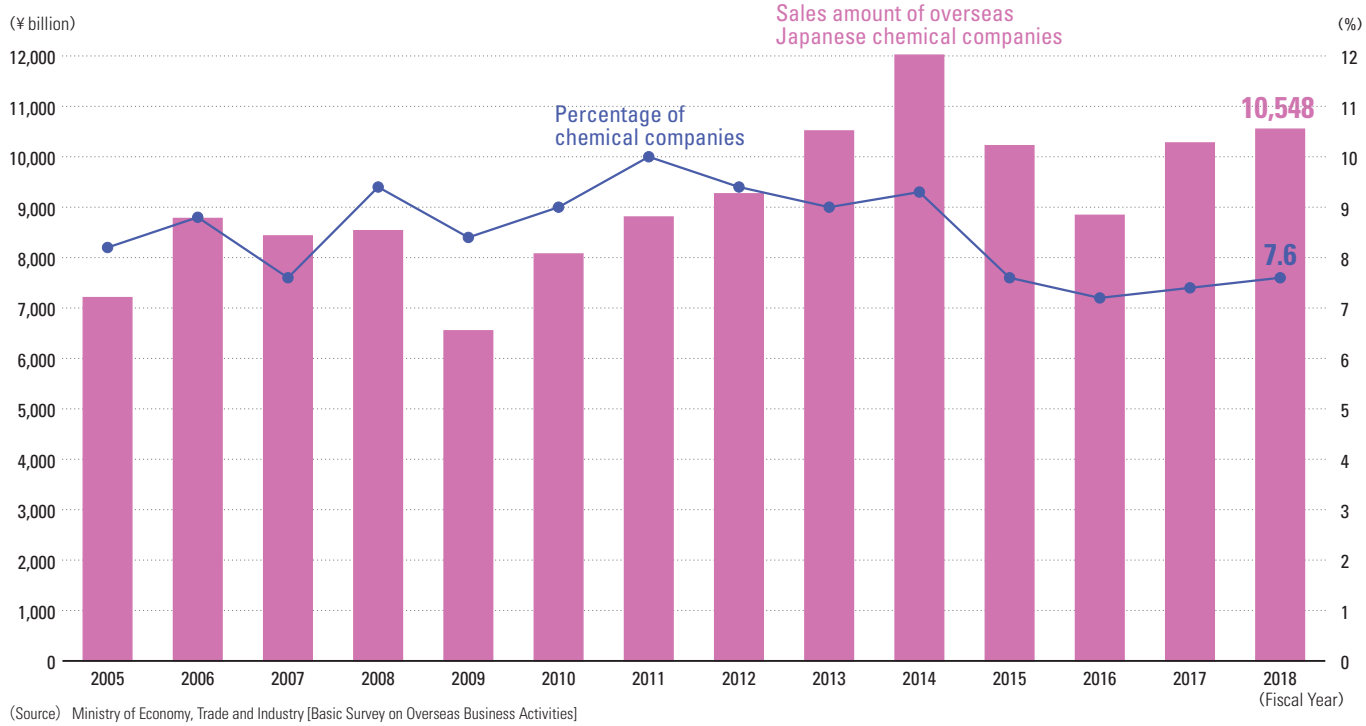
14 Ratio of overseas production/Sales of overseas subsidiary companies

Trend of overseas production of Japanese companies (FY2005-2018)



(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 (FY2005-2018)

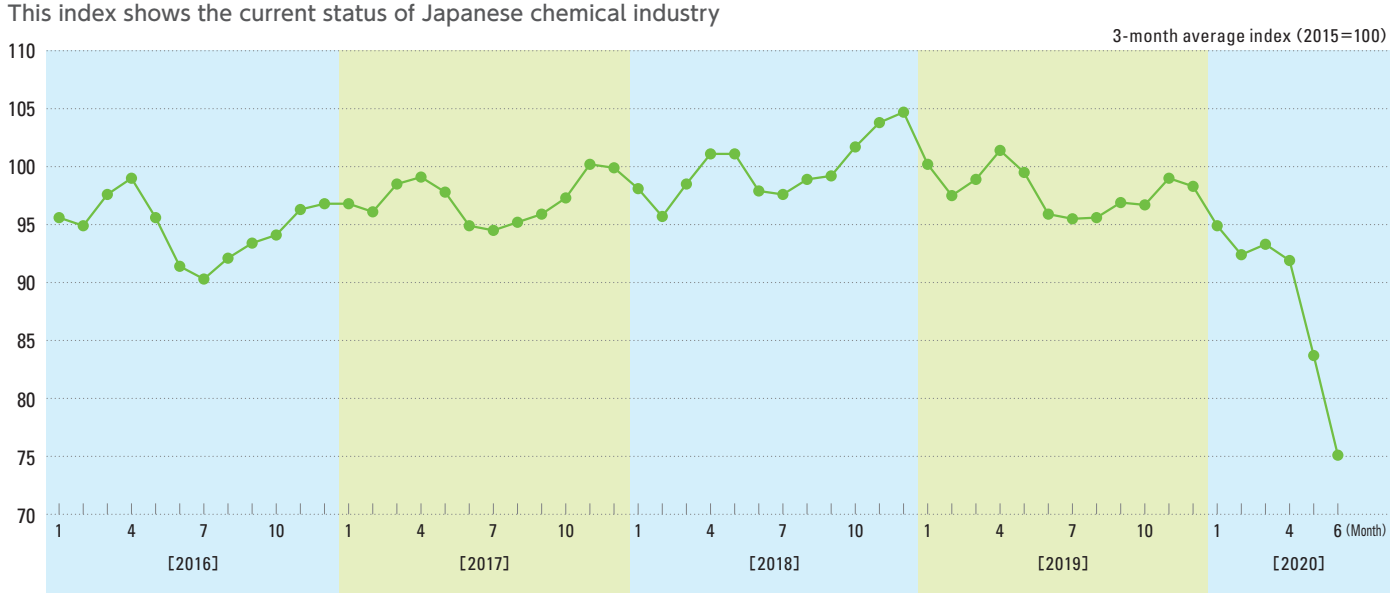


(Source) Ministry of Economy, Trade and Industry [Basic Survey on Overseas Business Activities]

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

1 Shipping index of Main Chemicals

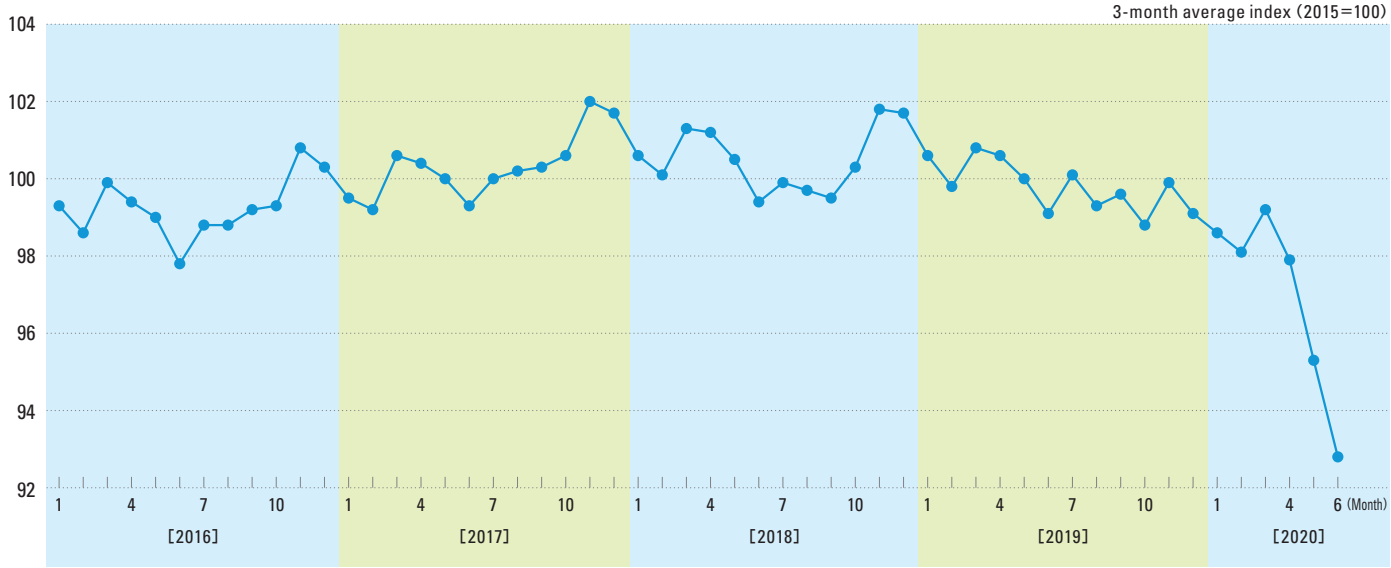
This index shows the current status of Japanese chemical industry



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.



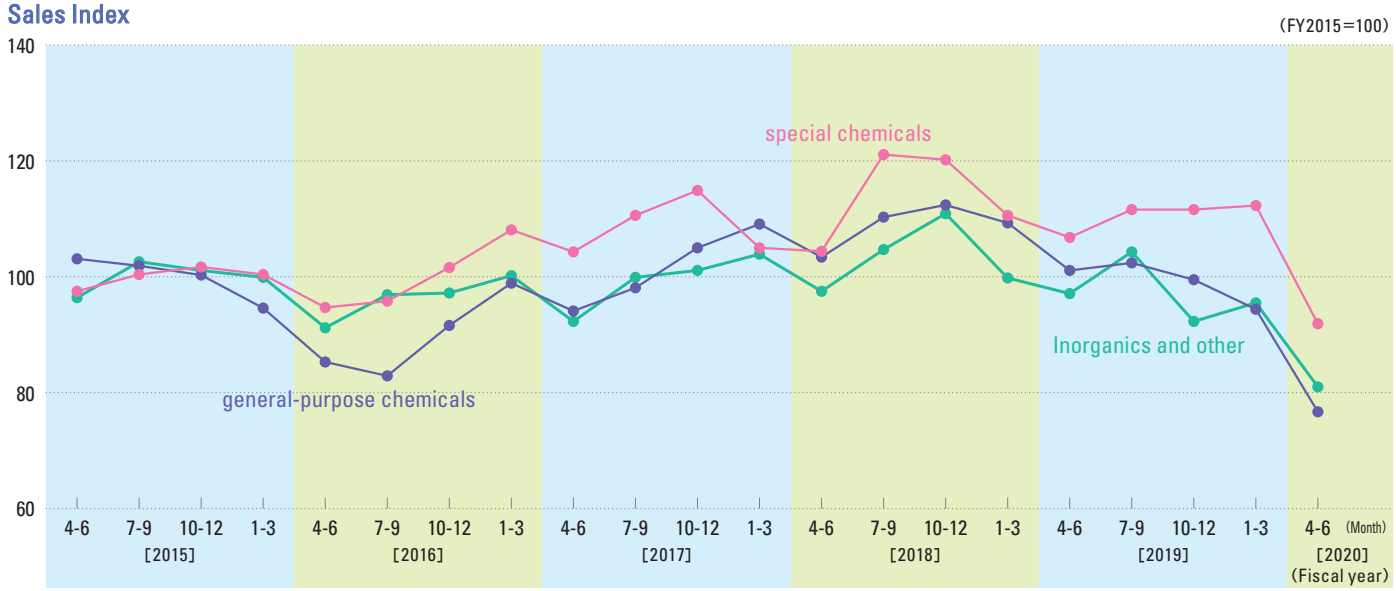
The total production value of major products in domestic each industry based on data published by customer association of chemical industry (such as automobiles, electrical, electronics, plastic products, rubber, chemical fibers) is reflected to the index in view of the impact of each industry on the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

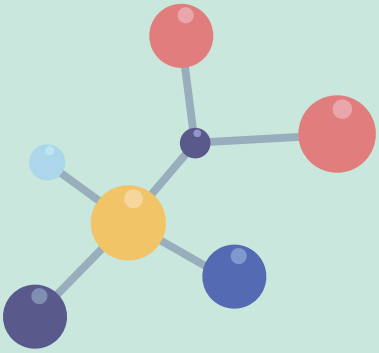
This index is categorized as "general-purpose chemicals", "special chemicals" and "Inorganics and other" based on summary of quarterly consolidated financial statements of 30 major chemical companies.

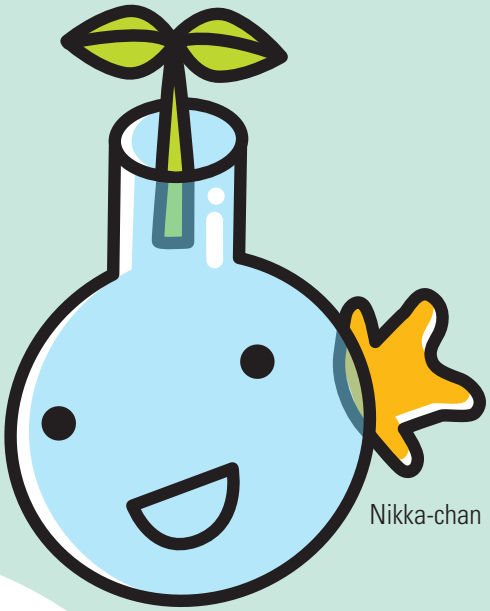
https://www.nikkakyo.org/english/data-report/report

JCIA web page → DATA&REPORT → JCIA Index Report

JCIA index is also available on the website

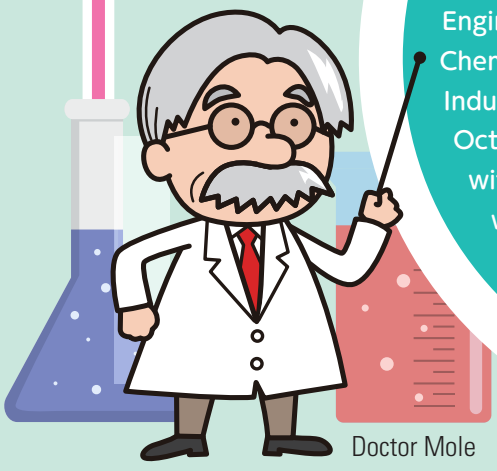
10/23 Chemistry Day





Nikka-chan

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.



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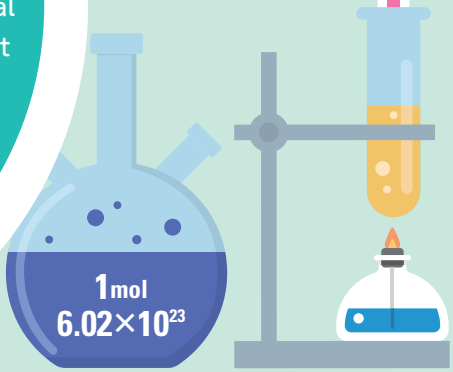

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