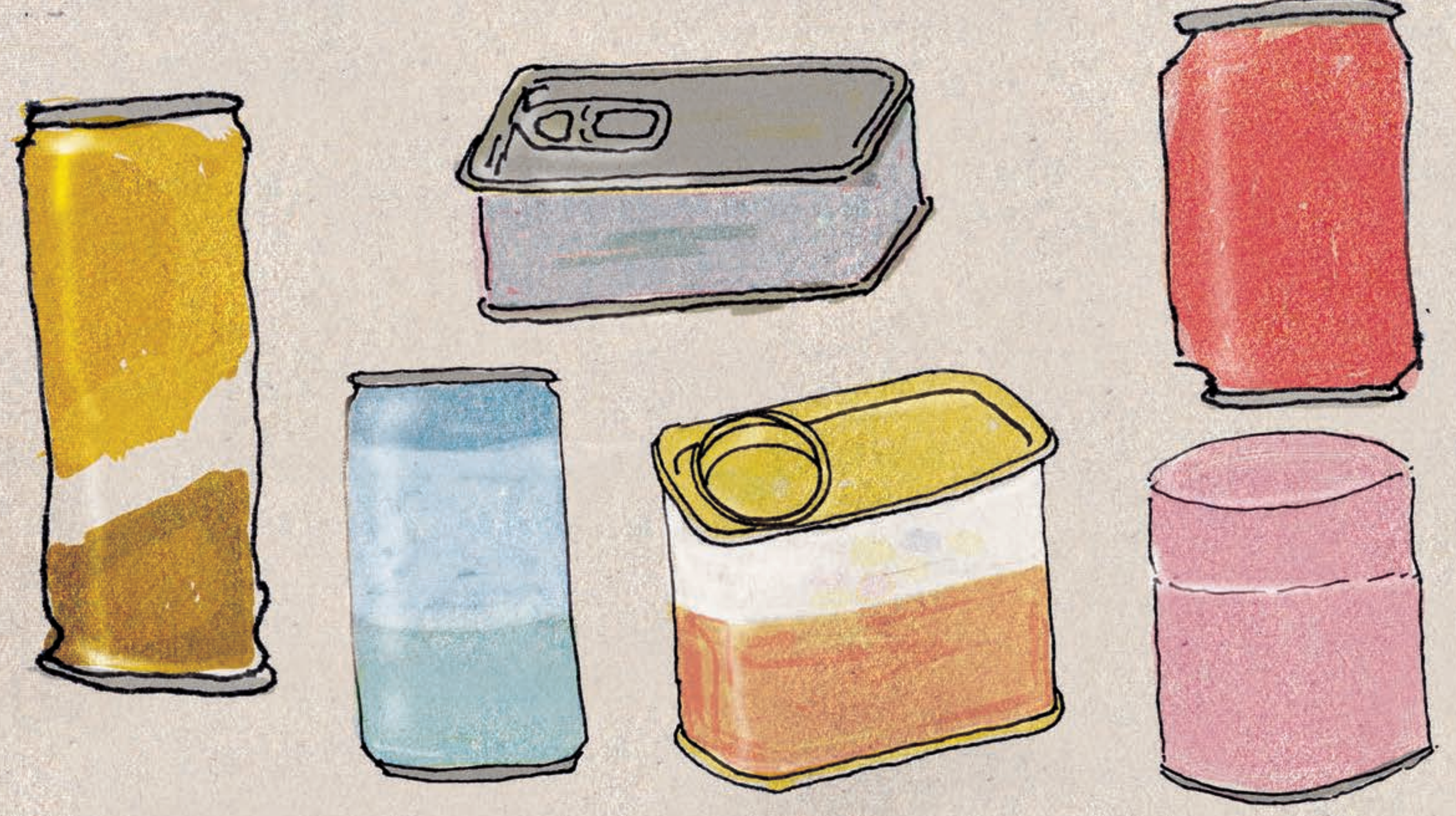
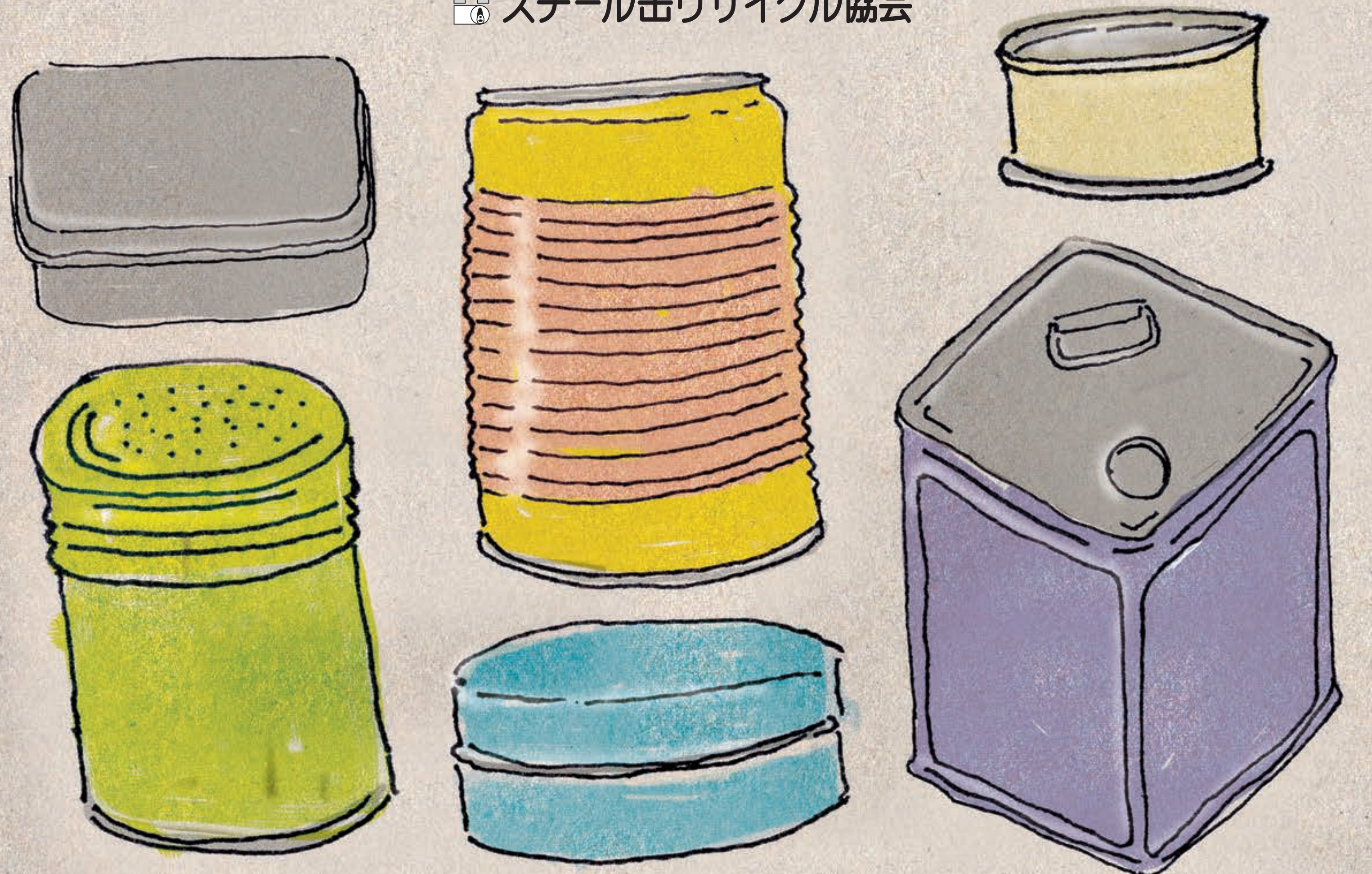


Annual Report on Steel Can Recycling 2017

JAPAN STEEL CAN RECYCLING ASSOCIATION
スチール缶リサイクル協会



Annual Report on Steel Can Recycling 2017

Acknowl-edgments

Japan Steel Can Recycling Association has conducted several activities mainly to promote steel can recycling as well as litter prevention, the environmental beautification, and public relations activities since the association established in 1973. The activities initially focused on promoting steel can recycling lead to establishment of comprehensive sorted collection system and even the recycle-based society. In FY2016, the recycling rate of steel cans reached 93.9%, which is the highest in the world.

In order to promote steel can recycling activities in Japan, "Steel Can Recycling Annual Report" summarizes the situation of steel can recycling in the municipalities, the trends of recipients of steel can scrap, market forces for steel can scrap, etc. This is the 22nd issue.

Our association will continue to promote our activities in order to establish recycle-based society and help much more people to improve their understanding of steel can recycling. We hope this report is useful for everyone.

October, 2017 Japan Steel Can Recycling Association

Ⅰ Present Conditions for Recycling Steel Cans

1 . What are Steel Cans? How Many Steel Cans are Produced?

- Steel cans are used for beverages such as juice and coffee (beverage cans), foods such as canned fish and orange (food cans), dried seaweed, Japanese tea and cookies (general-purpose cans), and foods and other products (18-liter cans).
- The production of beverage and food cans together amounted to 245,000 tons in 2016. This was for approximately 70% of all steel cans produced.
- In 2016, 6.8 billion beverage steel cans were produced in Japan and the per capita annual consumption was 54 cans.

Beverage and food cans together amounted to 245,000 tons

General-purpose cans 82 ,000 tons

18-liter cans 26,000 tons

The data were from the Iron and Steel Statistics of 2015 published by the Ministry of Economy, Trade and Industry, and the National Federation of 18 Liter Cans Manufacturers Corporative Union.

The number of total beverage and food steel cans

(Estimated values: The research conducted by Japan Steel Can Recycling Association)

(million cans)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beverage cans	12, 781	12, 596	12, 110	11, 831	11, 601	11, 198	10, 234	9, 577	7, 184	6, 814
Food cans	1, 114	1, 042	1, 007	993	893	898	858	886	872	850
Total	13, 895	13, 638	13, 117	12, 824	12, 494	12, 096	11, 092	10, 463	8, 056	7, 664

Marks of Steel Can

"Law for Promotion of the Utilization of Recyclable Resources" requires putting a mark on beverage cans to indicate their materials. And for general cans (i.e., cans for tea or confectioneries), the All Japan Federation of General Can Industries Association established a mark for their cans to indicate the can material. For 18 liter cans, The National Federation of 18 Liter Cans Manufacturers Corporative Union established a mark so that consumers can easily identify "steel cans" when sorting waste.

スチール

(Beverage Cans' Mark)

スチール

(General Cans' Mark)

スチール
使い切って リサイクル

(18 Liter Cans' Mark)

Components of Steel Can

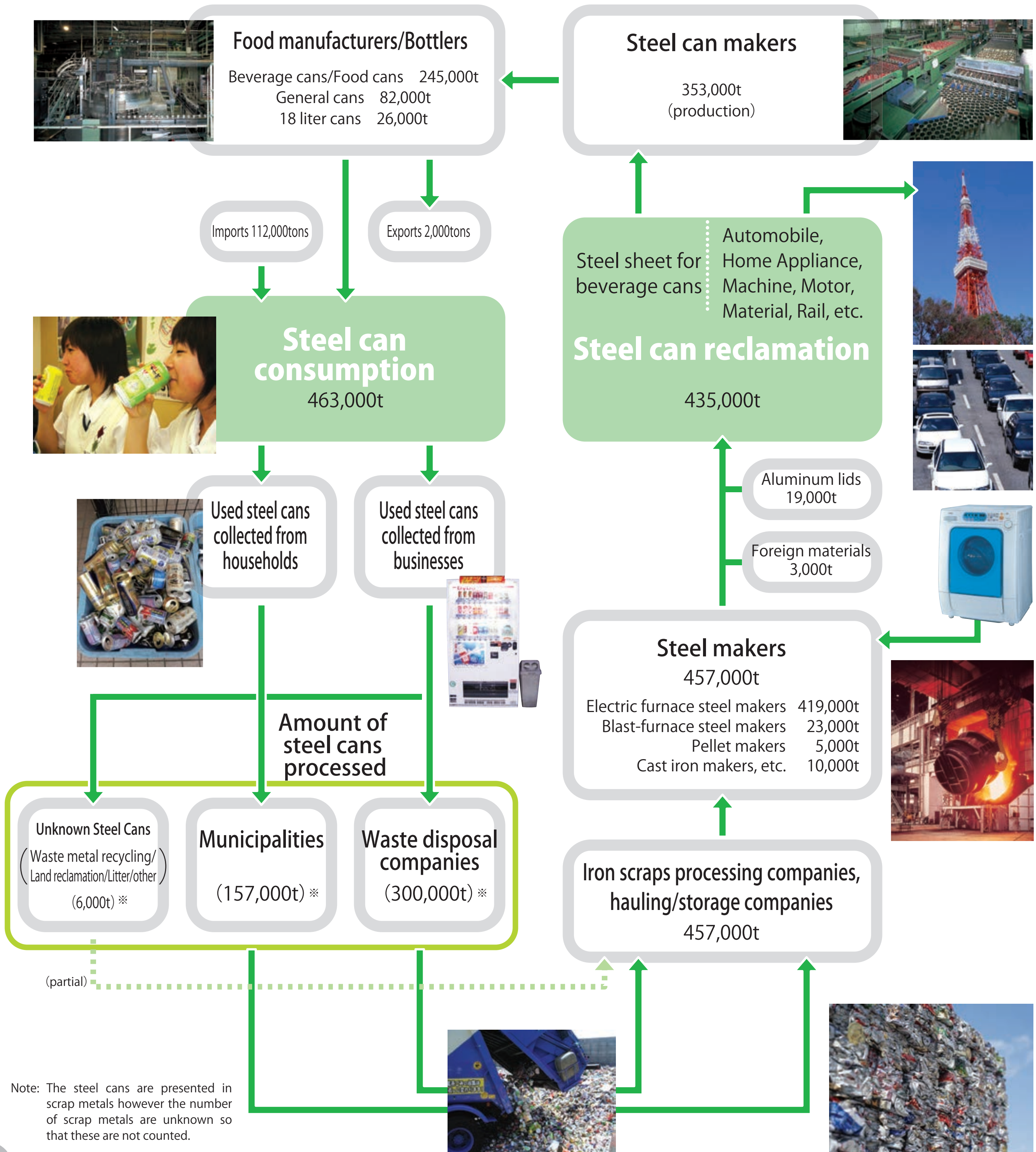
Steel sheets for beverage cans have high durability, workability, and intensity material.

Steel cans are recycled in various forms such as in the production of cars, rails, household electric appliances, reinforcing bars, and recycled steel cans.

Material ( ):reference number	Ratio of major and alloy components (%)	Major alloy components (%)
Steel sheets for beverage cans (SPTE T-4 CA)	Fe 99. 9 + Carbon 0. 02 to 0. 06	Aluminum 0. 005 Manganese 0. 03
Steel plates for cars (SPCE)	Fe 99. 99 + Carbon 0. 005 to 0. 01	Titanium 0. 0001
Steel plates for construction (SPCC)	Fe 99. 8 + Carbon 0. 1	Manganese 0. 5 max
Steel wire for construction (SWRM)	Fe 98 + Carbon 0. 1 to 0. 4	Manganese 0. 3 to 1. 5
H-type steel (SG415H)	Fe 98 + Carbon 0. 1 to 0. 4	Manganese 0. 4 to 1. 7 Chromium 0. 85 to 1. 25

2. What Routes are Used to Recycle Steel Cans?

- Used steel cans are collected using separate collection systems or noncombustible collection routes operated by municipalities as well as through business-operated recovery routes for collecting from automatic vending machines, offices and plants. In both cases, steel cans are separated by magnetic separators at recycling facilities and processed into pressed blocks state for easy transportation.
- This iron scrap is purchased by iron and steel makers (mostly electric furnace steel makers) from scrap processors. The steel cans are recycled in many ways such as raw material for producing steel materials for construction, and steel plates for automobiles, refrigerators, washing machines, and new steel cans, etc.



Note: The steel cans are presented in scrap metals however the number of scrap metals are unknown so that these are not counted.

※ ( )… estimated values

I Present Conditions for Recycling Steel Cans

3. How Much Steel Can is Recycled in Japan ?

The recycling rate for steel cans in FY2016 was 93.9%

The recycling rate in FY2016 achieved the target set by the Industrial Structure Council of the Ministry of Economy, Trade and Industry.

Factors of high recycling rate

① The world crude steel production in 2016 was 1,630,000,000 tons, lower than a record high of 1,670,000,000 tons. Furthermore, crude steel production in Japan has surpassed 105,000,000 tons per year, and the demand for it is high. The scrap steel cans are high quality and useful so it is increasingly highly regarded.

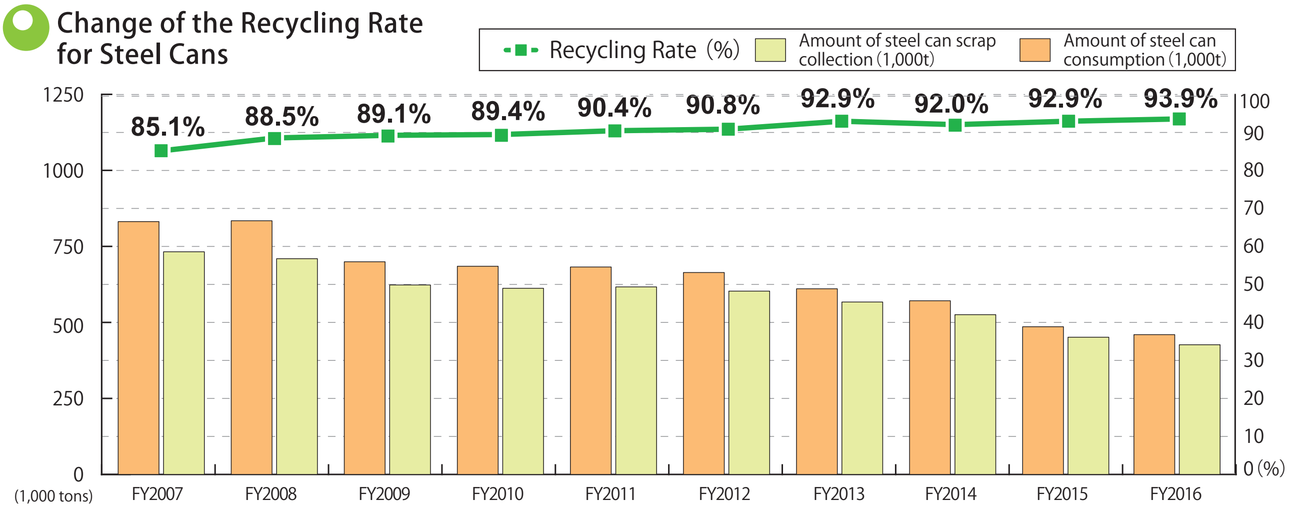
② The quality of raw materials in steel can scraps has improved year by year, since separate collection has well promoted through citizens' cooperation, separate collection system from municipalities as well as business activities has been fully equipped, and the accuracy of separation and processing at the recycling facilities and scrap processers have improved.

③ Since FY2008, we have known parts of the amounts which were shredded because a part of the can scraps shredded were distributed as standard except the can scraps.

Steel Can Recycling Rate of FY2016

$$\frac{\text{Amount of steel can recycling } 434,977 \text{ tons}}{\text{Amount of steel can consumption } 463,076 \text{ tons}} = 93.9\ \%$$

Change of the Recycling Rate for Steel Cans



The Recycling Rate by Items

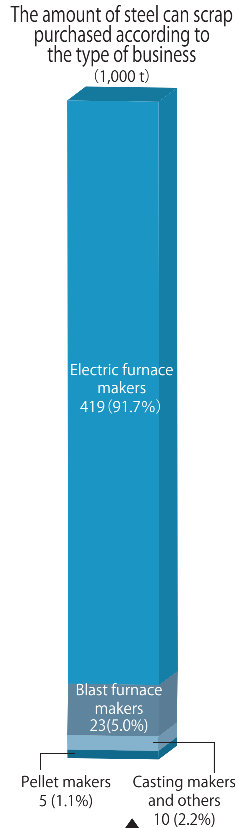
Items	Recycling rate (%)	Index	Method of calculation (Note)
Steel cans	93.9 (FY2016)	Recycling rate	Amount of steel can recycling / Amount of steel can consumption (Steel cans=Beverage cans+Food cans+General cans+Some 18-liter cans)
Glass bottles	68.4 (FY2015)	Recycling rate (cullet utilization ratio)	Amount of re-merchandising / Amount of domestic glass bottles consumption
PET bottles	86.9 (FY2015)	Recycling rate	Amount of PET bottles recycled in domestic and overseas / Amount of designated PET bottles sold
Paper containers/ packaging	25.0 (FY2015)	Collection rate	Amount of collection / Amount of discharge by households
Plastic containers	45.3 (FY2015)	Recovery rate	Amount of re-merchandising + Amount of self-collected / Prospective amounts of discharge
Aluminum cans	92.4 (FY2016)	Recycling rate	Amount of recycling of aluminum cans in domestic and overseas / Amount of sales of aluminum cans
Cartons	43.1 (FY2015)	Collection rate	Amount of domestic collection / Amount of cartons used (Included loss paper and old paper)
Cardboard	97.2 (FY2015)	Collection rate	Amount of actual domestic collection / Amount of consumption of cardboard + Balance of amount of cardboard accompanied with exported good sand those with imported goods

1. Types and Amount of Steel Can Scraps

Steel Can Scrap Purchase Amount According to Area and Type of Business

(Unit:1,000 tons)

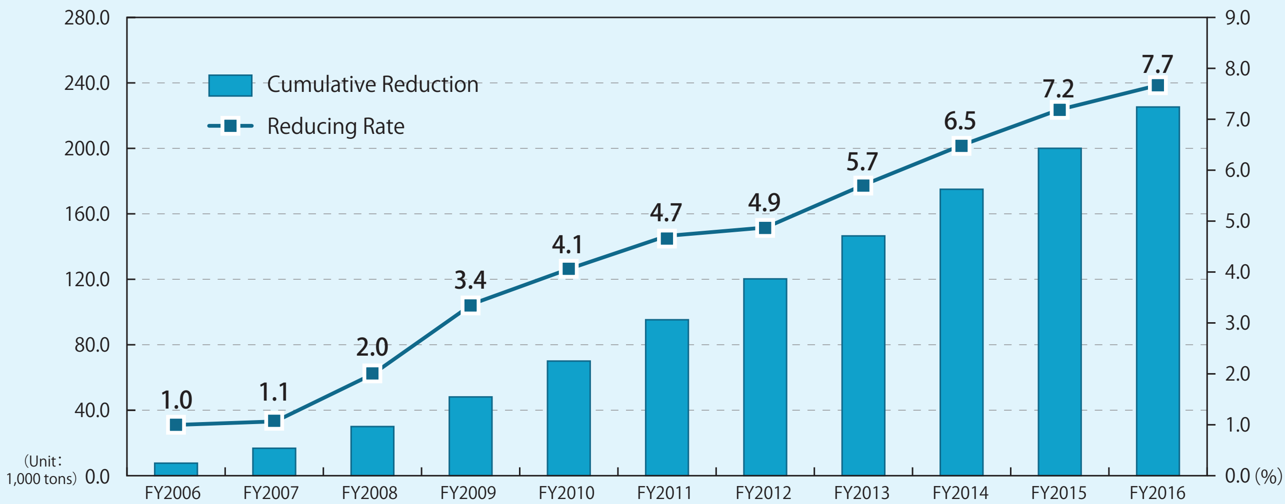
	FY2015(B)				FY2016(A)				
	Press	Shredder	Total	%	Press	Shredder	Total	%	(A-B)
Hokkaido	15	1	16	3.4	15	1	16	3.5	0
Tohoku	34	2	36	7.6	35	2	37	8.1	1
Kanto	110	36	146	30.8	114	34	148	32.4	2
Hokuriku	2	8	10	2.1	2	8	10	2.2	0
Tokai	48	16	64	13.5	40	17	57	12.5	−7
Kinki	127	11	138	29.1	110	8	118	25.9	−20
Chugoku/ Shikoku	14	5	19	4.0	22	3	25	5.5	6
Kyushu/ Okinawa	38	8	46	9.7	33	13	46	10.1	0
Total	388	86	474	100.0	371	86	457	100.0	−17
Electric furnace makers	335	76	411	86.7	341	78	419	91.7	8
Blast furnace makers	47	0	47	9.9	23	0	23	5.0	−24
Casting makers and others	3	8	11	2.3	4	6	10	2.2	−1
Pellet makers	3	2	5	1.1	3	2	5	1.1	0
Total	388	86	474	100.0	371	86	457	100.0	−17



COLUMN 1

Concerning the Reducing of Steel Cans

In the "Committee to Reduce the Weight of Steel Cans" launched by the can manufacturing industry in June 2006, we formulated our voluntary action plans and worked on technology development as an industry. The target in the 2nd Voluntary Action Plan "Reduction of weight by 5% on average per can in 2015 fiscal year with the 2004 fiscal year as the base year" was achieved with a reduction of 7.2%. In the 3rd voluntary action plan, we aim to achieve "a weight saving of 8% on average weight per can in 2020 fiscal year as compared with 2004 fiscal year". In 2016 fiscal year, the weight has been reduced to 7.7%.



Written by: Japan Steel Can Recycling Association

Uniform Standards of Ferrous Scraps

"Uniform Standards" us the criteria used for a distribution of iron scraps, and set up according to types and grades etc. The standard listed below is using as a national standard. Iron scraps which meet the requirement mean they are a product, however, some manufacturers use their own standard since a production capacity and goods vary at each work.

Classification	Category	Grade	Dimensions (mm) Thickness	Dimensions (mm) Width or Height × Length	Unit Weight (kg)	Remarks
Carbon Steel Scrap	Heavy	Being sized by guillotine shear, gas cutting, heavy construction machines, or others, to be divided, according to thickness, size, and unit weight, into the following:				
		HS	6≦	≦500 × ≦700	≦600	
		H1	6≦	≦500 × ≦1200	≦1000	
		H2	3≦t<6	≦500 × ≦1200	≦1000	
		H3	1≦t<3	≦500 × ≦1200	≦1000	
		H4	<1	≦500 × ≦1200	≦1000	
	Press	The basic material being chiefly steel-sheet-fabricated products and being compression-formed and rectangular parallelepiped by a press machine, to be divided, according to basic materials, into the following:				
		A	W+H+L≦1800, with the max dimension ≦800			Automobiles (mainly from End of Life Vehicles)
		B	W+H+L≦1800, with the max dimension ≦800			Except for Press A and C
		C	600≦W+H+L≦1800			Cans for food/drink
	Shredded	The basic material being chiefly steel-sheet-fabricated products and being crushed by shredder and then sorted by magnetic classifier, to be divided, according to basic materials, into the following:				
		A				Automobiles (mainly from End of Life Vehicles)
		B				Except for Shredded A
	New Scrap (Shindachi)	Consisting of cutting and blanking chips produced during the manufacture of steel-sheet-fabricated products, to be divided, according to shape and degree of oxidation, into the following:				
		Shredded				Shredded
		Press A	W+H+L≦1800, with the max dimension ≦800			Hot or cold Sheet with no rust excluding coated sheet
		Press B	W+H+L≦1800, with the max dimension ≦800			Hot or cold Sheet with some rust, incl Coated sheet without harm for steel making
		Busheling A	W or H ≦ 500 × L≦ 1200			Hot or cold Sheet with no rust excluding coated sheet
		Busheling B	W or H ≦ 500 × L≦ 1200			Hot or cold Sheet with some rust, incl Coated sheet without harm for steel making
	Turning	Consisting of cutting chips, produced during the manufacture of screws, machine parts, and the like, to be divided, according to shape and degree of oxidation, into the following:				
		A				Turning of mild steel with no rust, in fine forms
		B				Turning of mild steel with some rust, in various forms
		Press	W+H+L≦1800, with the max dimension ≦800			Press of Turning of mild steel with no rust, in fine forms
Pig Iron Scrap	Cast Iron	Consisting of used castings finely crushed into blocks, to be divided, according to basic materials, into the following:				
		A			≦1000	Machinery parts, Clean Auto Blocks etc.
		B			≦1000	Charging box cast, unstripped auto blocks
	Iron Boring	Consisting of cutting chips produced during the production of castings, to be divided, according to the degree of oxidation, into the following:				
		A				Iron boring of mild casting with no rust
		B				Iron boring of mild casting with some rust

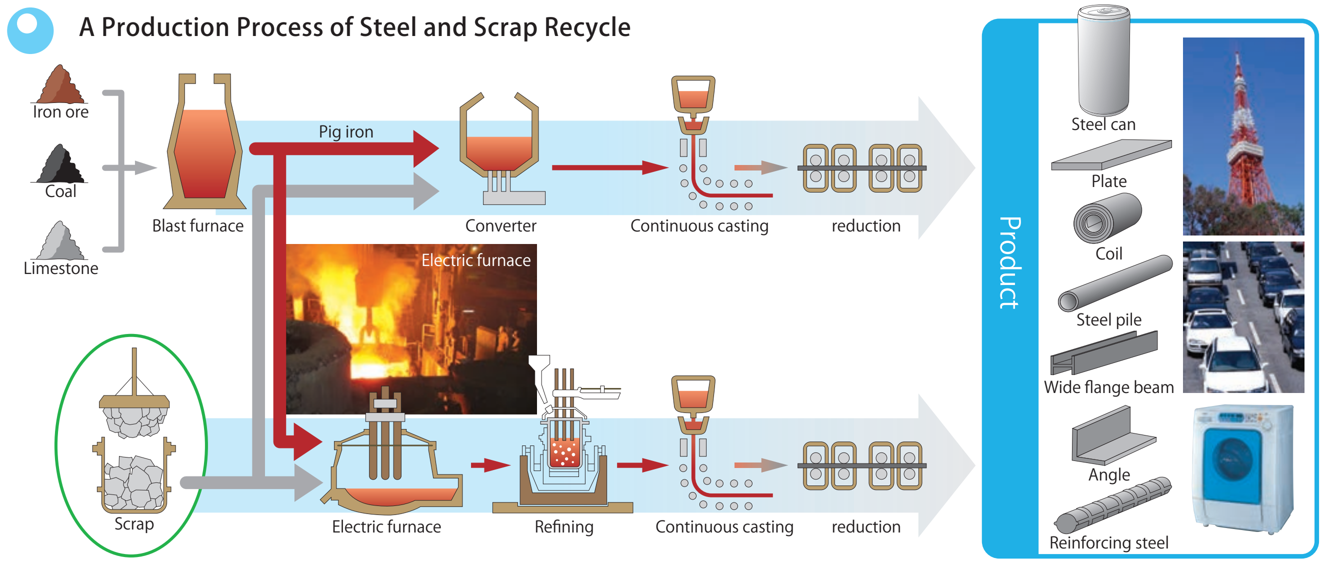
Japan Ferrous Raw Materials Association. Revised Jun 2008

2. How is Scrap Iron Recycled?

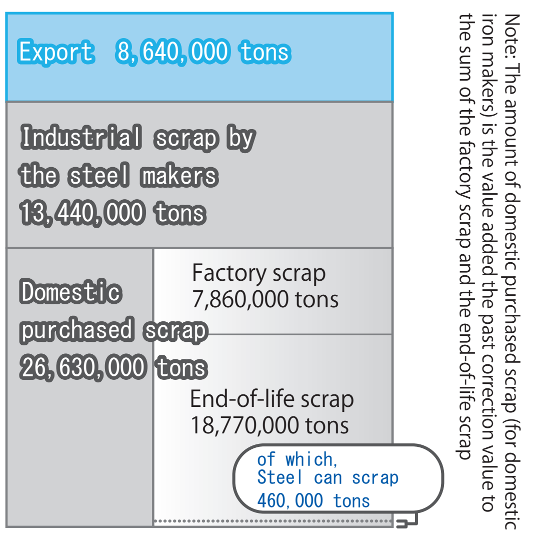
- The annual production of iron in Japan is approximately 105,170,000 tons in FY2016. Blast furnace and electric furnace methods are available to manufacture iron and steel. In Japan, 77.3% of Iron and steel is manufactured by blast furnaces and 22.7% by electric furnaces.
- Iron that remains from use in construction, automobiles, machines, can containers, etc. are recycled at iron and steel manufacturers (blast furnaces, electric furnaces, casting makers, etc.) as iron scrap.
- Iron scrap that is traded in the Japanese market (commercial scrap) amounts to 26,920,000 tons (increasing 1,290,000 tons from the previous year). And 8,640,000 tons were exported in FY2016 (increasing 570,000 tons from the previous year).

	Production Method	Number of makers and plants
Electric furnace maker	Iron scrap is melted in electric furnaces (by discharge heat from electrodes) to manufacture steel.	47 makers with 64 works
Blast furnace maker	Iron scrap is inserted when pig iron reduced from iron ore in a blast furnace is supplied to a converter to manufacture steel.	4 makers with 19 works

A Production Process of Steel and Scrap Recycle



Domestic Iron Scrap Supply and Demand (FY 2016)



(Unit: tons/year) Source: The Japan Ferrous Raw Materials Association

Technical Terms

【Electric furnace】
A heating chamber with a discharge heat to melt scrap iron

【Blast furnace】
A furnace used to produce pig iron from iron ore, coal and limestone

【Converter】
A furnace used to produce steel from melting pig iron and blowing oxygen into it. It is able to rotate 360 degree.

【Steel】
An iron contains less than 2% of carbon

【Pig iron】
An iron contains more than 2% of carbon

【Industrial scrap】
Scrap generated in rolling process, and consumed inside of factories

【Purchased scrap】
Scrap transacted in the scrap market

【Factory scrap】
Scrap generated in processes using steel as a material (e.g. cars, machines and shipbuilding)

【End-of-life scrap】
Scrap from dismantled buildings, disused cars, disused domestic electric equipments, and steel can scrap.

Information on Steel Works in Japan

The questionnaire results for annual report on steel can recycling 2016 show many of municipalities made a request about for information on recycling facilities that have tour inside.
The Japan Iron and Steel Federation provides excursion across the country. If you want to access, detail is given below.

Information on Steel Works in Japan

Web Site Information http://www.jisf.or.jp/kids/iku/map.html

3 . Trends in Price of Domestic Steel Can Scraps

Factors Determining the Price of Iron Scrap

① The quality of scraps
② Changes in the supply-demand balance in each region
③ Comparative values internationally (e.g., overseas market conditions resulting from the international availability of commodities, etc.)
④ Costs of scrap collection from the market, scrap collection by scrap processors, and scrap-processing.
⑤ Costs of material price variance (iron ore and others), and an iron dissolution by blast furnace makers.

Relation between the Price of Steel Scrap and the Price of H2 (Heavy and Other General Scrap)

The price of steel can scrap moves almost in parallel with that of H2 (see the next page).The difference in price between the scrap steel cans (C press) and H2 is anywhere from 2,000 yen to 9,000 yen depending on supply and demand, overseas market trends, and its region.C press with good quality could sell at higher price than H2.

The Sale Price of Pressed Steel from Cans vs. the Base Price of Steel Can Scrap in Municipalities

The pressed steel from cans separated and processed in municipalities is delivered to steel makers via scrap processors, hauling/storage companies, and others. Thus, the sale price for the steel press in the municipalities is equivalent to the scrap purchase price by the steel manufacturers minus the amount spent on delivery via the intermediate routes.

Trend in Price of Iron Scrap (2016～2017)

Demand for iron scrap is strong due to worldwide increase in crude steel production and the market is also on the rise (2016～2017)

World crude steel production continues to expand. According to the World Steel Association survey, the crude steel production in 67 countries in the first cumulative period of this year was 4.6% higher than the same period of the previous year, which was about 980 million tons. The annualized conversion is about 1.68 billion tons, which is forecast to be the highest crude steel output ever. As the world economy shows a moderate recovery trend, demand for steel is also growing, and developed and emerging countries are in the process of increasing steel production. As a result, demand for iron scrap was solid, and the market has been on the rise. In August, the purchase price of H2 (special grade) steelmakers in Japan has recovered to 30,000 yen per ton for the first time since October 2014. Iron ore and coking coal, which are the same raw materials for steel, are also on the rise. Particularly in Asia, in addition to China, the world's largest producer, Southeast Asia and South Asian countries are continuing to build new steel production facilities in anticipation of future economic growth and increasing demand for iron and steel, including iron scrap demand for raw materials, is expected to show a steady trend.

Price Trend of Pressed Steel from Cans (2016～2017)

Steel can press price is also on the rise, hitting a 3-year high (2016～2017)

As the iron scrap price continues to increase, the steel can scrap price has also risen sharply. The average price of the steel can press in the Kanto area (purchase price of the electric furnace maker) in August is expected to exceed 25,000 yen per ton. Like H2 (special grade), this is a 3-year high. It has increased about 80% from August last year and 20 % from January this year. In addition, the electric furnace makers that use steel can scraps as a raw material see steel can scraps as high in quality with stable quality and clear ingredients. It is increasing its presence as a stable source of raw material. Among the domestic electric furnace makers, some are setting a price that exceeds the H2 (special grade), the representative product of iron scrap. For this reason, high-quality steel can press continues to trade at high prices.

(¥/t)

	Average in 2007	Average in 2008	Average in 2009	Average in 2010	Average in 2011	Average in 2012	Average in 2013	Average in 2014	Average in 2015	Average in 2016	Average in 2017 (Jan-Aug)
Kanto region	27, 800	36, 000	15, 100	23, 700	25, 900	19, 400	26, 200	25, 600	16, 200	14, 500	21, 500
Osaka region	32, 700	41, 100	18, 600	27, 700	31, 100	23, 400	29, 000	27, 300	16, 700	15, 100	21, 300
Representative factory in West Japan	35, 400	42, 900	20, 400	29, 900	32, 100	25, 100	31, 600	30, 200	19, 100	18, 100	24, 600

For more information about the price trend of pressed steel from cans

Nikkan Shikyo Tsushinsha Co., Ltd. publishes "MRM (Metal Recycle Monthly)" that carries international and domestic scrap market trends, topics, hot issues, and explanation of recycling laws. **TEL: +81-3-3864-6021**

Trend of Iron Scrap Price ~Iron scrap price at 3-year high, what is the cause? ~

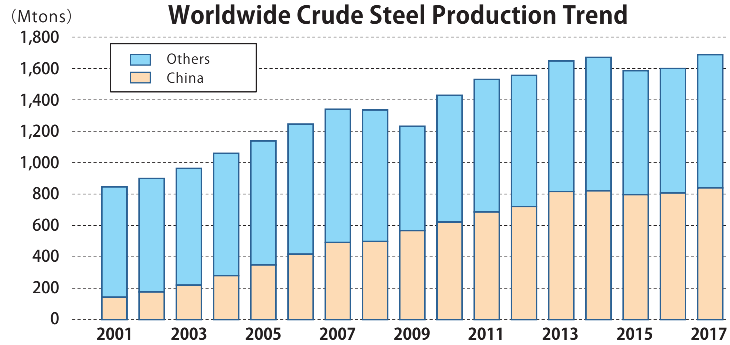
Prices of iron scrap continued to rise, and the prices are at a 3-year high as of late August. H2, the representative variety, is around 30,000 yen per ton (Kanto district), and steel can press is around 25,000 yen per ton (Kanto district). The trends are not isolated to Japan. The biggest factor is the increase in demands for raw materials due to the increase in crude steel production worldwide. Production is growing not only in emerging countries importing iron scrap as a raw material but also in developed countries that supply iron scrap. Crude steel is being produced at the highest pace ever worldwide this year. This has led to a rise in prices of raw materials for steel including iron scrap.

■ Increased iron and steel production in both developed and developing countries, increase demand for iron scrap

① Increase in steel demand due to economic recovery in Europe, the US and Japan.
② Anticipation for China's economic stimulus, production increase due to elimination of low quality steel materials.
③ Expansion of steel manufacturing facilities in South East and South Asia.
④ Problems of “over production” of steel, and “protectionism”

1 Recovery of Crude Steel Production in Developed Countries

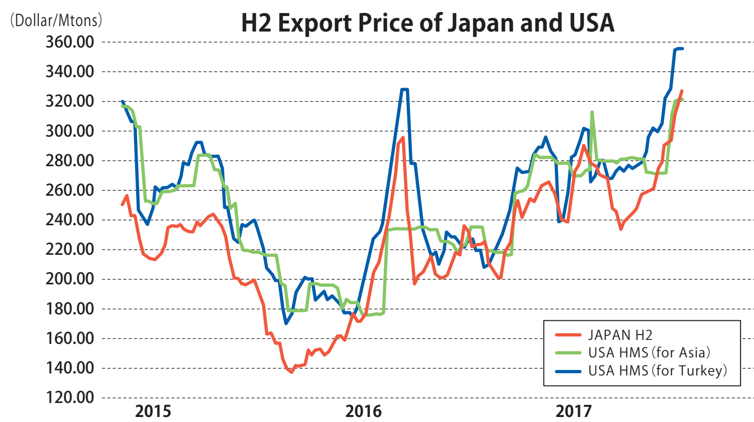
In developed countries, such as Europe, the US and Japan, the economy is gradually recovering, and both the demand and production of steel are growing. Crude steel production in the EU from January to July this year increased by 3.9% from the same period of the previous year, and a 2.1% increase in the US. Japan fell by 0.2% due to problems with blast furnace makers, but electric furnace steel production, which mainly uses iron scrap, showed a high growth rate of 8.7%. This increase in demand became a factor in the rise of the iron scrap price. Furthermore, these developed countries are a source of iron scrap to the world. If exports decline as a result of recovery in domestic demand, it will tighten global supply and demand, which will further raise prices.



Year2017, January - July are used annual rate (estimated).

2 China, Highest Production Level Ever

China, the world's largest steel producing country, has continued to produce at an all-time high level. Monthly production of crude steel surpassed the all-time high mark in March, April, June, and July this year. Strong expectations for domestic demand increased due to the economic measures of the government, and the prices of steel and iron scrap has been rising. Demand for iron scrap decreased due to the elimination of steel equipment that produces low-quality steel products outside the standard called "ditiaogang" this year, and the market worldwide plummeted temporarily in the April - May period. However, demand of standard steel product grew, and other steel manufacturers increased production, resulting in the recovery of the iron scrap demand and price.



Some part applies estimated figure.

3 New Expansion of Steel Production Facilities in Emerging Countries, Indian Production Set to Outpace that of Japan

Construction of iron and steel production facilities in the emerging countries is pushing up the demand for raw materials such as iron scrap. For example, in Asia, crude steel production in India is growing, and it has grown to the third largest in the world after China and Japan at the present time. Pakistan, Bangladesh, Vietnam, and others are also proceeding with the expansion of new production facilities, which has resulted in increased production. Also, Turkey, the world's largest iron scrap importer, is increasing production by double-digit compared to the previous year. These countries have little accumulation of iron, and they are running short of steel scrap. For this reason, import of iron scrap is a necessity, and they are strongly inquiring exporters. These factors also contributed to the increase in iron scrap price. Also, the price of steel ore, coking coal, auxiliary materials and other raw materials for steel are rising. After the sharp fall due to the turmoil caused by the abolition of "ditiaogang" in China, iron scrap prices recovered 30 to 40 percent by end of August, reaching a 3-year high. Iron ore and coking coal also recovered 50 to 60% from the lows in mid-June.

4 Problems Such as "Excessive Production" and "Protectionism" Remain, Sense of Caution in the Overheating Market

However, the worlds' steel industry still has problems of "excessive production equipment" and "excessive production". Surplus of steel materials lead to an increase in exports, and is causing “trade friction” in various parts of the world. Movements such as anti-dumping complaints and issuance of safeguards are taking place to protect the domestic steel industry. On the other hand, emerging and developing countries are trying to grow the domestic steel industry and are proceeding with new expansion of production facilities. The speculations of each country are intertwined. In the multilateral framework "Global Forum" to discuss such issues, concrete measures are being considered and the results are expected. In China where increased production continues, it is said that steel markets and raw material markets are "overheating" and measures to curb overheating of steel and coking coal futures markets are being taken. Both strong and weak factors including the issues discussed above are progressing concurrently, thus iron scrap prices may swing wildly.

Ⅲ The Method of Sorted Collection of Steel Cans

1. How Many Municipalities Sort Out Steel Cans?

The Implementation of "the Questionnaires on the Recycling of Steel Cans" in FY2016

We carried out a questionnaire survey annually to figure out the present condition of sorted collection practices by municipalities, such as collection methods and conditions of recycling facilities focusing on the recycling of steel cans.

Subjected research period：From April 2016 to March 2017
Research period：From June to July 2017
Research subject：The cities all over Japan and the 23 wards in Tokyo (813 Wards and cities)
The number of returned questionnaires：759 Wards/ Cities
The return rate：93.4%
The population coverage rate：88.1%

Note: Total population (estimated) is 126,933,000 as of October 1st, 2016 (data from the Statistics Bureau).

People sorted out recyclables as "Cans"

The Rate of Municipalities Practicing Sorted Collection

The trend has not changed since 2008. Most municipalities are practicing sorted waste.

	FY2008		FY2012		FY2016	
	# of wards and cities	rate (%)	# of wards and cities	rate (%)	# of wards and cities	rate (%)
Total	806	—	808	—	813	—
The number of returned questionnaires(The return rate)	735	91. 2	736	87. 8	759	93. 4
Practiced throughout the Municipal District	726	98. 8	724	98. 4	751	98. 9
Practiced in parts of the Municipal District	7	1. 0	10	1. 4	5	0. 7
Not practiced	2	0. 3	2	0. 3	3	0. 4

The Rate of Municipalities Collecting Resource Waste by Items (included collection in model regions)

Steel cans for beverages, aluminum cans, bottles, and PET bottles have been designated to be collected separately at more than 90% of the municipalities from FY2008. The number of the municipalities collect steel cans separately from paper container or spray cans.

	FY2008		FY2012		FY2016	
	# of wards and cities	rate (%)	# of wards and cities	rate (%)	# of wards and cities	rate (%)
Steel cans	704	96. 0	705	96. 0	733	97. 0
Aluminum cans	707	96. 5	707	96. 3	732	96. 8
Glass bottles	722	98. 5	723	98. 5	743	98. 3
PET bottles	693	94. 5	704	95. 9	723	95. 6
Cartons	544	74. 2	572	77. 9	602	79. 6
Cardboard	605	82. 5	624	85. 0	646	85. 4
Paper container Note1	268	36. 6	320	43. 6	402	53. 2
Plastic container Note1	444	60. 6	473	64. 4	495	65. 5
Metals	293	40. 0	312	42. 5	343	45. 4
Waste paper	603	82. 3	619	84. 3	641	84. 8
Fabric	366	49. 9	397	54. 1	427	56. 5
Spray cans	–	–	–	–	413	54. 6
Small household appliances	–	–	–	–	282	37. 3
Others Note2	302	41. 2	340	46. 3	315	41. 7
Total	733	100. 0	734	100. 0	756	100. 0

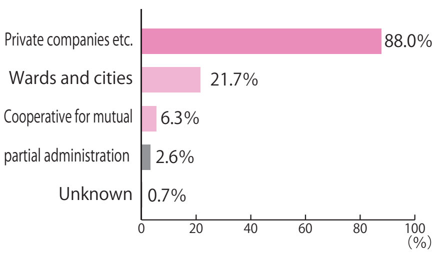
Note1: includes cases of collecting at a certain model area.
Note2: [Others] represents food trays, used cooking oil, kitchen waste, pruned branches, used batteries, fluorescents, etc.

2. How Do Municipalities Collect Steel Cans?

Agencies of Collecting Steel Cans (multiple answers)

To be an effective collecting cost, only 21.7% of municipalities collect by own and most of them (88.0%) does contract collection.

FY2016 (n=733)



Items Discharging together with Steel Cans (multiple answers)

More than 80% of municipalities collect steels cans with beverage aluminum cans, and food cans. The number of municipalities where discharge spray cans together with steel cans are decreasing since 2008.

	FY2008		FY2012		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Only beverage steel cans	–	–	12	1. 7	7	1. 0
Beverage aluminum cans	–	–	605	85. 8	631	86. 1
Food steel cans	639	90. 8	618	87. 7	665	90. 7
General cans	628	89. 2	598	84. 8	626	85. 4
Spray cans	395	56. 1	286	40. 6	285	38. 9
18 litter cans	185	26. 3	112	15. 9	108	14. 7
Glass bottles	–	–	149	21. 2	153	20. 9
Metals	–	–	92	13. 0	89	12. 1
Pet bottles	–	–	45	6. 4	46	6. 3
Others	–	–	41	5. 8	59	8. 0
Total	704	100. 0	705	100. 0	733	100. 0

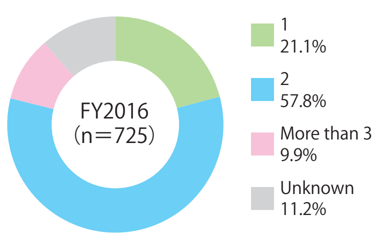
Recycling Route of Steel Cans (multiple answers)

98.9% of the municipalities collect steel cans. Other than municipalities collection rout, there are 51.7% of group collection, 19.0% of site collection, and 1.4% of store collection for the steel cans.

	FY2016	
	# of wards and cities	rate(%)
Sorted collection	725	98. 9
Collection from noncombustible waste	86	11. 7
Collection from combustible waste	8	1. 1
Group collection	379	51. 7
Site collection	139	19. 0
Store collection	10	1. 4
Total	733	100. 0

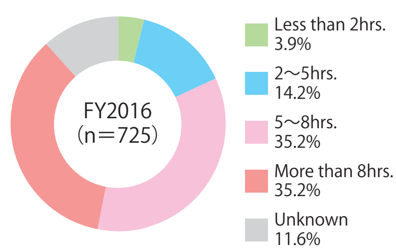
Number of Operation Staff per a Collection Truck per Day

More than half of municipalities collect steel cans by 2 staffs including a driver.



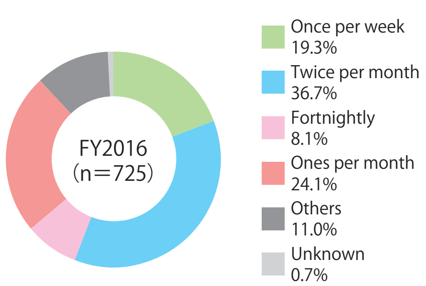
Hours for Collection per Day

Nevertheless, it depends on collecting items and population, most of municipalities take more than 5 hours to collect steel cans.



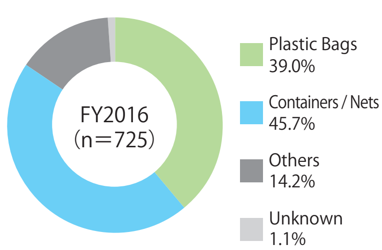
Frequency of steel cans collection

Most of municipalities collect steel cans twice per month.



Types of Rubbish Bin

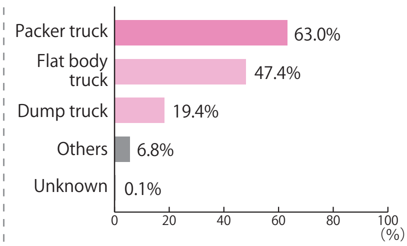
Normally the wastes are disposed by plastic bags, bulk containers or nets.



Types of Collection Trucks (multiple answers)

63.0% of municipalities use packer trucks and 47.4% use flat body trucks.

FY2016 (n=725)



3. How Are Steel Cans Recycled?

Recycling Facilities of Cans

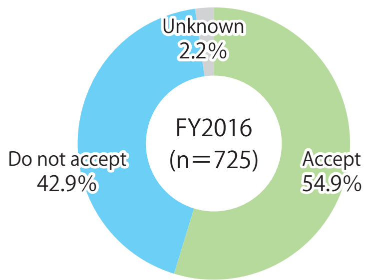
More than 40% of municipalities hold own intermediate process facilities. The number of third sectors facilities are decreased dramatically.

	FY2008		FY2012		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Wards and cities	288	45. 7	299	42. 5	292	40. 4
Cooperative for mutual partial administration	135	21. 4	143	20. 3	144	19. 9
Private companies etc.	207	32. 9	219	31. 1	236	32. 7
Third sectors	44	7. 0	5	0. 7	5	0. 7
Others	–	–	38	5. 4	45	6. 2
Total	630	100. 0	704	100. 0	722	100. 0

Note:FY2016 and FY2012 are single answer, FY2008 is multiple answer.

Whether the Facilities Accept Used Steel Cans from the Businesses

54.9% of facilities accept used steel cans from the businesses.



Selection Process and Forms after Selection of Cans

Before selection process and forms of steel cans, 29.0% for magnetic and hand separation, 24.7% for magnetic separation only, 16.0% for magnetic and machine separation, and 12.8% for magnetic and both machine and hand separation. More than 80% of municipalities use magnetic separation before selection process and forms of steel cans. Some municipalities directly sell it without separation.

	FY2016	
	# of wards and cities	rate(%)
Magnetic & hand separation	210	29. 0
Magnetic separation only	179	24. 7
Magnetic & machine separation	116	16. 0
Magnetic & machine separation (except cans) & hand separation (except cans)	93	12. 8
Hand separation only	26	3. 6
No separation	35	4. 8
Others	31	4. 3
Unknown	35	4. 8
Total	725	100. 0

About 80% of steel cans are pressed. 4.3% of municipalities do not separate the steel cans which goes directly to recyclers.

	FY2016	
	# of wards and cities	rate(%)
Press (Block-shape)	610	84. 1
Round cans etc.	25	3. 4
Shredder	24	3. 3
Press (individual cans)	3	0. 4
No processing	31	4. 3
Others	27	3. 7
Unknown	5	0. 7
Total	725	100. 0

Recommended Selection and Processing Forms of Steel Cans

Conformity to the segregation standard specified in the Containers and Packaging Recycling Law is the most necessary to smoothly recycle steel cans as resources.

Recommended Selection and Processing Forms of Steel Cans

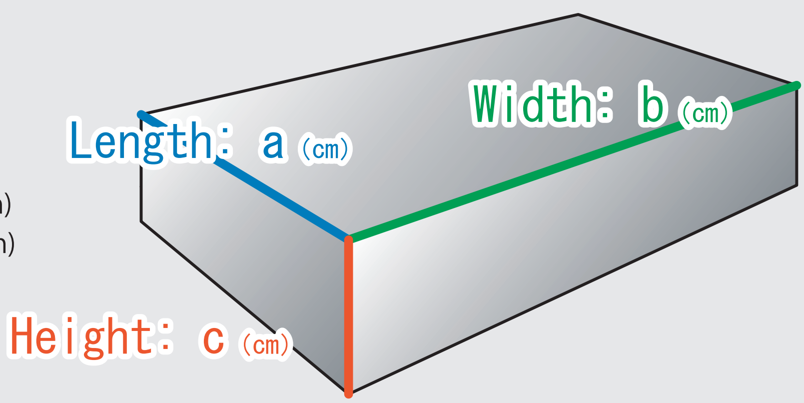
Source: The Japan ferrous raw materials association, "Uniform Standards of Ferrous Scraps"

[Size]

- Maximum Length ≦ 80(cm)
- 60(cm) ≦ a+b+c ≦ 180(cm)

[Bulk specific gravity]

- More than 0.6t/m^3



It is regulated not to contain foreign materials by legislation however, it still has identified lots of foreign materials. Please take a caution.

4. How Much Steel Can is Collected by Municipalities?

■The Total Recycling Quantity of Steel Cans in Japan is Estimated about 140,000 tons

The recycling quantity of steel cans for the 697 wards and cities that answered the questionnaire was 118,738 tons based on the record in FY2016. It translates into the recycling of a total of 140,490 tons nationwide.

■The Amount of Steel Can Recycled per Capita is 1.10kg Annually Based on the Record in FY2016.

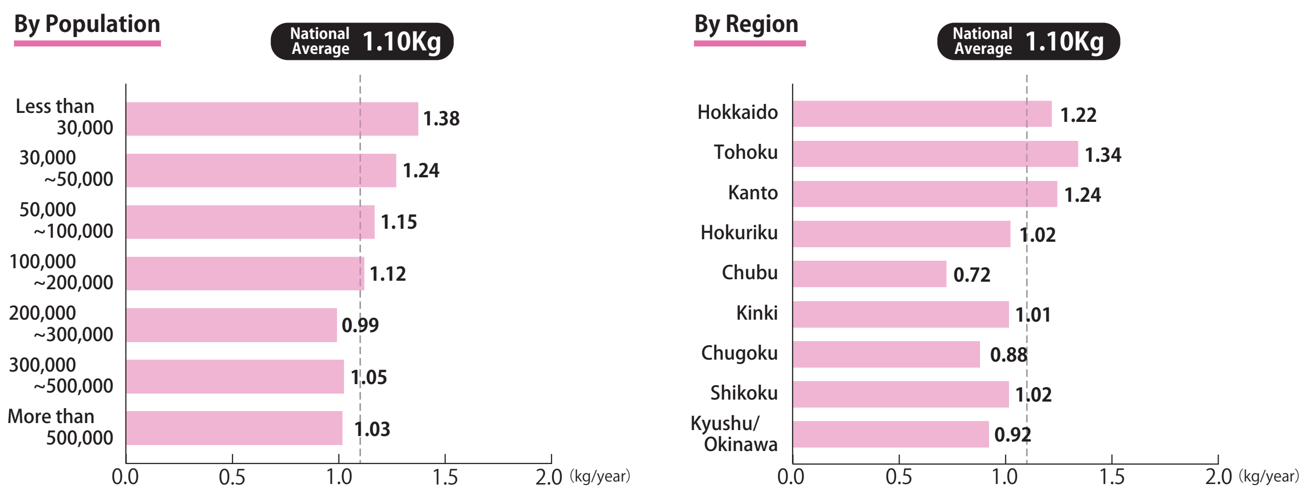
The average quantity of recycling is 1.10kg which decreases 0.09kg compare to last year. The highest recycling ratio is shown under the population of 30,000. Also, the amount recycled in East and North Japan regions is large than other regions.

Recycling Quantity of Steel Cans per Capita
(estimated based on the record in FY2016)

(Unit: t/yr)

	# of wards and cities	Recycling quantity of steel cans per capita
Press	583	98, 049
Round cans etc.	24	1, 890
Shredder	23	3, 409
Delivery to recycling manufactures	29	3, 834
Pressing individual cans	3	267
Others	20	6, 129
Unknown	15	5, 160
Total	697	118, 738

Recycling Quantity of Steel Cans per Capita (estimates based on the record in FY2016)



COLUMN 2

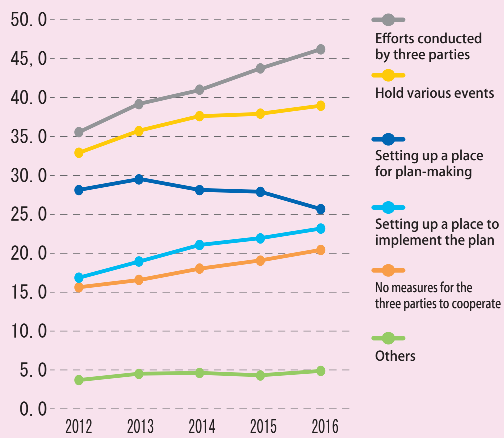
Triple Collaboration Among Municipalities, Citizens, and the Businesses in the Field of Environment.

Recycling administration or not, the word "Tripartite Collaboration" is often heard recently. This is the questionnaire about how many collaborative measures are implemented at the municipality level.

●Tripartite Collaboration Measures (multiple answers)

There are many municipalities implementing policies through cooperation among the three parties, which is an increasing trend since the 2012 fiscal year. The most frequent measures implemented are the three-party collaborative activities such as cleaning and waste reduction activities (46.0%), followed by events such as environmental fairs (39.0%), and setting up a forum for planning (23.3%). Others include "agreement to reduce plastic shopping bags," such as promoting bringing their own shopping bags and charging for plastic shopping bags.

	FY2016	
	# of wards and cities	rate(%)
Efforts conducted by three parties	344	46. 0
Hold various events	292	39. 0
Setting up a place for plan-making	174	23. 3
Setting up a place to implement the plan	151	20. 2
No measures for the three parties to cooperate	194	25. 9
Others	36	4. 8
Total	748	100. 0



5. How Are Steel Cans Collected from Noncombustible Waste?

■The Amount of Steel Cans Collected from Noncombustible Waste is Estimated to be 16,000 tons totally

According to the research data collected from 567 municipalities, the amount of iron collected is 248,451 tons in FY2016 (including 12,507 tons of steel can). This translates into the recycling of 332,134 tons nationwide (including 16,719 tons of steel can).

The amount of Steel Cans Collected from Noncombustible Waste (estimated based on the record in FY2016)

(Unit: t/yr)

Noncombustible Waste	# of wards and cities	The amount of iron collected	The amount of steel can collected
Magnetic separation after shredding	250	109, 465	5, 276
Magnetic separation and press after shredding	85	18, 640	884
Deliver to recycling manufacture after hand separation	96	59, 807	3, 135
Deliver to recycling manufacture after hand separation	20	6, 150	371
Press after magnetic separation	16	8, 562	767
Others	73	35, 781	1, 523
Unknown	27	10, 046	551
Total	567	248, 451	12, 507

Note: In the 23 wards, Tokyo, the recycling amount of ferrous metal from noncombustible waste is calculated from data of the clean association of Tokyo 23.

Form of Processing Ferrous Metals at Waste Disposal Facilities in FY2016

The highest ration of processing at noncombustible waste is press after magnetic separation (36.5%) and 14.6% of municipalities are hand separation only and 7.9% of municipalities do not collect steel cans from the noncombustible waste.

	# of wards and cities	rate(%)
Magnetic separation after shredding	277	36. 5
Deliver to recycling manufacture after hand separation	111	14. 6
Magnetic separation and press after shredding	106	14. 0
Deliver to recycling manufacture after hand separation	24	3. 2
Press after magnetic separation	20	2. 6
Do not collect steel cans from combustible waste	60	7. 9
Others	88	11. 6
Unknown	73	9. 6
Total	759	100. 0

Sales Condition According to the Form of Processing Ferrous Metals in FY2016

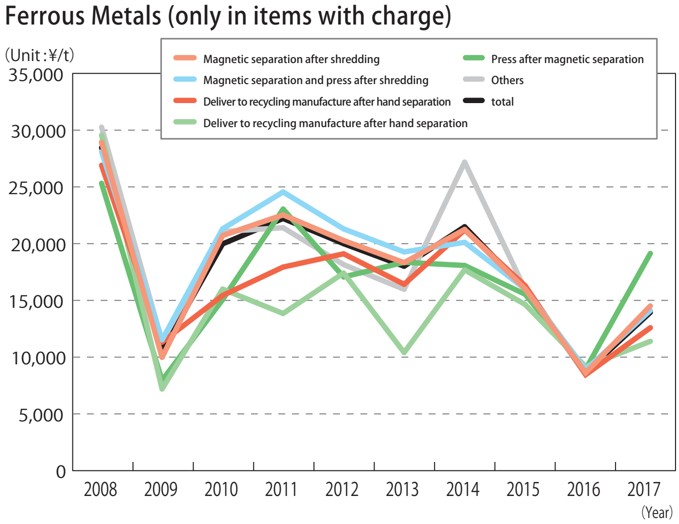
Both noncombustible and combustible waste scrap are mostly sold with charge. However, once there is extraneous material admixed except iron, there is a case of inverse onerous contract since it takes more time efforts to separate.

		With Charge	Inverse onerous contract	Without charge	Unknown	Total
Magnetic separation after shredding	# of wards and cities	221	11	5	40	277
	rate(%)	79. 8	4. 0	1. 8	14. 4	100. 0
Deliver to recycling manufacture after hand separation	# of wards and cities	73	10	5	23	111
	rate(%)	121. 7	16. 7	8. 3	38. 3	185. 0
Magnetic separation and press after shredding	# of wards and cities	83	1	4	18	106
	rate(%)	78. 3	0. 9	3. 8	17. 0	100. 0
Deliver to recycling manufacture after hand separation	# of wards and cities	17	0	1	6	24
	rate(%)	70. 8	0. 0	4. 2	25. 0	100. 0
Press after magnetic separation	# of wards and cities	12	1	1	6	20
	rate(%)	60. 0	5. 0	5. 0	30. 0	100. 0
Others	# of wards and cities	57	5	5	21	88
	rate(%)	64. 8	5. 7	5. 7	23. 9	100. 0
Unknown	# of wards and cities	391	19	18	147	575
	rate(%)	68. 0	3. 3	3. 1	25. 6	100. 0

Price Distribution Acc ording to the Form of Processing Ferrous Metals (only in items with charge)

The price of iron scrap falls dramatically due to market fluctuations and which affects to the price of iron scrap from noncombustible waste. The price of iron scrap from the noncombustible waste has recovered up to 14,032yen per tons.

	June-July, 2017	
	# of wards and cities	Price (¥/t)
Magnetic separation after shredding	221	14, 521
Magnetic separation and press after shredding	83	14, 418
Deliver to recycling manufacture after hand separation	73	12, 568
Deliver to recycling manufacture after hand separation	17	12, 347
Press after magnetic separation	12	19, 712
Others	57	12, 696
Total	391	14, 032



Ⅲ The Method of Sorted Collection of Steel Cans

6. How Much Pressed Steel from Cans Do Municipalities Sell?

Pricing Conditions of Steel Cans according to the Forms of Selling in FY2016

Most of the steel cans are sold with charge regardless of how they are sold, but the pressed cans are inverse onerous contract in some municipalities. The reason of inverse onerous contract is such as delivering directly to recycler cost consignment fee for processing.

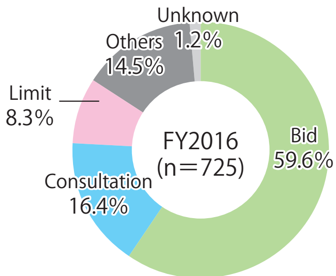
		Press	Shredder	Pressing individual cans	Round cans	Mixed round cans (aluminum & steel)	Others	Total
With charge	# of wards and cities	492	18	7	58	65	25	665
	rate(%)	97. 6	100. 0	100. 0	87. 9	87. 8	80. 6	95. 0
Without charge	# of wards and cities	9	0	0	3	5	1	18
	rate(%)	1. 8	0. 0	0. 0	4. 5	6. 8	3. 2	2. 6
Inverse onerous contract	# of wards and cities	3	0	0	5	4	5	17
	rate(%)	0. 6	0. 0	0. 0	7. 6	5. 4	16. 1	2. 4
Total	# of wards and cities	504	18	7	66	74	31	700
	rate(%)	100. 0	100. 0	100. 0	100. 0	100. 0	100. 0	100. 0

Note1: Quoted prices apply to the pressed steel from cans sold by the municipalities for delivery to recycling manufacturers (not to the final processed form output from the recycling facilities).

Note2: The chart excludes answers that include both pressed steel from cans and scrap iron collected from noncombustible wastes as commodities sold.

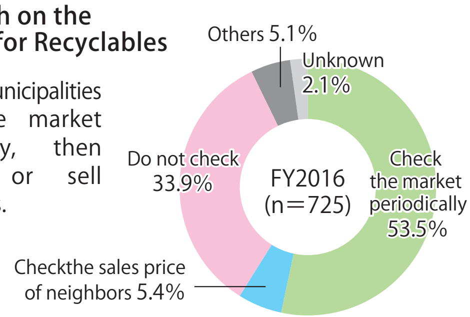
Methods to Decide Sales Price of Steel Cans

More than half of the municipalities decide the selling price by bidding.



Research on the Market for Recyclables

A half of municipalities check the market periodically, then contract or sell recyclables.



Average Price of Pressed Steel Cans According to Forms of Selling (FY2016)

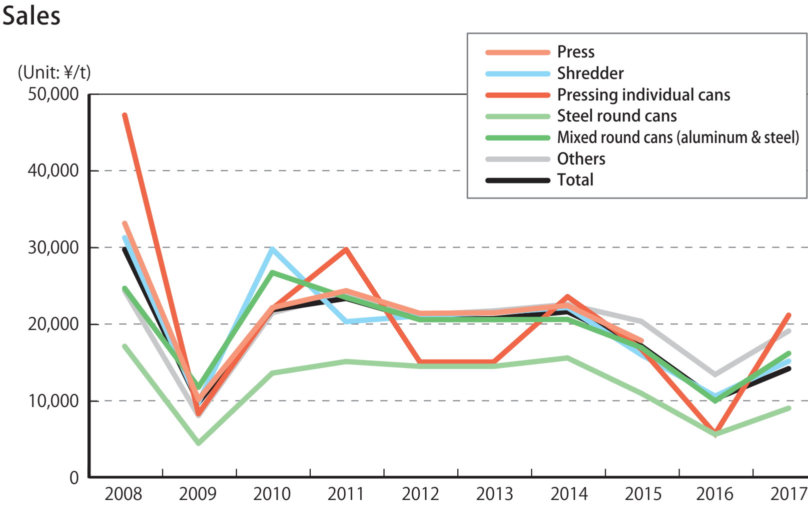
Price of steel cans collected by municipalities is ¥18,349/t. Price of steel cans and metals collected from noncombustible waste is ¥18,950/t (the price might influence with other metals).

	# of wards and cities	Price (¥/t)
Price of steel cans collected by municipalities	416	18, 349
Price of steel cans and iron collected from noncombustible waste	25	16, 026
Price of steel cans and metals collected from noncombustible waste	2	18, 950
Others	12	15, 407
Unknown	8	16, 277
Total	463	18, 114

Sales Price according to the Forms of Sales

The downturn in the market conditions that lasted from 2015 to the end of 2016 has recovered to the price of 2015 as of June - July 2017.

	June-July, 2017	
	# of wards and cities	Price (¥/t)
Press	463	18, 114
Shredder	17	15, 697
Pressing individual cans	5	21, 090
Steel round cans	55	9, 573
Mixed round cans (aluminum & steel)	64	16, 900
Others	24	19, 114
Total	628	17, 383

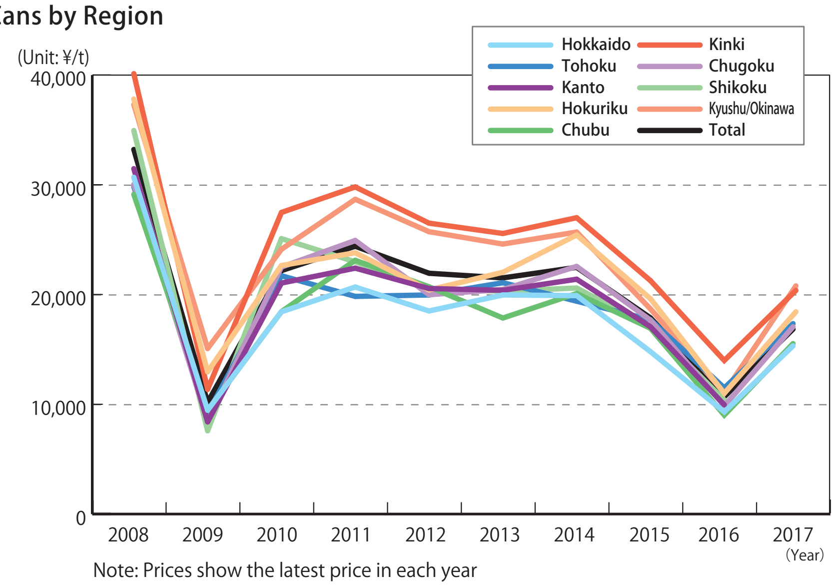


Note: Prices show the latest price in each year

Average Sales Price of Pressed Steel Cans by Region

Average sales price of pressed steel cans has been up and down until 2017. The price is high in Kyushu/Okinawa and Kinki, and low in Hokkaido, Chubu, and Shikoku.

	June-July, 2017	
	# of wards and cities	Price (¥/t)
Hokkaido	30	15, 551
Tohoku	43	17, 478
Kanto	131	17, 704
Hokuriku	19	18, 567
Chubu	49	15, 770
Kinki	61	20, 546
Chugoku	39	17, 112
Shikoku	21	15, 950
Kyushu/Okinawa	70	20, 979
Total	463	18, 114

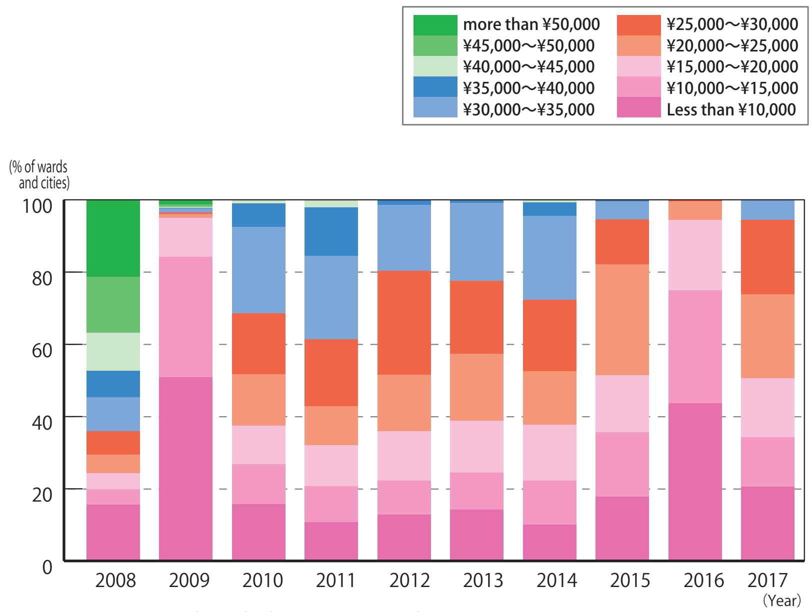


Note: Prices show the latest price in each year

Price Distribution of Pressed Steel from Cans

The price of pressed steel cans is traded under the price of ¥10,000/t among 40% of municipalities in 2016 but this year is only 20%. Although the price of pressed steel cans is traded under the price of ¥20,000/t among 10% of municipalities in 2016 but more than 40% of municipalities trade more than ¥20,000/t in this year.

	June-July, 2017	
	# of wards and cities	Price (¥/t)
Less than ¥10,000	95	20. 5
¥10,000～¥15,000	64	13. 8
¥15,000～¥20,000	75	16. 2
¥20,000～¥25,000	108	23. 3
¥25,000～¥30,000	96	20. 7
¥30,000～¥35,000	25	5. 4
¥35,000～¥40,000	0	0. 0
¥40,000～¥45,000	0	0. 0
¥45,000～¥50,000	0	0. 0
More than ¥50,000	0	0. 0
Total	463	100. 0

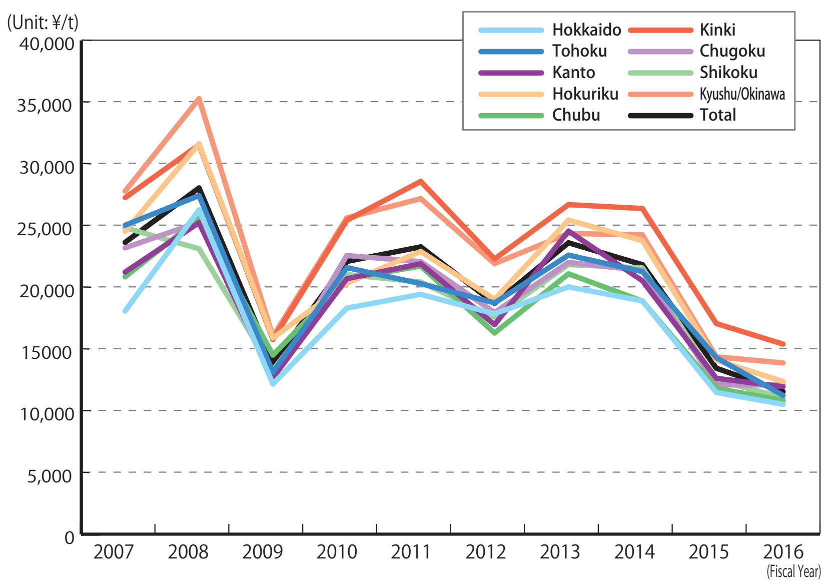


Note: Prices show the latest price in each year

Average Sales Price of Pressed Steel from Cans by the Fiscal Year

Prices continued to decline following the downturn in the market. Prices are high in Kinki and Kyushu/Okinawa and low in Hokkaido.

	FY2016	
	# of wards and cities	Price (¥/t)
Hokkaido	29	10, 729
Tohoku	43	12, 037
Kanto	128	12, 253
Hokuriku	19	12, 525
Chubu	49	11, 065
Kinki	57	15, 347
Chugoku	40	12, 322
Shikoku	20	11, 614
Kyushu/Okinawa	67	14, 547
Total	452	12, 725



Ⅳ Group Collection of Steel Cans

1 . How Many Municipalities Practice Group Collection?

About 80% of Municipalities Practice Group Collection Programs

The rate of municipalities involvement in group collection, all forms included is 80.9%. This would probably be higher if resource collections performed privately were included. Most of municipalities (97.1%) where population is more than 500,000, conduct practice group collection.

People are sorting recyclable wastes

The Rate of Practicing Group Collection

80.9% of municipalities are practicing group collection that suspects the number include self-collected by private sector. According to the scale of population, most of municipalities (97.1%) where population is more than 500,000, conduct practice group collection.

	FY2008		FY2012		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Practice	593	80. 7	603	81. 9	614	80. 9
Do not practice	111	15. 1	94	12. 8	88	11. 6
Unknown	27	3. 7	39	5. 3	54	7. 1
Others	4	0. 5	0	0. 0	3	0. 4
Total	735	100. 0	736	100. 0	759	100. 0

Note: [Do not practice] and [Unknown] include municipalities that have no information because group collection is performed privately.

The Rate of Practicing Group Collection according to the Scale of Population in FY2016

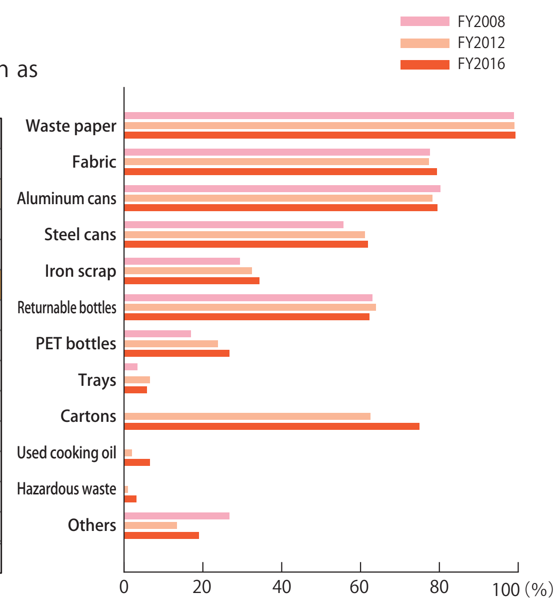
In large cities where more than 500,000 people reside conduct practicing group collection, however the trend indicates that the ratio gets lesser in small cities. Others are municipalities do not involve in practicing group collection but some groups like school or community does it by themselves.

	Practice		Do not practice		Unknown		Others		Total	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Less than 30,000	45	58. 4	16	20. 8	16	20. 8	0	0. 0	77	100. 0
30,000～50,000	128	74. 4	26	15. 1	17	9. 9	1	0. 6	172	100. 0
50,000～100,000	195	83. 0	28	11. 9	12	5. 1	0	0. 0	235	100. 0
100,000～200,000	132	86. 8	12	7. 9	7	4. 6	1	0. 7	152	100. 0
200,000～300,000	38	90. 5	3	7. 1	1	2. 4	0	0. 0	42	100. 0
300,000～500,000	43	91. 5	3	6. 4	1	2. 1	0	0. 0	47	100. 0
More than 500,000	33	97. 1	0	0. 0	0	0. 0	1	2. 9	34	100. 0

Target Item for Group Collection (multiple answers)

61.7% of municipalities collect steel cans in group collection. Items such as waste paper, cartons are collected in most of municipalities(99.0%).

	FY2008		FY2012		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Waste paper	586	98. 8	602	99. 8	608	99. 0
Fabric	459	77. 4	465	77. 1	486	79. 2
Aluminum cans	475	80. 1	471	78. 1	487	79. 3
Steel cans	329	55. 5	368	61. 0	379	61. 7
Iron scrap	174	29. 3	195	32. 3	210	34. 2
Returnable bottles	373	62. 9	385	63. 8	381	62. 1
PET bottles	100	16. 9	143	23. 7	164	26. 7
Trays	20	3. 4	39	6. 5	35	5. 7
Cartons	–	–	376	62. 4	459	74. 8
Used cooking oil	–	–	12	2. 0	40	6. 5
Hazardous waste	–	–	6	1. 0	19	3. 1
Others	158	26. 6	81	13. 4	116	18. 9
Total	593	100. 0	603	100. 0	614	100. 0

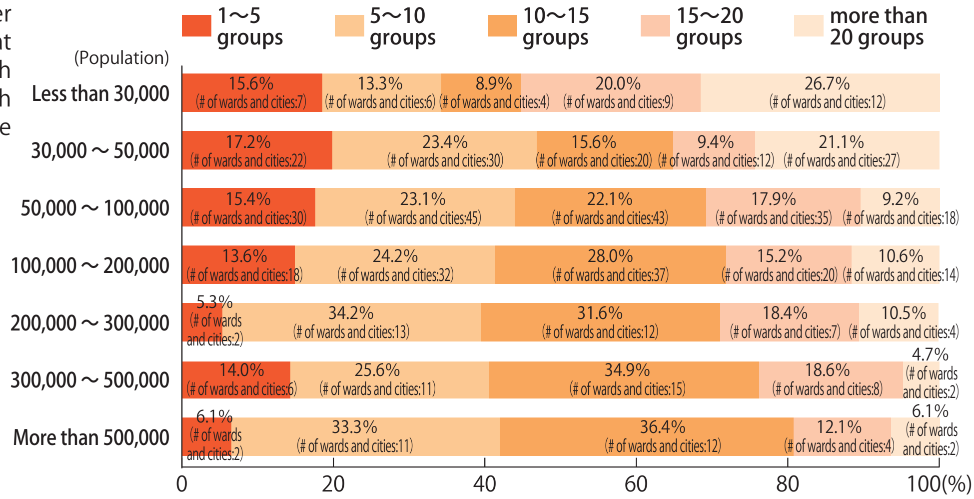


Note1: [Others] indicates plastic containers for beer, mixed paper, plastic items, etc.
Note2: [Used cooking oil] and [Hazardous waste] are added since FY2011

Number of Groups Practicing Group Collection according to the Scale of Population per 10,000 in FY2016

Average number of groups practicing group collection per 10,000 population is shown that less population region has high rate of participants and high population region has low rate of participants.

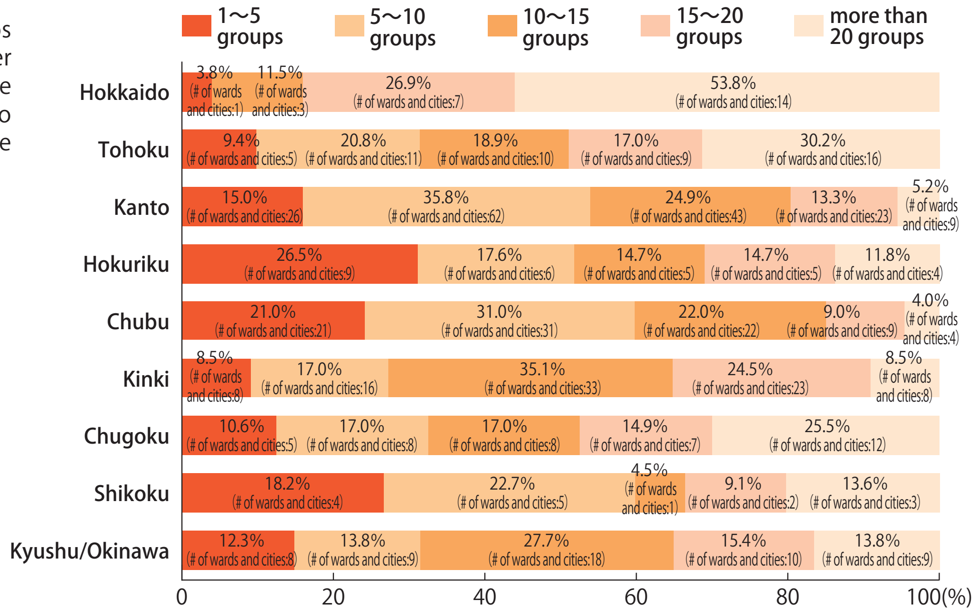
	Average practicing groups
Less than 30,000	19. 4
30,000～50,000	15. 3
50,000～100,000	12. 4
100,000～200,000	12. 8
200,000～300,000	12. 5
300,000～500,000	11. 3
More than 500,000	11. 7



Number of Groups Practicing Group Collection per 10,000 by Region in FY2016

The highest rate of groups practicing group collection per 10,000 is 53.8% among "more than 20 groups" in Hokkaido region where the average practicing groups is 25.1.

	Average practicing groups
Hokkaido	25. 1
Tohoku	17. 5
Kanto	10. 8
Hokuriku	11. 0
Chubu	9. 4
Kinki	14. 6
Chugoku	19. 6
Shikoku	11. 9
Kyushu/Okinawa	13. 9



COLUMN 3

Group Collection Support Project

Since the 2008 fiscal year, the Steel Can Recycling Association has been providing support to organizations that conduct group collections every year for the purpose of contributing to the creation of a recycling-oriented society. Quo card (gift card) equivalent to 5,000 yen ~ 25,000 yen per group were given to organizations that are undertaking group collection of steel cans that vitalize the local community, improve environmental awareness of residents, or reduce social cost. In 2016 fiscal year, 42 organizations such as neighborhood associations, senior citizens' associations, children's associations, and PTAs were selected for their support and were given a letter of appreciation. Apart from the above, we also provide support for elementary and junior high schools that are conducting or planning to conduct group collections that include steel cans, for the purpose of environmental learning to educate students who are responsible for the future.

For details, please refer to the association website http://steelcan.jp/.

2. How Do Municipalities Participate in Group Collection?

Participating Conditions of Municipalities toward Group Collection (multiple answers)

As the supporting measures by municipalities, 95.8% of them granted are financial incentives for practicing group, followed by PR (49.8%), and appeal to citizens (25.2%), and subsides to collecting companies (24.9%). Number of grants for practicing groups have increased and number of subsides to collecting companies have decreased since FY 2008.

	FY2008		FY2012		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Provide grants	553	93.3	569	94.4	588	95.8
PR	242	40.8	289	47.9	308	50.2
Provide subsidies	166	28.0	163	27.0	153	24.9
Appeal to citizens	125	21.1	142	23.5	155	25.2
Provide equipments	47	7.9	44	7.3	43	7.0
Coordination	58	9.8	70	11.6	79	12.9
Others	18	3.0	20	3.3	31	5.0
Unknown	22	3.7	15	2.5	4	0.7
Total	593	100.0	603	100.0	614	100.0

Grants to Practicing Groups for General Recyclables

¥3-5/kg (38.3%) is the highest ratio and second highest ratio is ¥5-7/kg (24.2%) and then less than ¥3/kg (20.6%).

	FY2008		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Less than ¥3/kg	113	22.7	112	20.6
¥3~¥5/kg	167	33.6	209	38.3
¥5~¥7/kg	138	27.8	132	24.2
¥7~¥10/kg	58	11.7	64	11.7
More than ¥10/kg	21	4.2	28	5.1
Total	497	100.0	545	100.0

Note: [Total] indicates the number of wards and cities providing financial aids toward groups.

Subsidies to Collecting Companies for General Recyclables

In FY 2008, ¥3-5/kg is shared more than half. The numbers over ¥5/kg are increased.

	FY2008		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Less than ¥3/kg	87	59.6	69	57.0
¥3~¥5/kg	40	27.4	22	18.2
¥5~¥7/kg	11	7.5	14	11.6
¥7~¥10/kg	3	2.1	8	6.6
More than ¥10/kg	5	3.4	8	6.6
Total	146	100.0	121	100.0

Note1: [Total] indicates the number of wards and cities providing financial aids toward companies.
Note2: it does not show the average price since calculation system is varied in each municipality.

Grants for Steel Cans

¥3-5/kg is the highest ratio for 33.3%.

	FY2008		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Less than ¥3/kg	30	15.7	42	16.5
¥3~¥5/kg	60	31.4	85	33.3
¥5~¥7/kg	60	31.4	77	30.2
¥7~¥10/kg	26	13.6	36	14.1
More than ¥10/kg	15	7.9	15	5.9
Total	191	100.0	255	100.0

Note: [Total] indicates the number of wards and cities providing financial aids for steel cans.

Subsidies for Steel Cans

Less than ¥3/kg is the highest ratio for 42.9%.

	FY2008		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Less than ¥3/kg	23	53.5	18	42.9
¥3~¥5/kg	10	23.3	11	26.2
¥5~¥7/kg	4	9.3	8	19.0
¥7~¥10/kg	2	4.7	3	7.1
More than ¥10/kg	4	9.3	2	4.8
Total	43	100.0	42	100.0

Note: [Total] indicates the number of wards and cities providing financial aids for steel cans.

3. How Do Municipalities Participate in Site Collection?

The site collection is located in city council or public facilities as a complementary role so that some wards and cities play site collection to collect batteries or hazardous waste which is not collected in sorted waste.

Site Collection Carried Out by Municipalities (multiple answers)

The ratio of involvement of site collection in municipalities are around 60% which increased from FY 2013. Although number of the municipalities where set out boxes at store, set out boxes at vacant lots and parks , and set out boxes at voluntary places are increased since 2013.

	FY2013		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Set out boxes at public facilities	358	49. 4	462	60. 9
Set out boxes at stores	88	12. 2	101	13. 3
Set out boxes at vacant lots and parks	36	5. 0	43	5. 7
Set out boxes at voluntary places	28	3. 9	38	5. 0
No Implementation	262	36. 2	252	33. 2
Total	724	100. 0	759	100. 0

Target Items for Site Collection Practiced by Municipalities (multiple answers)

Introducing the Promotion of Recycling of Small Waste Electrical and Electronic Equipment ACT on April 2013, the ration of collecting a small waste electrical and equipment in municipalities have increased from FY 2013 (34.0%) to FY 2016 (56.0%). However the number of municipalities where collect steel cans through site collection fall because other collecting services are well established. "Others" represents used cooking oil, ink cartridge, used batteries, etc.

	FY2013		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Newspaper	161	41. 5	194	39. 2
Waste paper	156	40. 2	192	38. 8
Cardboard	152	39. 2	189	38. 2
Fabric	128	33. 0	175	35. 4
Aluminum cans	118	30. 4	150	30. 3
Steel cans	110	28. 4	139	28. 1
Metals	40	10. 3	53	10. 7
Returnable bottles	96	24. 7	119	24. 0
PET bottles	166	42. 8	193	39. 0
Trays	115	29. 6	121	24. 4
Milk cartons	190	49. 0	246	49. 7
Small household appliances	132	34. 0	277	56. 0
Hazardous waste	150	38. 7	193	39. 0
Others	143	36. 9	215	43. 4
Unknown	10	2. 6	7	1. 4
Total	388	100. 0	495	100. 0

The Rate of Practicing Group Collection by Region

Site collection at public facilities is major in Kanto and Chubu. In Chubu region, set out boxes at public facilities (71.9%), set out boxes at stores around carpark (18.2%), set out boxes at vacant lots and parks (13.2%) are major sites. On the other hand, the municipalities where do not conduct group collection by region are 47.8% in Tohoku and 40.7% in Chugoku region.

	Set out boxes at public facilities		Set out boxes at stores around carpark		Set out boxes at vacant lots and parks		Set out boxes at voluntary places		No Implementation	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Hokkaido (34)	23	69. 7	2	6. 1	0	0. 0	2	6. 1	7	21. 2
Tohoku (71)	32	46. 4	11	15. 9	1	1. 4	2	2. 9	33	47. 8
Kanto (194)	135	70. 7	31	16. 2	6	3. 1	5	2. 6	54	28. 3
Hokuriku (47)	23	52. 3	5	11. 4	1	2. 3	4	9. 1	17	38. 6
Chubu (120)	87	71. 9	22	18. 2	16	13. 2	7	5. 8	21	17. 4
Kinki (104)	59	57. 3	15	14. 6	8	7. 8	6	5. 8	40	38. 8
Chugoku (51)	28	51. 9	5	9. 3	4	7. 4	3	5. 6	22	40. 7
Shikoku (32)	22	64. 7	2	5. 9	0	0. 0	4	11. 8	9	26. 5
Kyushu/Okinawa (110)	53	48. 2	8	7. 3	7	6. 4	5	4. 5	49	44. 5

4. How Do Municipalities Participate in Store collection?

Few areas cooperate with municipalities and retailers for store collection, however most of retailers make an effort independently as a part of their corporate social responsibility.

Basically, the method of cooperation is PR and some municipalities provide recycling box and collect recyclable waste from store. To promote store collection, there are number of issues other than cost or space, the regulation of waste disposal is different with each municipalities.

Cooperation for store collection (multiple answers)

Lots of the municipalities do not have relationship with retailers (63.5%) and these municipalities are small population. Among the municipalities where collect recyclable waste from retailers, most of things are PET bottles. Some regional municipalities do collect all items because of no private recycling facilities other than municipalities.

	FY2013		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
No Cooperation	438	60. 4	482	63. 5
Collecting recyclable waste from retailers	106	14. 6	136	17. 9
PR	106	14. 6	135	17. 8
Providing a recycling box	65	9. 0	75	9. 9
Set up a recognition system	60	8. 3	74	9. 7
Set up a forum for discussion with retailers	28	3. 9	34	4. 5
Set up a forum for discussion with public and retailers	18	2. 5	17	2. 2
Total	725	100. 0	759	100. 0

The Rate of Municipalities Collection Resource Waste from Retailers (multiple answers)

Most of the items collected by local governments are PET bottles (46.3%), but they are decreasing compared to 2013 fiscal year. This seems to be affected by the fact that the municipalities in Tokyo have decided not to collect them. Meanwhile, 28.7% of municipalities collect small household appliances, which is an increase of more than 10% compared to 2013 fiscal year.

	FY2013		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Newspaper	0	0. 0	5	3. 7
Waste paper	0	0. 0	6	4. 4
Cardboard	0	0. 0	5	3. 7
Fabric	0	0. 0	6	4. 4
Aluminum cans	4	3. 8	12	8. 8
Steel cans	3	2. 8	10	7. 4
Metals	1	0. 9	3	2. 2
Returnable bottles	3	2. 8	11	8. 1
PET bottles	53	50. 0	63	46. 3
Trays	24	22. 6	29	21. 3
Milk cartons	24	22. 6	30	22. 1
Small household appliances	13	12. 3	39	28. 7
Hazardous waste	23	21. 7	28	20. 6
Others	20	18. 9	31	22. 8
Unknown	11	10. 4	6	4. 4
Total	106	100. 0	136	100. 0

Understanding of collection amount (multiple answers)

In case retailers manage store collection itself, only 12.5% of municipalities get report from retailers and other 46.4% of municipalities do not know what items they collect or how much they collect.

	FY2013		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Known only undertaken amount	97	44. 5	112	42. 3
Informed by a retailer	19	8. 7	33	12. 5
No Grasp	95	43. 6	123	46. 4
Unknown	11	5. 0	3	1. 1
Total	218	100. 0	265	100. 0

Awareness of Notification by the Ministry of Environment

On January 8, 2016, the Ministry of the Environment conducted a survey on the subsequent response to the promotion of recycling waste PET bottles etc. collected at storefronts that were notified to prefectures and government ordinance cities, following last year. Acknowledgement of the notification is increasing, but the local government that is implementing it is 2.6%, which is extremely low.

	FY2015		FY2016	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Received the notice but no plans corresponding to at the moment	311	57. 6	368	59. 7
Received the notice and considered at the moment	93	17. 2	114	18. 5
Already implementing the plans	14	2. 6	16	2. 6
Do not know about the notification	114	21. 1	105	17. 0
Others	8	1. 5	13	2. 1
Total	540	100. 0	616	100. 0

Report

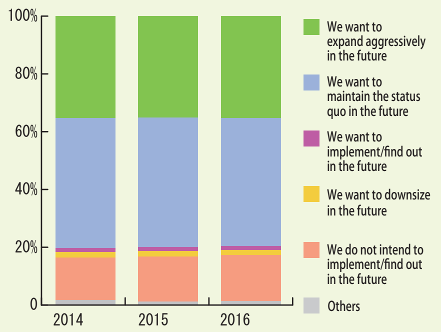
The Reality of Private Collection of Steel Cans -Future Prospects-

As a recycling route of resources other than Municipalities Collection, there are collection methods such as Group Collection, Site Collection, and Store Collection. In the future, the effectiveness of recycling could be enhanced by practicing Municipalities Collection and Group Collection in parallel, and at the same time implementing multiple route of collecting resources such as Store Collection and Site Collection based on locality such as areas with many elderly people or residential area that is concentrated in a relatively small area. To promote these Private Collection activities, the support and the cooperation from the local government is necessary, so a research was done to investigate what the local governments think of the resource collecting route and its future intentions and the reasons for them for 3 years. As a result, there is not much difference in 3 years.

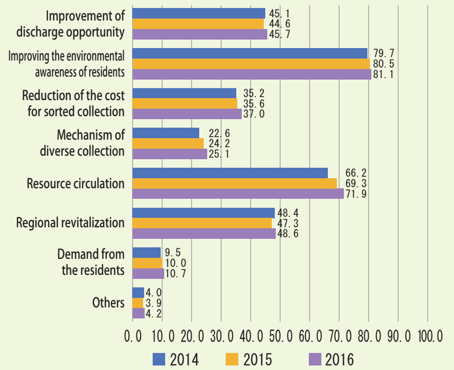
(1) Group Collection

Regarding the intention to expand in the future, the majority of municipalities answered "will continue to maintain the current situation," followed by "want to actively expand in the future." If we include local governments who answered "want to conduct or grasp the situation," it accounts for 80% of those answering having intention to expand group collection, and it is on an upward trend since 2014 fiscal year. The main reasons for the promotion are "raising environmental awareness of residents" and "recycling of resources."

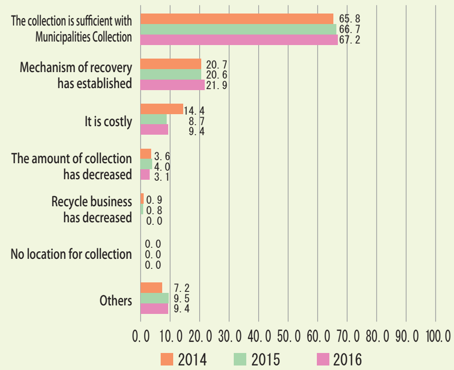
● Future Intentions



● The Reasons of Promoting Private Collection Route



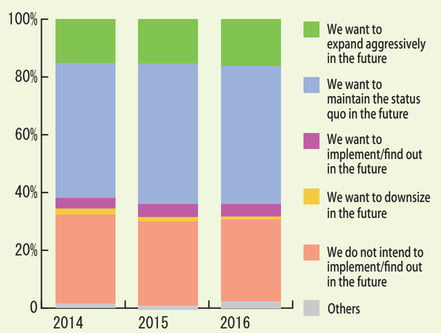
● The Reasons for the downsize/ non-implementation or not finding out



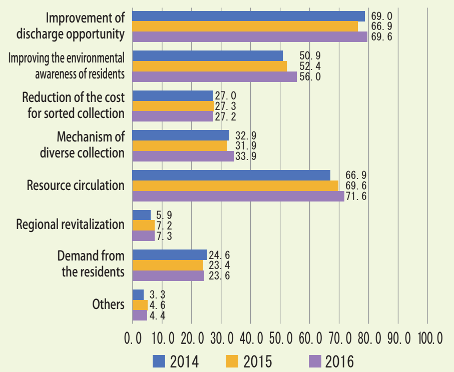
(2) Site Collection

70% of municipalities intend to expand, and it is on an upward trend since 2014 fiscal year. The main reasons for the promotion are "improvement of emission opportunities," "resource recycling," and "improvement of environmental awareness of residents."

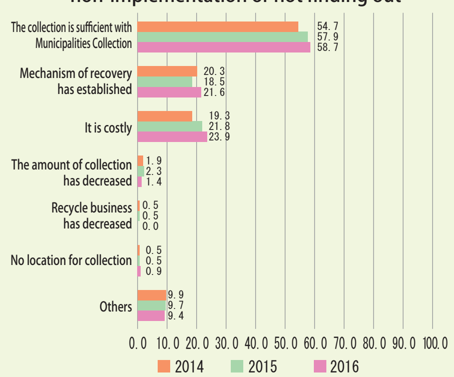
● Future Intentions



● The Reasons of Promoting Private Collection Route



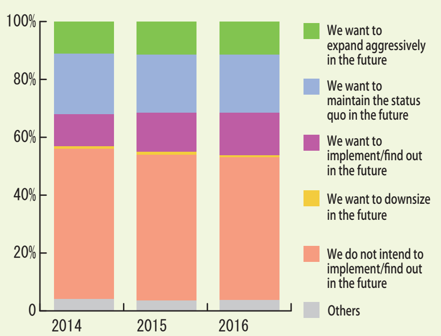
● The Reasons for the downsize/ non-implementation or not finding out



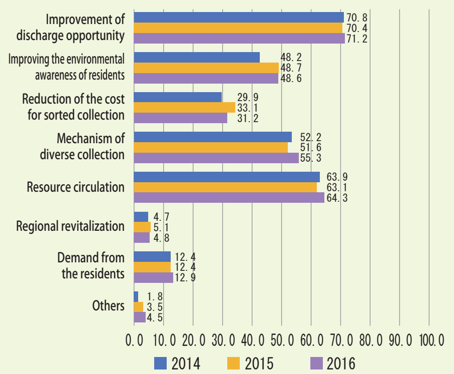
(3) Store Collection

About 50% answered "no intention of conducting or grasping the situation in the future" concerning the intention of future expansion, which shows a different trend compared to the group collection and base collection, but compared with 2014 fiscal year, there was a 5% increase in the answer of "want to conduct or grasp the situation." The biggest reason for shrinking of the project/non-implementation/no grasp of the situation is "administrative collection is sufficient."

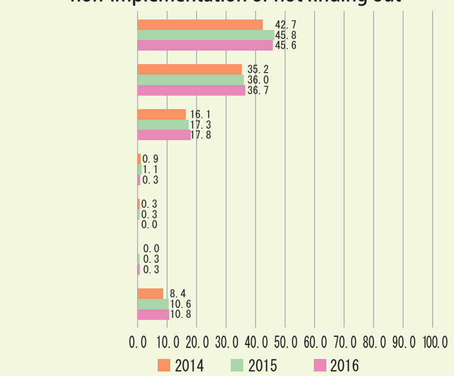
● Future Intentions



● The Reasons of Promoting Private Collection Route



● The Reasons for the downsize/ non-implementation or not finding out



Data 1

The Method for Calculating the Steel Can Recycling Rate

Following is the method for calculating the steel can recycling rate.

Amount of Steel Can Consumption

Calculation Method

The weight of domestically produced steel cans shipped, weight of steel cans used for import/export of canned food and weight of steel cans imported as empty cans between January and December of 2016 were monitored based on the Ministry of Economy, Trade and Industry Statistics and "Japan Exports and Imports" from the Ministry of Finance, as well as the surveyed weight of steel cans.

Calculation Results (① − ② + ③ + ④): 463,076 ton

①Weight of domestically produced steel cans shipped：352,162 tons
- Figures in tons from the Ministry of Economy, Trade and Industry Statistics were used for Beverage cans, food cans and general cans.
- The weight of 18-liter cans is calculated by multiplying figures in tons from the Ministry of Economy, Trade and Industry Statistics by the (food) ratio announced by the National Federation of 18 Liter Cans Manufacturers Corporative Union.

②The weight of steel cans used for exporting canned food：1,653 tons
- Calculated based on "Japan Exports and Imports" from the Ministry of Finance.

③The weight of steel cans used for importing canned food：108,759 tons
- Calculated based on "Japan Exports and Imports" from the Ministry of Finance. We assumed that the main types of cans used for manufacturing in Japan were used for food, tomatoes/vegetables and pet foods imported in "air-tight containers" (including not only cans but also other containers), and we estimated the number of cans and calculated the weight of containers by multiplying by the unit can weight.
- Exported pet food cans: 14,981 tons (*Calculated based on the data from the Pet Food Manufacturers Association, Japan)

④Weight of steel cans imported as empty cans：3,808 tons
- Figures in tons from "Japan Exports and Imports" from the Ministry of Finance.

Amount of steel can recycling

Calculation Method

- We assumed that 3 months elapses between the sale of steel can goods and the collection of the cans for recycling and we sent a survey form regarding usage amounts of scrap steel cans during the period from April 2016 to March 2017 to a total of 74 manufacturers including furnace manufacturers, blast furnace manufacturers, Pellet manufacturers, and casting manufacturers.
- In addition, we estimated, according to the survey data, the amount of steel cans for steelmaking raw materials recycled under the standard other than C Shredder through shredding process of iron scrap dealers across the country, and incorporated it into the subject calculation.
- We subtracted the weight of aluminum caps for beverage cans included in the scrap steel cans and foreign substances such as iron scraps except steel can from this total value.

Calculation Results (① − ② − ③) : 434,977 ton

①Weight of scrap steel cans used：456,802 tons
②Weigh of foreign substances such as aerosol cans, iron scrap included in ① above：2,982 tons
③Weight of aluminum lids for beverage containers included in ① above：18,843 tons

The Steel Can Recycling Rate in FY2016

$$\frac{\text{Amount of steel can recycling (434,977 tons)}}{\text{Amount of Steel Can Consumption (463,076 tons)}} = 93.9\ \%$$

Data 2

Distribution Diagram of Steel Makers (Electric Furnace & Blast Furnace) and Pellet Works

* The research conducted by Japan Steel Can Recycling Association (As of July 2017)

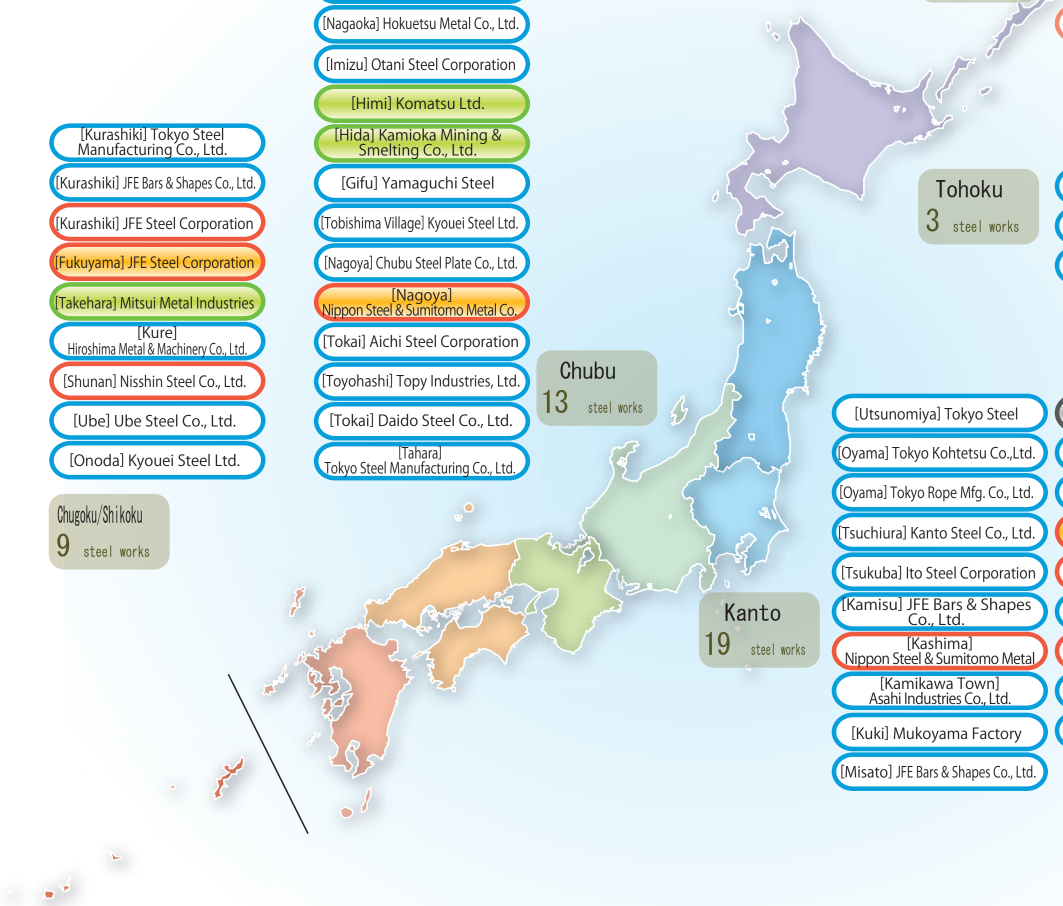
Total in Japan **74** Steel Works

- Blast furnace steel works ··· 15
- Electric furnace steel works ··· 50
- Casting works, etc. ··· 6
- Pellet works ········ 3
- Manufacturing plant of steel sheets steel for cans ······ 6

■Steel cans are recycled in most of these steel works and foundries.

■Recycled products are produced in nearest plant in each region to recycle efficiently.

At 6 works (included number of 74 works), steel sheets for cans are produced to make steel cans.



Hokkaido 3 steel works

- [Sapporo] JFE Bars & Shapes Co., Ltd.
- [Tomakomai] Shimizu Steel Co.,Ltd.
- [Muroran] Nippon Steel & Sumitomo Metal Co.

Tohoku 3 steel works

- [Hachinohe] Tokyotekko. Co., Ltd.
- [Ishinomaki] Ito Steel Corporation
- [Sendai] JFE Steel Corporation

Chubu 13 steel works

- [Tsubame] Mitsuboshi Metal Industries, Ltd.
- [Nagaoka] Hokuetsu Metal Co., Ltd.
- [Imizu] Otani Steel Corporation
- [Himi] Komatsu Ltd.
- [Hida] Kamioka Mining & Smelting Co., Ltd.
- [Gifu] Yamaguchi Steel
- [Tobishima Village] Kyouei Steel Ltd.
- [Nagoya] Chubu Steel Plate Co., Ltd.
- [Nagoya] Nippon Steel & Sumitomo Metal Co.
- [Tokai] Aichi Steel Corporation
- [Toyohashi] Topy Industries, Ltd.
- [Tokai] Daido Steel Co., Ltd.
- [Tahara] Tokyo Steel Manufacturing Co., Ltd.

Chugoku/Shikoku 9 steel works

- [Kurashiki] Tokyo Steel Manufacturing Co., Ltd.
- [Kurashiki] JFE Bars & Shapes Co., Ltd.
- [Kurashiki] JFE Steel Corporation
- [Fukuyama] JFE Steel Corporation
- [Takehara] Mitsui Metal Industries
- [Kure] Hiroshima Metal & Machinery Co., Ltd.
- [Shunan] Nisshin Steel Co., Ltd.
- [Ube] Ube Steel Co., Ltd.
- [Onoda] Kyouei Steel Ltd.

Kanto 19 steel works

- [Utsunomiya] Tokyo Steel
- [Oyama] Tokyo Kohtetsu Co.,Ltd.
- [Oyama] Tokyo Rope Mfg. Co., Ltd.
- [Tsuchiura] Kanto Steel Co., Ltd.
- [Tsukuba] Ito Steel Corporation
- [Kamisu] JFE Bars & Shapes Co., Ltd.
- [Kashima] Nippon Steel & Sumitomo Metal
- [Kamikawa Town] Asahi Industries Co., Ltd.
- [Kuki] Mukoyama Factory
- [Misato] JFE Bars & Shapes Co., Ltd.
- [Saitama] Japan Beverage Ecology Inc.
- [Kawaguchi] Jyonan Seikosho
- [Funabashi] Goudou Steel Ltd.
- [Chiba] JFE Steel Corporation
- [Kimitsu] Nippon Steel & Sumitomo Metal Co.
- [Adachi-ward] Chiyoda-Steel Co., Ltd.
- [Kawasaki] JFE Steel Corporation
- [Kawasaki] Nippon Yakin Kogyo Co., Ltd.
- [Hiratsuka] Sanko Seiko Co., Ltd.

Okinawa 1 steel works

- [Okinawa] Takunan Steel Co., Ltd

Kyushu 7 steel works

- [Kitakyushu (Yahata)] Nippon Steel & Sumitomo Metal Co.
- [Kitakyushu] Tokai Co.,Ltd.
- [Kitakyushu] Tokyo Steel Manufacturing Co., Ltd.
- [Kitakyushu] Kitakyushu Akikan Recycle Station Co., Ltd.
- [Takeo] Kyushu Steel Co.
- [Uto] Osaka Steel Co., Ltd.
- [Oita] Nippon Steel & Sumitomo Metal Co.

Kinki 19 steel works

- [Nagaokakyo] Daigo Inc.
- [Hirakata] Kyouei Steel Ltd.
- [Hirakata] Kubota, Ltd.
- [Osaka] Kurimoto, Ltd.
- [Osaka] Nakayama Steel. Works ,Ltd.
- [Sakai] Shinkansai Steel Corporation
- [Sakai] Osaka Steel Co.,Ltd.
- [Sakai] Kurimoto, Ltd.
- [Kisiwada] Kishiwada Steel Co., Ltd.
- [Wakayama] Nippon Steel & Sumikin Shapes Corporation
- [Wakayama] Nippon Steel & Sumitomo Metal Co.
- [Kobe] Kobe Steel Ltd.
- [Kakogawa] Kobe Steel Ltd.
- [Takasago] Kobe Steel Ltd.
- [Himeji] Nippon Steel & Sumitomo Metal Co.
- [Himeji] Yamato Kogyo Co., Ltd.
- [Himeji] JFE Bars & Shapes Co., Ltd.
- [Himeji] Goudou Steel Ltd.
- [Himeji] Sanyo Special Steel co., Ltd.

Data 3

Activities of the Japan Steel Can Recycling Association (October 2016 ~ September 2017)

■ Research

・April ~ September, 2017 : Survey of steel can recycling conditions

■ Exhibited at events on environments in nationwide. Performed promotion and PR for beautification and 3Rs.

・October 2016：“JFE Chiba Festival” in Chiba
・November 2016：“JFE West Japan Fair in Kurashiki” in Okayama
・November 2016：“Tokai Autumn Festival 2016” in Aichi
・December 2016：“EcoPro 2016” in Tokyo
・May 2017：”JFE West Japan Fair in Fukuyama” in Hiroshima
・July 2017：”Eco-Products Kawagoe 2017” in Saitama
・September 2017：“Environment Festival for Children 2017” in Chuo-ku, Tokyo
・September 2017：”Can Art Festival in Otaru” in Hokkaido


Eco-Products 2016

■ Practiced “Campaigns for Anti-Littering and Beautification”

・October 2016 in Yokohama, May 2017 in Sapporo, and September 2017 in Fukui
・Performed 502 times at 359 sites in total 45 years from 1973 till September 2017


Practiced “Campaigns for Anti-Littering and Beautification” in Yokohama

■ Performed “Excursion at Steel Plants”

・January 2017：Taisho University visited “JFE Steel Corporation East Japan Works”
・July 2017：School teachers (elementary, junior, and high school) in urban area visited “JFE Steel Corporation East Japan Works”
・July 2017：Keio Girls Senior High School visited “Nippon Steel & Sumitomo Metal Corporation Kimitsu Works”
・August 2017：Pupils living in Chuo-ku visited “Nippon Steel & Sumitomo Metal Corporation Kimitsu Works”

■ Supported elementary and junior high schools for practicing environmental education

・January 2017：Commended and Supported 50 elementary & junior high schools

■ Supported groups practicing group collection

・February 2017：Commended and Supported 42 groups performing group collection of steel can

■ Held “Poster Contest on Steel Cans Recycling”

・January 2017：Commended 1 Grand Prize, 4 Sectoral Highest Award, and 36 Honorable Mention. Total of 41 Prize and 1 School Activity Prize (new)

■ Published periodicals etc. and distributed to nationwide

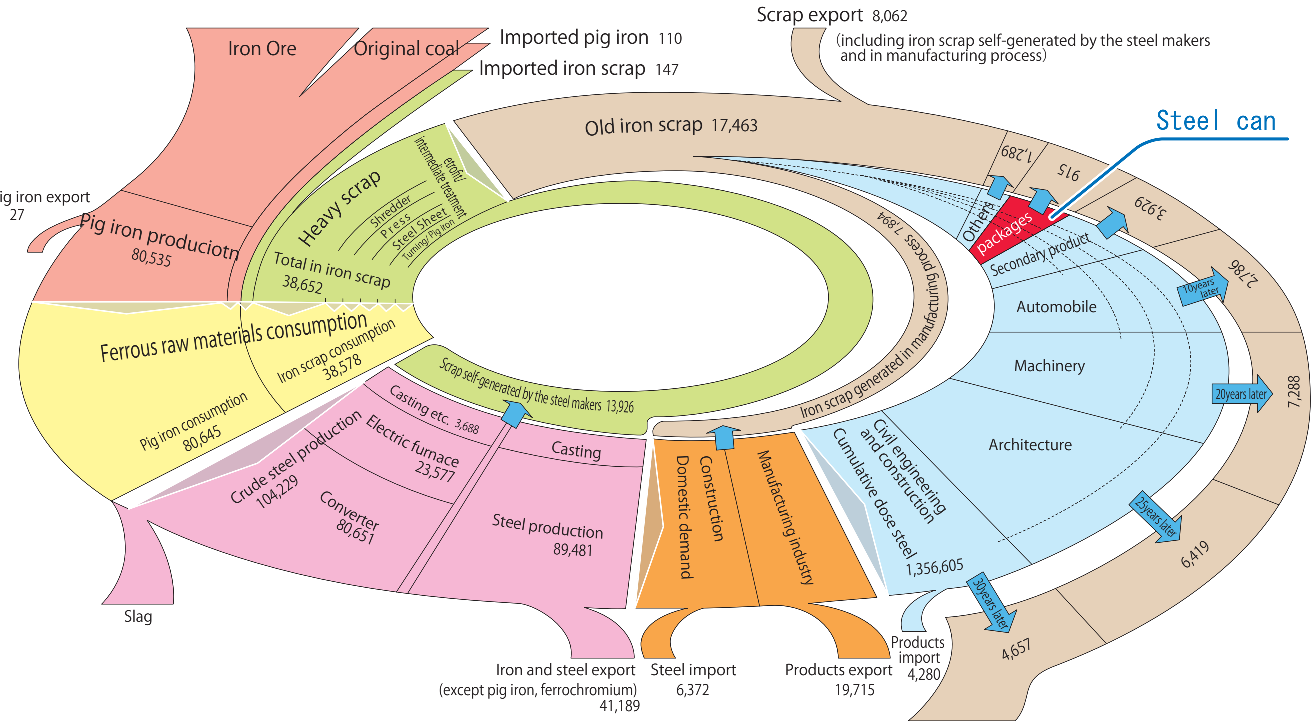
・March 2017：PR magazine “Steel Can Age vol.37”
・August 2017：PR poster “Steel cans are “infinite recycling” Re-born and being active throughout the country!”

■ Others

・October 2016：Published “Annual Report on Steel Can Recycling 2016”
・October 2016：Held “Press briefing” at Tekko Kaikan
・Practiced delivery sessions, lectures and invited for lecture (on demand)
・Practiced join projects to promote 3Rs of recycling containers and packaging by the Liaison Committee of Associations Promoting 3Rs

Promoting efforts toward partnership among the actors for making recycling society

Japanese Steel Circulation Figure (FY2015) Unit:1,000t



＊1 Cumulative dose steel as of March 2016
＊2 Iron and steel import and export are from"Cumulative Dose Steel in FY2015(estimated)" Figure4, quarterly Tetsugen, vol. 71.
＊3 The amount of collected old iron scrap is from "Annual Report on Ferrous Raw Materials No.27 (2016)." vol.V-3.
＊4 Supply and Demand of pig iron/iron scrap are from "Annual Report on Ferrous Raw Materials No.27 (2016)." vol.II-1-Figure 2.
＊5 Iron ore and original coal have no data due to the abolition of statistics by the Ministry of Economy, Trade and Industry.

Data from the Japan Ferrous Raw Materials Association

Steel cans are excellent in recycling that regenerate many iron and steel products

Summary of Japan Steel Can Recycling Association

Purpose of Foundation

We are a private organization that pursues social contributions through researches about litter prevention measures by used steel cans and steel cans recycle. We mainly conduct recycling measures, beautification, litter prevention measures, and promotional activities.

Foundation

April 17, 1973

Representatives

Chairman ··············· Saeki Yasumitsu (Representative Director and Executive Vice-President, Nippon Steel & Sumitomo Metal Corporation)
Vice-Chairman········ Mori Yasuji (Executive Managing Director, Toyo Seikan Kaisha, Ltd.)
Vice-Chairman········ Yamaguchi Hirohisa (Executive Vice-President, Daiwa Can Company)
Executive Director ··· Nakata Ryohei

Member corporations (12 companies)

Steel makers··········· Nippon Steel & Sumitomo Metal Corporation, JFE Steel Corporation, Toyo Kohan Co., Ltd.
Can manufacturers··· Toyo Seikan Kaisha, Ltd., Daiwa Can Company, Hokkai Can., Ltd.
Distributors ············ Mitsui & Co. Steel Ltd., Marubeni-Itochu Steel Inc., Metal One Corporation, JFE Shoji Trade Corporation, Nippon Steel & Sumikin Bussan Corporation, Tokan Trading Corporation

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Japan Steel Can Recycling Association

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Editor: Dynax Urban Environment Research Institute
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Steel cans can be recycled forever, and are the most eco-friendly container.

リデュース リユース リサイクル