



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 of 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 <small>Note1</small>	268	36.6	320	43.6	402	53.2
Plastic container <small>Note1</small>	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 <small>Note2</small>	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.

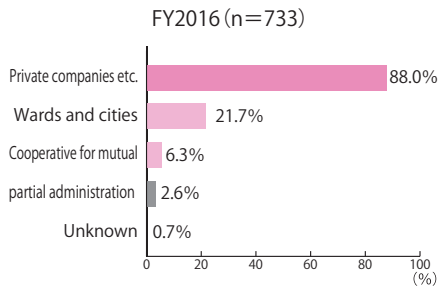


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2. How Do Municipalities Collect Steel Cans?

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.



Recycling Route of Steel Cans (multiple answers)

98.9% of the municipalities collect steel cans. Other than municipalities collection route, 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

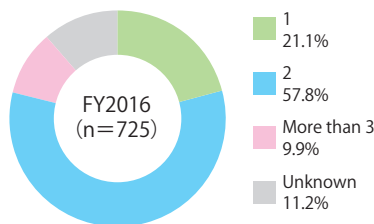
Items Discharging together with Steel Cans (multiple answers)

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

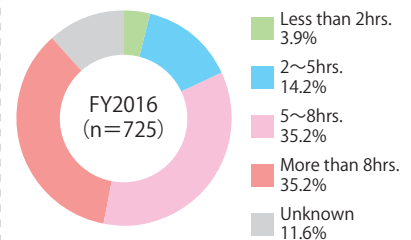
Number of Operation Staff per a Collection Truck per Day

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



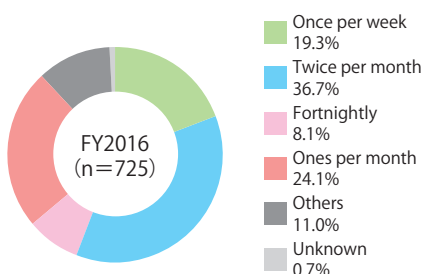
Hours for Collection per Day

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



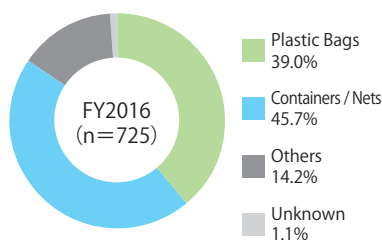
Frequency of steel cans collection

Most of municipalities collect steel cans twice per month.



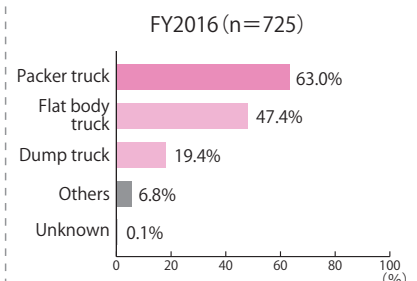
Types of Rubbish Bin

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.





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3. How Are Steel Cans Recycled?

Recycling Facilities of Cans

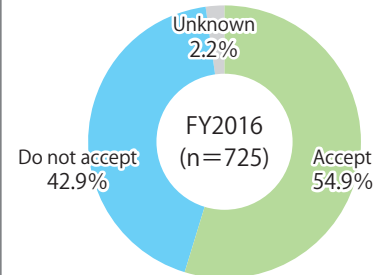
More than 40% of municipalities hold own intermediate process facilities. The number of third sectors facilities are decreased dramatically.

	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

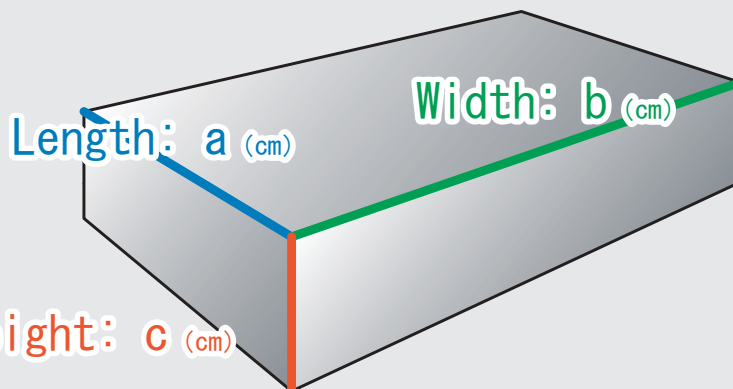
Source: The Japan ferrous raw materials association, "Uniform Standards of Ferrous Scraps"

[Size]

- Maximum Length $\leq 80(\text{cm})$
- $60(\text{cm}) \leq a+b+c \leq 180(\text{cm})$

[Bulk specific gravity]

- More than $0.6\text{t}/\text{m}^3$



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



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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.

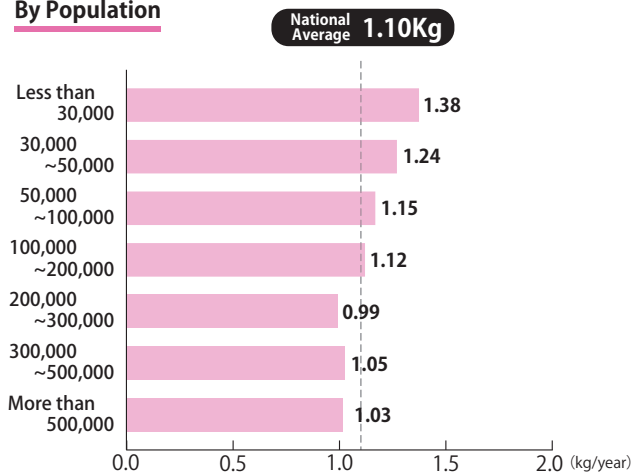
Recycling Quantity of Steel Cans per Capita (estimated based on the record in FY2016)

(Unit: t/yr)

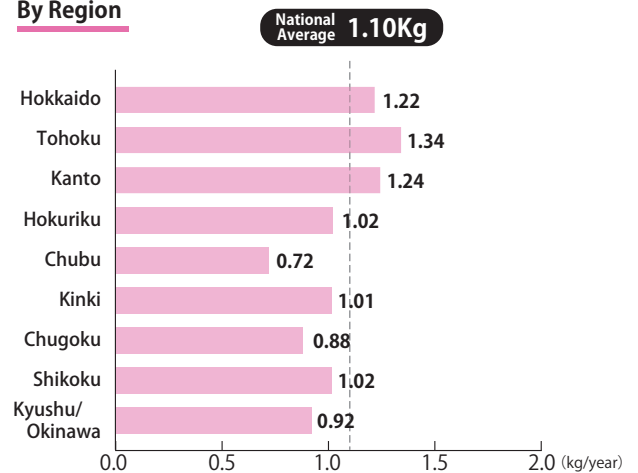
	# of wards and cities	Recycling quantity of steel cans per capita
Press	583	98,049
Round cans etc.	24	1,890
Shredder	23	3,409
Delivery to recycling manufactures	29	3,834
Pressing individual cans	3	267
Others	20	6,129
Unknown	15	5,160
Total	697	118,738

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

By Population



By Region



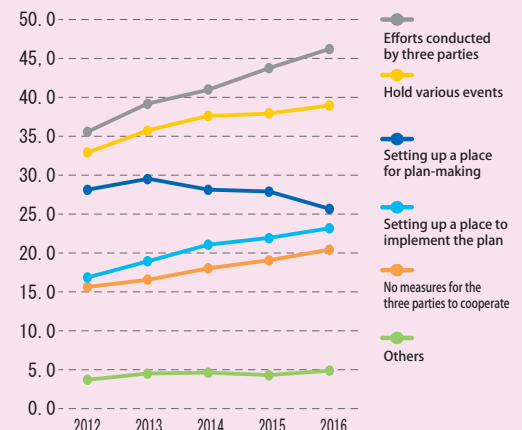
Triple Collaboration Among Municipalities, Citizens, and the Businesses in the Field of Environment.

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 place 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





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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

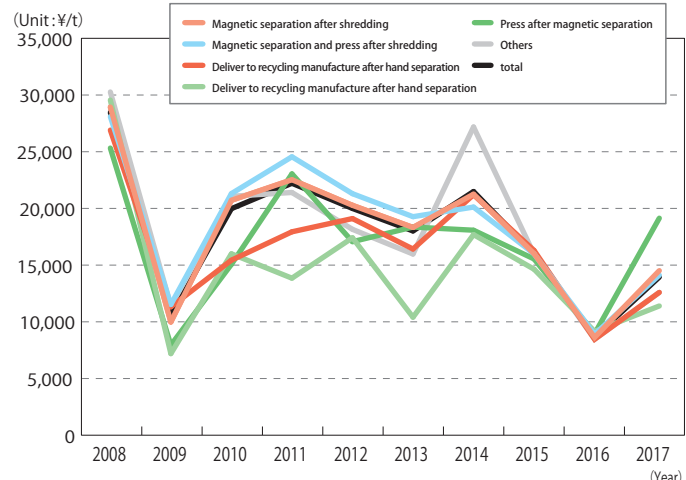
Both noncombustible and combustible waste scrap are mostly sold with charge. However, once there is extraneous material admixed except iron, there is a case of inverse onerous contract since it takes more time efforts to separate.

		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 According 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





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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.

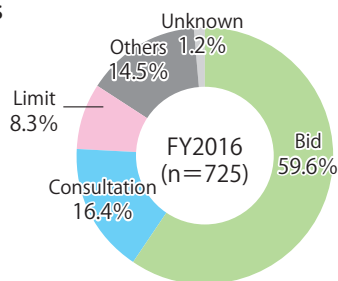
		Press	Shredder	Pressing individual cans	Round cans	Mixed round cans (aluminum & steel)	Others	Total
With charge	# of wards and cities	492	18	7	58	65	25	665
	rate(%)	97.6	100.0	100.0	87.9	87.8	80.6	95.0
Without charge	# of wards and cities	9	0	0	3	5	1	18
	rate(%)	1.8	0.0	0.0	4.5	6.8	3.2	2.6
Inverse onerous 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.

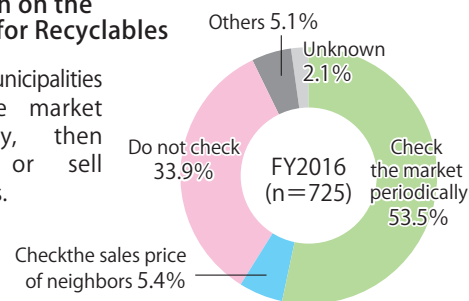
Methods to Decide Sales Price of Steel Cans

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)

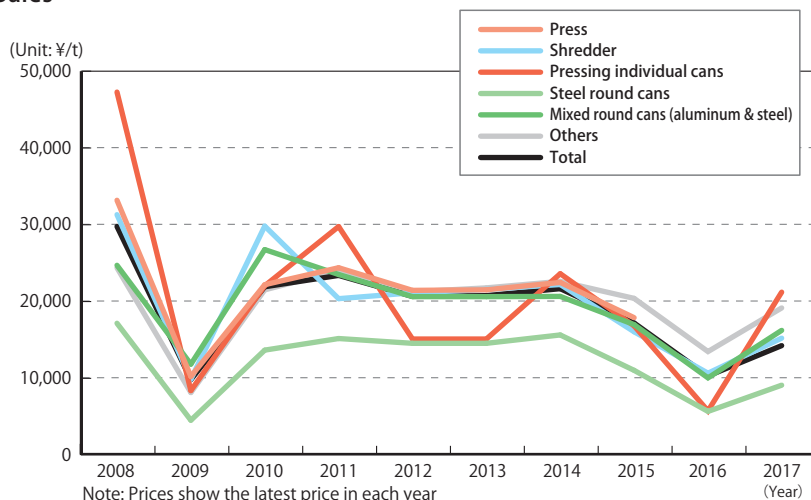
Price of steel cans collected by municipalities is ¥18,349/t. Price of steel cans and metals collected from noncombustible waste is ¥18,950/t (the price might influence with other metals).

	# 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.

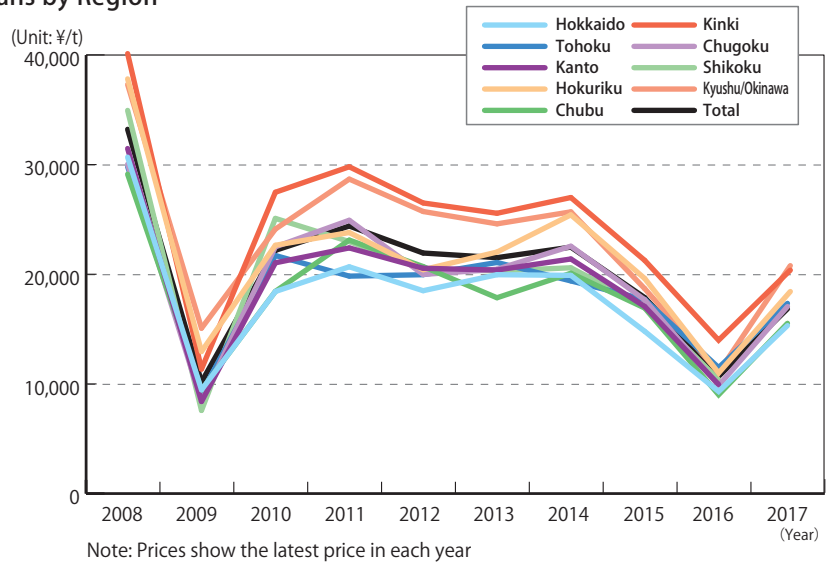
	June-July, 2017	
	# of wards and cities	Price (¥/t)
Press	463	18,114
Shredder	17	15,697
Pressing individual cans	5	21,090
Steel round cans	55	9,573
Mixed round cans (aluminum & steel)	64	16,900
Others	24	19,114
Total	628	17,383



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.

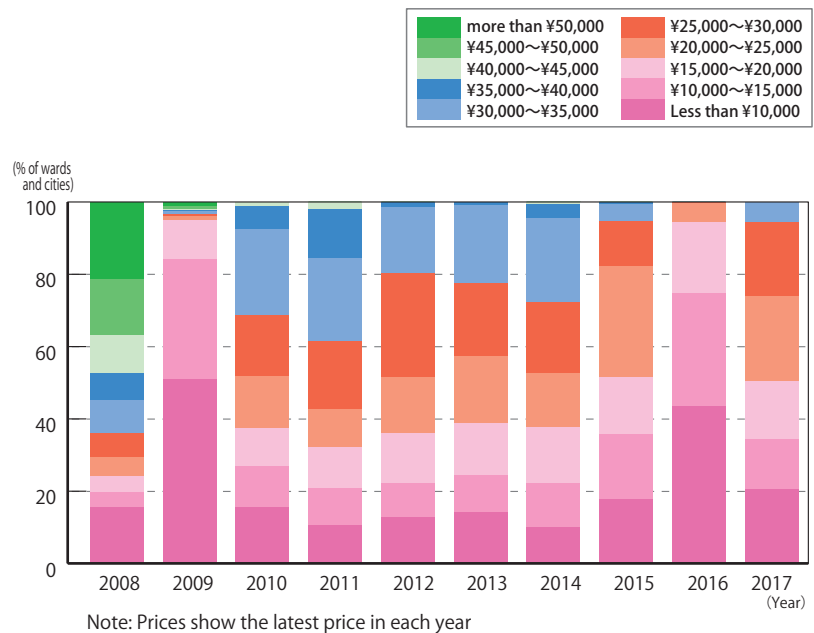
	June-July, 2017	
	# of wards and cities	Price (¥/t)
Hokkaido	30	15,551
Tohoku	43	17,478
Kanto	131	17,704
Hokuriku	19	18,567
Chubu	49	15,770
Kinki	61	20,546
Chugoku	39	17,112
Shikoku	21	15,950
Kyushu/Okinawa	70	20,979
Total	463	18,114



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



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

