



### 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 FY2018

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 2018 to March 2019

Research period : From June to July 2019

Research subject : The cities all over Japan and the 23 wards in Tokyo (815 Wards and cities)

The number of returned questionnaires : 728 Wards/ Cities

The return rate : 89.3%

The population coverage rate : 83.6%

Note: Total population (estimated) is 126,443,000 as of October 1st, 2018 (data from the Statistics Bureau).



People sorted out recyclables as "Cans"

### The Rate of Municipalities Practicing Sorted Collection

The trend has not changed since 2009. Most of municipalities are practicing sorted waste.

	FY2009		FY2013		FY2018	
	# of wards and cities	rate (%)	# of wards and cities	rate (%)	# of wards and cities	rate (%)
<b>Total</b>	809	—	808	—	815	—
The number of returned questionnaires(The return rate)	710	87.8	725	89.7	728	89.3
Practiced throughout the Municipal District	701	98.7	717	98.9	719	98.8
Practiced in parts of the Municipal District	7	1.0	7	1.0	6	0.8
Not practiced	2	0.3	1	0.1	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 FY2009. The number of the municipalities collect steel cans separately from paper container or spray cans.

	FY2009		FY2013		FY2018	
	# of wards and cities	rate (%)	# of wards and cities	rate (%)	# of wards and cities	rate (%)
<b>Steel cans</b>	683	96.5	701	96.8	694	95.7
<b>Aluminum cans</b>	686	96.9	700	96.7	695	95.9
<b>Glass bottles</b>	697	98.4	712	98.3	692	95.4
<b>PET bottles</b>	675	95.3	696	96.1	682	94.1
<b>Waste paper</b>	591	83.5	609	84.1	610	84.1
<b>Cartons</b>	541	76.4	567	78.3	565	77.9
<b>Cardboard</b>	595	84.0	611	84.4	606	83.6
<b>Paper container</b>	292	41.2	358	49.4	405	55.9
<b>Plastic container</b>	435	61.4	470	64.9	468	64.6
<b>Fabric</b>	362	51.1	391	54.0	405	55.9
<b>Metals</b>	292	41.2	310	42.8	318	43.9
<b>Small household appliances</b>	Include others		137	18.9	337	46.5
<b>Spray cans</b>			268	37.0	461	63.6
<b>Food trays</b>			Include others		175	24.1
<b>Used cooking oil</b>					176	24.3
<b>Others</b>	316	44.6	415	57.3	203	28.0
<b>Total</b>	708	100.0	724	100.0	725	100.0

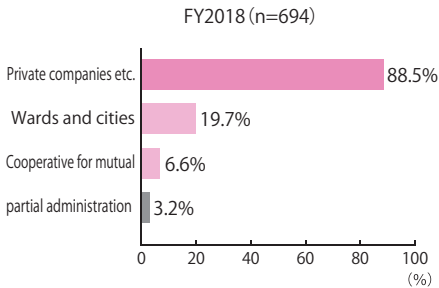


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## 2. How Do Municipalities Collect Steel Cans?

#### Agencies of Collecting Steel Cans (multiple answers)

To be an effective collecting cost, only 19.7% of municipalities collect by own and most of them (88.5%) does contract collection.



#### Recycling Route of Steel Cans (multiple answers)

95.7% of the municipalities collect steel cans. Other than municipalities collection route, there are 50.5% of group collection and 19.9% of site collection for the steel cans.

	FY2018	
	# of wards and cities	rate(%)
Sorted collection	694	95.7
Collection from noncombustible waste	68	9.4
Collection from combustible waste	6	0.8
Group collection	366	50.5
Site collection	144	19.9
Store collection	6	0.8
Total	725	100.0

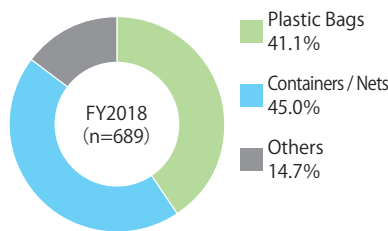
#### Items Discharging together with Steel Cans (multiple answers)

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.

	FY2009		FY2013		FY2018	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Only beverage steel cans	683	100.0	13	1.9	5	0.7
Beverage aluminum cans			599	85.4	597	86.0
Food steel cans	635	93.0	617	88.0	603	86.9
General cans	622	91.1	595	84.9	554	79.8
Spray cans	404	59.2	285	40.7	239	34.4
18 litter cans	181	26.5	118	16.8	94	13.5
Metals	-	-	87	12.4	70	10.1
Glass bottles	-	-	144	20.5	146	21.0
Pet bottles	-	-	44	6.3	44	6.3
Others	-	-	47	6.7	41	5.9
Total	683	100.0	701	100.0	694	100.0

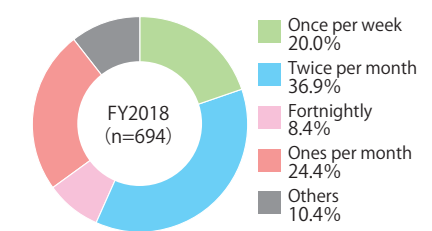
#### Types of Rubbish Bin

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



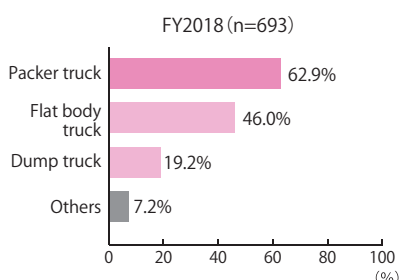
#### Frequency of steel cans collection

Most of municipalities collect steel cans twice per month.



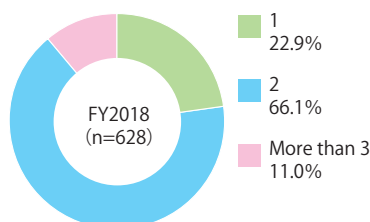
#### Types of Collection Trucks (multiple answers)

62.9% of municipalities use packer trucks and 46.0% use flat body trucks.



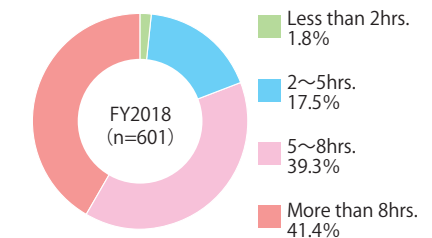
#### Number of Operation Staff per a Collection Truck per Day

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.





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### 3. How Are Steel Cans Recycled?

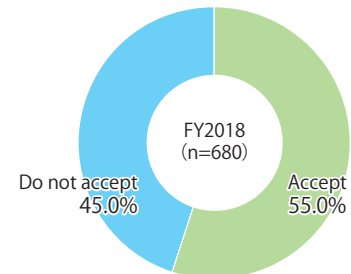
#### Recycling Facilities of Cans

More than 40% of municipalities hold own intermediate process facilities.

	FY2009		FY2013		FY2018	
	# of wards and cities	rate(%)	# of wards and cities	rate(%)	# of wards and cities	rate(%)
Wards and cities	290	40.7	294	42.7	290	43.3
partial administration	134	18.8	138	20.0	160	23.9
Private companies etc.	244	34.2	213	30.9	233	34.8
Third sectors	3	0.4	5	0.7	4	0.6
Others / Multiple answers	-	-	39	5.7	16	2.4
<b>Total</b>	<b>713</b>	<b>100.0</b>	<b>689</b>	<b>100.0</b>	<b>669</b>	<b>100.0</b>

#### Whether the Facilities Accept Used

55.0% of facilities accept used steel cans from the businesses.



#### Selection Process of Cans

Before selection process and forms of steel cans, 33.0% for magnetic and hand separation, 23.5% for magnetic separation only, and 15.5% for magnetic and machine separation. More than 80% of municipalities use magnetic separation before selection process and forms of steel cans. Some municipalities directly sell it without separation.

	FY2018	
	# of wards and cities	rate(%)
Magnetic & hand separation	222	33.0
Magnetic separation only	158	23.5
Magnetic & machine separation	104	15.5
Magnetic & machine separation (except cans) & hand separation (except cans)	102	15.2
Hand separation only	19	2.8
No separation	34	5.1
Others	33	4.9
<b>Total</b>	<b>672</b>	<b>100.0</b>

#### Forms after Selection of Cans

About 80% of steel cans are pressed. 4.8% of municipalities do not separate the steel cans which goes directly to recyclers.

	FY2018	
	# of wards and cities	rate(%)
Press (Block-shape)	581	84.1
Shredder	24	3.5
Round cans etc.	20	2.9
Press (individual cans)	4	0.6
No processing	33	4.8
Others	29	4.2
<b>Total</b>	<b>691</b>	<b>100.0</b>

#### 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

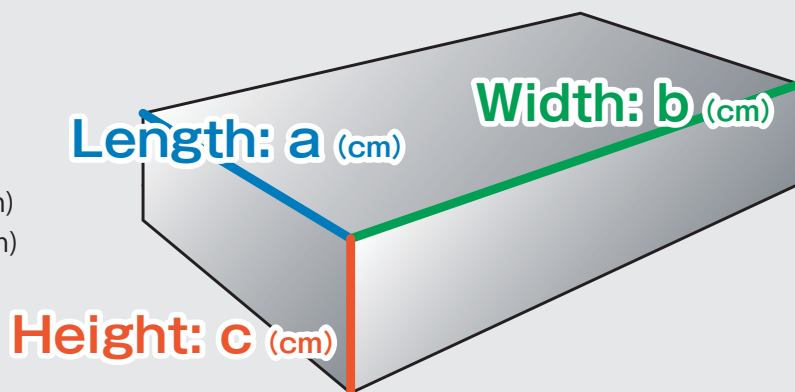
Source: The Japan ferrous raw materials association, "Uniform Standards of Ferrous Scraps"

[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 130,000 tons

The recycling quantity of steel cans for the 661 wards and cities that answered the questionnaire was 102,431 tons based on the record in FY2018. It translates into the recycling of a total of 130,314 tons nationwide.

#### ■ The Amount of Steel Can Recycled per Capita is 1.00kg Annually Based on the Record in FY2018.

The average quantity of recycling is 1.00kg which decreases 0.16kg compare to last year. The highest recycling ratio is shown among the population of less than 30,000. Also, the amount recycled in Hokkaido region and Tohoku region is large than other regions.

#### Recycling Quantity of Steel Cans per Capita (estimated based on the record in FY2018)

(Unit: t/yr)

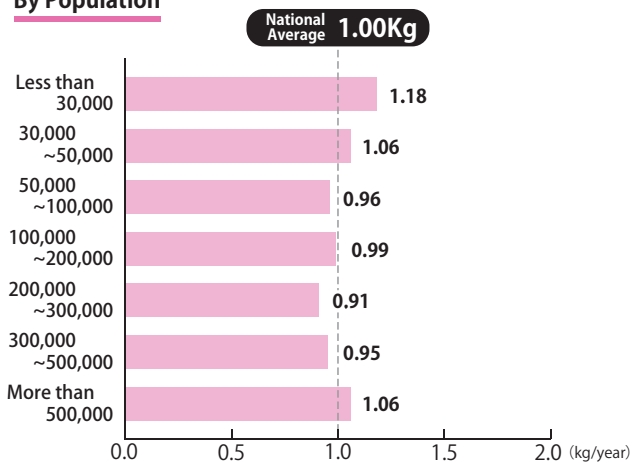
	# of wards and cities	Recycling quantity of steel cans per capita
Press	555	87,787
Shredder	22	3,471
Round cans etc.	18	1,263
Pressing individual cans	4	346
Delivery to recycling manufactures	30	3,832
Others	32	5,732
<b>Total</b>	<b>661</b>	<b>102,431</b>

Note: [Others] indicates unknown or multiple answers.

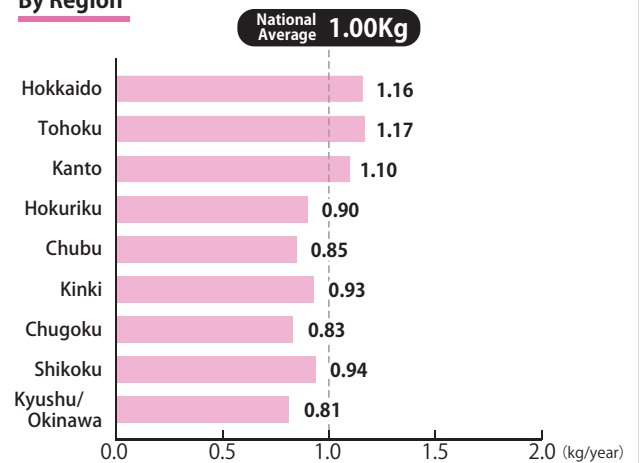


#### Recycling Quantity of Steel Cans per Capita (estimates based on the record in FY2018)

##### By Population



##### By Region



### Cans of Trivia

In 1871 (Meiji 4), Masanori Matsuda, the chief of a foreign language school in Nagasaki, was taught a manufacturing method by French teacher Leon Julie and prototyped canned sardine oil. That is said that the beginning of Japanese canning.

Beverage cans appeared in 1955 (Showa 30), and beer cans with aluminum pull tabs were released in 1965 (Showa 40), and became ring tab lids (left) that separate the pull tabs from the drinking part. This has led to the rapid spread of canned beverages because of the convenience of drinking anywhere, anytime.

However, littering and scattering of the pull tab became a social problem, and it was switched to a stay-on tab lid (right) from around 1990. The stay-on tub lid is designed so that the tub itself does not come off from the can, and is used in all beverage cans currently produced in Japan.



Ring Tub



Stay-on Tub



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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 29,000 tons totally

According to the research data collected from 565 municipalities, the amount of iron collected is 249,834 tons in FY2018 (including 20,783 tons of steel can). This translates into the recycling of 351,309 tons nationwide (including 29,224 tons of steel can).

The amount of Steel Cans Collected from Noncombustible Waste (estimated based on the record in FY2018)

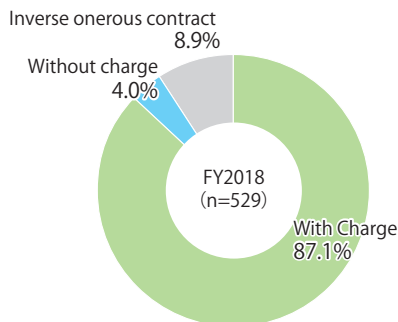
	# of wards and cities	The amount of iron collected	The amount of steel can collected
Magnetic separation after shredding	249	126,293	10,651
Magnetic separation and press after shredding	85	18,441	1,786
Deliver to recycling manufacture after hand separation	122	56,811	4,197
Deliver to recycling manufacture after hand separation	12	5,476	401
Press after magnetic separation	13	5,361	689
Others	84	37,452	3,058
<b>Total</b>	<b>565</b>	<b>249,834</b>	<b>20,783</b>

Note1: 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.

Note2: [Others] indicates unknown or multiple answers.

#### ○ Sales Price of Processing Ferrous Metals from Noncombustible Waste

Noncombustible waste scrap is mostly sold with charge (87.1%). However, once there is extraneous material admixed except iron, there is a case of inverse onerous.



#### ○ Form of Processing Ferrous Metals [only in items with charge]

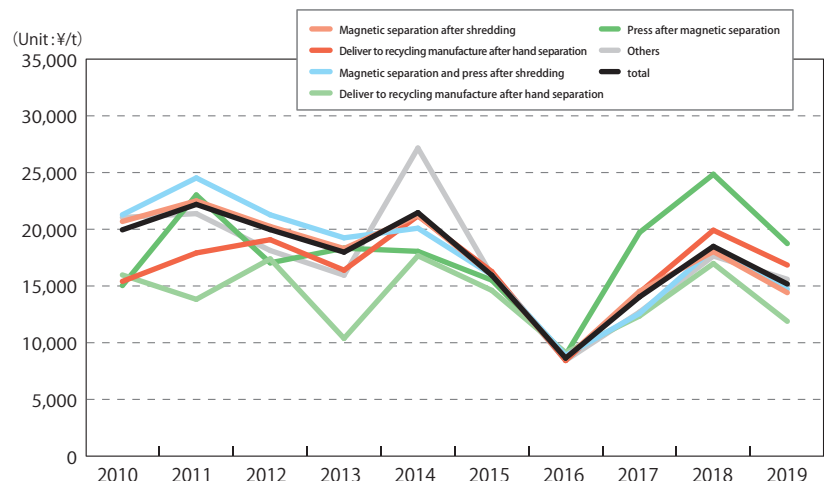
The highest ration of processing at noncombustible waste is magnetic separation after shedding (44.9%), then 18.9% of municipalities are magnetic separation and press after shredding. On the other hand, 16.5% of municipalities are hand separation only.

	FY2018	
	# of wards and cities	rate(%)
Magnetic separation after shredding	207	44.9
Deliver to recycling manufacture after hand separation	76	16.5
Magnetic separation and press after shredding	87	18.9
Deliver to recycling manufacture after hand separation	11	2.4
Press after magnetic separation	13	2.8
Others	67	14.5
<b>Total</b>	<b>461</b>	<b>100.0</b>

#### ○ 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 once in 2018, but dropped again in 2019.

	June-July, 2019	
	# of wards and cities	Price (¥/t)
Magnetic separation after shredding	207	14,412
Deliver to recycling manufacture after hand separation	76	14,720
Magnetic separation and press after shredding	87	16,845
Deliver to recycling manufacture after hand separation	11	11,886
Press after magnetic separation	13	18,740
Others	67	15,588
<b>Total</b>	<b>461</b>	<b>15,176</b>





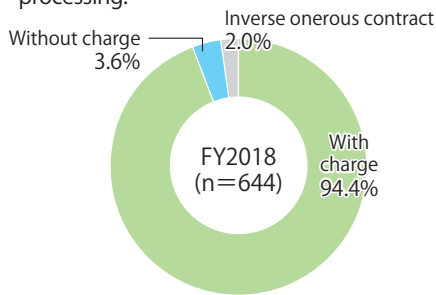


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## 6. How Much Pressed Steel from Cans Do Municipalities Sell?

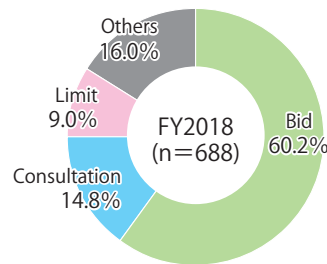
#### Price Conditions of Steel Cans

94.4% of steel cans are sold with charge, 3.6% without charge, and 2.0% are inverse onerous contract in municipalities. The reason of inverse onerous contract is such as delivering directly to recycler cost consignment fee for processing.



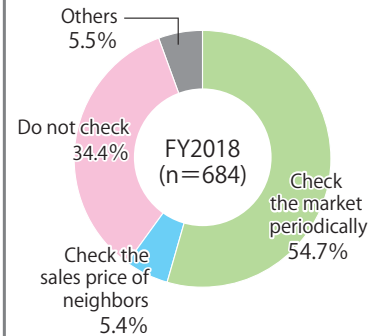
#### Methods to Decide Sales Price of Steel Cans

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.



[Following cases are only for the municipalities where the steel cans are sold with charge]

#### Form of Steel Cans

Over 75.0% of municipalities are sold pressed steel cans, 10.4% are mixed round cans, 8.4% are steel round cans.

	FY2018	
	# of wards and cities	rate(%)
Press	456	75.0
Shredder	17	2.8
Pressing individual cans	2	0.3
Steel round cans	51	8.4
Mixed round cans (aluminum & steel)	63	10.4
Others	19	3.1
<b>Total</b>	<b>608</b>	<b>100.0</b>

#### Average Sales Price of Pressed Steel Cans

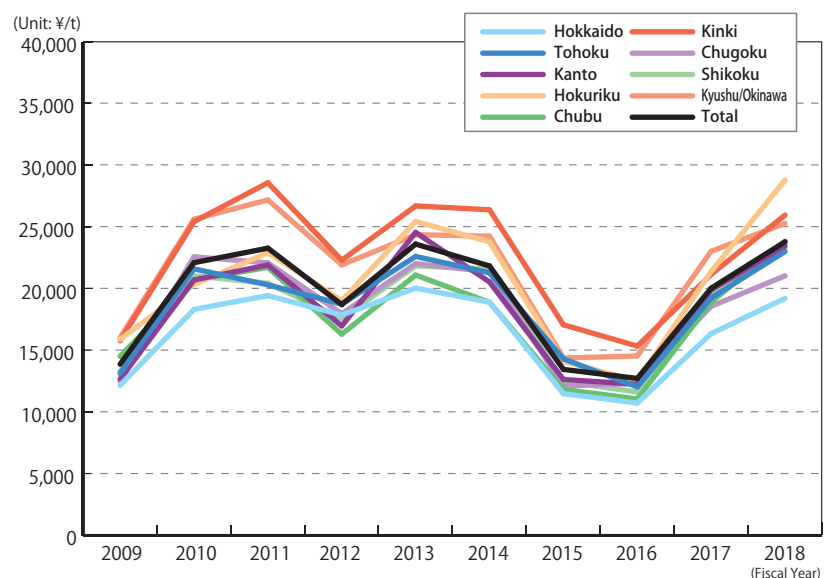
Price of steel cans collected by municipalities is ¥23,907/t.

	FY2018	
	# of wards and cities	Price (¥/t)
Price of steel cans collected by municipalities	397	23,907
Price of steel cans and iron collected from noncombustible waste	17	23,367
Price of steel cans and metals collected from noncombustible waste	1	32,366
Others	10	19,415
<b>Total</b>	<b>425</b>	<b>23,800</b>

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

The average sales price of pressed steel from cans has increased in total. Prices were higher in Kinki until 2016 but Kyushu/Okinawa are the highest in FY 2017, and Hokuriku is the highest in FY2018.

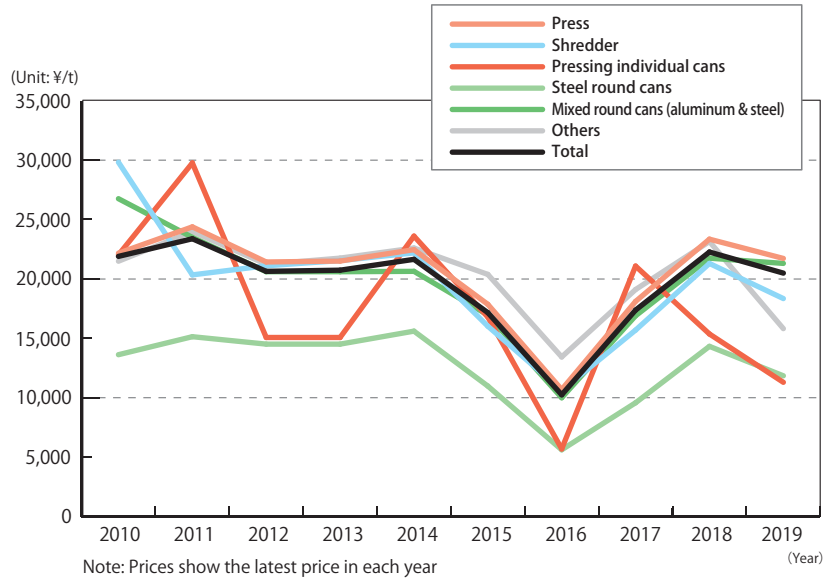
	FY2018	
	# of wards and cities	Price (¥/t)
Hokkaido	26	19,210
Tohoku	37	23,003
Kanto	130	23,454
Hokuriku	17	28,790
Chubu	48	23,829
Kinki	50	25,954
Chugoku	35	21,038
Shikoku	18	23,265
Kyushu/Okinawa	70	25,280
<b>Total</b>	<b>431</b>	<b>23,794</b>



## Latest 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 2014 as of 2018. The price of steel cans is dropped in 2019.

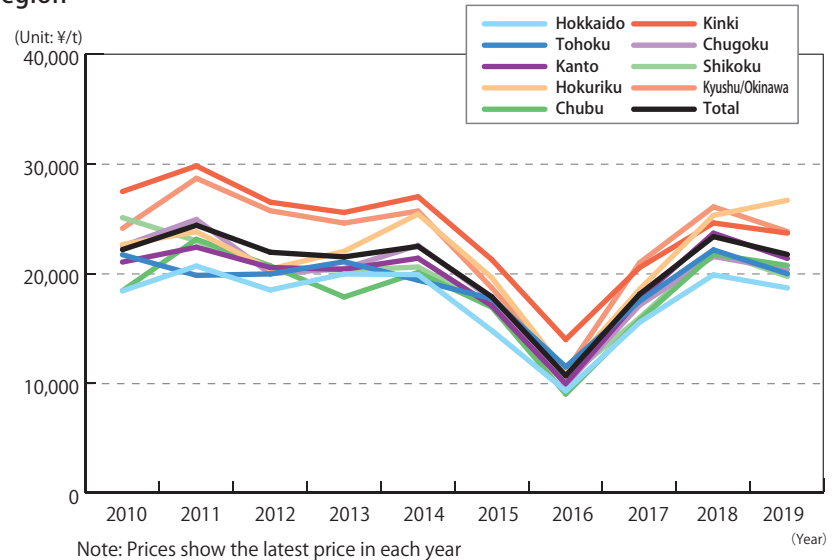
	June-July,2019	
	# of wards and cities	Price (¥/t)
Press	453	21,736
Shredder	17	18,355
Pressing individual cans	2	11,300
Steel round cans	51	11,848
Mixed round cans (aluminum & steel)	57	21,318
Others	20	15,823
<b>Total</b>	<b>600</b>	<b>20,499</b>



## Latest Price of Pressed Steel Cans by Region

Latest sales price of pressed steel cans has been up and down since 2016. The price is high in Kyushu/Okinawa, Hokuriku and Kinki.

	June-July,2019	
	# of wards and cities	Price (¥/t)
Hokkaido	28	18,684
Tohoku	42	19,979
Kanto	134	21,377
Hokuriku	18	26,676
Chubu	49	20,729
Kinki	54	23,681
Chugoku	34	20,355
Shikoku	21	19,730
Kyushu/Okinawa	73	23,819
<b>Total</b>	<b>453</b>	<b>21,736</b>



## Latest Price Distribution of Pressed Steel from Cans

The price of pressed steel cans is traded over the price of ¥20,000/t among 60% of municipalities. 13.3% of municipalities trade less than ¥10,000/t.

Price (¥/t)	June-July,2019	
	# of wards and cities	rate(%)
More than ¥40,000	1	0.2
¥35,000~¥40,000	10	2.2
¥30,000~¥35,000	103	22.7
¥25,000~¥30,000	99	21.9
¥20,000~¥25,000	63	13.9
¥15,000~¥20,000	62	13.7
¥10,000~¥15,000	55	12.1
Less Than ¥10,000	60	13.3
<b>Total</b>	<b>453</b>	<b>100.0</b>

