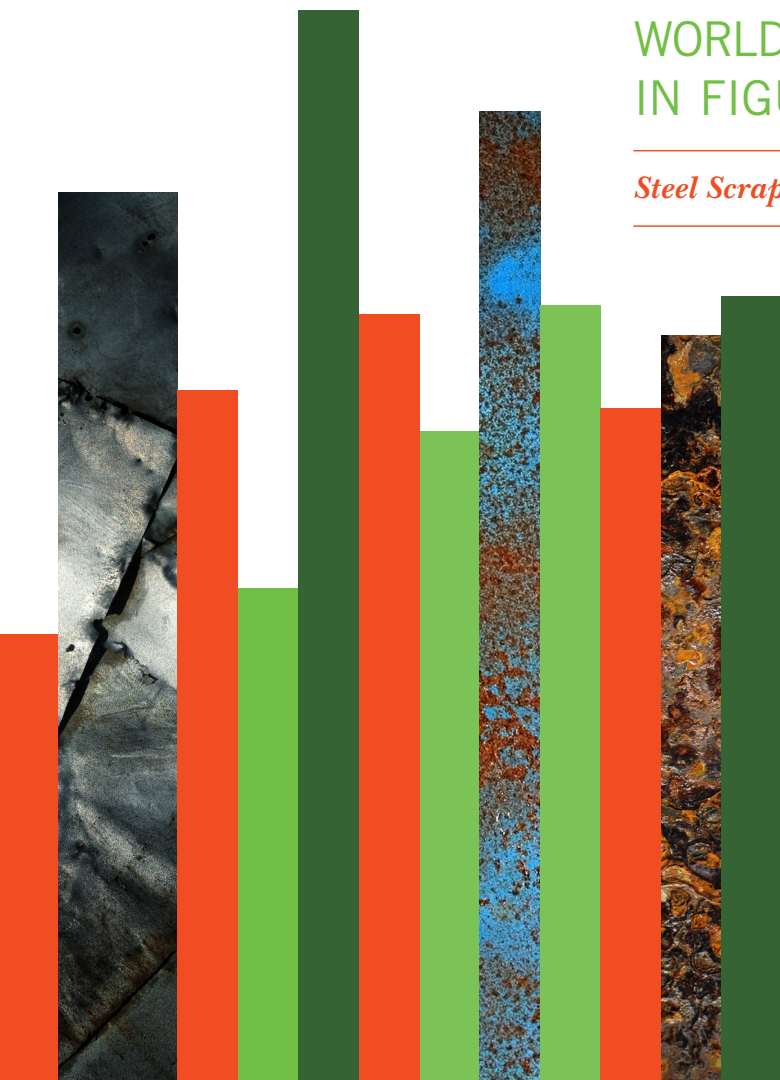


WORLD STEEL RECYCLING
IN FIGURES 2013 – 2017

Steel Scrap – a Raw Material for Steelmaking



Bureau of
International Recycling
Ferrous Division

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FOREWORD

The ninth edition of our BIR ferrous report “World Steel Recycling in Figures”, which covers the five-year period between 2013 and 2017, highlights the importance of ferrous scrap as a global raw material for the world’s steelworks and for its iron and steel foundries.



It is a great pleasure for me to announce the publication of the ninth edition of our “World Steel Recycling in Figures” report. This compilation of important statistics relating to the global ferrous scrap markets has received a hugely positive reception since it appeared for the first time in 2010.

In our latest edition, the final figures for 2017 show an increase in world crude steel output and in global steel scrap use as a raw material for steelmaking. It highlights the strong growth in China’s steel scrap usage last year - which was closely related to the closure of most of its induction furnaces – and the resulting statistical effects.

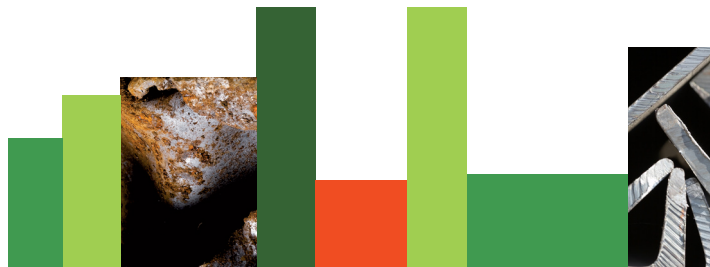
Total steel scrap use in the seven key countries and regions for which we have statistics was 425 million tonnes while related crude steel production was 1.37

billion tonnes. For the world as a whole, we calculate a steel scrap use of around 600 million tonnes last year, with global crude steel production at 1.69 billion tonnes.

According to our calculations, annual ferrous scrap use in the world’s iron and steel foundries has been approximately 69 million tonnes over recent years.

The final figures for 2017 also show positive signs in external steel scrap trading, which increased to 99 million tonnes last year.

In the ninth edition of “World Steel Recycling in Figures”, we have included an overview of the main suppliers not only for Turkey as the world’s foremost steel scrap importer but also for the Republic of Korea, the second biggest steel scrap importer. Furthermore, we have prepared a flow chart covering steel scrap exports from China, which grew quickly last year.



The report as a whole contains nine flow charts – features which have received a particularly warm welcome. Overall, it incorporates a total of 59 graphs and tables, the same as its predecessor.

As ever, the scale of world trade in steel scrap underlines the need for a free raw material market.

I would like to extend special thanks to Rolf Willeke, the BIR Ferrous Division’s Statistics Advisor, who prepared and evaluated all the figures as well as developing the graphs and tables in our report. Since last year, he has been working with Daniela Entzian from our BDSV member federation in Germany, to whom I extend my appreciation. Rolf and his team are working with a worldwide network, so I would like to express my deep thanks to all the supporters of our publication.

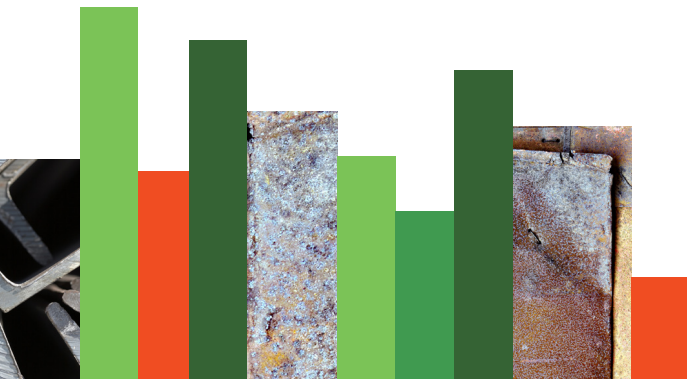
For an even more accurate appraisal of the market, we want to continue to improve the ferrous scrap figures at our disposal, including our quarterly update of the world statistics.

We hope that our BIR ferrous report “World Steel Recycling in Figures 2013-2017” will be useful to you and your day-to-day business operations.

Brussels, May 2018

Tom Bird

Interim President of the BIR Ferrous Division



EXECUTIVE SUMMARY

In our ninth edition of “World Steel Recycling in Figures”, the statistics for 2017 show an increase in world crude steel output and in global steel scrap use as a raw material for steelmaking. The figures also highlight the strong growth last year in China’s official steel scrap usage, as well as the positive signs in external steel scrap trading.



World crude steel production reached 1.69 billion tonnes in 2017, up 3.9% from 2016. According to worldsteel, crude steel production increased in all regions except the CIS last year.

The global increase in basic oxygen furnace production (+2.3% to 1.228 billion tonnes) was bettered by the upturn in scrap-intensive electric furnace production (+8% to around 445 million tonnes). There was a smaller increase in global blast furnace iron production (+1.1% to 1.180 billion tonnes) but stronger growth in global DRI production (+7.5% to 71.9 million tonnes).

Looking at the key countries and regions, worldsteel confirms that China’s crude steel production reached 831.7 million tonnes in 2017 (+3% over the previous year) such that the country’s share of world output was 49.2%. Increases in crude steel production were also registered last year in the EU-28 (+3.8% to 168.1 million tonnes), the USA (+4% to 81.6 million tonnes), the Republic of Korea (+3.6% to 71 million tonnes), Turkey (+13.1% to 37.5 million tonnes) and Russia

(+1.3% to 71.3 million tonnes) whereas the figure for Japan was virtually unchanged (-0.1% to 104.7 million tonnes).

China, the world’s biggest steel scrap user

According to official figures, steel scrap consumption grew in China last year to 147.9 million tonnes, prompting a dramatic increase in the proportion of steel scrap used in the country’s steel production to 17.8%.

During the preparation of our ninth edition of “World Steel Recycling in Figures”, intensive talks have been held to evaluate the reasons for this unexpected development in China’s steel scrap consumption. During our investigation, it was learned that this growth was closely related to China’s closure of induction furnaces last year, with most of this sector’s production and steel scrap consumption not included in official figures. Estimates indicate that steel scrap use in the country’s induction furnaces could have amounted to around 60 million tonnes in 2016. Given that the figures we have been receiving since 2010 from the China Association of Metalscrap Utilization (CAMU) have not incorporated the large quantity of

steel scrap used by induction furnace operators in 2016 and in preceding years, no direct comparisons can be made with the figures for 2017.

Following the closure of its induction furnaces, most of this 60 million tonnes of steel scrap was used last year by China's basic oxygen furnace (BOF) and electric furnace (EF) steel producers, thus explaining last year's sharp increase in China's official steel scrap usage. As we can see from our trading statistics, a further 2.2 million tonnes of steel scrap was not used domestically in China but was instead exported.

The increase in China's official usage figure for last year is in line with the government's plans for a general increase in steel scrap use in domestic steel production.

EF production accounted for 6.5% of China's overall steel production in 2017 but this figure is expected to climb over the coming years. As a result, further investments in steel scrap processing are planned, especially in shredder capacity.

For 2017, total steel scrap use in the seven key countries and regions was 425 million tonnes while related crude steel production was 1.37 billion tonnes. For the world as a whole, we calculate steel scrap usage of around 600 million tonnes for last year – including own arisings – in a global crude steel production total of, as noted above, 1.69 billion tonnes.

The proportion of steel scrap used in crude steel production was 35.5% worldwide last year.

According to our calculations, there were own arisings (circulating scrap) of around 194 million tonnes; the proportion of own arisings used in crude steel production dropped from nearly 12% in 2016 to 11.5% in 2017 as a result of mills' efforts to improve efficiency. Our calculations also reveal scrap purchases by steelworks worldwide of 406 million tonnes last year.

According to our statistics for last year, there were increases in steel scrap consumption among key countries and regions of the world. For example, the EU-28 recorded year-on-year growth of 5.6% in steel scrap consumption to 93.35 million tonnes whereas the region's crude steel production increased by a smaller proportion (+3.8%). The EU's biggest steel scrap users were Italy (+8.4% to 21.589 million tonnes), Germany (+3.5% to 19.008 million tonnes), Spain (+5.5% to 11.075 million tonnes) and France (+2.3% to 7.193 million tonnes). The proportion of steel scrap used in the region's crude steel production was 55.5% last year.

The USA recorded an increase in its steel scrap usage last year (+3.7% to 58.8 million tonnes) but growth in crude steel production was a little higher (+4%). The electric furnace share of US crude steel production increased to 68.4% in 2017 while the proportion of steel scrap used in the country's crude steel production was 72.1%.

Our 2017 figures reveal a year-on-year increase in Japan's steel scrap usage (+6.6% to 35.8 million tonnes) whereas the country's crude steel production was virtually unchanged (-0.1%). The proportion

of steel scrap used in the country's crude steel production was 34.2% last year.

The Republic of Korea recorded growth in its steel scrap usage last year of 11.3% to 30.5 million tonnes and yet domestic crude steel production increased only by 3.6%. The proportion of steel scrap used in the country's crude steel production was 43% in 2017.

The increase in Turkey's steel scrap consumption of 17% to 30.3 million tonnes was greater than the upturn in the country's crude steel production (+13.1%). The proportion of steel scrap used in Turkish crude steel production in 2017 was 80.8%.

The increase in Russia's crude steel production last year (+1.3%) was outstripped by the growth in its steel scrap usage (+2.5% to 28.5 million tonnes). The proportion of steel scrap used in Russia's crude steel production was 39.9% in 2017.

Relatively stable ferrous scrap use in world's iron and steel foundries

Our calculation model for global ferrous scrap use in iron and steel foundries is produced in collaboration with experts from the German Foundry Association (BDG). These calculations cover the period from 2010 to 2016; it was not possible to incorporate figures for 2017 because world casting production is determined only by the magazine "Modern Casting" with a time lag of one year. For 2016, we have calculated global ferrous scrap usage of 68.9 million tonnes (-0.89% when compared to 2015) for a world iron and steel casting production of 83.18 million tonnes (-1.09%).

Strong increase in Turkey's overseas purchases of steel scrap

Last year brought an increase in Turkey's overseas steel scrap purchases of 18.4% to 20.981 million tonnes, thereby underlining its position as the world's foremost steel scrap importer. The country's main suppliers were the USA (+16.5% to 3.798 million tonnes) and the UK (+22% to 3.18 million tonnes).

Steel scrap imports were also higher last year for the Republic of Korea (+5.6% to 6.175 million tonnes); the country's main suppliers were Japan (+17.3% to 4.014 million tonnes) and Russia (-1.4% to 1.018 million tonnes). Also higher in 2017 were steel scrap imports into the USA (+20% to 4.636 million tonnes), the EU-28 (+14.2% to 3.139 million tonnes), China (+7.6% to 2.326 million tonnes), Canada (+15% to 2.115 million tonnes), Indonesia (+77.5% to 1.812 million tonnes) and Belarus (+9.6% to 1.353 million tonnes). Conversely, import declines were recorded by India (-15.9% to 5.365 million tonnes), Taiwan (-7.5% to 2.919 million tonnes) and Mexico (-5.9% to 1.782 million tonnes).

To date for Pakistan, we have available only a steel scrap import figure for 2016 (+24% year on year to 4.039 million tonnes).

EU-28: still the leading steel scrap exporter

Global external steel scrap trading - including internal EU-28 trade - amounted to 99 million tonnes last year (+9.3% compared to 2016).

The EU-28, still the world's leading steel scrap exporter, upped its outbound shipments by 12.9% to 20.055 million tonnes, the main buyer being Turkey (+21.6% to 12.604 million tonnes). The EU-28 also increased its overseas shipments of steel scrap last year to Egypt (+54.2% to 1.391 million tonnes), Pakistan (+0.7% to 1.366 million tonnes), the USA (+6.2% to 0.920 million tonnes), Switzerland (+16% to 0.523 million tonnes) and Morocco (+117.1% to 0.495 million tonnes). Conversely, a drop was recorded in EU-28 deliveries to India (-50% to 0.883 million tonnes).

The EU-28's internal steel scrap exports totalled 29.123 million tonnes last year (+7.7% compared to 2016).

Last year brought higher US exports of steel scrap (+17.1% to 15.016 million tonnes). Among the leading buyers to extend their purchases from the USA were Turkey (+14.6% to 3.631 million tonnes), Mexico (+1.8% to 1.667 million tonnes), Taiwan (+3.9% to 1.419 million tonnes), China (+14.5% to 1.017 million tonnes), Canada (+28.4% to 0.919 million tonnes) and Vietnam (+86.8% to 0.710 million tonnes). Conversely, there was a decline in US scrap shipments to India (-36.5% to 0.707 million tonnes).

An upturn was apparent last year in steel scrap exports from Canada (+21.4% to 4.409 million tonnes), Australia (+25% to 1.979 million tonnes) and Hong Kong (+2.4% to 1.380 million tonnes). In contrast, steel scrap export decreases were recorded in 2017 by Japan (-5.5% to 8.217 million tonnes),

Russia (-6% to 5.193 million tonnes) and Singapore (-24.6% to 0.790 million tonnes).

New to our worldwide export review are figures for China. As noted above, China's steel scrap exports were closely related to last year's closure of domestic induction furnace capacity. According to our figures, China exported 2.230 million tonnes of steel scrap in 2017, with the biggest buyers being Indonesia on 0.690 million tonnes as well as Thailand and Vietnam on 0.318 million tonnes.

Most of the world's leading steel scrap exporters are major net steel scrap exporters: last year's export surplus was, for example, 16.9 million tonnes for the EU-28 and 10.4 million tonnes for the USA.

Our figures show that ferrous scrap is a raw material used worldwide in steelworks and in iron and steel foundries. It is an ecological and beneficial raw material as well as an internationally-traded commodity subject to world market prices, thus underlining the need for a free world raw material market.

In closing, I would like to extend my special thanks to Daniela Entzian with whom I have worked closely over the last year.

Rolf Willeke

Statistics Advisor of the BIR Ferrous Division

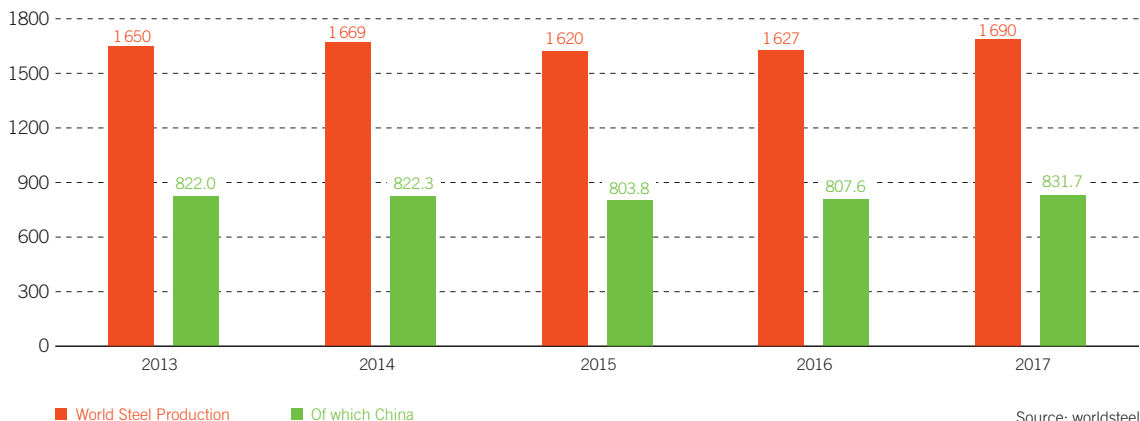
GRAPHS AND TABLES

WORLD CRUDE STEEL PRODUCTION – SUMMARY (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
European Union (28)	166.4	169.3	166.12	162.0	168.1	+3.8
of which Germany	42.65	42.9	42.7	42.1	43.2	+2.8
Other Europe	38.6	38.4	35.8	37.7	42.3	12.4
of which Turkey	34.7	34.0	31.51	33.2	37.5	+13.1
C.I.S.	108.4	106.1	101.6	102.1	102.1	0.0
of which Russia	69.0	71.5	70.9	70.5	71.3	+1.3
North America	118.98	121.1	110.9	110.6	115.7	+4.8
of which USA	86.9	88.2	78.8	78.5	81.6	+4.0
South America	45.8	45.1	43.9	40.2	43.7	+8.6
of which Brazil	34.2	33.9	33.3	31.3	34.4	+9.9
Africa	15.96	14.9	13.7	13.1	15.1	+14.9
of which South Africa	7.2	6.41	6.4	6.1	6.3	+2.6
Middle East	26.97	29.99	29.43	31.5	34.5	+9.5
of which Iran	15.4	16.3	16.15	17.9	21.2	+18.7
Asia	1 123.65	1 139.2	1 112.9	1 123.9	1 162.9	+3.5
of which China	822.0	822.3	803.8	807.6	831.7	+3.0
Oceania	5.6	5.5	5.7	5.8	6.0	+2.5
of which Australia	4.7	4.6	4.9	5.25	5.3	+1.3
World	1 650	1 669	1 620	1 627	1 690	+3.9
Total 66 countries						

Source: worldsteel

WORLD CRUDE STEEL PRODUCTION (MILLION TONNES)



THE 12 LARGEST STEEL-PRODUCING COUNTRIES (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
1 China	822.0	822.3	803.8	807.6	831.7	+3.0
2 Japan	110.6	110.6	105.1	104.8	104.7	-0.1
3 Indien	81.3	87.3	89.0	95.5	101.4	+6.2
4 USA	86.9	88.2	78.8	78.5	81.6	+4.0
5 Russia	69.0	71.5	70.9	70.4	71.3	+1.3
6 Korea Rep.	66.1	71.5	69.7	68.6	71.0	+3.6
7 Germany	42.6	42.9	42.7	42.1	43.3	+2.8
8 Turkey	34.7	34.0	31.5	33.2	37.5	+13.1
9 Brazil	34.2	33.9	33.3	31.3	34.4	+9.9
10 Italy	24.1	23.7	22.0	23.4	24.1	+3.0
11 Taiwan	22.3	23.1	21.4	21.8	22.4	+3.2
12 Ukraine	32.8	27.2	23.0	24.2	22.7	-6.4

Source: worldsteel

WORLD CRUDE STEEL PRODUCTION BY BOF AND EF PROCESS

YEAR 2017

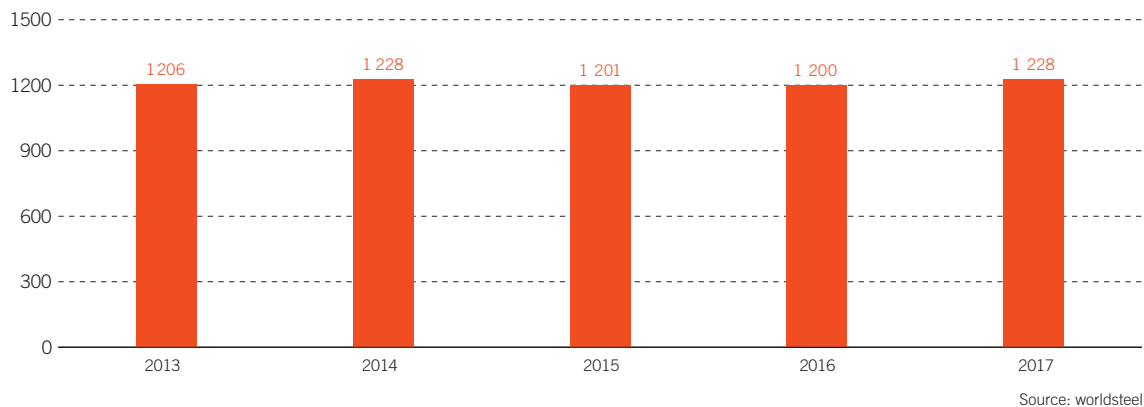
	Million Tonnes		Percentage of Total Production	
	BOF	EF	BOF	EF
European Union (28)	100.6	67.5	59.8	40.1
of which Germany	30.6	12.7	70.6	29.4
Other Europe	13.8	28.5	32.6	67.5
of which Turkey	11.6	26.0	30.8	69.2
C.I.S.	68.4	27.2	66.9	26.7
of which Russia	47.7	22.0	66.9	30.8
North America	37.8	78.0	32.6	67.4
of which USA	25.8	55.8	31.6	68.4
South America	30.0	13.2	68.6	30.2
of which Brazil	26.7	7.2	77.6	21.0
Africa	4.3	10.0	30.0	70.0
of which South Africa	3.7	2.6	59.2	40.8
Middle East	2.2	30.1	6.9	93.1
of which Iran	2.2	19.0	10.5	89.5
Asia	966.2	189.2	83.5	16.4
of which China	777.7	54.0	93.5	6.5
Oceania	4.8	1.2	79.5	20.5
of which Australia	4.1	1.2	77.0	23.0
World	1228	445	73.0	26.5
Total 66 countries				

BOF – Basic Oxygen Furnace

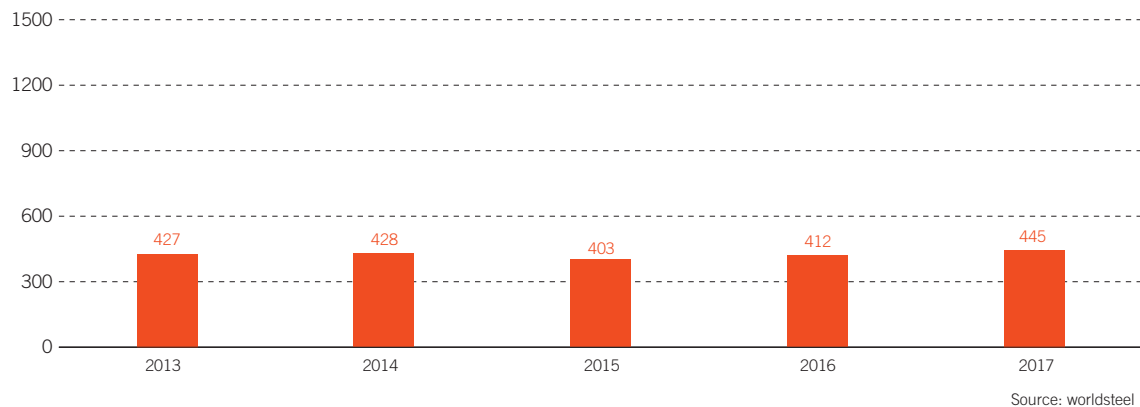
EF – Electric Furnace

Source: worldsteel

WORLD BOF – BASIC OXYGEN FURNACE PRODUCTION (MILLION TONNES)



WORLD EF – ELECTRIC FURNACE PRODUCTION (MILLION TONNES)



PRODUCTION OF CRUDE STEEL AND PRIMARY IRON IN THE WORLD (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	1 650	1 669	1 620	1 627	1 690	+3.9
of which:						
Basic Oxygen Furnace (BOF)	1 206	1 229	1 201	1 200	1 228	+2.3
Electric Furnace (EF)	427	428	403	412	445	+8.0
(Share BOF of Crude Steel) in %	73.1	73.6	73.1	74.1	72.7	
(Share EF of Crude Steel) in %	25.9	25.6	24.9	25.3	26.3	
Blast Furnace Iron Production	1 207	1 186	1 157	1 167	1 180	+1.1
(Ratio B F Iron / Crude Steel) in %	73.2	71.1	71.4	71.7	69.8	
Direct Reduced Iron (DRI) Production	67.9	68.3	63.9	66.9	71.9	+7.5
(Ratio DRI / Crude Steel) in %	4.1	4.1	3.9	4.1	4.3	

Source: worldsteel

STEEL SCRAP USE FOR STEELMAKING IN KEY COUNTRIES AND REGIONS (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
1 China	85.7	87.5	83.3	90.1	147.9	N.A.*
2 EU-28	90.3	91.6	90.61	88.4	93.35	+5.6
3 USA	59.0	62.0	56.5	56.7	58.8	+3.7
4 Japan	36.7	36.9	33.53	33.57	35.8	+6.6
5 Korea Rep.	32.7	32.6	29.85	27.4	30.5	+11.3
6 Turkey	30.4	28.2	24.1	25.9	30.3	+17.0
7 Russia	25.9	30.7	27.2	27.8	28.5	+2.5

*No direct comparisons can be made because most of the steel scrap consumed by the outdated induction furnaces was not included in the figures for 2016 and for preceding years.

Source: EUROFER, CAMU, USGS/ISRI-calculations, Ministry of Economy in Japan, KOSA, TCIUD, RUSMET

STEEL SCRAP USE AND CRUDE STEEL PRODUCTION IN KEY COUNTRIES AND REGIONS (MILLION TONNES)

	Steel Scrap Consumption		Crude Steel Production	
	2017	%Change	2017	%Change
China	147.9	N.A.*	831.728	+3.0
EU-28	93.35	+5.6	168.140	+3.8
USA	58.8	+3.7	81.612	+4.0
Japan	35.8	+6.6	104.662	-0.1
Korea Rep.	30.5	+11.3	71.030	+3.6
Turkey	30.3	+17.0	37.524	+13.1
Russia	28.5	+2.5	71.340	+1.3
Total	425	N.A.*	1 366	+4.8

*No direct comparisons can be made because most of the steel scrap consumed by the outdated induction furnaces was not included in the figures for 2016 and for preceding years.

Change:% 2017/2016
Source: worldsteel, EUROFER, CAMU, USGS/ISRI - calculations, TCUD, Japan Ministry of Economy, KOSA, RUSMET

ESTIMATION OF STEEL SCRAP USE FOR STEELMAKING IN THE WORLD (MILLION TONNES)

	2017		2017
Crude Steel Production	1 690	Total Steel Scrap Use	600
of which:		(Ratio Steel Scrap / Crude Steel) in %	35.5
Basic Oxygen Furnace (BOF)	1 228	Own Arisings (Circulating Scrap)	194
Electric Furnace (EF)	445	(Ratio Own Arisings / Crude Steel) in %	11.5
(Share BOF of Crude Steel) in %	72.7	(Share Own Arisings of Scrap Use) in %	32.3
(Share EF of Crude Steel) in %	26.3	Purchases of Scrap by Steelworks	406
Blast Furnace Iron Production	1 180	(Share Purchases of Scrap Use) in %	67.7
(Ratio B F Iron / Crude Steel) in %	69.8		
Direct Reduced Iron (DRI) Production	71.9		
(Ratio DRI / Crude Steel) in %	4.3		

Source: worldsteel and own calculation by BIR

CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN CHINA (MILLION TONNES)

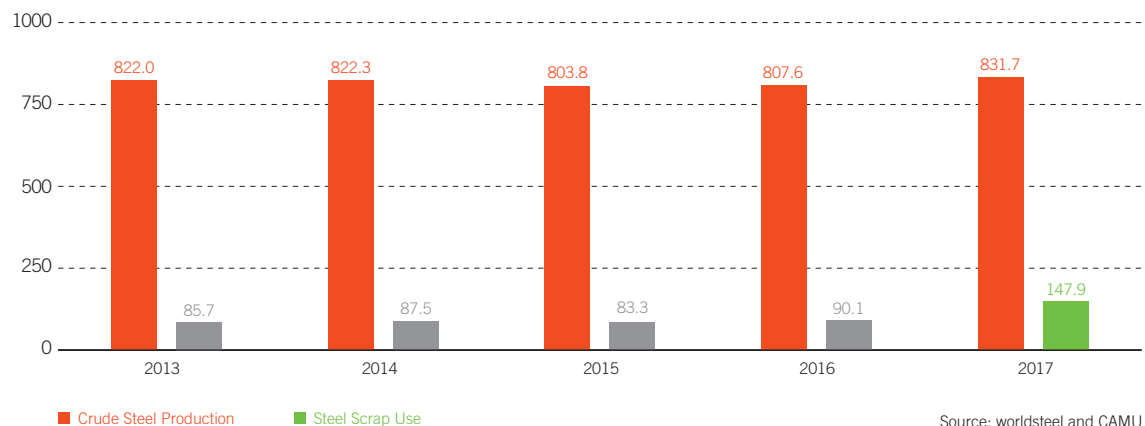
	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	822.0	822.3	803.8	807.6	831.7	+3.0
of which:						
Share BOF of Crude Steel in %	90.5	93.9	93.9	93.7	93.5	
Share EF of Crude Steel in %	9.5	6.1	6.1	6.3	6.5	
Total Steel Scrap Use	85.7	87.5	83.3	90.1	147.9	N.A.*
Ratio Steel Scrap / Crude Steel in %	10.4	10.6	10.4	11.2	17.8	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and CAMU

*No direct comparisons can be made because most of the steel scrap consumed by the outdated induction furnaces was not included in the figures for 2016 and for preceding years.

STEEL SCRAP FOR STEELMAKING IN CHINA (MILLION TONNES)



STEEL SCRAP FOR STEELMAKING IN EU-28 COUNTRIES (MILLION TONNES)

	Steel Scrap Consumption			Crude Steel Production		
	2017	2016	%Change	2017	2016	%Change
Italy	21.589	19.920	+8.4	24.068	23.373	+3.0
Germany	19.008	18.360	+3.5	43.260	42.080	+2.8
Spain	11.075	10.495	+5.5	14.461	13.616	+6.2
France	7.193	7.028	+2.3	15.506	14.413	+7.6
Poland	6.536	5.571	+17.3	10.330	9.001	+14.8
Belgium	3.166	3.075	+3.0	7.700	7.687	+0.2
United Kingdom	2.695	2.556	+5.4	7.491	7.635	-1.9
Austria	2.629	2.584	+1.7	8.135	7.438	+9.4
Luxemburg	2.446	2.450	-0.2	2.172	2.175	-0.2
Sweden	2.317	2.185	+6.0	4.713	4.617	+2.1
Portugal	2.202	2.140	+2.9	2.076	2.010	+3.3
Finland	2.171	2.231	-2.7	4.003	4.101	-2.4
Romania	2.003	1.764	+13.5	3.361	3.276	+2.6
Czech Republic	1.656	1.880	-11.9	4.553	5.305	-14.2
Greece	1.595	1.359	+17.4	1.359	1.158	+17.4
Slovakia	1.473	1.379	+6.8	4.974	4.808	+3.5
Netherlands	1.372	1.583	-13.3	6.781	6.917	-2.0
Hungary	0.799	0.560	+42.7	1.901	1.274	+49.2
Slovenia	0.721	0.690	+4.5	0.648	0.613	+5.7
Bulgaria	0.699	0.565	+23.7	0.652	0.527	+23.7
Croatia	0	0	+0.0	0	0	0.0
EU-28	93.345	88.374	+5.6	168.140	162.024	+3.8

Source: Steel Scrap Consumption: EUROFER, Steel Production: worldsteel

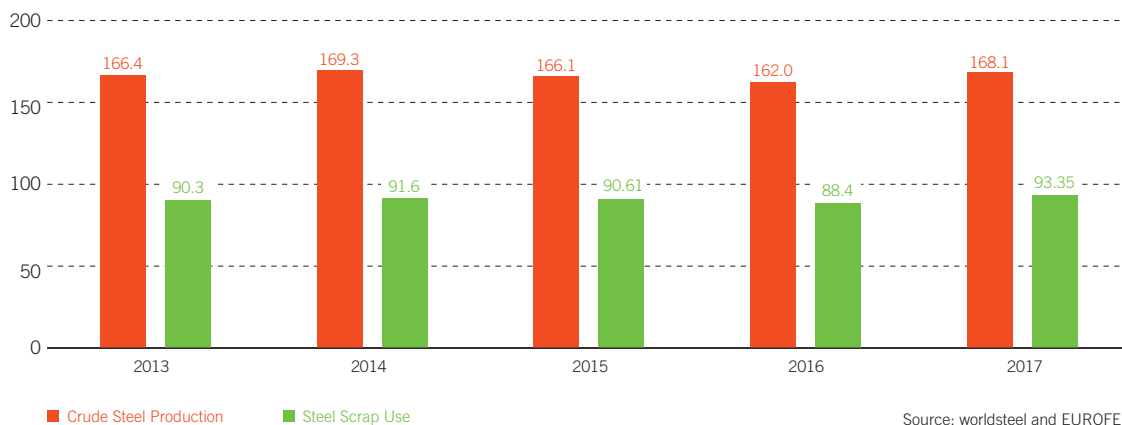
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN THE EU-28 (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	166.4	169.3	166.1	162.0	168.1	+3.8
of which:						
Share BOF of Crude Steel in %	60.2	61.0	60.7	60.5	59.8	
Share EF of Crude Steel in %	39.6	39.0	39.3	39.5	40.1	
Total Steel Scrap Use	90.3	91.6	90.61	88.4	93.35	+5.6
Ratio Steel Scrap / Crude Steel in %	54.3	54.1	54.6	54.6	55.5	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and EUROFER

STEEL SCRAP FOR STEELMAKING IN THE EU-28 (MILLION TONNES)



Source: worldsteel and EUROFER

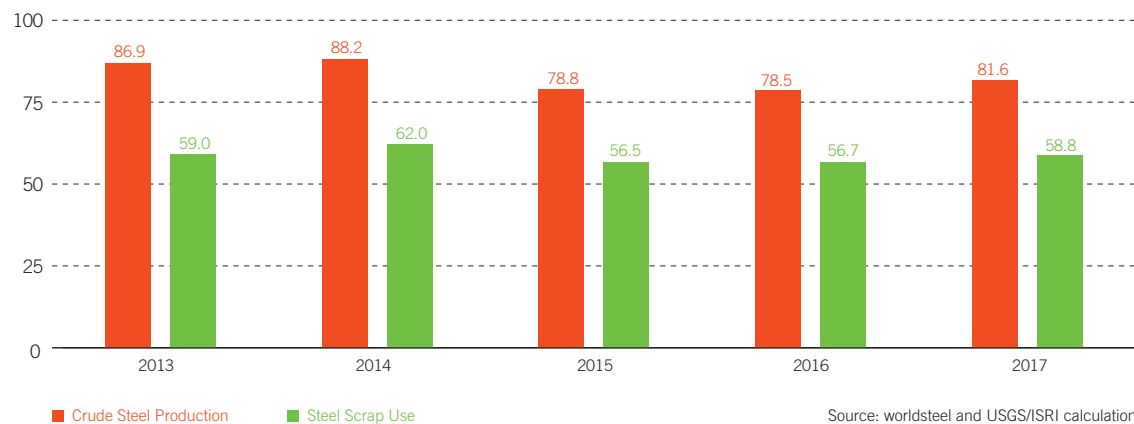
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN THE USA (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	86.9	88.2	78.8	78.5	81.6	+4.0
of which:						
Share BOF of Crude Steel in %	39.4	37.4	37.3	33.0	31.6	
Share EF of Crude Steel in %	60.6	62.6	62.7	67.0	68.4	
Total Steel Scrap Use	59.0	62.0	56.5	56.7	58.8	+3.7
Ratio Steel Scrap / Crude Steel in %	67.9	70.3	71.7	72.2	72.1	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and USGS/ISRI calculation

STEEL SCRAP FOR STEELMAKING IN THE USA (MILLION TONNES)



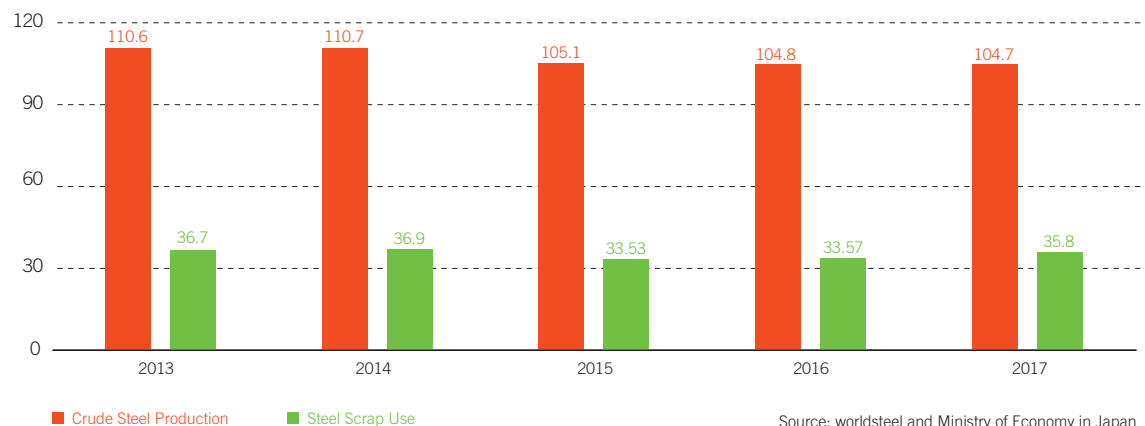
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN JAPAN (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	110.6	110.7	105.1	104.8	104.7	-0.1
of which:						
Share BOF of Crude Steel in %	77.5	76.8	77.1	77.8	75.8	
Share EF of Crude Steel in %	22.5	23.2	22.9	22.2	24.2	
Total Steel Scrap Use	36.7	36.9	33.53	33.57	35.8	+6.6
Ratio Steel Scrap / Crude Steel in %	33.2	33.3	31.9	32.1	34.2	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and Ministry of Economy in Japan

STEEL SCRAP FOR STEELMAKING IN JAPAN (MILLION TONNES)



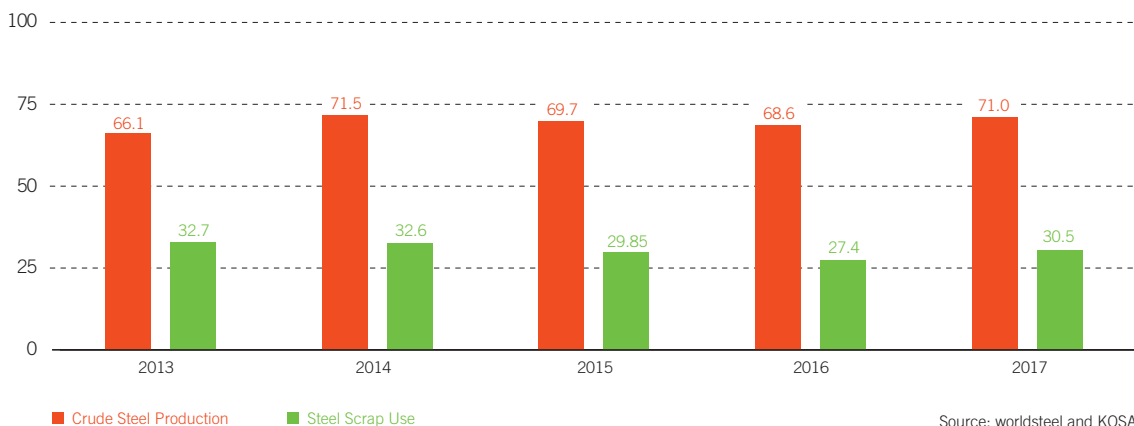
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN THE REPUBLIC OF KOREA (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	66.1	71.5	69.7	68.6	71.0	+3.6
of which:						
Share BOF of Crude Steel in %	61.0	66.2	77.1	69.3	67.1	
Share EF of Crude Steel in %	39.0	33.8	22.9	30.7	32.9	
Total Steel Scrap Use	32.7	32.6	29.85	27.4	30.5	+11.3
Ratio Steel Scrap / Crude Steel in %	49.5	45.6	42.9	39.9	43.0	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and KOSA

STEEL SCRAP FOR STEELMAKING IN THE REPUBLIC OF KOREA (MILLION TONNES)



Source: worldsteel and KOSA

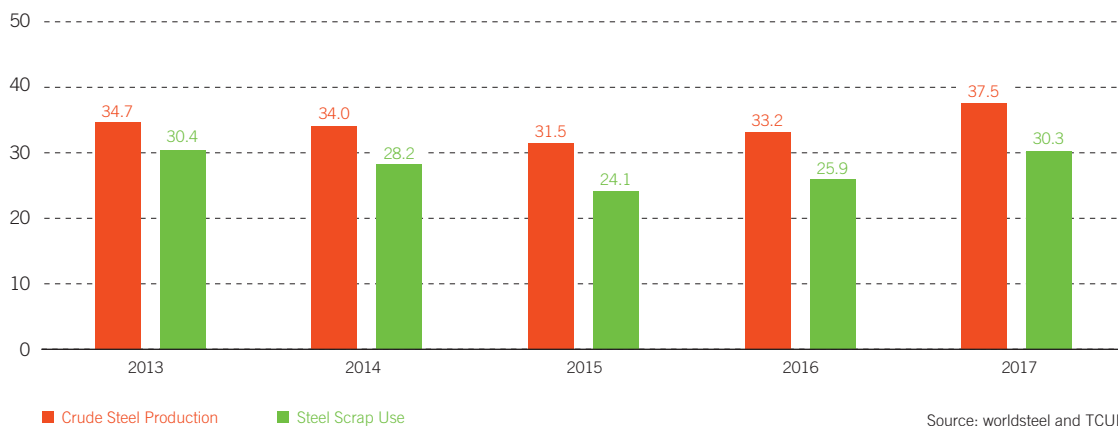
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN TURKEY (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	34.7	34.0	31.5	33.2	37.5	+13.1
of which:						
Share BOF of Crude Steel in %	28.7	30.2	35.0	34.1	30.8	
Share EF of Crude Steel in %	71.3	69.8	65.0	65.9	69.2	
Total Steel Scrap Use	30.4	28.2	24.1	25.9	30.3	+17.0
Ratio Steel Scrap / Crude Steel in %	87.6	82.9	76.5	78.0	80.8	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and TCUD

STEEL SCRAP FOR STEELMAKING IN TURKEY (MILLION TONNES)



Source: worldsteel and TCUD

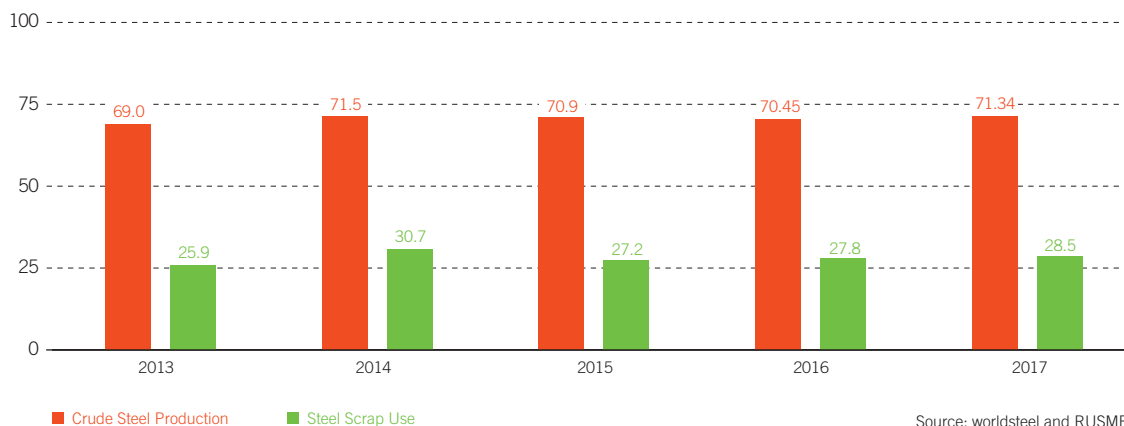
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN RUSSIA (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Crude Steel Production	69.0	71.5	70.9	70.45	71.34	+1.3
of which:						
Share BOF of Crude Steel in %	66.3	66.6	67.7	66.9	66.9	
Share EF of Crude Steel in %	30.2	30.6	29.0	30.8	30.8	
Total Steel Scrap Use	25.9	30.7	27.2	27.8	28.5	+2.5
Ratio Steel Scrap / Crude Steel in %	37.5	42.9	38.4	39.5	39.9	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and RUSMET

STEEL SCRAP FOR STEELMAKING IN RUSSIA (MILLION TONNES)



Source: worldsteel and RUSMET

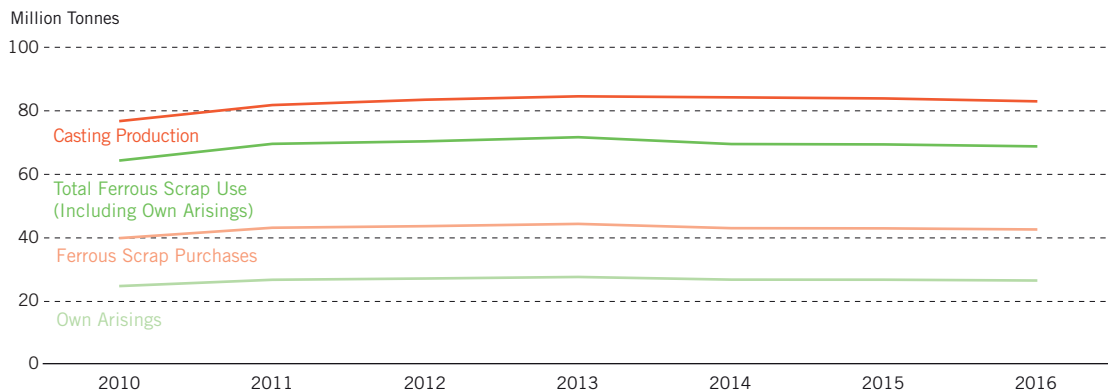
FERROUS SCRAP USE IN IRON AND STEEL FOUNDRIES IN THE WORLD (MILLION TONNES)

	2010	2011	2012	2013	2014	2015	2016	% 2016/ 2015
Iron Steel and Malleable Casting Production	76.9	82.0	83.7	84.77	84.44	84.10	83.18	-1.09
Total Ferrous Scrap Use	64.4	69.7	70.5	71.81	69.64	69.52	68.90	-0.89
(Ratio Scrap Use / Casting Production) in %	83.8	85.0	84.2	84.71	82.47	82.66	82.83	
Own Arisings (Circulating Scrap) ¹	24.6	26.6	27.0	27.49	26.64	26.62	26.36	-0.98
(Share Own Arisings of Scrap Use) in %	38.2	38.2	38.2	38.28	38.26	38.29	38.25	
Ferrous Scrap Purchases	39.8	43.1	43.6	44.32	42.96	42.90	42.55	-0.82
(Share Purchases of Scrap Use) in %	61.8	61.9	61.8	61.72	61.68	61.71	61.75	

Source: Modern Casting and own calculations by BDG/BIR

1. Own Arisings (Circulating Scrap) is the term for lumpy metal remains evolving during the casting process. Elements belonging to this process such as sprues, runners, ingates and feeders are essential to produce a raw casting, but they do not belong to the actual casting and are therefore eliminated during the finishing process of it. Rejects and scrap developing in the foundry are added to the Circulating Scrap as well.

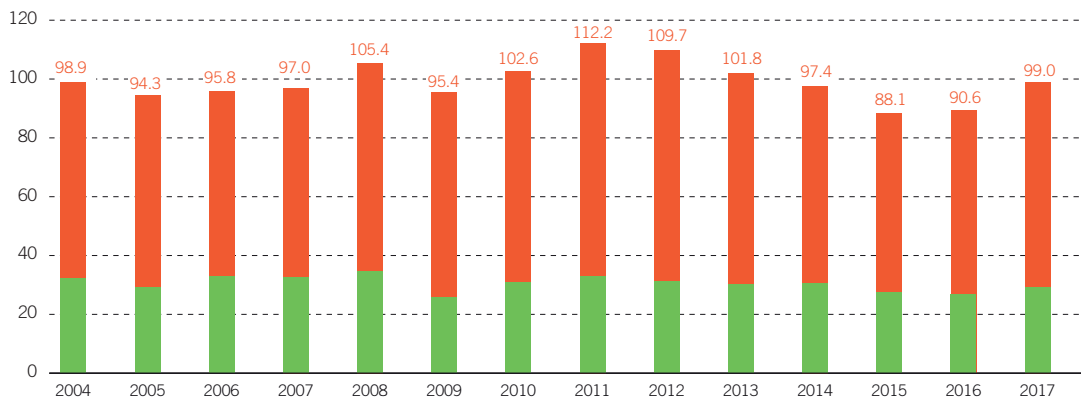
FERROUS SCRAP USE IN IRON AND STEEL FOUNDRIES IN THE WORLD



Source: Modern Casting and own calculations by BDG/BIR

VOLUME OF GLOBAL EXTERNAL STEEL SCRAP TRADE (MILLION TONNES)

Steel Scrap External Trade Including EU Intra Trade



■ EU Intra Trade (Steel Scrap Trade between EU countries)

Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP IMPORTERS (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
Turkey	19.725	19.068	16.251	17.716	20.981	+18.4
Korea Rep.	9.260	8.002	5.758	5.845	6.175	+5.6
India	5.636	5.699	6.710	6.380	5.365	-15.9
USA	3.882	4.215	3.513	3.864	4.636	+20.0
Taiwan	4.453	4.272	3.373	3.155	2.919	-7.5
EU-28	3.191	3.142	2.849	2.749	3.139	+14.2
China	4.465	2.564	2.328	2.162	2.326	+7.6
Canada	1.746	1.520	1.516	1.839	2.115	+15.0
Indonesia	2.399	2.137	1.020	1.020	1.812	+77.5
Mexico	0.864	0.915	1.483	1.893	1.782	-5.9
Belarus	1.239	1.253	1.382	1.235	1.353	+9.6

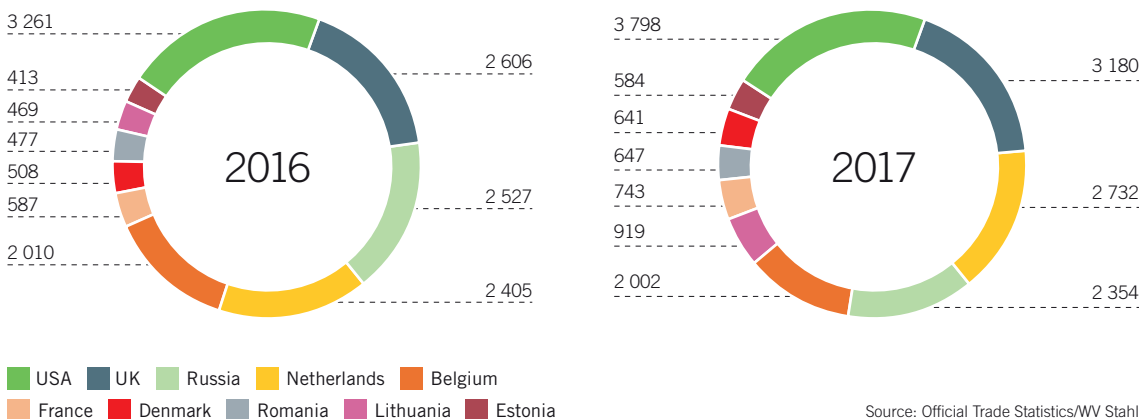
Source: Official Trade Statistics/WV Stahl

STEEL SCRAP IMPORTS OF TURKEY (THOUSAND TONNES)

	2016	2017	%Change		2016	2017	%Change
Total	17 716	20 981	+18.4	USA	3 261	3 798	+16.5
				UK	2 606	3 180	+22.0
				Netherlands	2 405	2 732	+13.6
				Russia	2 527	2 354	-6.8
				Belgium	2 010	2 002	-0.4
				Lithuania	469	919	+95.9
				France	587	743	+26.6
				Romania	477	647	+35.6
				Denmark	508	641	+26.2
				Estonia	413	584	+41.4

Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP SUPPLIERS OF TURKEY – DEVELOPMENT 2016 VS. 2017 (THOUSAND TONNES)



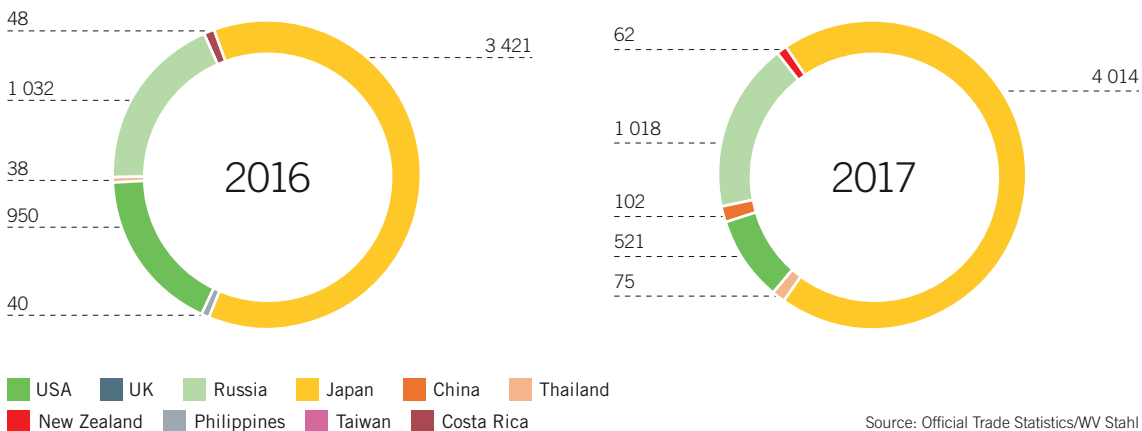
Source: Official Trade Statistics/WV Stahl

STEEL SCRAP IMPORTS OF REPUBLIC OF KOREA (THOUSAND TONNES)

	2016	2017	%Change		2016	2017	%Change
Total	5 845	6 175	+5.6	Japan	3 421	4 014	+17.3
				Russia	1 032	1 018	-1.4
				USA	950	521	-45.2
				China	5	102	+++
				Thailand	38	75	+97.4
				New Zealand	11	62	+463.6
				Philippines	40	46	+15.0
				UK	5	42	+740.0
				Taiwan	10	42	+320.0
				Costa Rica	48	22	-54.2

Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP SUPPLIERS OF REP. OF KOREA – DEVELOPMENT 2016 VS. 2017 (THOUSAND TONNES)



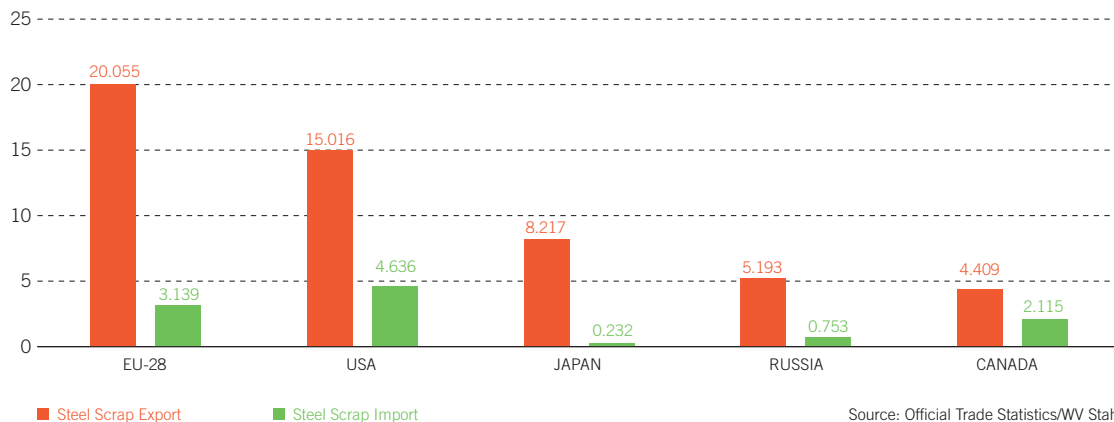
Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP EXPORTERS (MILLION TONNES)

	2013	2014	2015	2016	2017	% 2017/ 2016
EU-28	16.806	16.953	13.743	17.769	20.055	+12.9
USA	18.495	15.340	12.976	12.819	15.016	+17.1
Japan	8.129	7.339	7.839	8.698	8.217	-5.5
Russia	4.549	5.765	5.646	5.524	5.193	-6.0
Canada	4.521	4.510	3.415	3.632	4.409	+21.4
China	-	-	-	-	2.230	-
Australia	2.200	2.362	1.898	1.583	1.979	+25.0
Hong Kong	1.193	1.292	1.239	1.347	1.380	+2.4
Singapore	0.978	0.911	0.844	1.048	0.790	-24.6

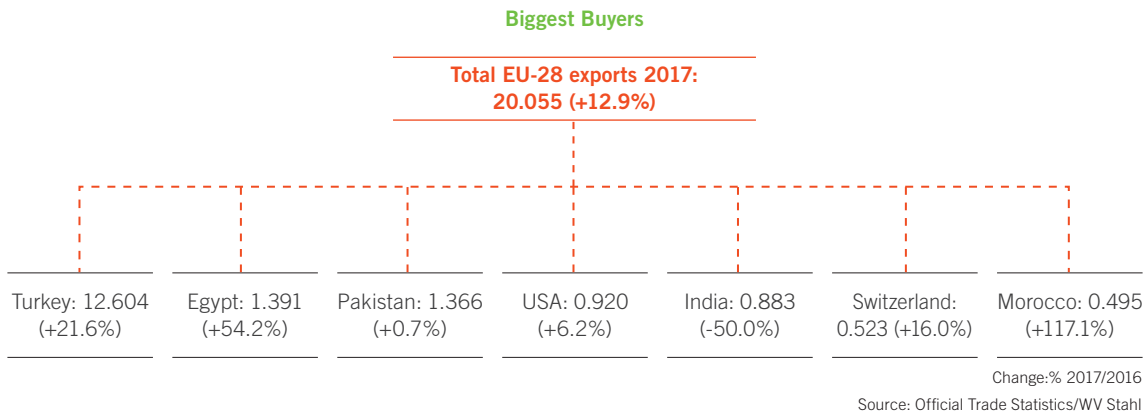
Source: Official Trade Statistics/WV Stahl

MAJOR NET STEEL SCRAP EXPORTERS 2017 (MILLION TONNES)

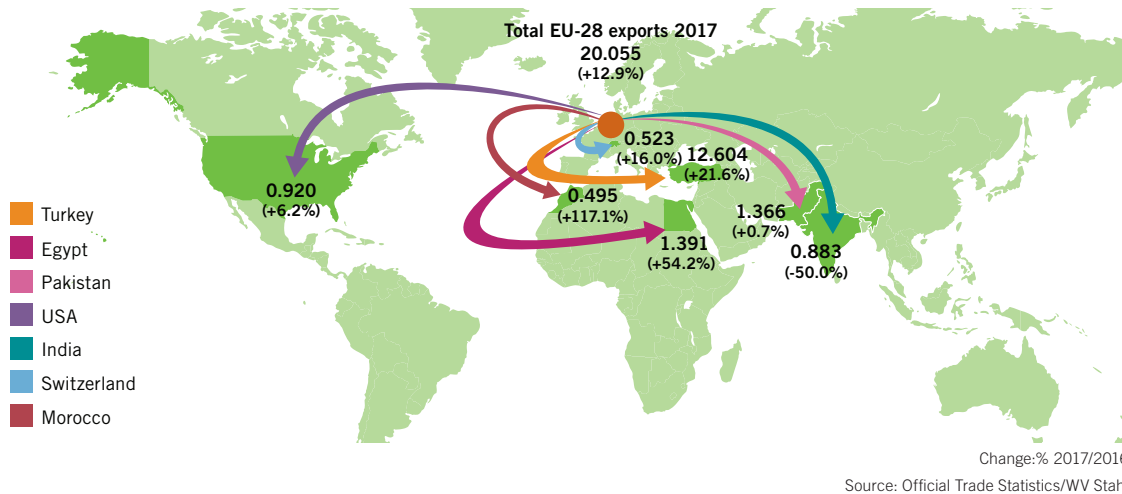


Source: Official Trade Statistics/WV Stahl

EU-28 STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



MAIN FLOWS OF EU-28 STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



EU-28 EXTERNAL STEEL SCRAP EXPORTS BY COUNTRY (MILLION TONNES)

Steel Scrap Exports by Main EU-28 Exporters to Third Countries

Exporters	2017	2016	%Change	Biggest Buyers	2017	%Change
United Kingdom	6.965	6.332	+10.0	Turkey	3.106	+22.2
				Pakistan	0.965	+9.5
				Egypt	0.824	+37.3
				India	0.507	-50.6
				USA	0.506	+39.0
Netherlands	3.398	3.055	+11.2	Bangladesh	0.299	-32.7
				Turkey	2.676	+16.7
				USA	0.196	+7.7
				Morocco	0.151	+18.9
				Bangladesh	0.109	+34.5
Belgium	2.634	2.436	+8.1	India	0.094	-47.2
				Turkey	2.003	+8.5
				Egypt	0.469	+66.9
				China	0.065	+10.2
Germany	1.191	1.074	+10.9	Turkey	0.633	+55.1
				Switzerland	0.364	+10.3
				India	0.055	-59.9
Sweden	0.912	0.881	+3.5	Turkey	0.376	+73.3
				USA	0.201	-27.7
				Norway	0.148	-3.3
France	0.864	0.774	+11.6	Turkey	0.623	+5.8
				Switzerland	0.101	+74.1
Romania	0.617	0.418	+47.6	Turkey	0.532	+29.4
Bulgaria	0.345	0.224	+54.0	Turkey	0.279	+52.5
EU-28 Extra Trade	20.055	17.769	+12.9			

Change: % 2017/2016
Source: Official Trade Statistics/WV Stahl

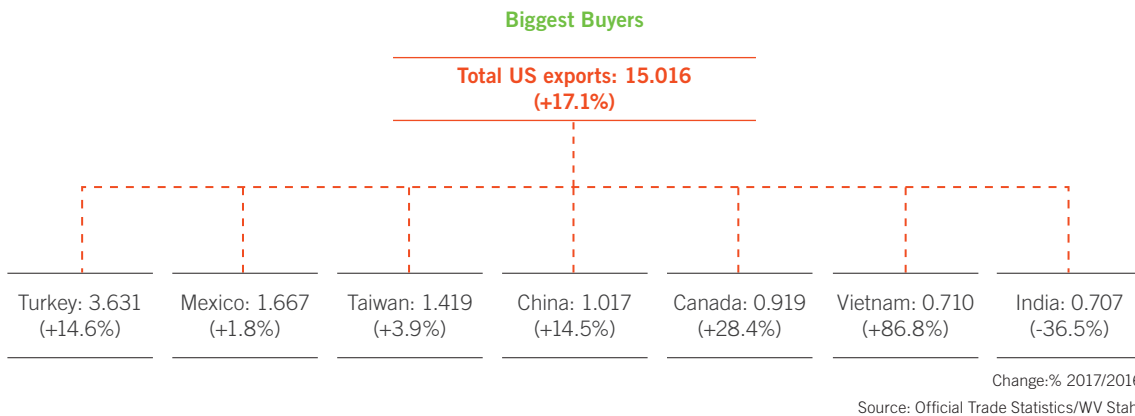
EU-28 INTERNAL STEEL SCRAP EXPORTS BY COUNTRY (MILLION TONNES)

Main Steel Scrap Exports between EU-28 Countries

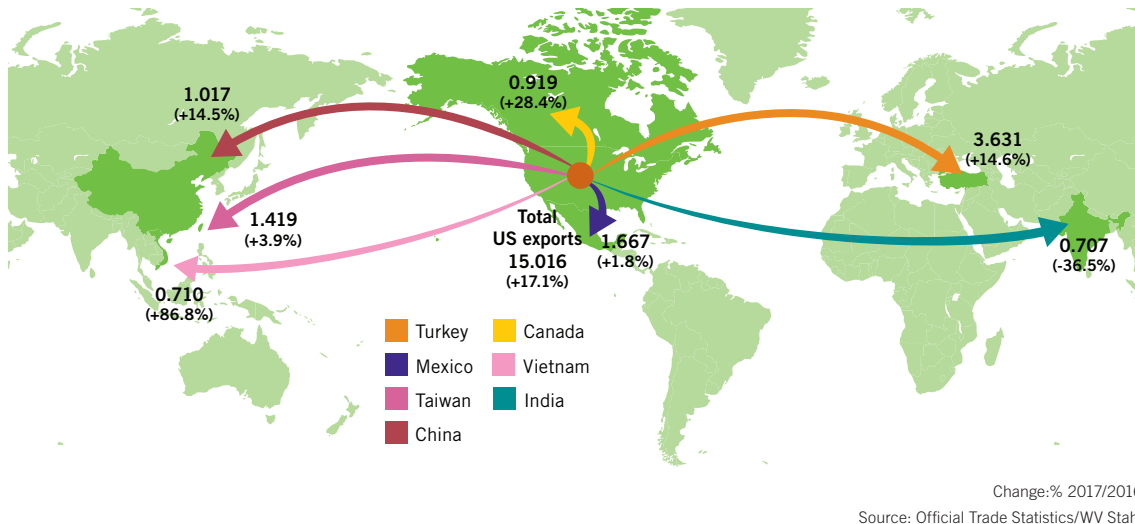
Exporters	2017	2016	%Change	Biggest Buyers	2017	%Change
Germany	7.336	7.600	-3.5	Netherlands	1.762	-11.2
				Italy	1.579	+7.0
				Luxembourg	1.223	-5.3
				Belgium	1.183	-14.4
				France	0.649	+1.1
France	5.389	4.775	+12.9	Spain	1.742	+12.5
				Belgium	1.552	+13.4
				Luxembourg	0.764	-7.4
				Italy	0.589	+20.7
Netherlands	2.718	2.240	+21.3	Germany	0.884	+22.6
				Belgium	0.652	+70.2
				Finland	0.400	+1.0
Czech Republic	2.226	1.799	+23.7	Germany	0.910	+31.5
				Poland	0.535	+22.1
				Italy	0.314	+22.2
United Kingdom	1.799	1.769	+1.7	Spain	1.007	+13.0
				Portugal	0.372	-10.1
Poland	1.340	1.201	+11.6	Germany	0.727	+16.1
				Czech Republic	0.285	-5.3
Belgium	1.276	1.121	+13.8	France	0.571	+10.7
				Netherlands	0.301	-8.0
				Luxembourg	0.207	+17.6
Austria	1.184	1.051	+12.7	Italy	0.699	+22.4
				Germany	0.368	+1.1
EU-28 Intra Trade	29.123	27.030	+7.7			

Change: % 2017/2016
Source: Official Trade Statistics/WV Stahl

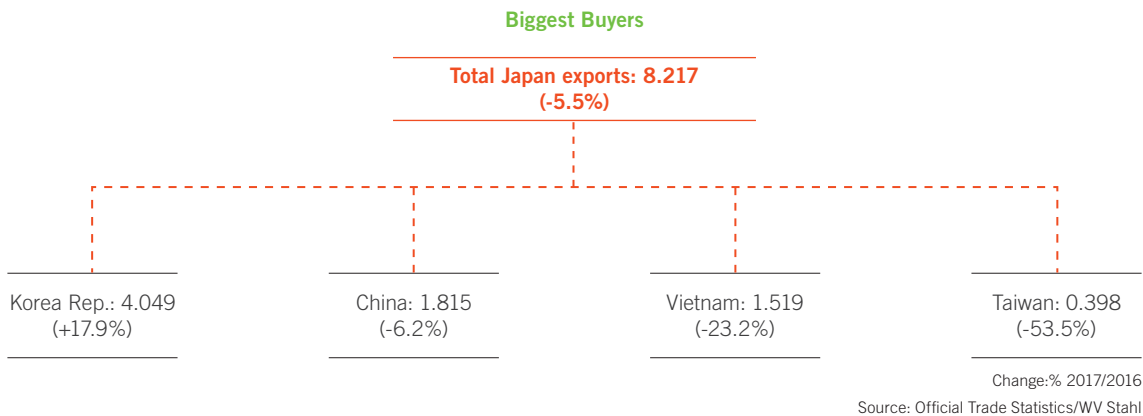
US STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



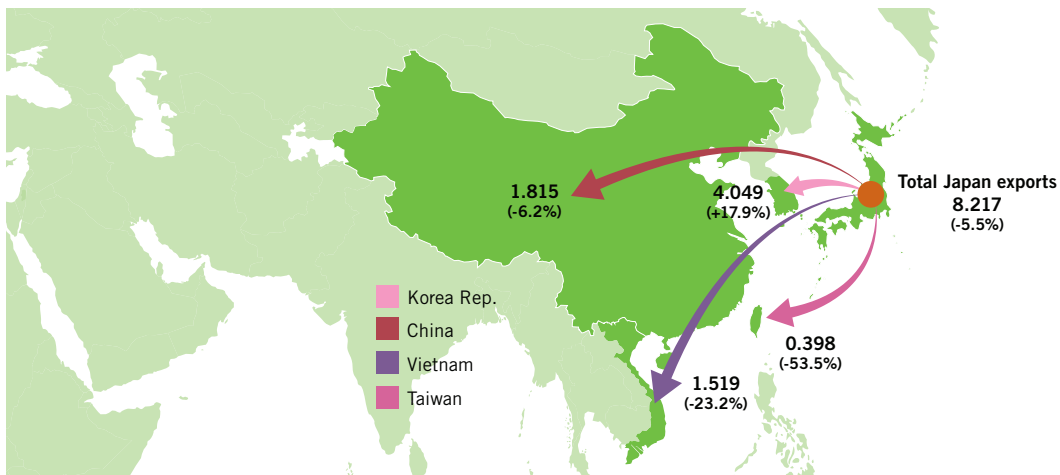
MAIN FLOWS OF US STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



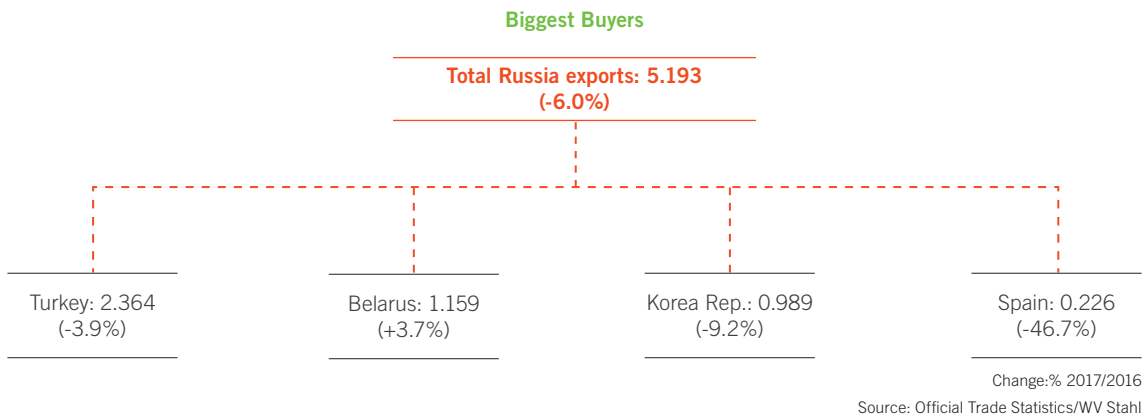
JAPAN STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



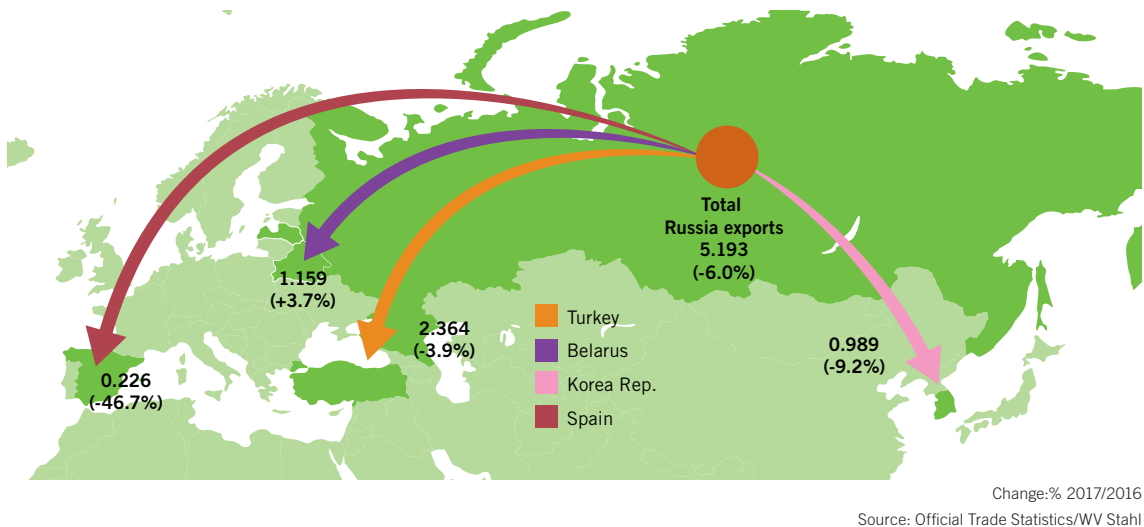
MAIN FLOWS OF JAPANESE STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



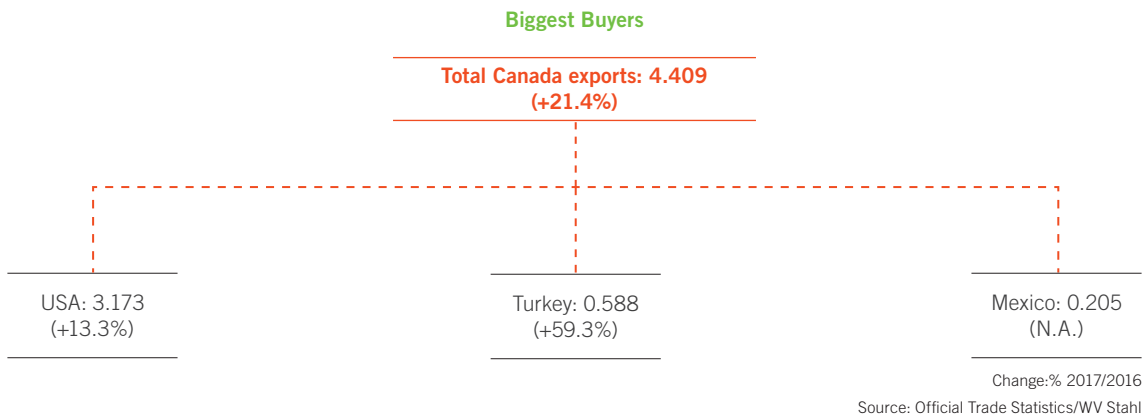
RUSSIA STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



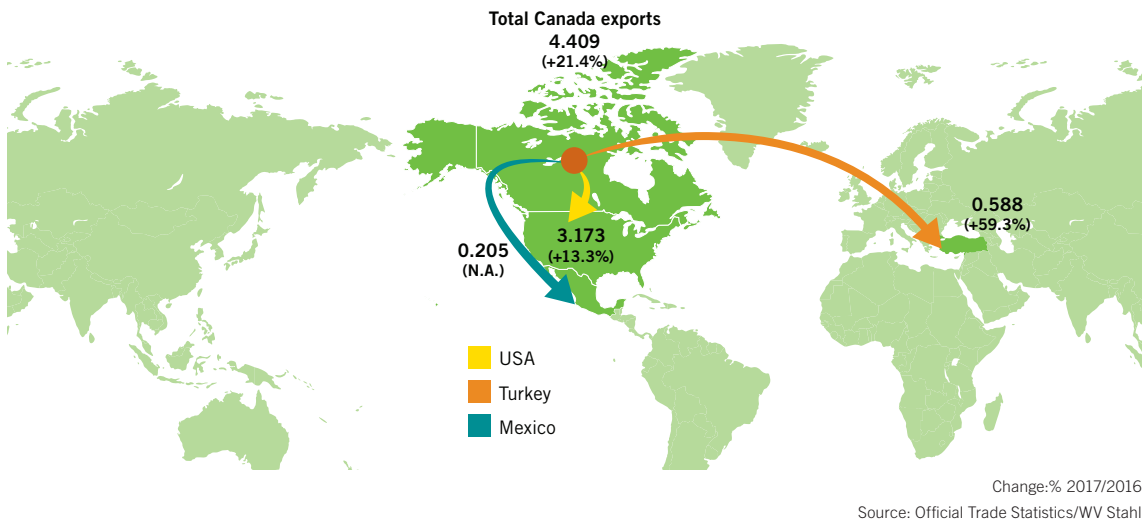
MAIN FLOWS OF RUSSIAN STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



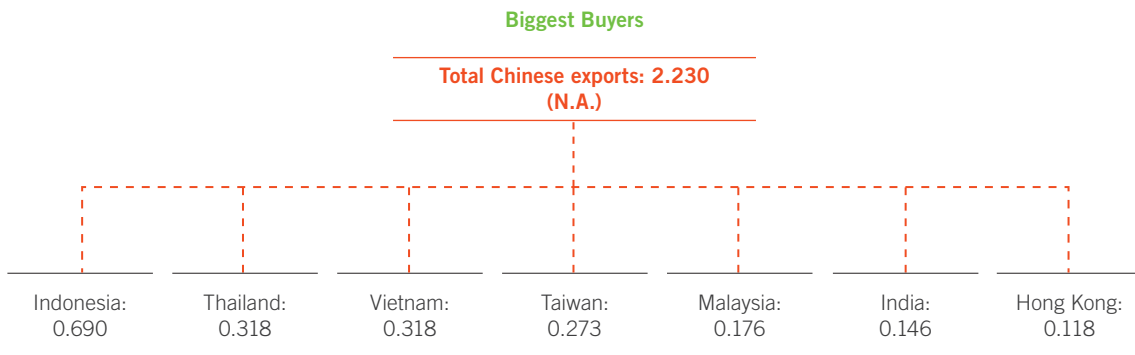
CANADA STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



MAIN FLOWS OF CANADIAN STEEL SCRAP EXPORTS 2017 (MILLION TONNES)

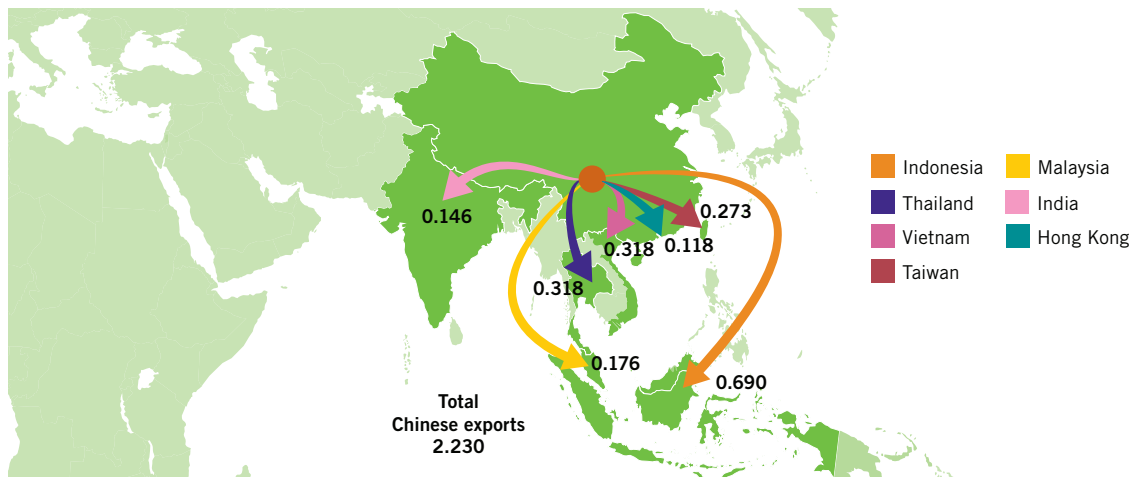


CHINA STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



Source: Official Trade Statistics/WV Stahl

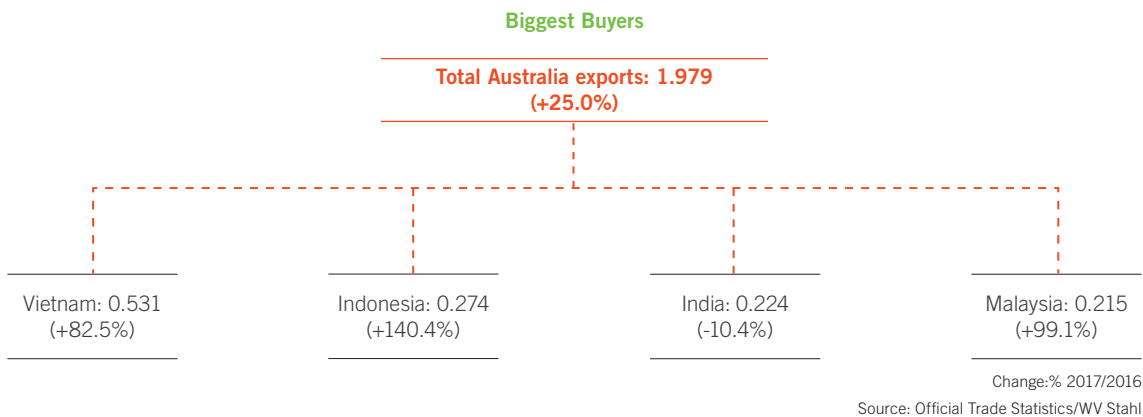
MAIN FLOWS OF CHINESE STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



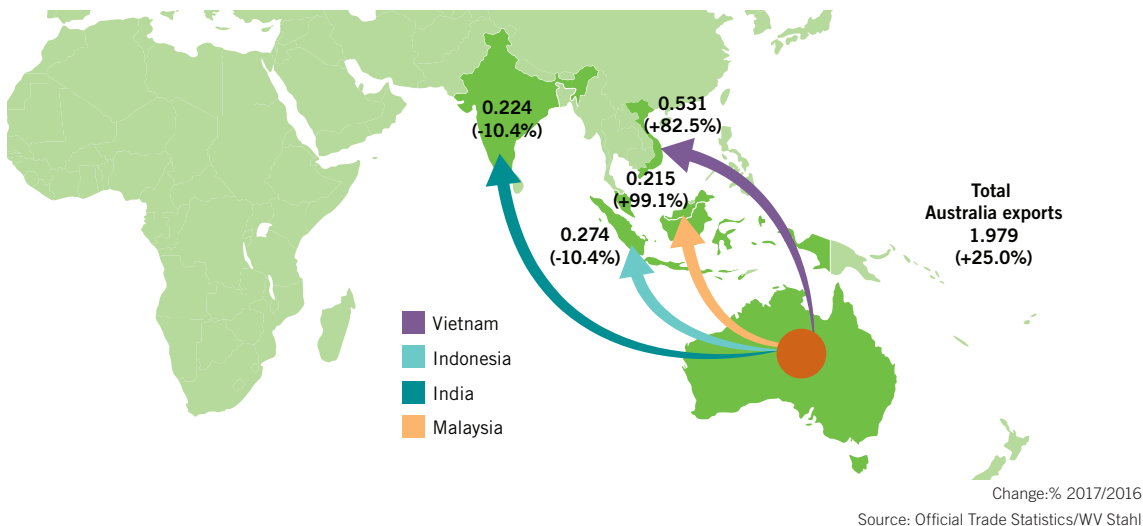
Change:% 2017/2016

Source: Official Trade Statistics/WV Stahl

AUSTRALIA STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



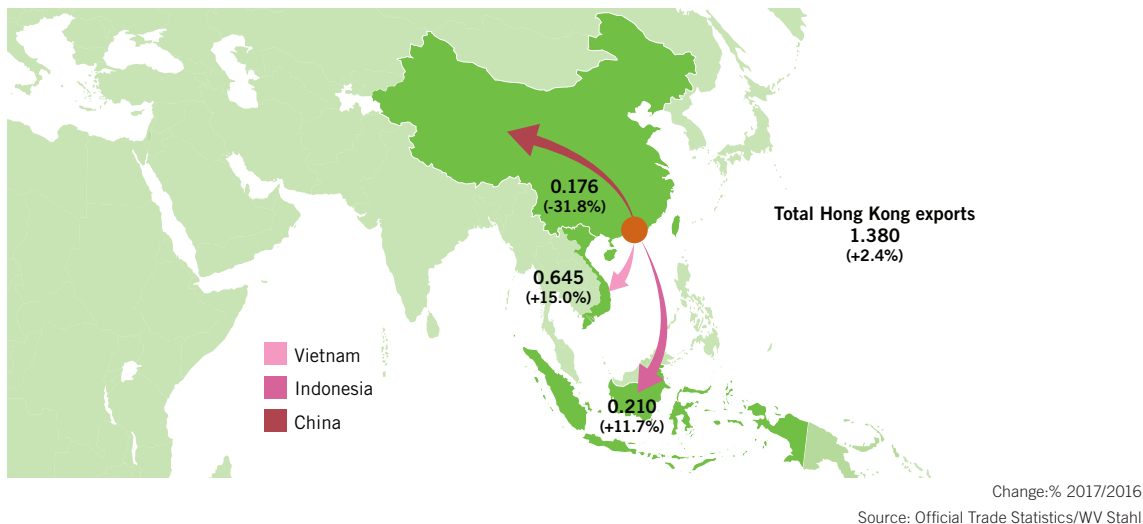
MAIN FLOWS OF AUSTRALIAN STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



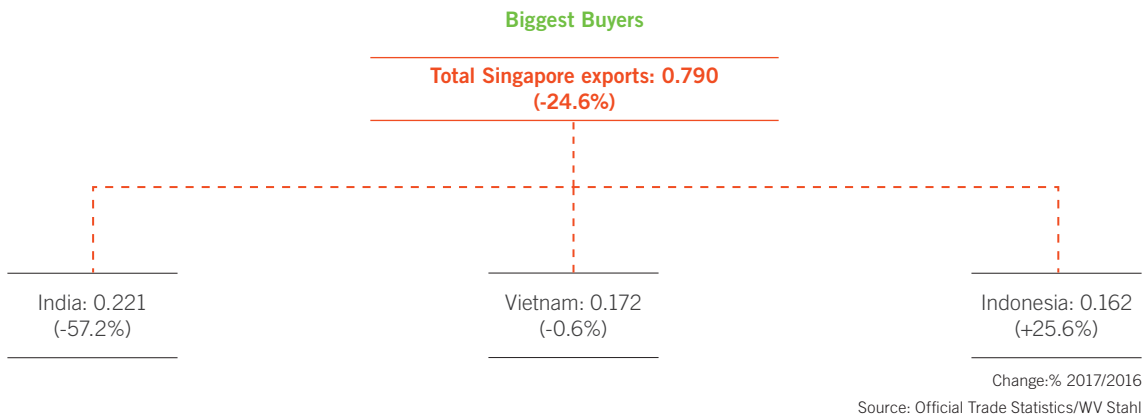
HONG KONG STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



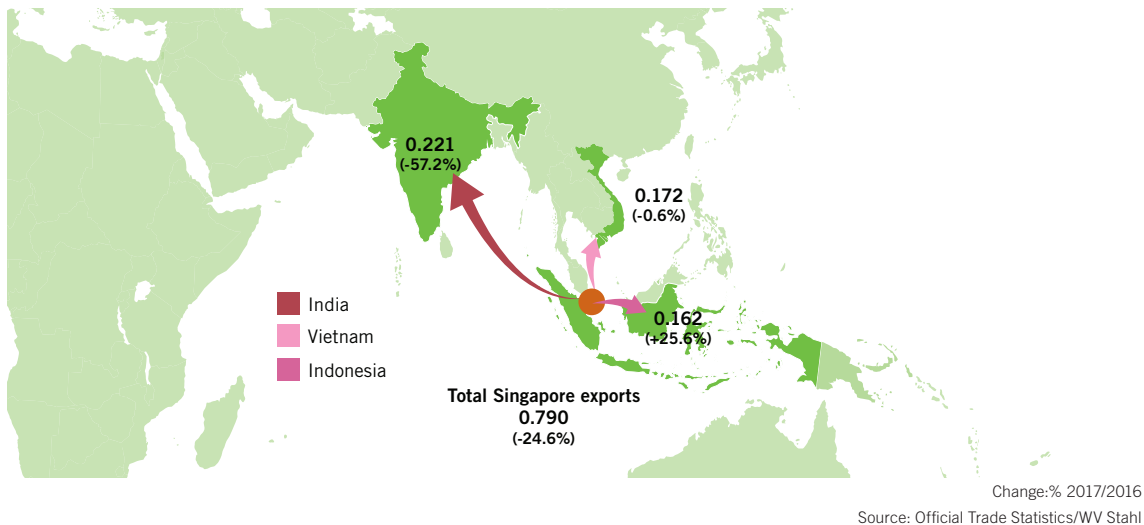
MAIN FLOWS OF HONG KONG STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



SINGAPORE STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



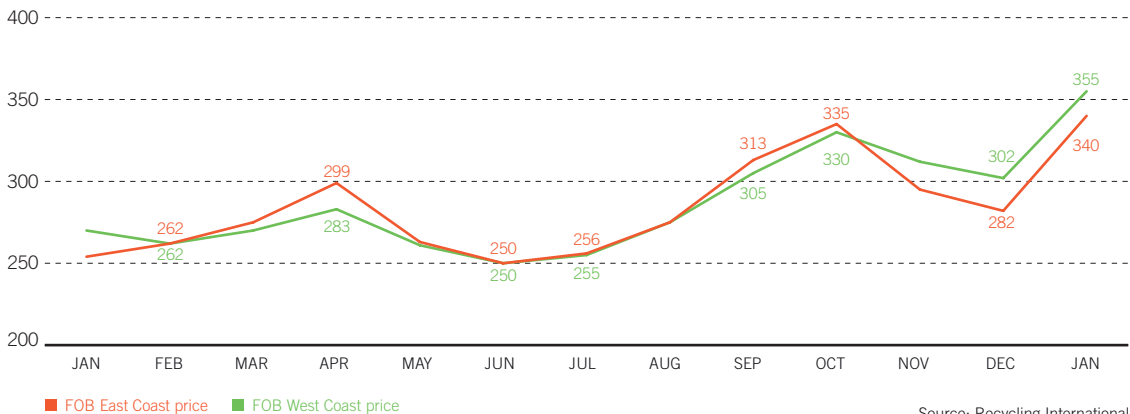
MAIN FLOWS OF SINGAPORE STEEL SCRAP EXPORTS 2017 (MILLION TONNES)



STEEL SCRAP PRICE CURVES JANUARY 2017/2018

USA Export Price (US\$/GRT)

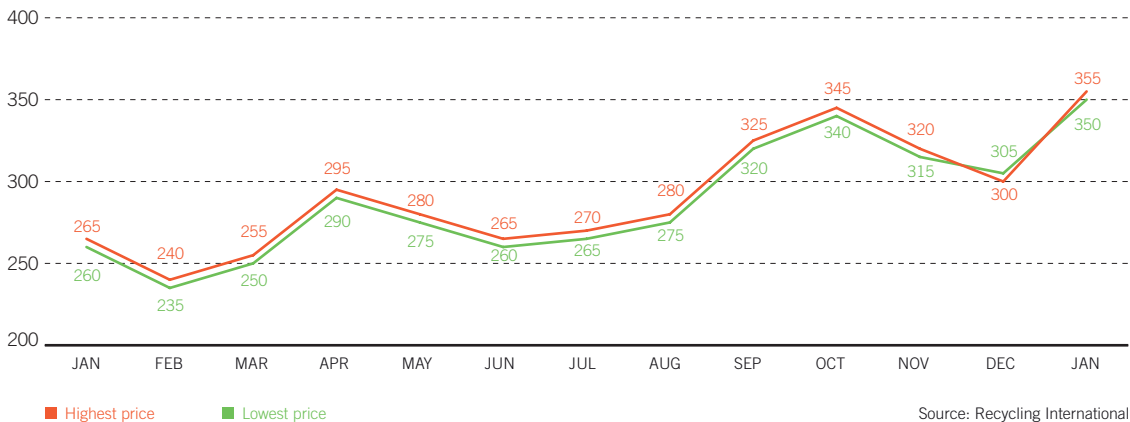
HMS 1, heavy steel scrap (1/4 inch)



Source: Recycling International

CFR Prices for shipments from EU to Turkey (US\$/t)

HMS 80/20 heavy steel scrap

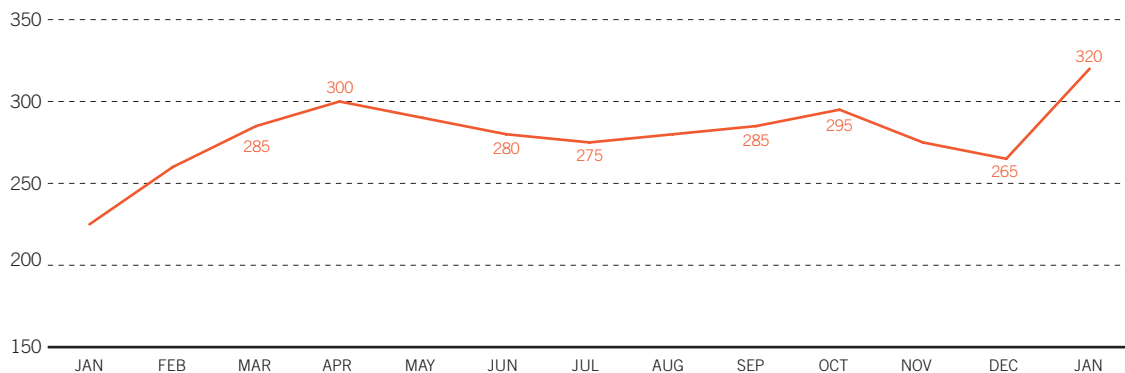


Source: Recycling International

STEEL SCRAP PRICE CURVES JANUARY 2017/2018

USA Domestic Scrap Prices (US\$/GRT)

HMS 1, heavy steel scrap (1/4 inch) composite price delivered at mills



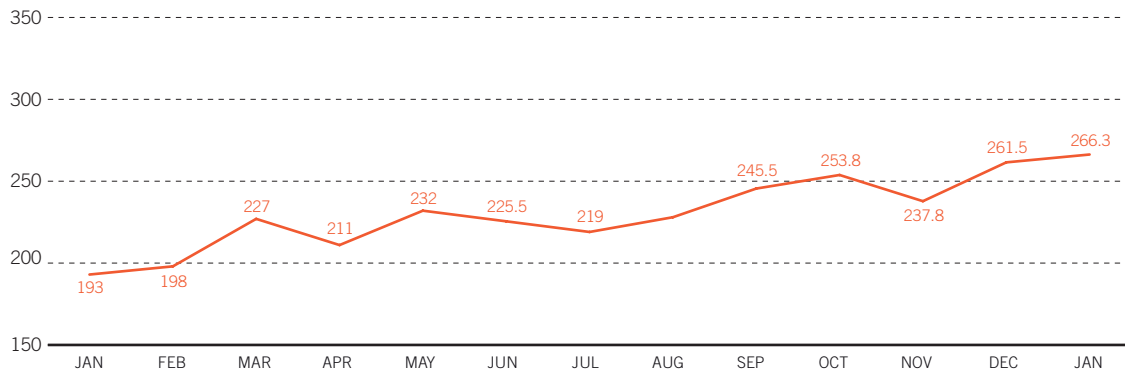
Source: Recycling International

Composite Sales Price ex Yard in Germany* (€/t)

E3/European Standard Quality No. 3, heavy old steel scrap (>6mm)

* Composite sales price considers sales to domestic and international steel works and foundries on weighted average basis

Source: BDSV/SecureCalc



Source: Recycling International

GLOSSARY

BIR	Bureau of International Recycling, Brussels, Belgium
BDG	German Foundry Association, Düsseldorf, Germany
BDSV	German Steel Recycling Federation, Düsseldorf, Germany
CAMU	China's Association of Metalscrap Utilization, Beijing, China
EuRIC	European Recycling Industries' Confederation, Brussels, Belgium
EUROFER	European Confederation of Iron and Steel Industries, Brussels, Belgium
ISRI	Institute of Scrap Recycling Industries, Washington, USA
KOSA	Korea Iron & Steel Association, Seoul, Republic of Korea
METI	Ministry of Economy, Trade and Industry, Tokyo, Japan
Modern Casting	Magazine for Foundries and Diecasters, Schaumburg, Illinois, USA
Official Trade Statistics	Prepared by WV Stahl, Düsseldorf, Germany
Recycling International	International Trade Magazine, Doetinchem, The Netherlands
RUSLOM.COM	National Recycling Association of Russia, Moscow, Russia
RUSMET	Russian Research Company for Metal Markets, Moscow, Russia
TCUD	Turkish Steel Producers Association, Ankara, Turkey
USGS	U.S. Geological Survey, Reston, USA
worldsteel	World Steel Association, Brussels, Belgium
WV Stahl	German Steel Federation, Düsseldorf, Germany



Bureau of
International Recycling
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BIR – REPRESENTING THE FUTURE LEADING RAW MATERIAL SUPPLIERS

Bureau of International Recycling aisbl
Avenue Franklin Roosevelt 24
1050 Brussels
Belgium

T. +32 2 627 57 70
F. +32 2 627 57 73

bir@bir.org
www.bir.org
