

WORLD STEEL RECYCLING IN FIGURES 2014 – 2018

Steel Scrap – a Raw Material for Steelmaking

10TH EDITION



Bureau of
International Recycling
Ferrous Division

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FOREWORD

The latest edition of our BIR report “World Steel Recycling in Figures”, which covers the five-year period between 2014 and 2018, 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 what is the tenth edition of “World Steel Recycling in Figures”. Under the presidency of Christian Rubach, the BIR Ferrous Division launched the first edition during our Convention in Istanbul back in 2010. Since

then, this compilation of important statistics relating to the global ferrous scrap markets has been extremely well received.

In our tenth edition, the final figures for 2018 show an increase in world crude steel output and in global steel scrap use as a raw material for steelmaking. It also highlights the strong growth in China’s steel scrap usage last year.

Total steel scrap use in the seven key countries and regions increased to around 469 million tonnes in 2018,

while related crude steel production was 1.469 billion tonnes. It is important to note that the figure of 469 million tonnes represents verified data for 81% of global steelmaking.

According to our calculations, annual ferrous scrap use in the world’s iron and steel foundries has been between 69 and 73 million tonnes over recent years.

The final figures for 2018 also show positive developments in external steel scrap trading, which increased to 105.4 million tonnes last year.

In the tenth edition of “World Steel Recycling in Figures”, we have included an overview – supported by graphs – not only for the main suppliers of Turkey as the world’s foremost steel scrap importer and the Republic of Korea as the second-largest importer, but also for India which claimed third place in the steel scrap importer league table last year.



The report as a whole contains eight 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 materials 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 2017, he has been working closely 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.

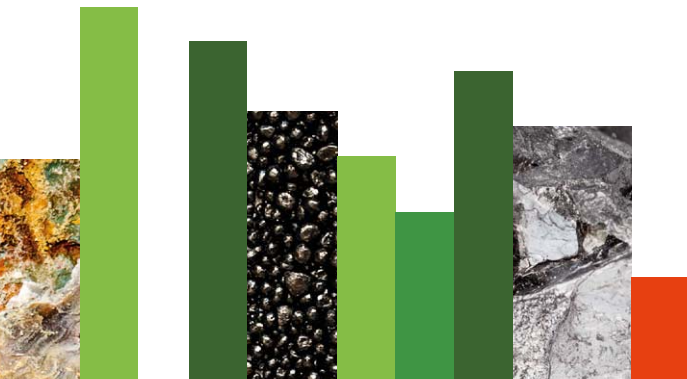
For an even more accurate appraisal of the market, we want to continue to improve the ferrous scrap figures at our disposal, including our quarterly update of the world statistics.

We hope that the tenth edition of "World Steel Recycling in Figures 2014-2018" will be useful to you and your day-to-day business operations.

Brussels, May 2019

Gregory Schnitzer

President of the BIR Ferrous Division



EXECUTIVE SUMMARY

In our tenth edition of “World Steel Recycling in Figures”, the statistics for 2018 show an increase in world crude steel output and in steel scrap use as a raw material for steelmaking in key countries and regions. The figures highlight the strong growth in China’s steel scrap usage as well as an increase in global external steel scrap trading.



World crude steel production reached 1.808 billion tonnes in 2018, up 4.5% from 2017. According to worldsteel, crude steel production increased in all regions last year - with the exception of the EU which saw a 0.5% contraction.

The global increase in basic oxygen furnace production (+1.8% to 1.267 billion tonnes) was bettered by the upturn in scrap-intensive electric furnace production (+12% to around 524 million tonnes). There was a small increase in global blast furnace iron production (+2.3% to 1.246 billion tonnes) but stronger growth in global DRI production (+11.9% to 84.3 million tonnes).

Looking at the key countries and regions, worldsteel confirms that China’s crude steel production reached 928.3 million tonnes in 2018 (+6.6% over the previous year), such that the country’s share of world output was 51.3%. Increases in crude steel production were also registered last year in the USA (+6.1% to 86.6 million tonnes), Russia (+1.7% to 72.8 million tonnes)

and the Republic of Korea (+2% to 72.5 million tonnes). Conversely, there were small declines in crude steel production in the EU-28 (-0.5% to 167.7 million tonnes), Japan (-0.3% to 104.3 million tonnes) and Turkey (-0.6% to 37.3 million tonnes).

Further increase in China’s steel scrap usage

According to our figures, steel scrap consumption soared 27% in China last year to 187.8 million tonnes; this compares to 147.9 million tonnes in 2017 and underlines China’s position as the world’s largest steel scrap user. The proportion of steel scrap used in the country’s steel production increased to 20.2% in 2018.

As indicated in our quarterly reports, this increase in steel scrap usage is mainly due to the fact that the Chinese government has established stricter environmental quality standards and thereby higher pollutant emissions standards for the steel industry. To meet these new thresholds and in order to avoid production restrictions, most basic oxygen furnace mills have actively increased their steel scrap input. It has been reported that their steel scrap/crude steel ratio is

currently around 25-30%. In addition, many new electric furnaces are being installed or are in the pipeline for the near future. Worldsteel confirms that China's electric furnace production increased from 54 million tonnes in 2017 to 120.7 million tonnes last year. As a result, further investments in steel scrap processing are planned, especially in shredder capacity.

According to our statistics, there were also increases last year in steel scrap consumption for the EU-28, the USA, Japan and Russia:

The EU-28 recorded slender growth in steel scrap consumption in 2018 (+0.3% to 93.812 million tonnes) while the region's crude steel production went down (-0.5%). The proportion of steel scrap used in the region's crude steel production increased to 55.9% in 2018.

The USA recorded a small increase in its steel scrap usage last year (+2.2% to 60.1 million tonnes) whereas its crude steel production jumped 6.1%. The proportion of steel scrap used in the country's crude steel production declined to 69.4% in 2018.

Our 2018 figures reveal an increase in Japan's steel scrap usage (+2.1% to 36.5 million tonnes) whereas the country's crude steel production dropped by 0.3%. The proportion of steel scrap used in Japan's crude steel production increased to 35% in 2018.

Growth in Russia's crude steel production last year (+1.7%) was eclipsed by the increase in the nation's

steel scrap usage (+5.5% to around 31 million tonnes). The proportion of steel scrap used in Russia's crude steel production climbed to 42.5% in 2018.

Also last year, there was a fall in Turkey's steel scrap consumption (-0.4% to 30.1 million tonnes) while the country's crude steel production dipped 0.6%. The proportion of steel scrap used in Turkish crude steel production declined to 80.7% in 2018.

The Republic of Korea recorded a decrease in steel scrap usage last year (-2.3% to 30 million tonnes) whereas its crude steel production increased by 2%. The proportion of steel scrap used in the Republic of Korea's crude steel production dropped to 41.4% in 2018.

469 million tonnes steel scrap use in key countries and regions

In 2018, there was an increase to around 469 million tonnes in steel scrap used by key countries and regions (+10.1% over the previous year) while related crude steel production was around 1.469 billion tonnes.

It is important to note that the figure of 469 million tonnes represents verified data for 81% of global steelmaking. For the world as a whole, we are dependent on estimates of total steel scrap use. Particularly when considering the changes in global crude steel and primary iron production during the course of last year, we would like to mention an estimation project initiated by the steel industry in order to better quantify total steel scrap use in global crude steel production.

Growing ferrous scrap use in 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 2017; it was not possible to incorporate figures for 2018 because world casting production is determined only by magazine “Modern Casting” with a time lag of one year. For 2017, global ferrous scrap usage of 72.7 million tonnes has been calculated (+5.5% when compared to 2016) for a world iron and steel casting production of 87.5 million tonnes (+5.1%).

Small decline in Turkey's overseas steel scrap purchases

2018 brought a small decline in Turkey's overseas steel scrap purchases of 1.5% to 20.660 million tonnes. However, the data still confirm Turkey's position as the world's foremost steel scrap importer. The country's main suppliers were the USA (-2.4% to 3.705 million tonnes), the UK (-16.7% to 2.648 million tonnes), Russia (+7% to 2.518 million tonnes), the Netherlands (-15.1% to 2.318 million tonnes) and Belgium (-4.5% to 1.911 million tonnes).

The Republic of Korea was the world's second-largest steel scrap importer in 2018 with a year-on-year increase of 3.5% to 6.393 million tonnes. The country's main suppliers were Japan (+0.7% to 4.041 million tonnes), Russia (-9.3% to 0.923 million tonnes) and the USA (+68.3% to 0.877 million tonnes).

The world's third-largest steel scrap importer last year was India with an 18% increase over 2017 to 6.33 million tonnes. The country's main suppliers were the United Arab Emirates (+57.6% to 1.160 million tonnes), the USA (-14.4% to 0.702 million tonnes), the UK (+35% to 0.694 million tonnes) and Singapore (+126.3% to 0.473 million tonnes).

Also higher in 2018 were steel scrap imports into the USA (+8.5% to 5.030 million tonnes), Taiwan (+24.3% to 3.629 million tonnes), Canada (+64.1% to 3.471 million tonnes), Indonesia (+35.2% to 2.510 million tonnes), Mexico (+7.4% to 1.913 million tonnes) and Belarus (+10.6% to 1.497 million tonnes). Conversely, import declines were recorded by the EU-28 (-7.2% to 2.850 million tonnes), Thailand (-1% to 1.724 million tonnes) and China (-42.3% to 1.343 million tonnes).

We have also received an official 2018 steel scrap import figure for Pakistan of 4.366 million tonnes (-8.8% compared to the previous year).

Steep upturn in US steel scrap exports

Global external steel scrap trade - including internal EU-28 trade - amounted to 105.4 million tonnes last year (+2.6% compared to 2017).

2018 produced a steep upturn in US overseas steel scrap shipments of 15.4% to 17.332 million tonnes, the main buyer being Turkey on 3.433 million tonnes (-5.5% year on year). Among the leading buyers to extend their purchases from the USA were Taiwan

(+39% to 1.972 million tonnes), Mexico (+9.2% to 1.821 million tonnes), Canada (+53.3% to 1.409 million tonnes), Vietnam (+43.9% to 1.022 million tonnes), India (+33.5% to 0.944 million tonnes) and the Republic of Korea (+67.7% to 0.899 million tonnes).

The EU-28 remained the world's leading steel scrap exporter last year in upping its outbound shipments by 6.7% to 21.436 million tonnes. The major buyer of EU-28 steel scrap was Turkey (-5.7% to 11.091 million tonnes). EU-28 overseas shipments of steel scrap increased last year to Egypt (+16.8% to 1.624 million tonnes), Pakistan (+18.4% to 1.619 million tonnes), India (+72.2% to 1.584 million tonnes), Bangladesh (+61.5% to 0.714 million tonnes) and Indonesia (+570.3% to 0.496 million tonnes). Conversely, a drop was recorded in EU-28 deliveries to the USA (-11.2% to 0.817 million tonnes).

The EU-28's internal steel scrap exports totalled 29.090 million tonnes last year (-1.4% compared to 2017).

In 2018, an upturn was apparent in steel scrap exports from Russia (+4.2% to 5.542 million tonnes) and Canada (+15.8% to 5.107 million tonnes). In contrast, there was a year-on-year decline in Japan's overseas shipments of steel scrap (-9.8% to 7.405 million tonnes). Drops in overseas shipments were also recorded last year by Australia (-0.6% to 1.968 million tonnes), Hong Kong (-6.2% to 1.295 million tonnes) and Singapore (-1.9% to 0.775 million tonnes).

In 2018, there was also a sharp decrease in steel scrap exports from China (-85% to 0.337 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, 18.6 million tonnes for the EU-28 and 12.3 million tonnes for the USA.

Over the past 10 years, we have been able to show the worldwide use of our ferrous scrap as a raw material in steelworks and foundries, as well as to underline that our ferrous scrap is an ecological raw material and an internationally-traded commodity subject to world market prices.

It has been a great pleasure to witness the enthusiasm with which the figures have been greeted. My favourite compliment has been: "Rolf, I love your statistics."

I am grateful for the very good co-operation with the BIR Ferrous Division board and the BIR Secretariat. I would like to extend my deep thanks to all those supporting this publication.

Our publication will continue into the future. So last but not least, I would like to extend my special thanks to Daniela Entzian, who has been working closely with me for the last two years.

Rolf Willeke

Statistics Advisor of the BIR Ferrous Division

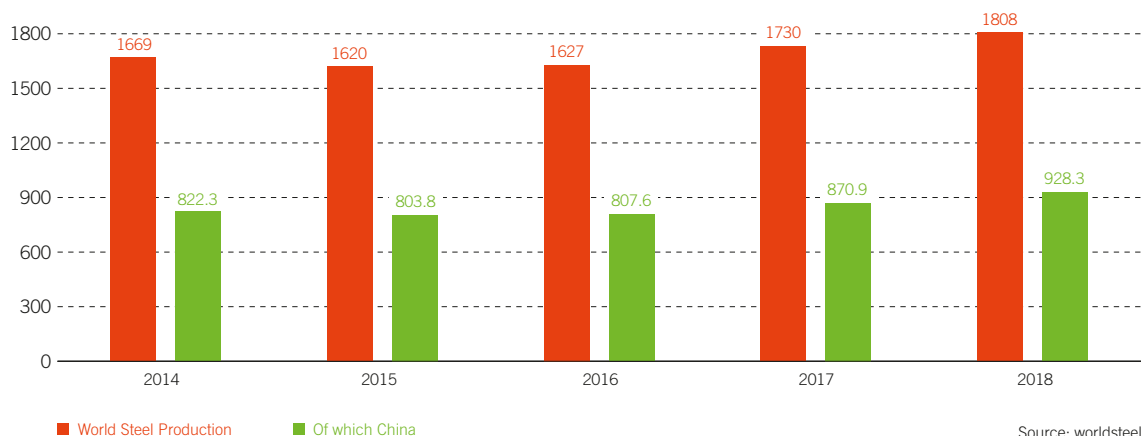
GRAPHS & TABLES

WORLD CRUDE STEEL PRODUCTION SUMMARY (MILLION TONNES)

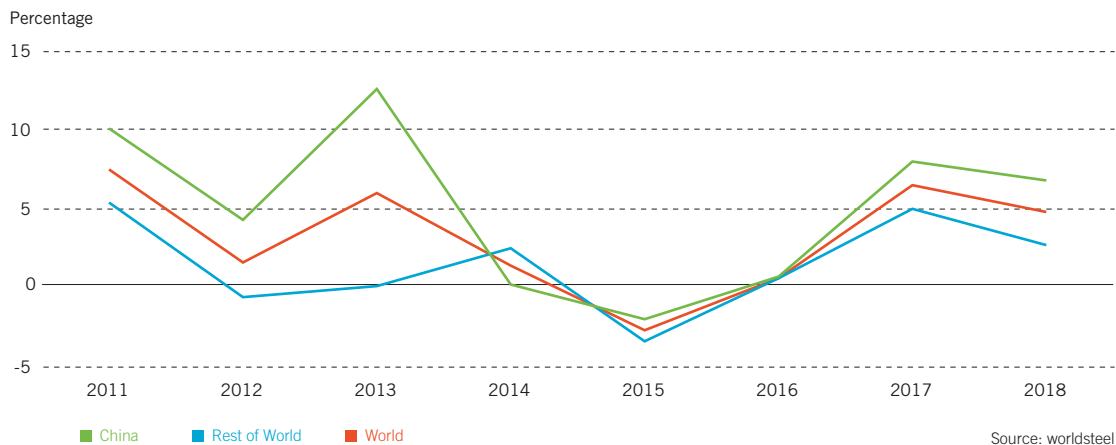
	2014	2015	2016	2017	2018	% 2018/ 2017
European Union (28)	169.2	166.3	162.2	168.5	167.6	-0.5
Other Europe	38.4	35.8	37.6	42.2	42.4	+0.6
of which Turkey	34.0	31.5	33.2	37.5	37.3	-0.6
C.I.S.	106.1	101.6	102.1	100.9	101.3	+0.3
of which Russia	71.5	70.9	70.5	71.6	72.8	+1.7
North America	121.1	110.9	110.6	115.8	120.5	+4.1
of which USA	88.2	78.8	78.5	81.6	86.6	+6.1
South America	45.04	43.9	40.2	43.7	44.3	+1.3
Africa	14.9	13.7	13.1	15.0	16.1	+7.2
of which South Africa	6.4	6.4	6.1	6.3	6.3	+0.4
Middle East	30.0	29.4	31.5	34.5	38.0	+10.3
of which Iran	16.3	16.1	17.9	21.2	24.5	+15.5
Asia	1139.2	1112.9	1123.9	1203.2	1271.0	+5.6
of which China	822.3	803.8	807.6	870.9	928.3	+6.6
of which Japan	110.7	105.1	104.8	104.7	104.3	-0.3
of which Korea Republic	71.5	69.7	68.6	71.0	72.5	+2.0
Oceania	5.5	5.7	5.8	6.0	6.3	+5.9
of which Australia	4.6	4.9	5.3	5.3	5.7	+6.8
World	1669	1620	1627	1730	1808	+4.5
Total 64 Countries						

Source: worldsteel and RUSMET

WORLD CRUDE STEEL PRODUCTION (MILLION TONNES)



CRUDE STEEL PRODUCTION ANNUAL GROWTH TREND (IN PERCENT)



WORLD CRUDE STEEL PRODUCTION BY BOF AND EF PROCESS

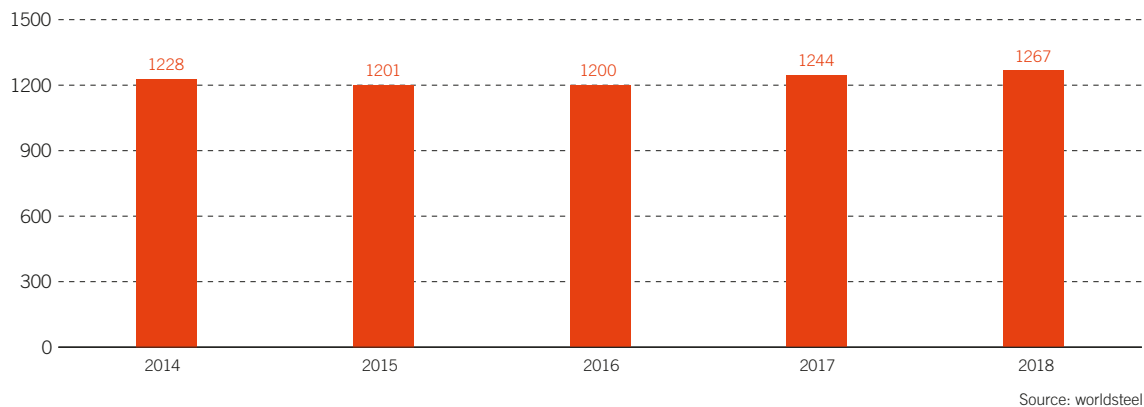
YEAR 2018

	Million Tonnes		Percentage of Total Production	
	BOF	EF	BOF	EF
European Union (28)	98.1	69.6	58.5	41.5
Other Europe	14.0	28.5	32.9	67.1
of which Turkey	11.5	25.8	30.9	69.1
C.I.S.	67.2	27.6	66.3	29.2
of which Russia	48.0	22.1	66.9	30.8
North America	40.9	80.5	33.2	66.8
of which USA	27.7	58.9	32.0	68.8
South America	30.1	13.5	68.2	30.6
Africa	4.4	10.9	28.7	71.3
of which South Africa	3.9	2.4	61.6	38.4
Middle East	2.3	33.6	6.3	93.7
of which Iran	2.3	22.3	9.2	90.8
Asia	1005.8	258.6	79.5	20.4
of which China	807.6	120.7	87.0	13.0
of which Japan	78.2	26.1	75.0	25.0
of which Korea Republic	48.2	24.2	66.6	33.4
Oceania	4.9	1.5	77.0	23.0
of which Australia	4.2	1.5	74.3	25.7
World	1266.7	524.2	70.4	29.2
Total 64 Countries				

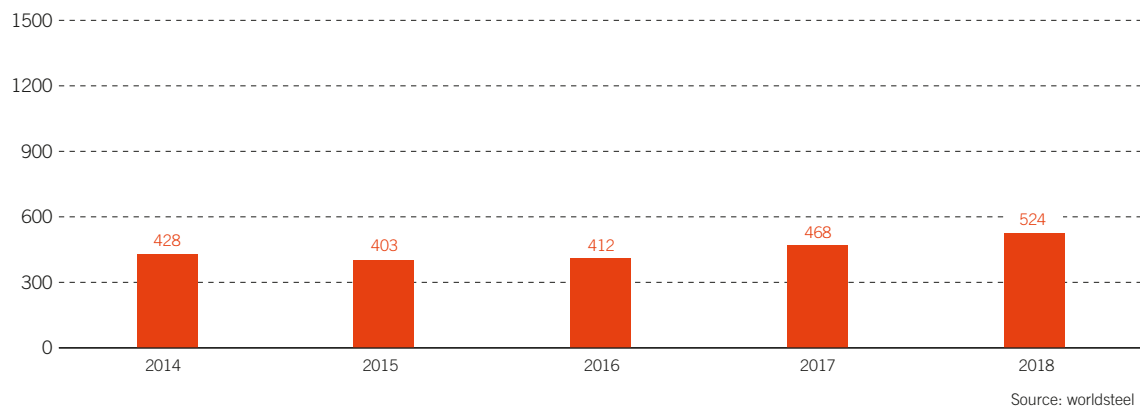
BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel

WORLD BOF – BASIC OXYGEN FURNACE PRODUCTION (MILLION TONNES)



WORLD EF – ELECTRIC FURNACE PRODUCTION (MILLION TONNES)



THE 12 LARGEST STEEL-PRODUCING COUNTRIES (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
1 China	822.3	803.8	807.6	870.9	928.3	+6.6
2 India	87.3	89.0	95.5	101.5	106.5	+4.9
3 Japan	110.7	105.1	104.8	104.7	104.3	-0.3
4 USA	88.2	78.8	78.5	81.6	86.6	+6.1
5 Russia	71.5	70.9	70.5	71.6	72.8	+1.7
6 Korea Republic	71.5	69.7	68.6	71.0	72.5	+2.0
7 Germany	42.9	42.7	42.1	43.3	42.4	-2.0
8 Turkey	34.0	31.5	33.2	37.5	37.3	-0.6
9 Brazil	33.9	33.3	31.3	34.4	34.7	+1.1
10 Iran	16.3	16.1	17.9	21.2	24.5	+15.5
11 Italy	23.7	22.0	23.4	24.1	24.5	+1.7
12 Taiwan	23.1	21.4	21.8	22.4	23.2	+3.6

Source: worldsteel and RUSMET

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

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	1669	1620	1627	1730	1808	+4.5
of which						
Basic Oxygen Furnace (BOF)	1229	1201	1200	1244	1267	+1.8
Electric Furnace (EF)	428	403	412	468	524	+12.0
(Share BOF of Crude Steel) in %	73.6	73.1	74.1	72.3	70.4	
(Share EF of Crude Steel) in %	25.6	24.9	25.3	27.2	29.2	
Blast Furnace Iron	1186	1157	1167	1218	1246	+2.3
(Ratio B F Iron / Crude Steel) in %	71.1	71.4	71.7	70.4	68.9	
Direct Reduced Iron (DRI)	69.9	65.0	64.2	75.4	84.3	+11.9
(Ratio DRI / Crude Steel) in %	4.2	4.0	3.9	4.4	4.7	

Source: worldsteel

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

	2014	2015	2016	2017	2018	% 2018/ 2017
China	87.5	83.3	90.1	147.9	187.8	+27.0
EU-28	91.6	90.61	88.4	93.6	93.8	+0.3
USA	62.0	56.5	56.7	58.8	60.1	+2.2
Japan	36.9	33.53	33.57	35.77	36.51	+2.1
Russia	30.7	27.2	27.8	29.34	30.96	+5.5
Turkey	28.2	24.1	25.9	30.27	30.14	-0.4
Korea Republic	32.6	29.85	27.4	30.67	29.96	-2.3

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

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

	Steel Scrap Consumption			Crude Steel Production		
	2018	2017	% Change	2018	2017	% Change
China	187.8	147.9	+27.0	928.264	870.855	+6.6
EU-28	93.812	93.574	+0.3	167.660	168.518	-0.5
USA	60.1	58.8	+2.2	86.607	81.612	+6.1
Japan	36.514	35.778	+2.1	104.324	104.661	-0.3
Russia	30.957	29.338	+5.5	72.789	71.585	+1.7
Turkey	30.14	30.27	-0.4	37.312	37.524	-0.6
Korea Republic	29.956	30.665	-2.3	72.464	71.030	+2.0
Total	469.3	426.3	+10.1	1469.420	1405.785	+4.5

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

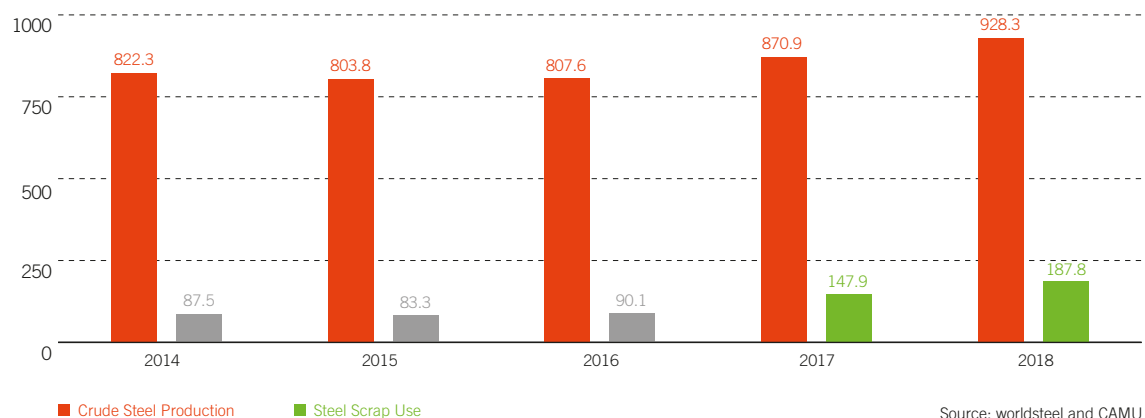
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN CHINA (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	822.3	803.8	807.6	870.9	928.3	+6.6
of which						
Share BOF of Crude Steel in %	93.9	93.9	93.7	90.7	87.0	
Share EF of Crude Steel in %	6.1	6.1	6.3	9.3	13.0	
Total Steel Scrap Use	87.5	83.3	90.1	147.9	187.8	+27.0
Ratio Steel Scrap / Crude Steel in %	10.6	10.4	11.2	17.8	20.2	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and CAMU

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
European Union 28	93.345	88.374	+5.6	168.140	162.024	+3.8

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

Please note that the split of the scrap consumption by country can only be published with a 12-month delay according to new compliance rules of EUROFER.

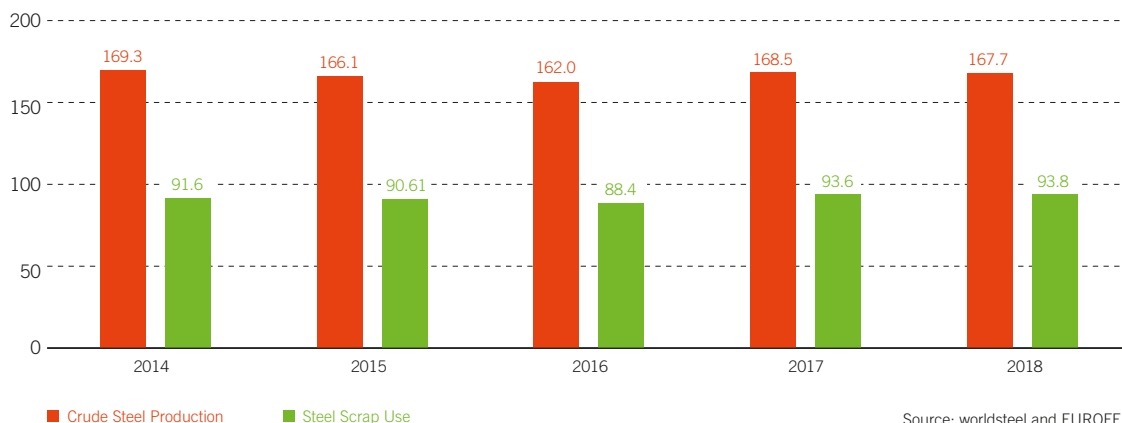
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN THE EU-28 (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	169.3	166.1	162.0	168.5	167.7	-0.5
of which						
Share BOF of Crude Steel in %	61.0	60.7	60.5	59.6	58.5	
Share EF of Crude Steel in %	39.0	39.3	39.5	40.4	41.5	
Total Steel Scrap Use	91.6	90.61	88.4	93.6	93.8	+0.2
Ratio Steel Scrap / Crude Steel in %	54.1	54.6	54.6	55.5	55.9	

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

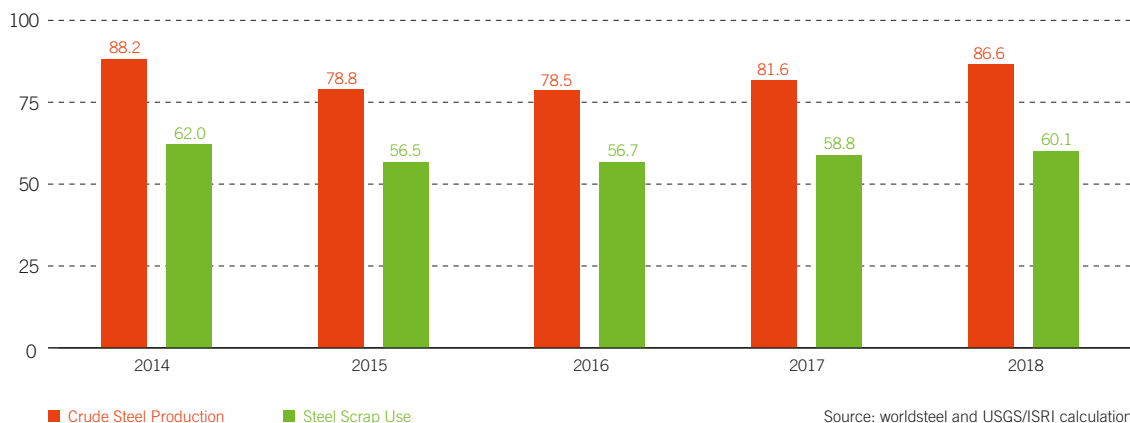
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN THE USA (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	88.2	78.8	78.5	81.6	86.6	+6.1
of which						
Share BOF of Crude Steel in %	37.4	37.3	33.0	31.6	32.0	
Share EF of Crude Steel in %	62.6	62.7	67.0	68.4	68.0	
Total Steel Scrap Use	62.0	56.5	56.7	58.8	60.1	+2.2
Ratio Steel Scrap / Crude Steel in %	70.3	71.7	72.2	72.1	69.4	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and USGS/ISRI calculation

STEEL SCRAP FOR STEELMAKING IN THE USA (MILLION TONNES)



Source: worldsteel and USGS/ISRI calculation

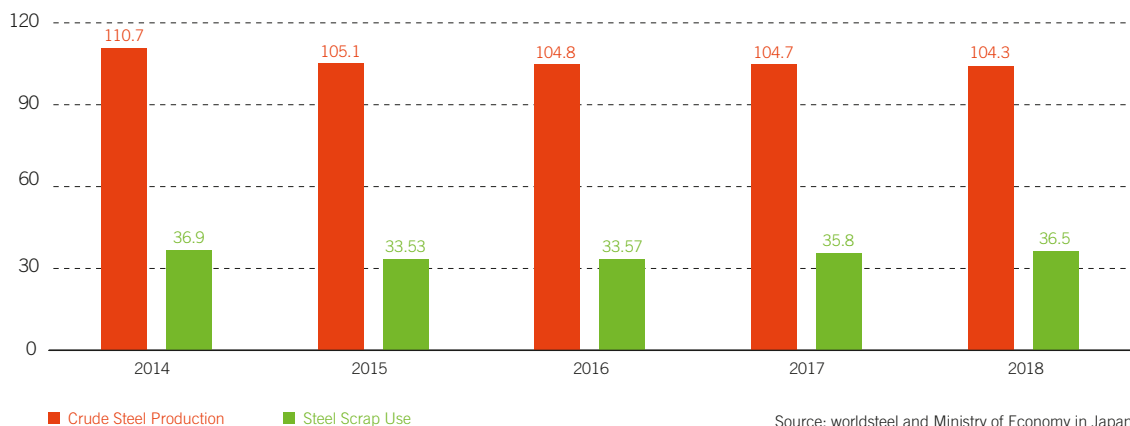
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN JAPAN (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	110.7	105.1	104.8	104.7	104.3	-0.3
of which						
Share BOF of Crude Steel in %	76.8	77.1	77.8	75.8	75.0	
Share EF of Crude Steel in %	23.2	22.9	22.2	24.2	25.0	
Total Steel Scrap Use	36.9	33.53	33.57	35.8	36.5	+2.1
Ratio Steel Scrap / Crude Steel in %	33.3	31.9	32.1	34.2	35.0	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and Ministry of Economy in Japan

STEEL SCRAP FOR STEELMAKING IN JAPAN (MILLION TONNES)



Source: worldsteel and Ministry of Economy in Japan

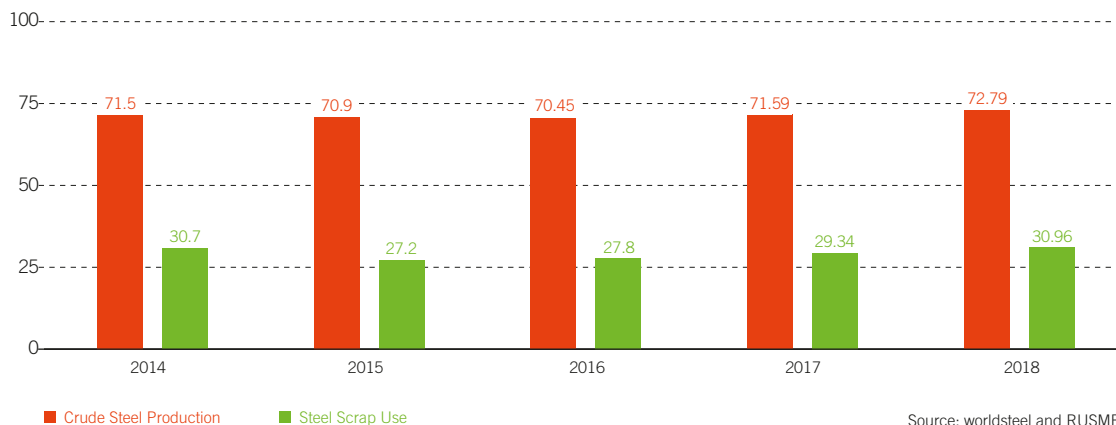
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN RUSSIA (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	71.5	70.9	70.45	71.59	72.79	+1.7
of which						
Share BOF of Crude Steel in %	66.3	66.6	67.7	66.7	65.9	
Share EF of Crude Steel in %	30.2	30.6	29.0	30.7	30.2	
Total Steel Scrap Use	30.7	27.2	27.8	29.34	30.96	+5.5
Ratio Steel Scrap / Crude Steel in %	42.9	38.4	39.5	41.0	42.5	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and RUSMET

STEEL SCRAP FOR STEELMAKING IN THE RUSSIA (MILLION TONNES)



Source: worldsteel and RUSMET

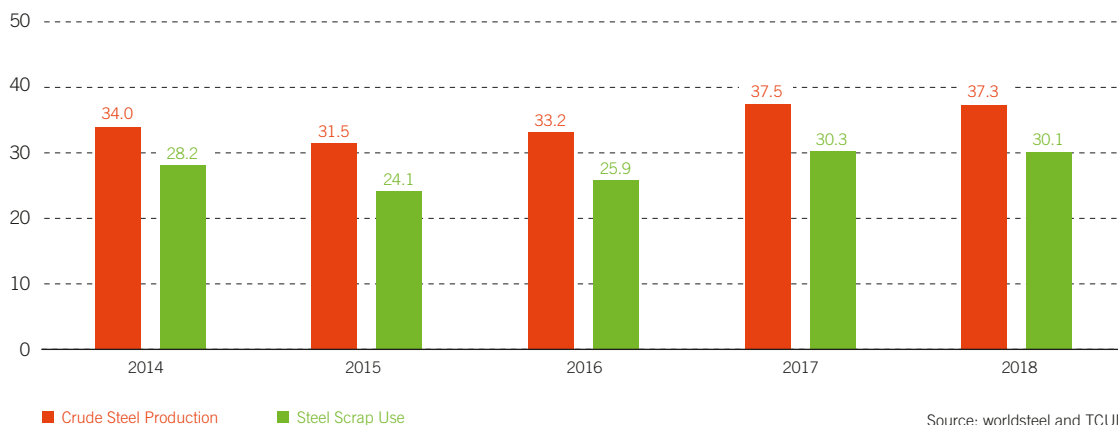
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN **TURKEY** (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	34.0	31.5	33.2	37.5	37.3	-0.6
of which						
Share BOF of Crude Steel in %	30.2	35.0	34.1	30.8	30.9	
Share EF of Crude Steel in %	69.8	65.0	65.9	69.2	69.1	
Total Steel Scrap Use	28.2	24.1	25.9	30.3	30.1	-0.4
Ratio Steel Scrap / Crude Steel in %	82.9	76.5	78.0	80.8	80.7	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and TCUD

STEEL SCRAP FOR STEELMAKING IN **TURKEY** (MILLION TONNES)



Source: worldsteel and TCUD

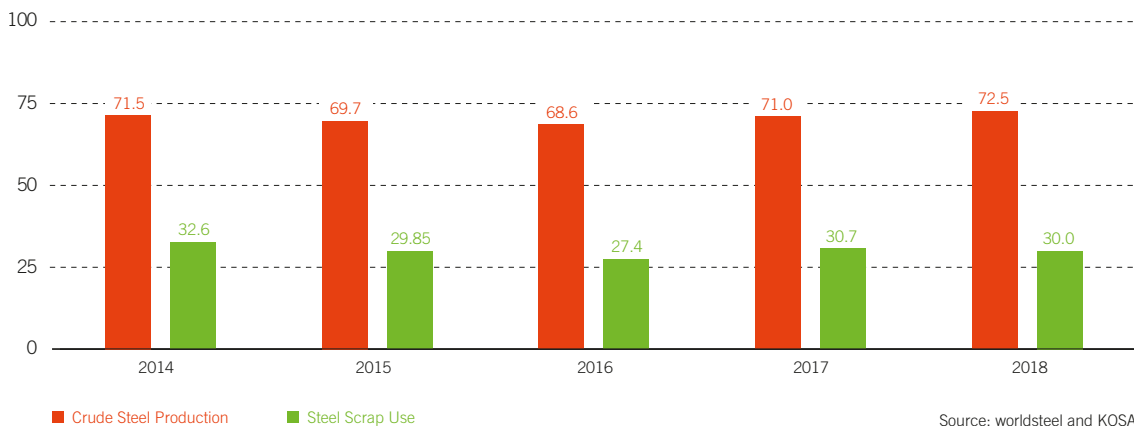
CRUDE STEEL PRODUCTION AND STEEL SCRAP USE IN THE REPUBLIC OF KOREA (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Crude Steel Production	71.5	69.7	68.6	71.0	72.5	+2.0
of which						
Share BOF of Crude Steel in %	66.2	77.1	69.3	67.1	66.6	
Share EF of Crude Steel in %	33.8	22.9	30.7	32.9	33.4	
Total Steel Scrap Use	32.6	29.85	27.4	30.7	30.0	-2.3
Ratio Steel Scrap / Crude Steel in %	45.6	42.9	39.9	43.2	41.4	

BOF – Basic Oxygen Furnace
EF – Electric Furnace

Source: worldsteel and KOSA

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



Source: worldsteel and KOSA

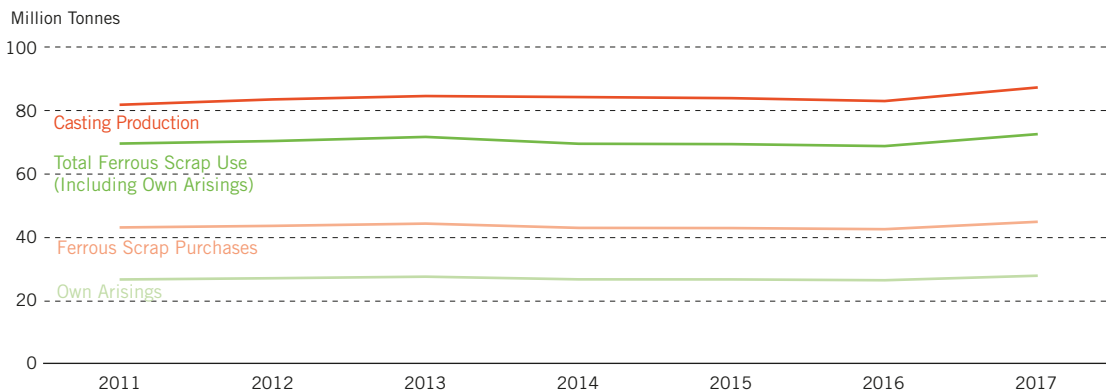
FERROUS SCRAP USE IN IRON AND STEEL FOUNDRIES IN THE WORLD (MILLION TONNES)

	2011	2012	2013	2014	2015	2016	2017	% 2017/ 2016
Iron Steel and Malleable Casting Production	82.0	83.7	84.8	84.4	84.0	83.2	87.5	+5.1
Total Ferrous Scrap Use	69.7	70.5	71.8	69.6	69.5	68.9	72.7	+5.5
(Ratio Scrap Use / Casting Production) in %	84.97	84.24	84.71	82.47	82.66	82.83	83.03	
Own Arisings (Circulating Scrap)*	26.6	27.0	27.5	26.6	26.6	26.4	27.8	+5.3
(Share Own Arisings of Scrap Use) in %	38.15	38.22	38.28	38.26	38.29	38.25	38.25	
Ferrous Scrap Purchases	43.1	43.6	44.3	43.0	42.9	42.5	44.9	+5.6
(Share Purchases of Scrap Use) in %	61.85	61.78	61.72	61.68	61.71	61.75	61.75	0.0

Source: Modern Casting and own calculations by BDG/BIR

* 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.

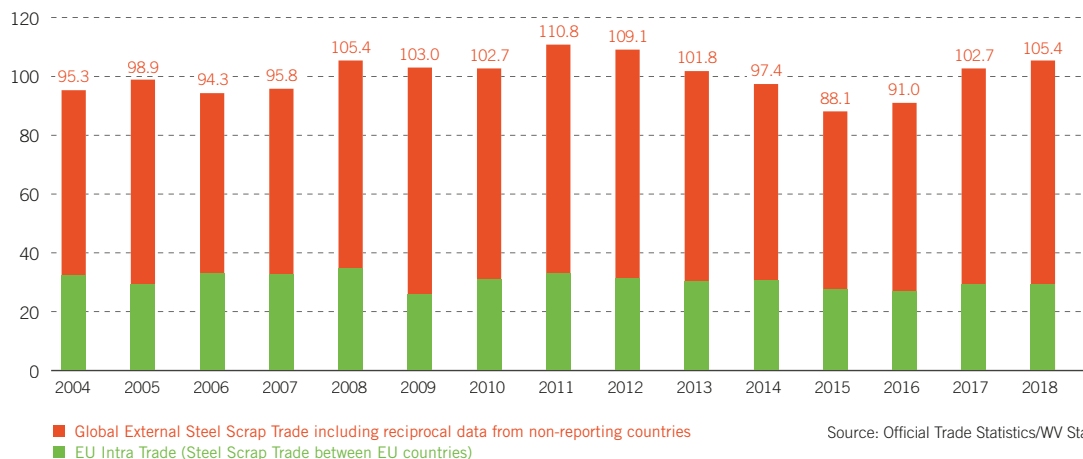
FERROUS SCRAP USE IN IRON AND STEEL FOUNDRIES IN THE WORLD (MILLION TONNES)



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



MAIN STEEL SCRAP IMPORTERS (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
Turkey	19.068	16.251	17.716	20.980	20.660	-1.5
Korea Republic	8.002	5.758	5.845	6.175	6.393	+3.5
India	5.699	6.710	6.380	5.365	6.330	+18.0
USA	4.215	3.513	3.864	4.636	5.030	+8.5
Taiwan	4.272	3.373	3.155	2.919	3.629	+24.3
Canada	1.520	1.516	1.839	2.115	3.471	+64.1
EU-28	3.142	2.849	2.749	3.071	2.850	-7.2
Indonesia	2.137	1.020	1.020	1.857	2.510	+35.2
Mexico	0.915	1.483	1.893	1.782	1.913	+7.4
Thailand	1.383	0.945	0.953	1.741	1.724	-1.0
Belarus	1.253	1.382	1.235	1.353	1.497	+10.6
China	4.465	2.564	2.328	2.326	1.343	-42.3

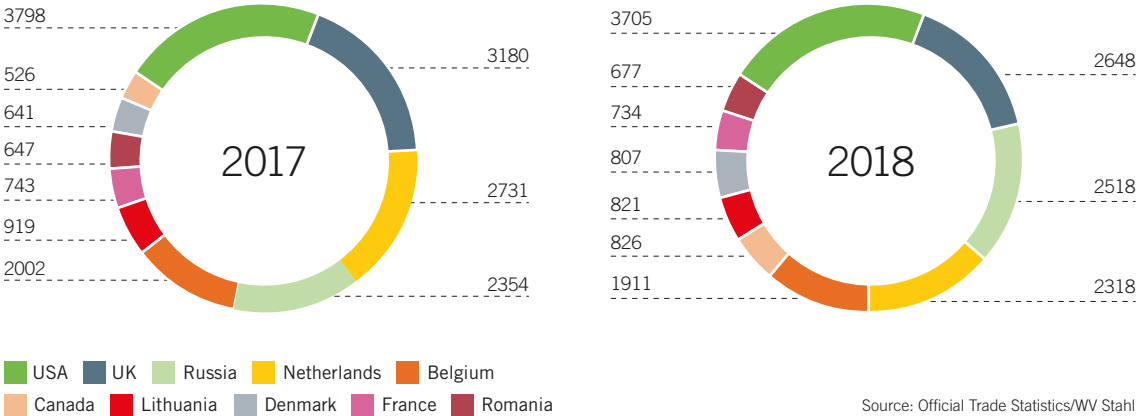
Source: Official Trade Statistics/WV Stahl

STEEL SCRAP IMPORTS OF **TURKEY** (THOUSAND TONNES)

	2017	2018	% Change		2017	2018	% Change
Total	20980	20660	-1.5	USA	3798	3705	-2.4
				UK	3180	2648	-16.7
				Russia	2354	2518	+7.0
				Netherlands	2731	2318	-15.1
				Belgium	2002	1911	-4.5
				Canada	526	826	+57.0
				Lithuania	919	821	-10.7
				Denmark	641	807	+25.9
				France	743	734	-1.2
				Romania	647	677	+4.6

Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP SUPPLIERS OF **TURKEY** – DEVELOPMENT 2017 VS. 2018 (THOUSAND TONNES)



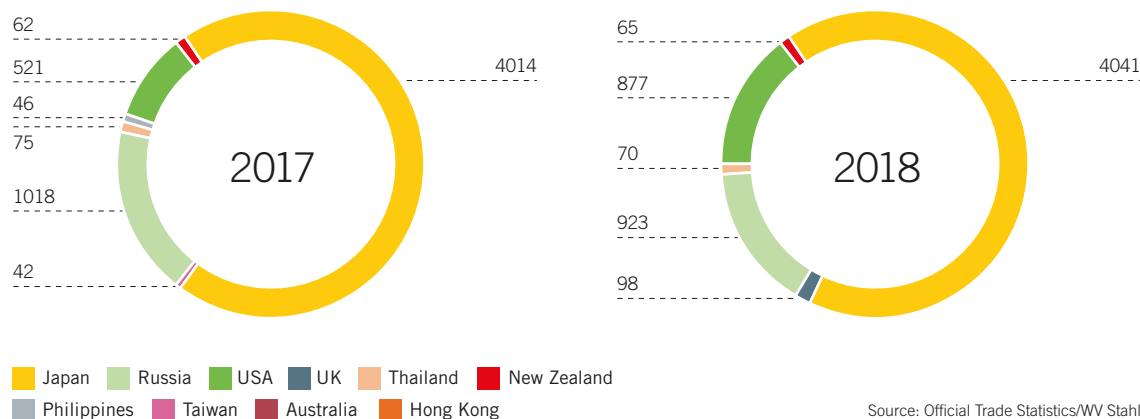
Source: Official Trade Statistics/WV Stahl

STEEL SCRAP IMPORTS OF REPUBLIC OF KOREA (THOUSAND TONNES)

	2017	2018	% Change		2017	2018	% Change
Total	6175	6393	+3.5	Japan	4014	4041	+0.7
				Russia	1018	923	-9.3
				USA	521	877	+68.3
				UK	42	98	+133.3
				Thailand	75	70	-6.7
				New Zealand	62	65	+ 4.8
				Philippines	46	37	-19.6
				Taiwan	42	29	-31.0
				Australia	11	19	+72.7
				Hong Kong	13	18	+38.5

Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP SUPPLIERS OF REP. OF KOREA – DEVELOPMENT 2017 VS. 2018 (THOUSAND TONNES)



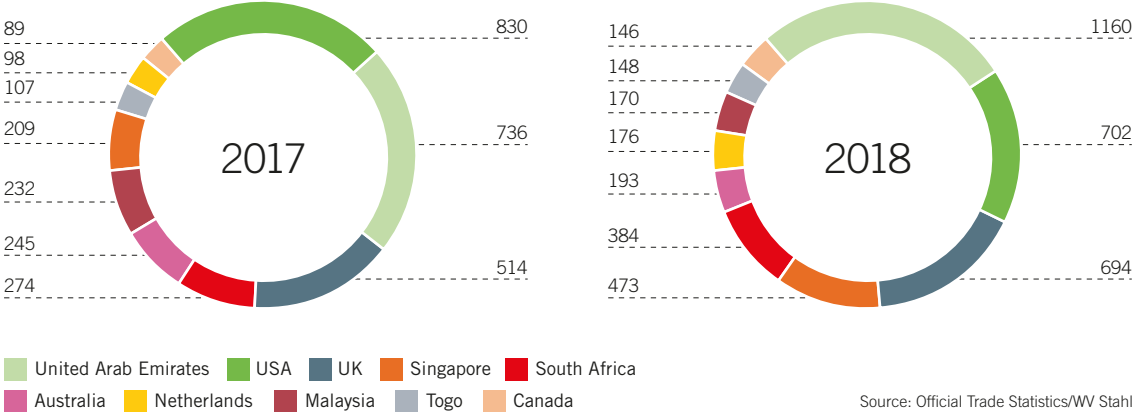
Source: Official Trade Statistics/WV Stahl

STEEL SCRAP IMPORTS OF INDIA (THOUSAND TONNES)

	2017	2018	% Change		2017	2018	% Change
Total	5365	6330	+18.0	United Arab Emirates	736	1160	+57.6
				USA	830	702	-14.4
				UK	514	694	+35.0
				Singapore	209	473	+126.3
				South Africa	274	384	+40.1
				Australia	245	193	-21.2
				Netherlands	98	176	+79.6
				Malaysia	232	170	-26.7
				Togo	107	148	+38.3
				Canada	89	146	+64.0

Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP SUPPLIERS OF INDIA – DEVELOPMENT 2017 VS. 2018 (THOUSAND TONNES)



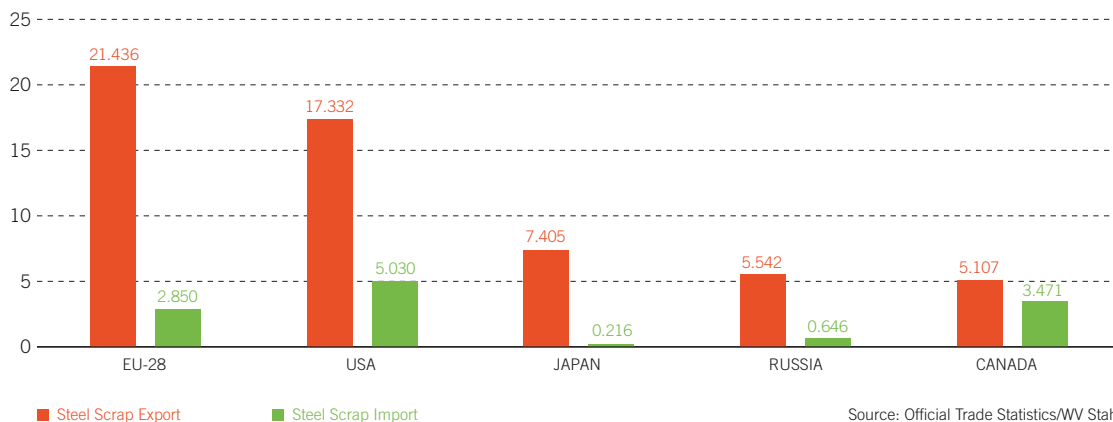
Source: Official Trade Statistics/WV Stahl

MAIN STEEL SCRAP EXPORTERS (MILLION TONNES)

	2014	2015	2016	2017	2018	% 2018/ 2017
EU-28	16.953	13.743	17.769	20.085	21.436	+6.7
USA	15.340	12.976	12.819	15.016	17.332	+15.4
Japan	7.339	7.839	8.698	8.208	7.405	-9.8
Russia	5.765	5.646	5.524	5.320	5.542	+4.2
Canada	4.510	3.415	3.632	4.409	5.107	+15.8
Australia	2.362	1.898	1.583	1.979	1.968	-0.6
Hong Kong	1.292	1.239	1.347	1.380	1.295	-6.2
Singapore	0.911	0.844	1.048	0.790	0.775	-1.9

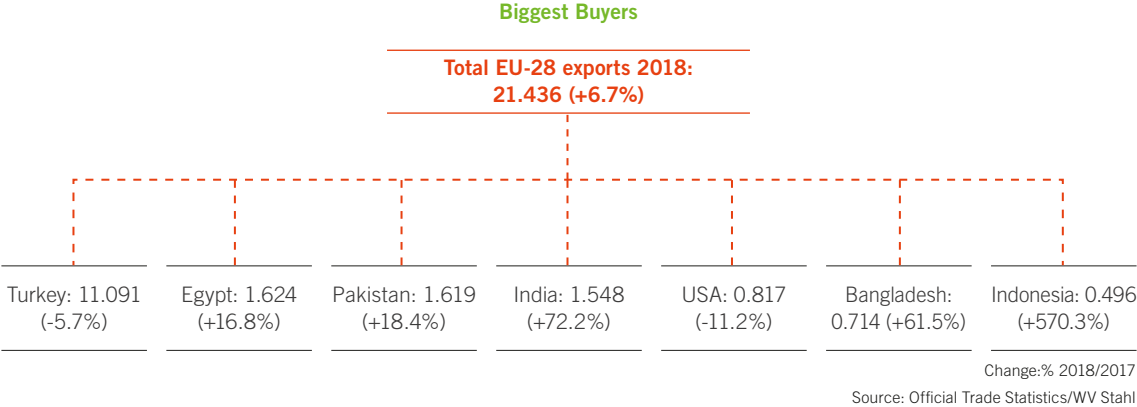
Source: Official Trade Statistics/WV Stahl

MAJOR NET STEEL SCRAP EXPORTERS 2018 (MILLION TONNES)

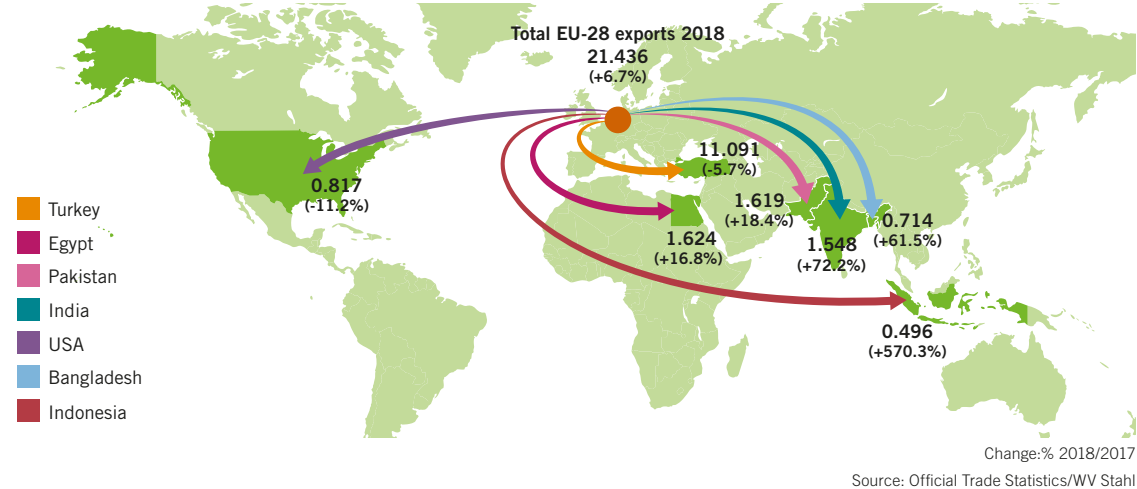


Source: Official Trade Statistics/WV Stahl

EU-28 STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



MAIN FLOWS OF EU-28 STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



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

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

Exporters	2018	2017	% Change	Biggest Buyers	2018	% Change
United Kingdom	7.031	6.966	+0.9	Turkey	2.517	-19.0
				Pakistan	1.053	+9.1
				Egypt	0.858	+4.1
				India	0.703	+38.7
				Bangladesh	0.547	+82.9
				Indonesia	0.412	+472.2
Netherlands	3.450	3.390	+1.8	Turkey	2.227	-16.3
				USA	0.258	+31.6
				India	0.238	+126.7
				Egypt	0.204	+397.6
Belgium	2.768	2.640	+4.8	Turkey	1.917	-4.3
				Egypt	0.530	+13.0
				India	0.121	+245.7
Germany	1.372	1.191	+15.2	Turkey	0.691	+9.2
				Switzerland	0.353	-2.8
				India	0.179	+225.5
				Pakistan	0.099	+98.0
France	0.960	0.863	+11.2	Turkey	0.671	+7.9
				Switzerland	0.090	-10.9
Sweden	0.881	0.912	-3.4	Turkey	0.293	+22.1
				USA	0.221	+10.0
				Norway	0.144	-2.7
Romania	0.676	0.617	+9.6	Turkey	0.585	+10.0
Bulgaria	0.311	0.350	-11.1	Turkey	0.244	-15.9
EU-28 Extra Trade	21.436	20.085	+6.7			

Change: % 2018/2017

Source: Official Trade Statistics/WV Stahl

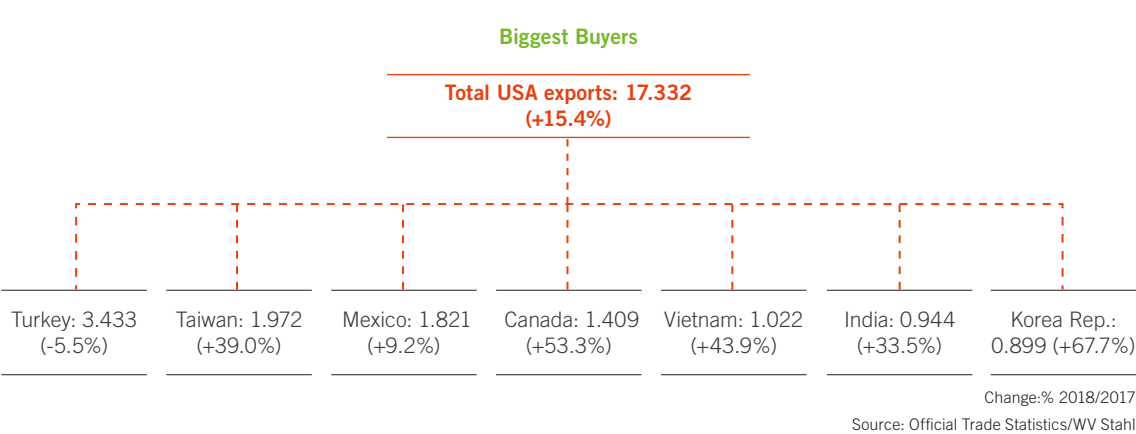
EU-28 INTERNAL STEEL SCRAP EXPORTS BY COUNTRY (MILLION TONNES)

Main Steel Scrap Exports between EU-28 Countries

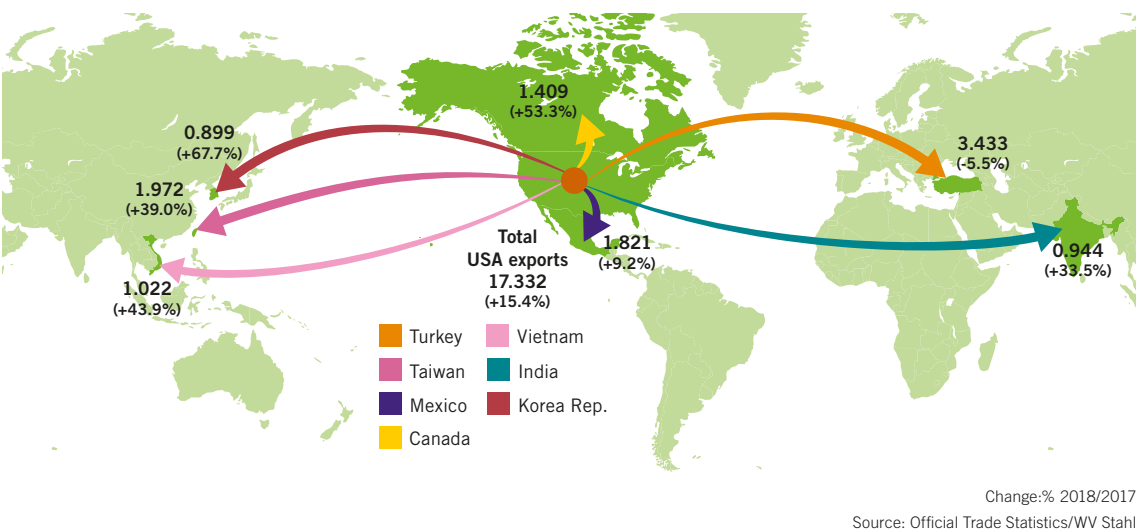
Exporters	2018	2017	% Change	Biggest Buyers	2018	% Change
Germany	7.193	7.609	-5.5	Italy	1.786	+10.4
				Netherlands	1.477	-18.0
				Belgium	1.280	+1.4
				Luxembourg	1.242	-3.1
				France	0.581	-14.6
France	5.488	5.420	+2.9	Spain	1.697	-3.9
				Belgium	1.601	+3.1
				Luxembourg	0.798	+4.3
				Italy	0.666	+12.7
Netherlands	2.681	2.717	-1.3	Germany	0.965	+4.9
				Belgium	0.681	+3.5
				Finland	0.405	+1.3
Czech Republic	2.243	2.247	-0.2	Germany	0.969	+6.0
				Poland	0.453	-15.5
				Italy	0.369	+14.2
United Kingdom	1.638	1.805	-9.4	Spain	0.811	-19.4
				Portugal	0.313	-15.9
Poland	1.358	1.357	+0.7	Germany	0.707	-3.2
				Czech Republic	0.319	+11.5
Belgium	1.251	1.257	-0.5	France	0.522	-8.4
				Netherlands	0.278	-5.4
				Luxembourg	0.268	+30.7
Austria	1.012	1.181	-14.3	Italy	0.545	-22.3
				Germany	0.357	- 2.7
EU-28 Intra Trade	29.090	29.499	-1.4			

Change: % 2018/2017
Source: Official Trade Statistics/WV Stahl

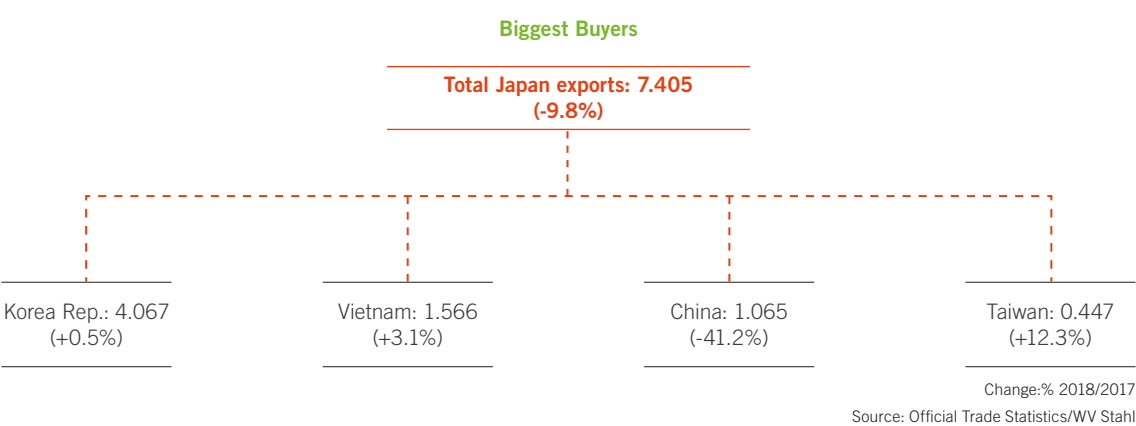
US STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



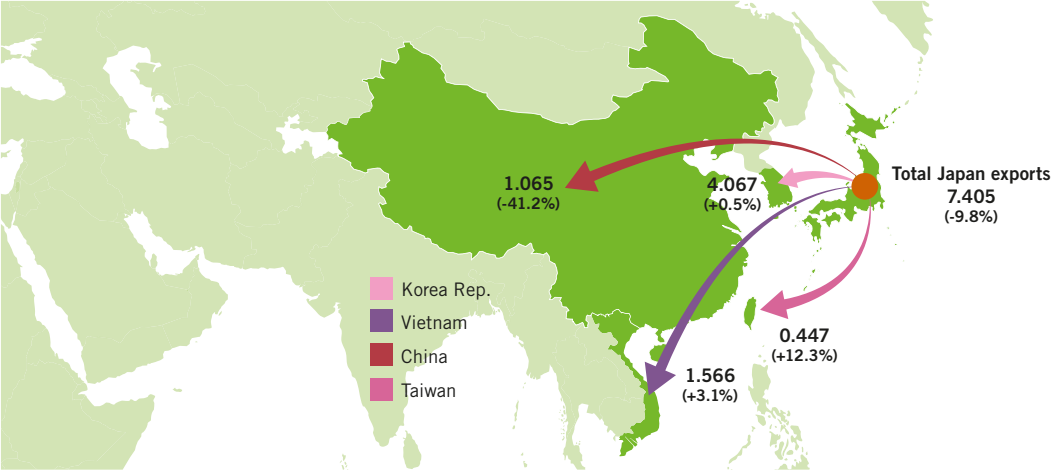
MAIN FLOWS OF US STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



JAPAN STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



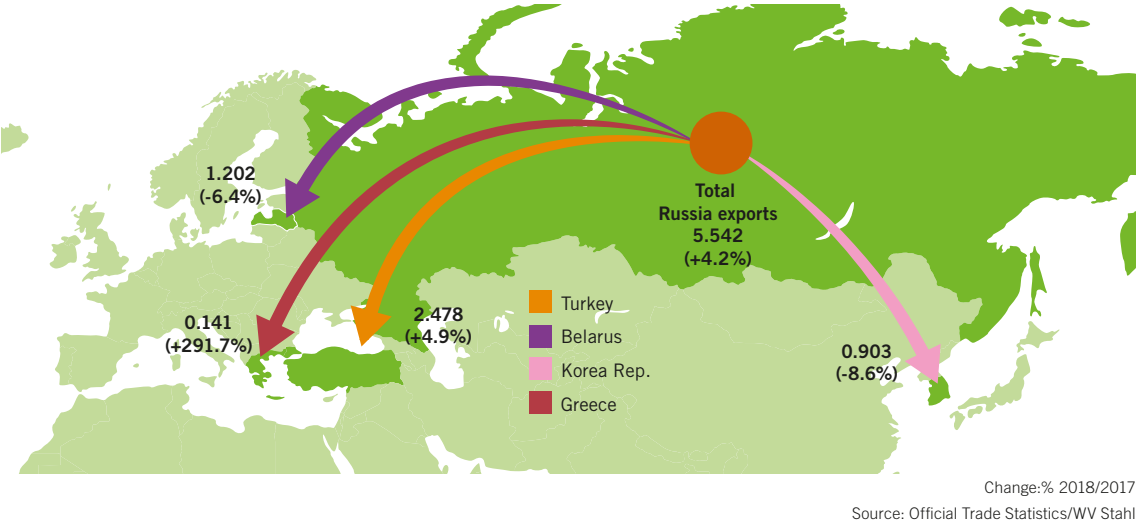
MAIN FLOWS OF JAPANESE STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



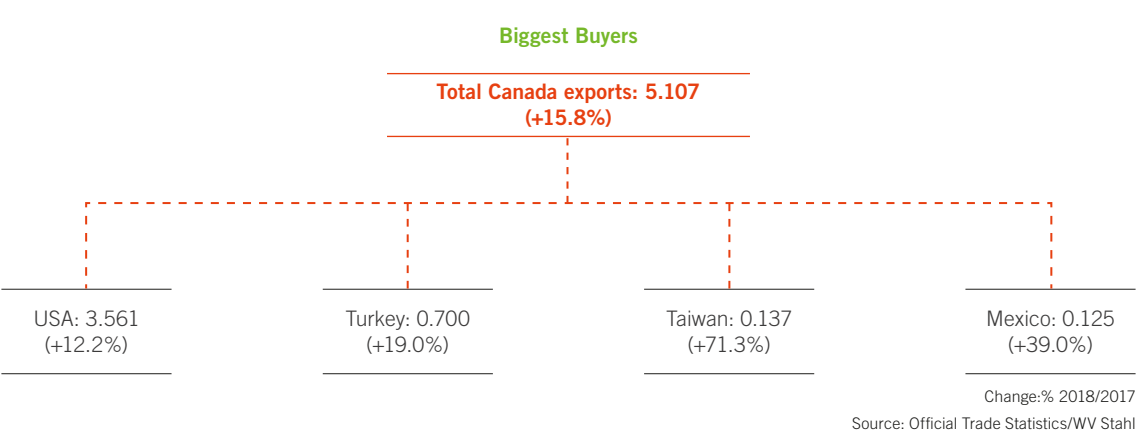
RUSSIA STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



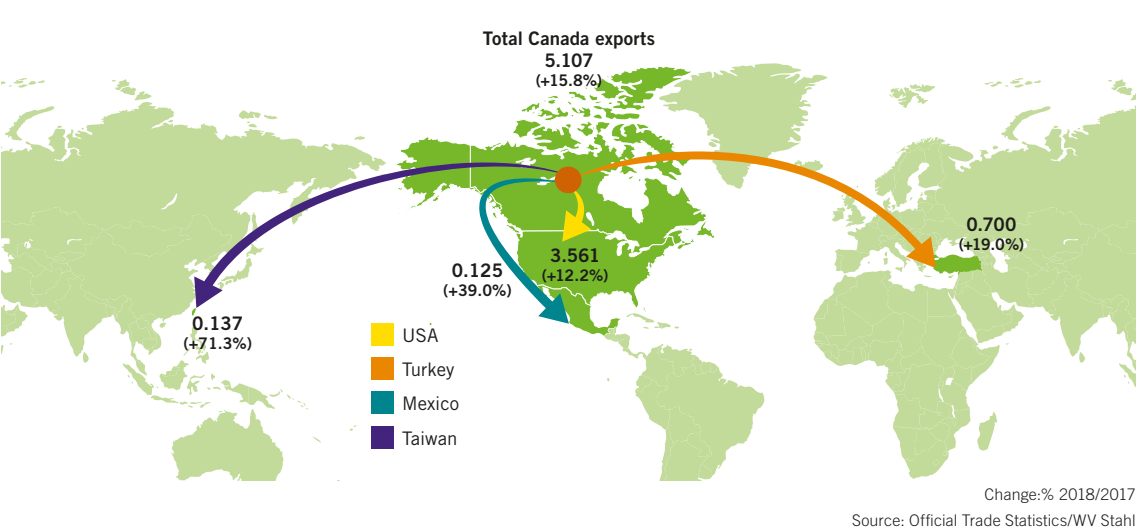
MAIN FLOWS OF RUSSIAN STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



CANADA STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



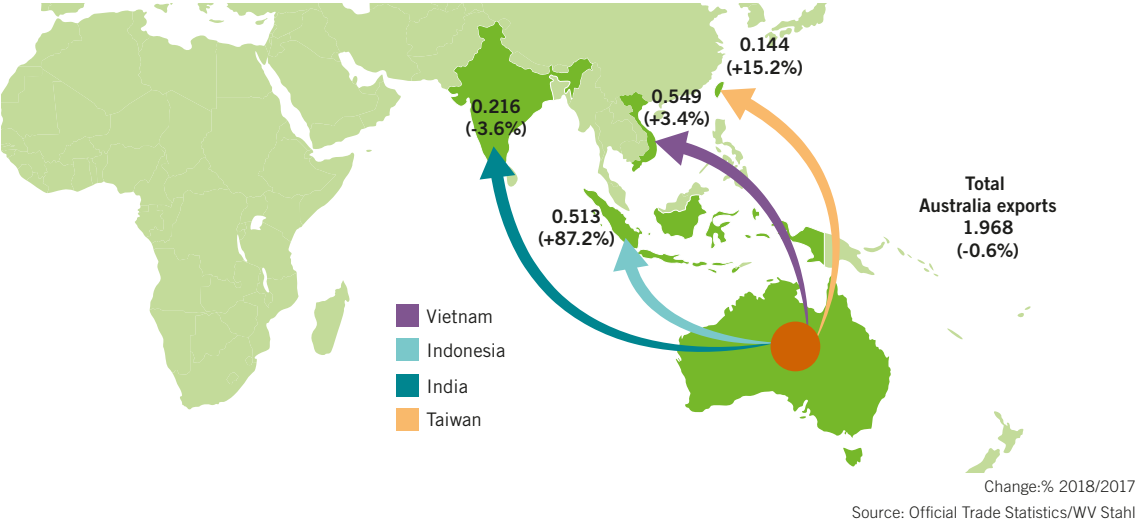
MAIN FLOWS OF CANADIAN STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



AUSTRALIA STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



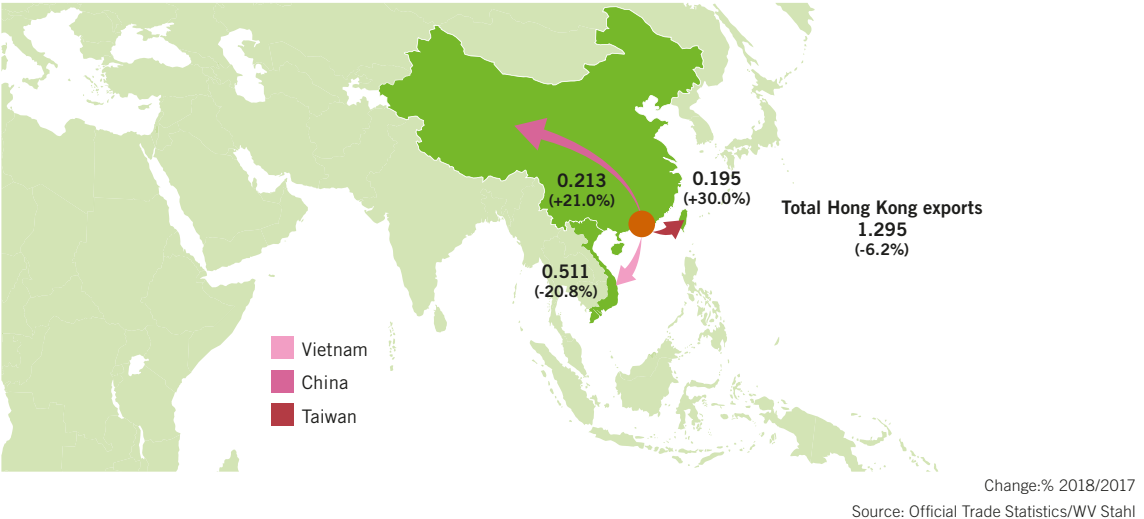
MAIN FLOWS OF AUSTRALIAN STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



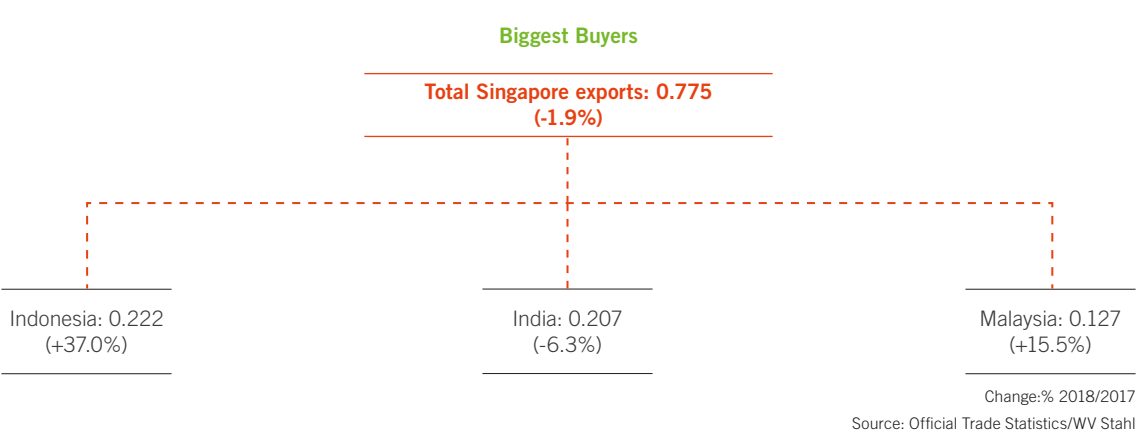
HONG KONG STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



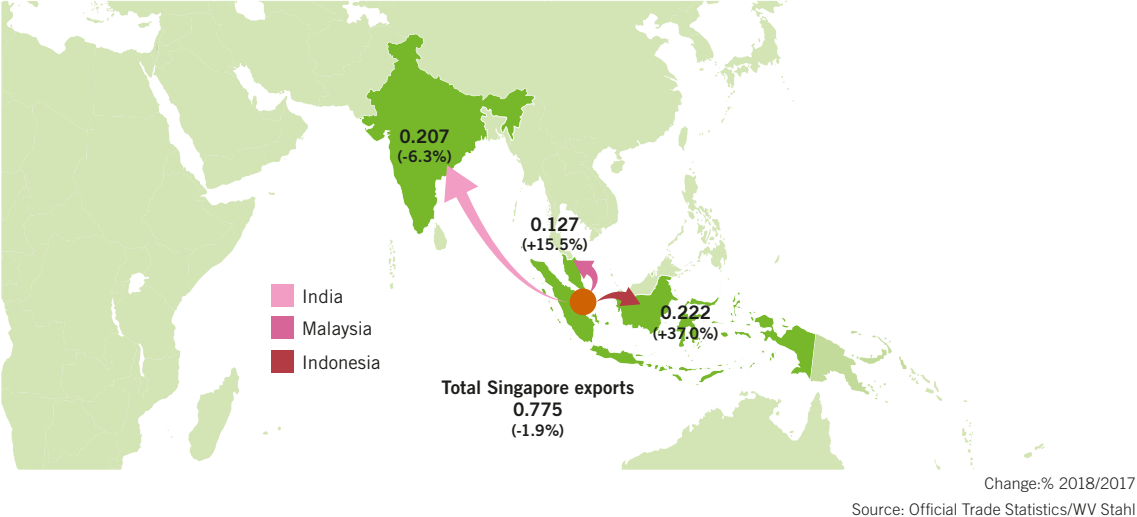
MAIN FLOWS OF HONG KONG STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



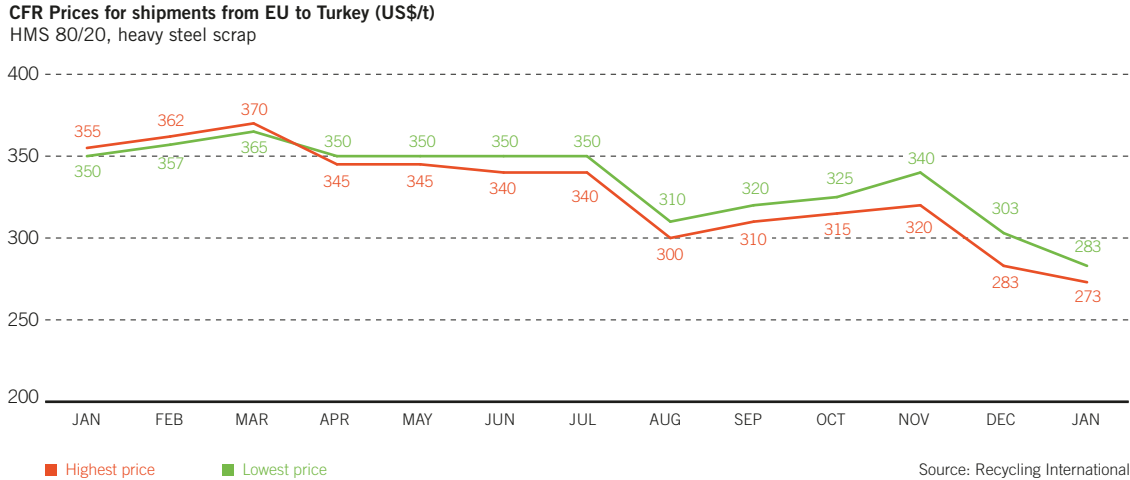
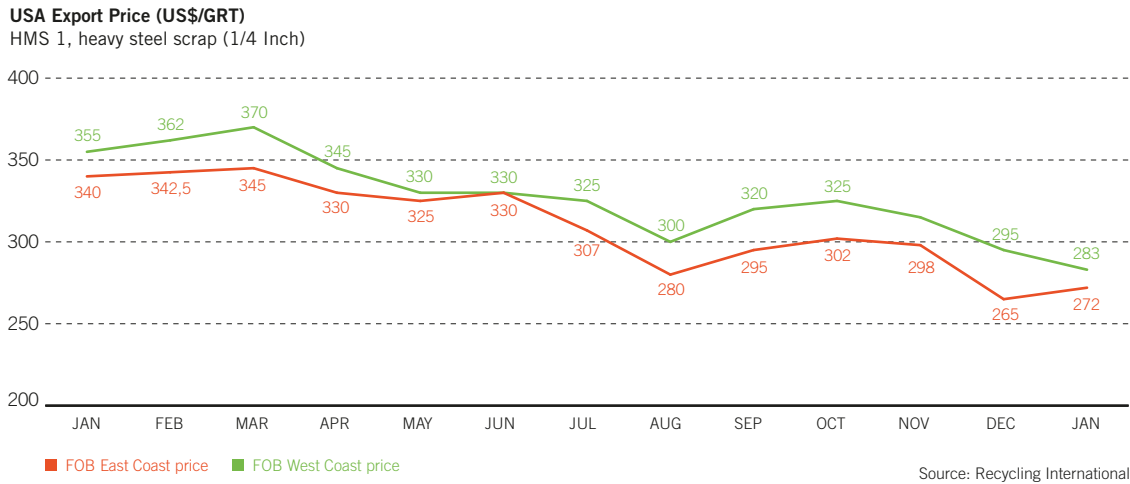
SINGAPORE STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



MAIN FLOWS OF SINGAPORE STEEL SCRAP EXPORTS 2018 (MILLION TONNES)



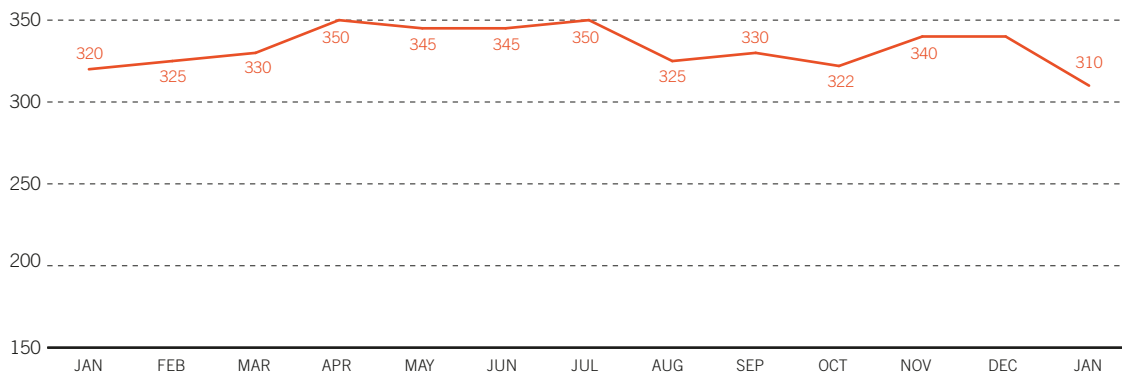
STEEL SCRAP PRICE CURVES JANUARY 2018/2019



STEEL SCRAP PRICE CURVES JANUARY 2018/2019

USA Domestic Scrap Prices (US\$/GRT)

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



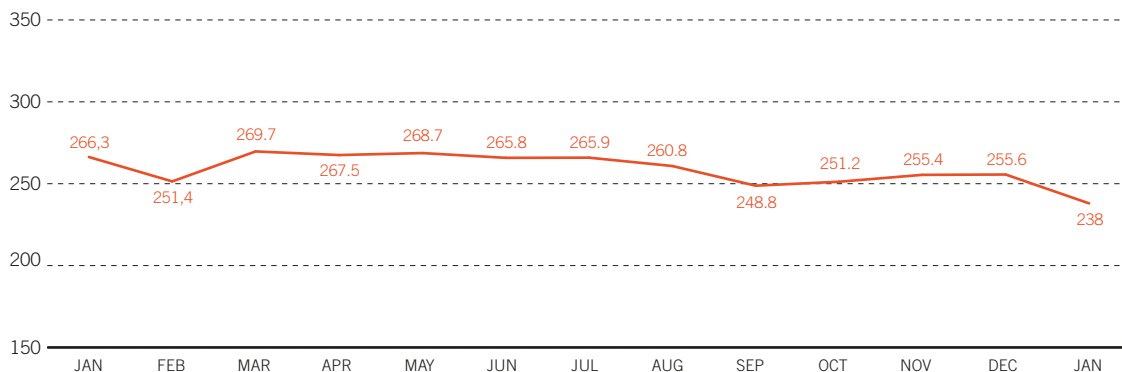
Source: Recycling International

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
Ferrous Division

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
