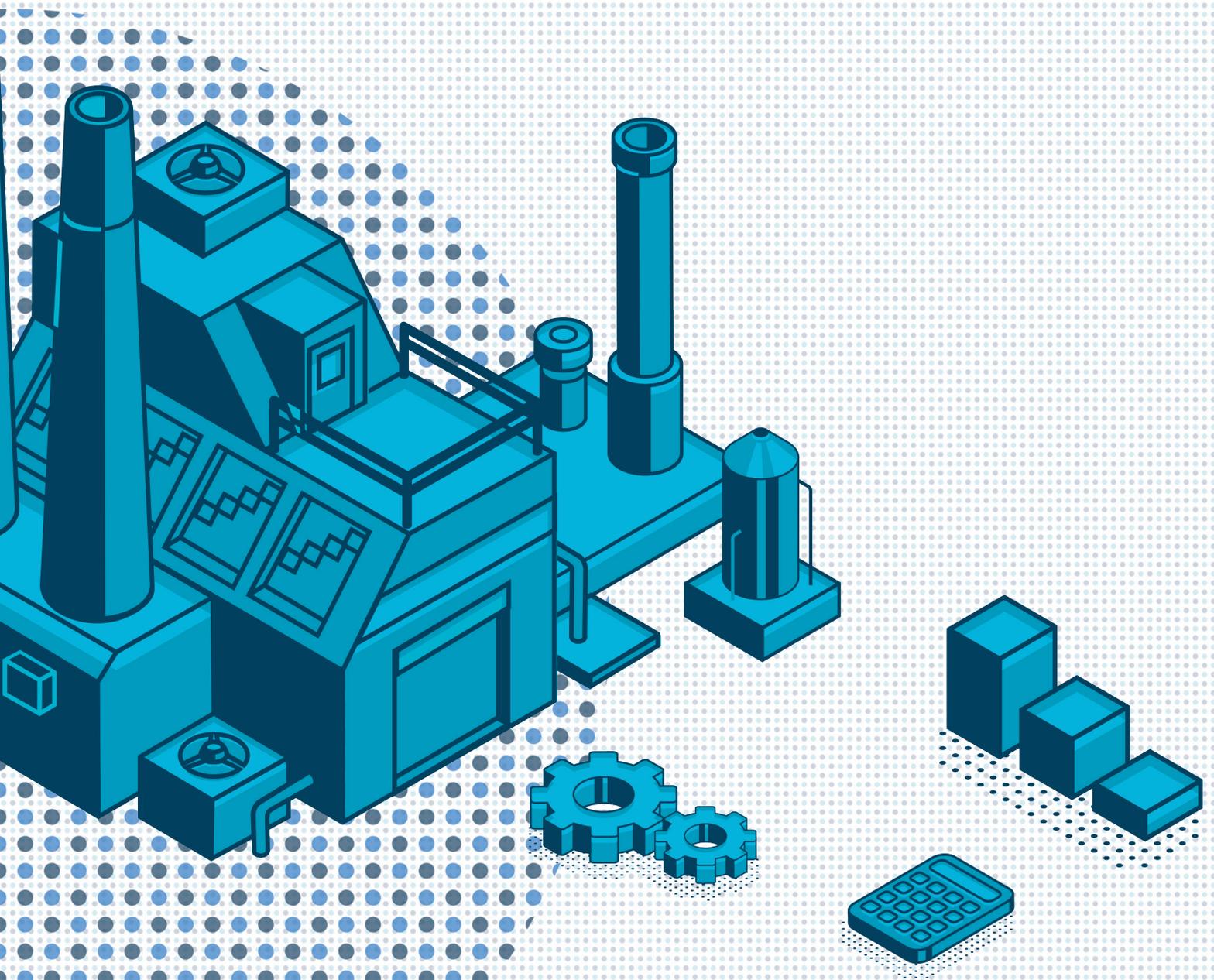


Ukrainian Iron & Steel Industry

in Figures 2019



Let me introduce our new product – “Ukrainian Iron & Steel Industry in Figures” report. It’s the first complex and free access study of Ukrainian iron & steel industry.



Stanislav Zinchenko
GMK Center Director

Having local expertise, GMK Center describes specific of Ukrainian steel sector, shows performance and trends. This report is like the portrait of iron & steel industry of Ukraine.

Iron & steel industry – is a key, basic sector for entire Ukrainian economy. During last 4 years, it faced with number of challenges – Donbass conflict, shortage of raw materials, changing of sales directions, logistic problems, weakening of domestic steel market. You will be able to see the consequences and how industry responded to these issues.

“ **GMK Center having local expertise, describes specific of Ukrainian steel sector, shows performance and trends. This report is like the portrait of iron & steel industry of Ukraine.**

Ukraine has one of the lowest steel consumption in the world – 105.6 kg per capita in 2018, comparing with global average 224 kg.

Development of domestic steel market is one of the most important tasks of newly elected President and Parliament. It could be achieved through infrastructure investments and stimulating investment activity. In fact, even small Ukrainian steel market is attractive for foreign suppliers. We can see this fact in growing import volume during last 3 years. It confirms

the thesis that there are no small markets on the global steel map.

Global steelmaking map has changed. This was facilitated by protectionist sentiments in developed countries, continued growth in consumption in China, economic development of Southeast Asia and MENA countries.

Where is the place of Ukraine on this map, the place as a manufacturer, exporter and consumer? How much global protectionism influenced on Ukrainian steel industry? Are there abilities to increase crude steel production volumes? You will find the answers to these and many other questions as you read this document.

Ukraine holds the 10th position among largest producers of pig iron and the 13th among steel producers worldwide. But global iron & steel industry faced with important fundamental problems: protectionism, excess capacity, slowing down of global economy and demand for steel products, the need for environmental CAPEX. Ukrainian iron & steel industry meets these challenges with ambitious plans, the largest investment program for the last 10 years.

CONTENTS

INTRODUCTION	3
INDUSTRY IMPACT	5
UKRAINIAN IRON & STEEL INDUSTRY MAP	6-7
STEEL PRODUCTION:	8-11
By process	
By company	
By product	
INTERNATIONAL TRADE:	12-16
Steel export by product	
Steel export by country	
Steel import by product	
Steel import by country	
STEEL CONSUMPTION:	17-19
By product	
By sector	
RAW MATERIALS:	20-23
Iron ore	
Coke	
Scrap	
Ferroalloys	
TOP 10 FACTS ABOUT UKRAINIAN IRON & STEEL INDUSTRY	24
ACTUAL POSSIBILITIES OF UKRAINIAN STEEL SECTOR	25-26

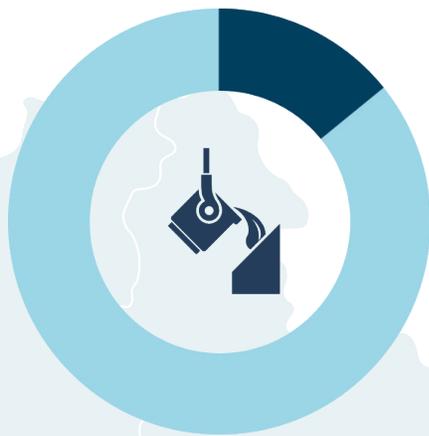
The study was done in partnership with the World Steel Dynamics

About WSD

World Steel Dynamics is a «Strategic Information Service» providing critical and new perspectives on possible and probable steel industry developments. WSD regularly analyzes and publishes reports on steel prices, steelmakers' costs, steel supply/demand and steel finances. WSD also undertakes customized steel research assignments, specialized in-depth studies, private consulting studies and investment banking assessments.



www.worldsteeldynamics.com



12%
share of steel and related industries in the Ukrainian GDP

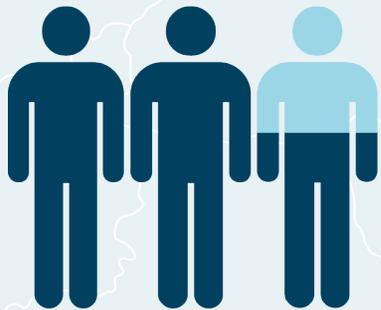
5.0%
direct effect: steel industry companies

5.7%
indirect effect: suppliers of steel industry companies

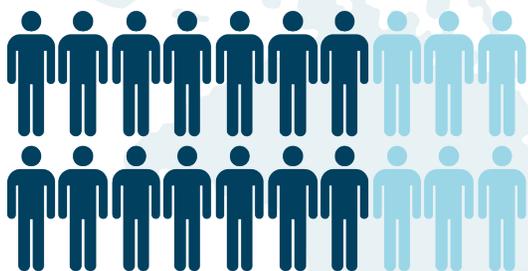
1.3%
induced effect: consumer spendings of steel industry and its suppliers employees



\$4.8
added value in related industries generated by \$1 in the steel industry



2.6 jobs
created by one steel worker in related industries



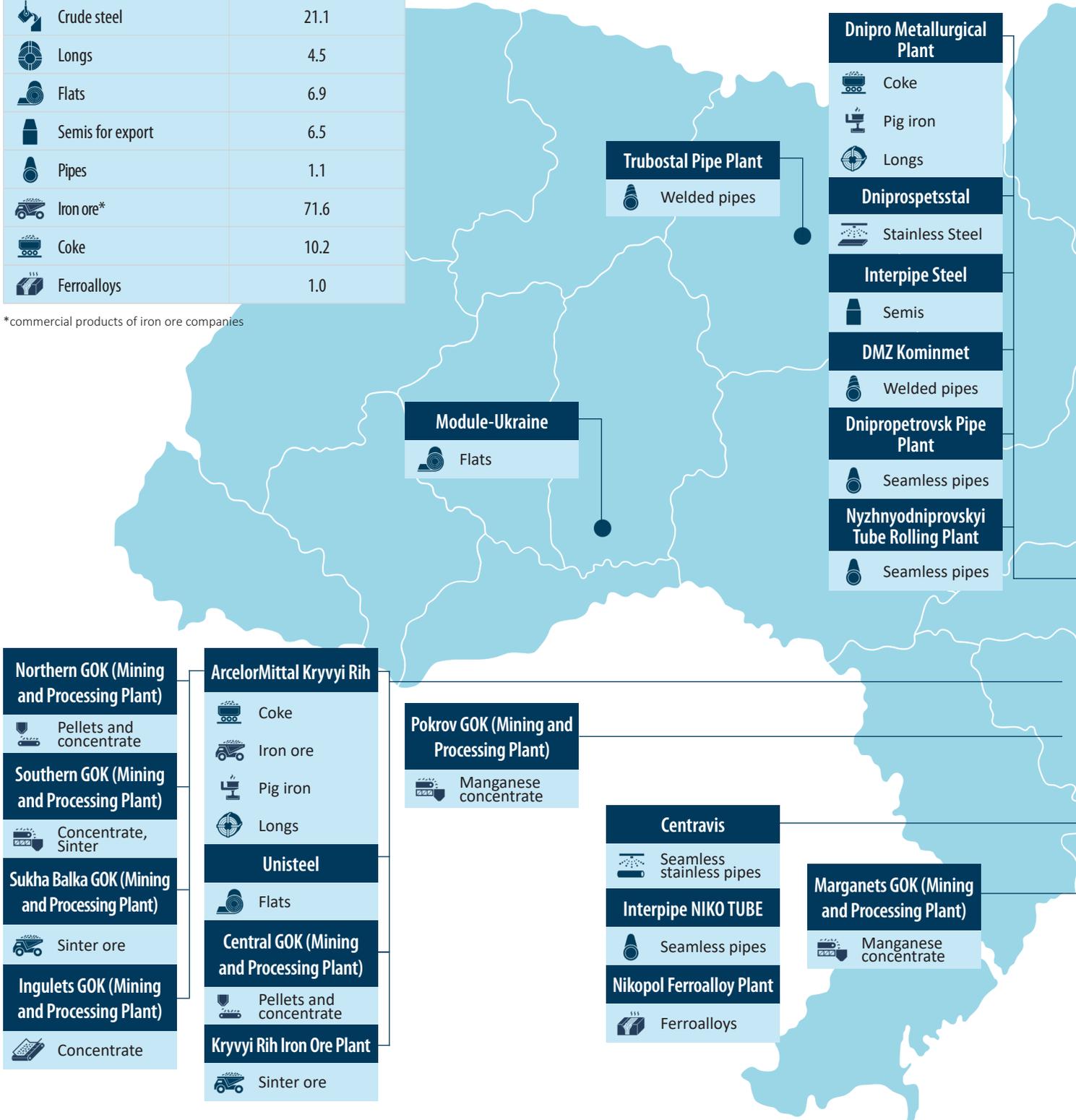
679 thousand persons
employed in steel and related industries

190 thousand persons
employed by steelmaking companies

UKRAINIAN IRON & STEEL INDUSTRY MAP

Production volume in Ukraine in 2018		M tonnes
	Pig iron	20.6
	Crude steel	21.1
	Longs	4.5
	Flats	6.9
	Semis for export	6.5
	Pipes	1.1
	Iron ore*	71.6
	Coke	10.2
	Ferroalloys	1.0

*commercial products of iron ore companies



UKRAINIAN IRON & STEEL INDUSTRY MAP

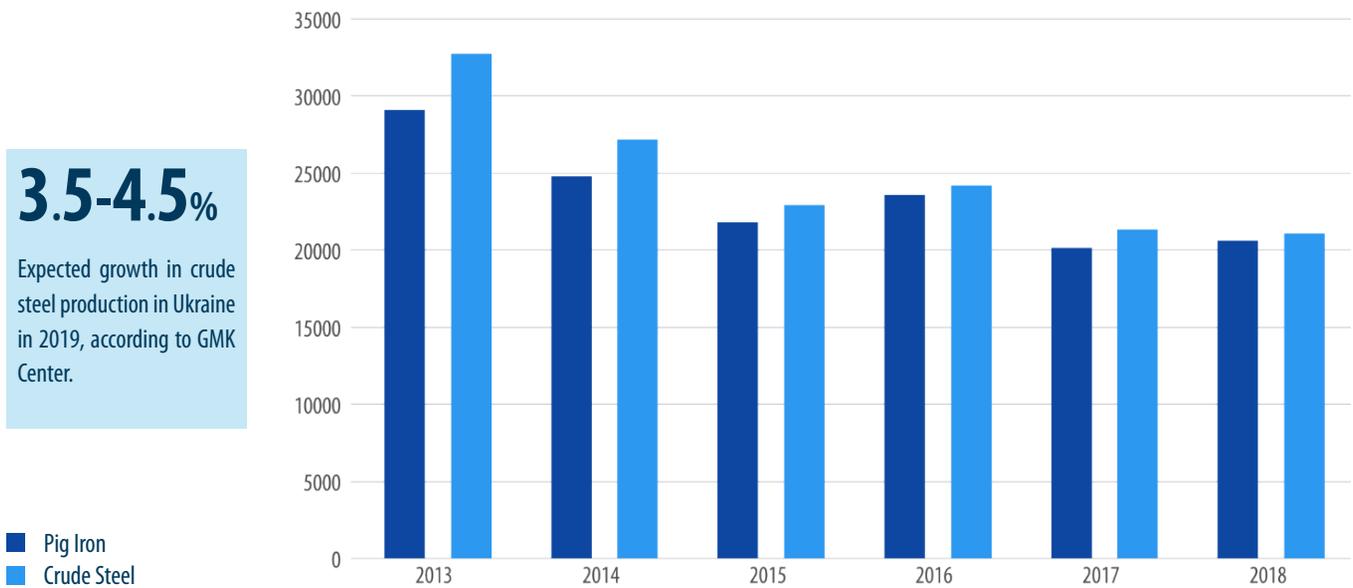


 Uncontrolled territories

STEEL PRODUCTION

Iron and steel production in Ukraine

2013-2018, K tonnes

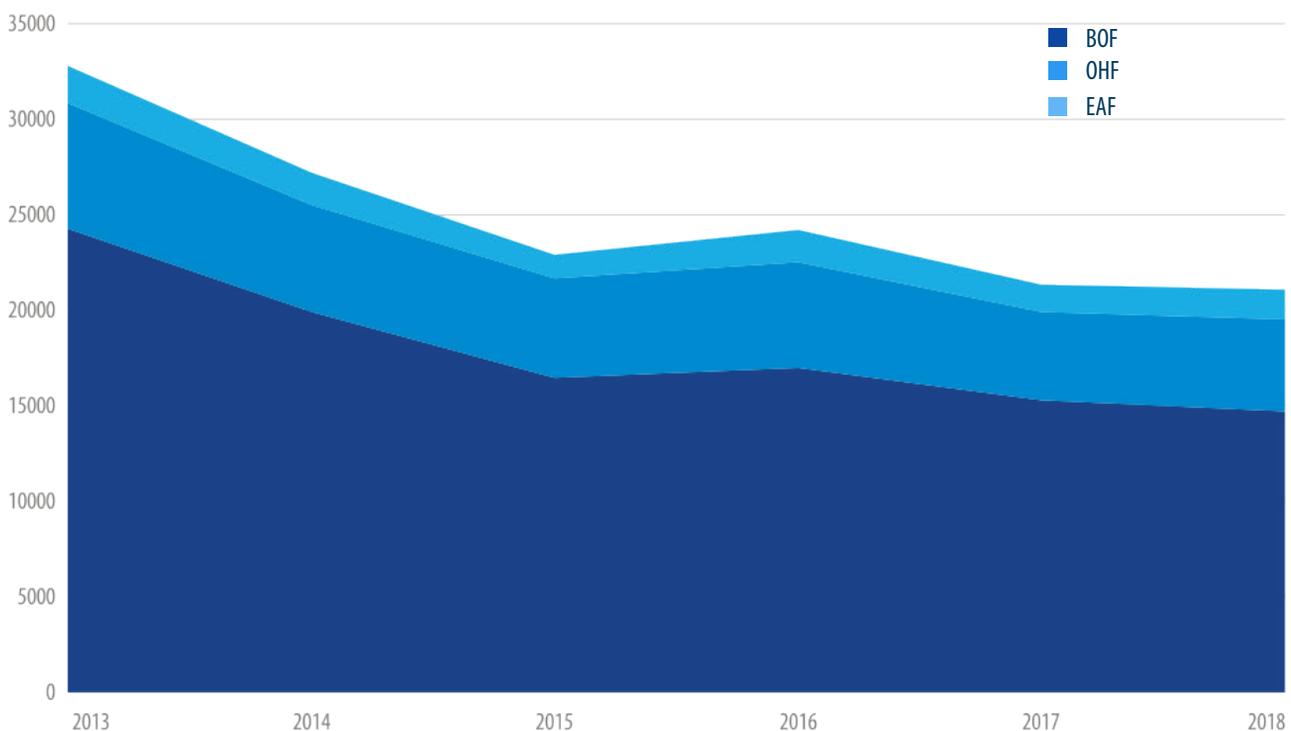


In five years, steel production in Ukraine dropped by over 35.6%, down to 21.1 million tonnes in 2018. It can be attributed to the conflict in Donbas, weak situation in the economy of Ukraine, decreased steel consumption in the domestic market, and technological changes.

In 2018, the situation in the industry has stabilized. In 2019, GMK Center expects steel production to grow by 3.5%–4.5%, up to 22.0–22.3 million tonnes.

Crude Steel Production by Process

2013-2018, K tonnes



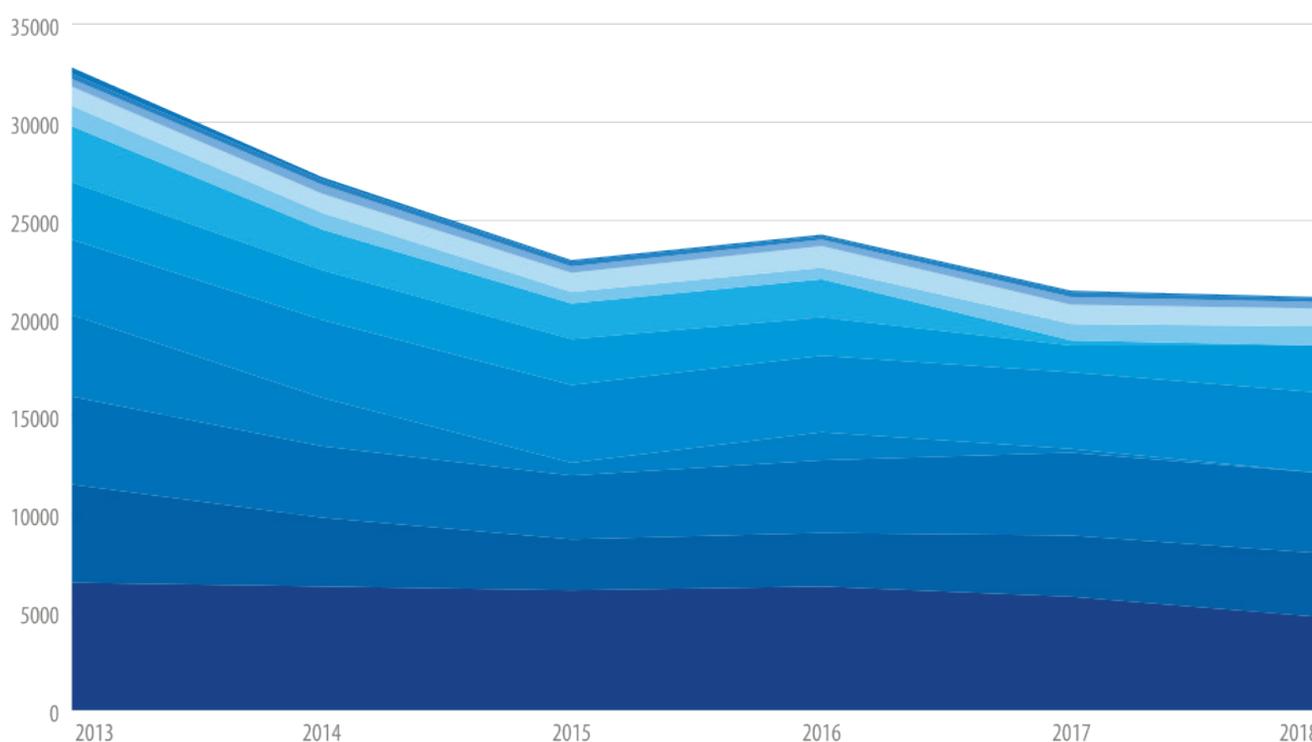
2013-2018, K tonnes

Crude Steel Production by company

	2013	2014	2015	2016	2017	2018
■ ArcelorMittal Kryvyi Rih	6,476.2	6,309.7	6,089.2	6,316.2	5,808.0	4,764.0
■ Ilyich Iron and Steel Works	5,044.2	3,546.1	2,646.3	2,736.7	3,096.7	3,241.8
■ Azovstal	4,469.1	3,599.9	3,206.6	3,705.6	4,264.0	4,085.6
■ Alchevsk Iron and Steel Works	4,173.7	2,502.7	680.7	1,398.0	158.1	0.0
■ Zaporizhstal	3,819.0	3,957.1	3,985.5	3,897.0	3,928.0	4,105.0
■ Dniprovskiy Iron and Steel Works	2,927.3	2,528.4	2,325.0	1,967.3	1,358.7	2,409.1
■ Yenakieve Iron and Steel Works	2,888.4	2,061.8	1,820.3	1,951.9	269.2	0.0
■ Interpipe Steel	1,032.0	883.2	584.5	629.5	855.0	973.0
■ Dnipro Metallurgical Plant	995.9	987.0	1,006.9	1,058.6	921.2	920.0
■ Elektrostal	365.2	410.0	301.0	326.9	439.0	289.9
■ Dniprospsstal	273.7	276.7	243.4	235.8	256.8	246.0
■ Other	302.2	104.5	73.8	63.4	54.8	62.0
Total	32,766.9	27,167.1	22,963.2	24,286.9	21,409.5	21,096.4

The conflict in Donbas has considerably changed the playing field. Alchevsk Iron and Steel Works and Yenakieve Iron and Steel Works are still in the uncontrolled territory. Azovstal and Ilyich Iron and Steel Works in Mariupol had some raw material logistics issues. Dnipro Metallurgical Plant was close to outage due to a high debt burden and lack of liquidity. In 2018, the situation with supplies to Mariupol plants improved.

Dniprovskiy Iron and Steel Works is back to business. Dnipro Metallurgical Plant has got a new owner with large-scale modernization plans. The downward trends in 2018 was largely attributed to force-majeure production issues at ArcelorMittal Kryvyi Rih, which will not affect production performance in 2019.



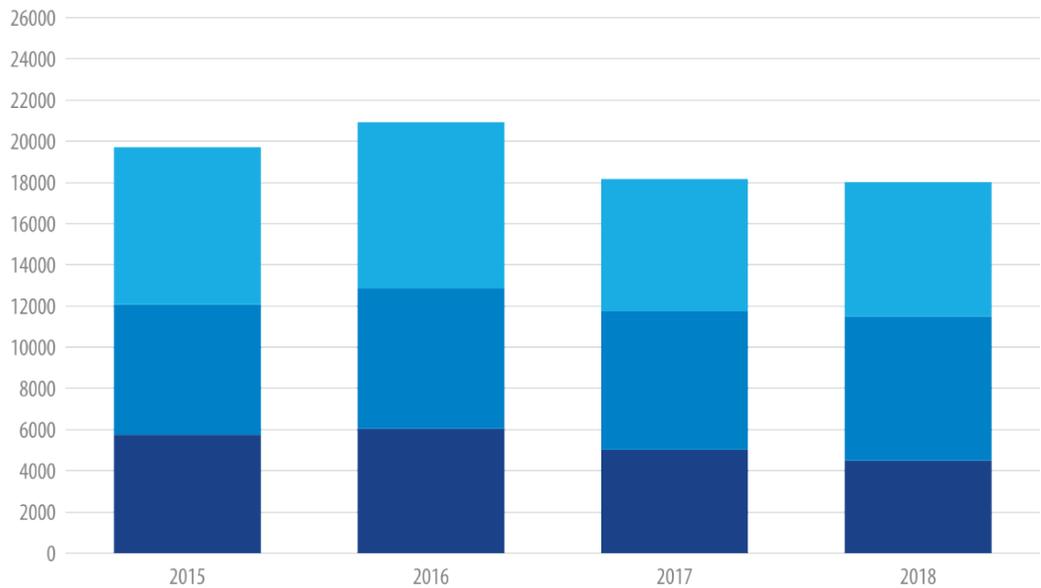
STEEL PRODUCTION

Production of finished steel products (incl semi-products for export)

2015-2018, K tonnes

11%
Flat products output growth during 2016-2018.

- Semis
- Flats
- Longs



In the last three years, the output of flat products increased by 11%.

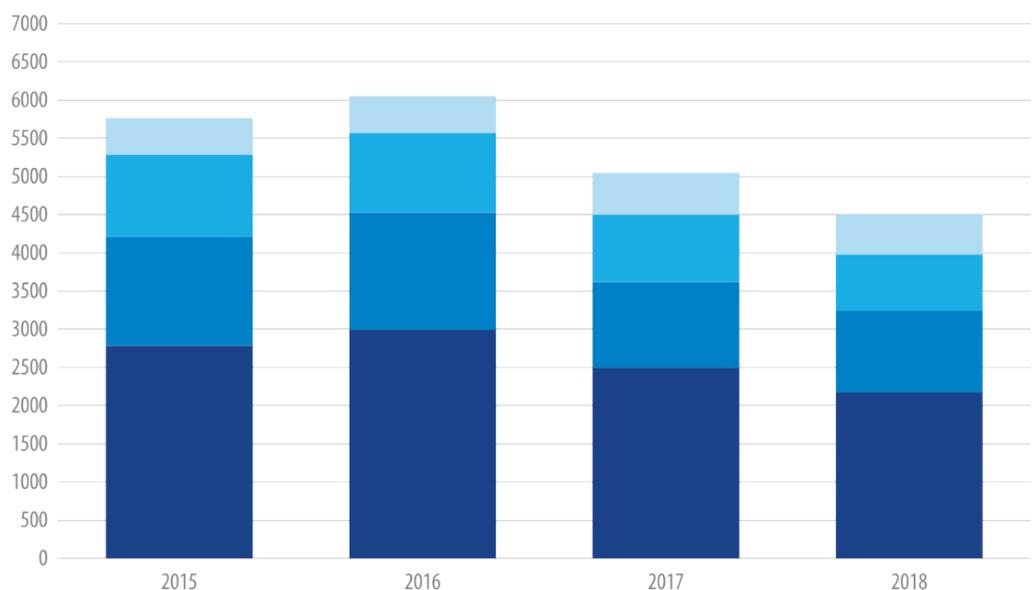
A drop in the production of long products can be attributed to both internal problems faced by companies and safeguard measures on the part of foreign countries.

Production of long products

2015-2018, K tonnes

0.5 M tonnes
Of rebar export has lost due to safeguard measures in Egypt.

- Other longs
- Structural shapes
- Wire rod
- Rebar



Rebar and wire rod production dropped after the control over Yenakieve Iron and Steel Works, a large producer, and its branch, Makiyivka Iron and Steel Works, was lost in March 2017. Rebar exports were affected by safeguard measures in the key markets, mainly in Egypt.

In 2017–2018, rebar imports to Ukraine have shown a substantial rise.

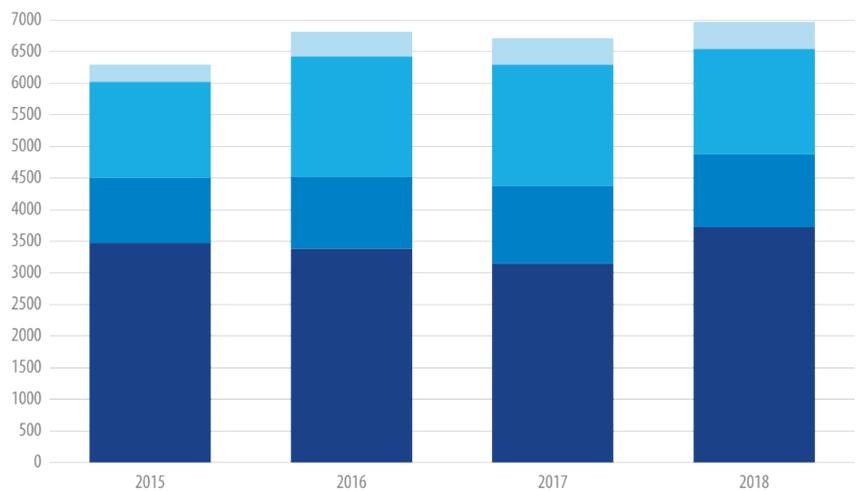
2015-2018, K tonnes

■ HRC ■ CRC ■ Plate ■ HDGC

Production of flat products (incl. strip for tubular products)

Decreased production at Alchevsk Iron and Steel Works was offset by the growth at other companies in the sector.

Companies are developing high added value products: hot-dip galvanized coil production increased by 60% in three years.

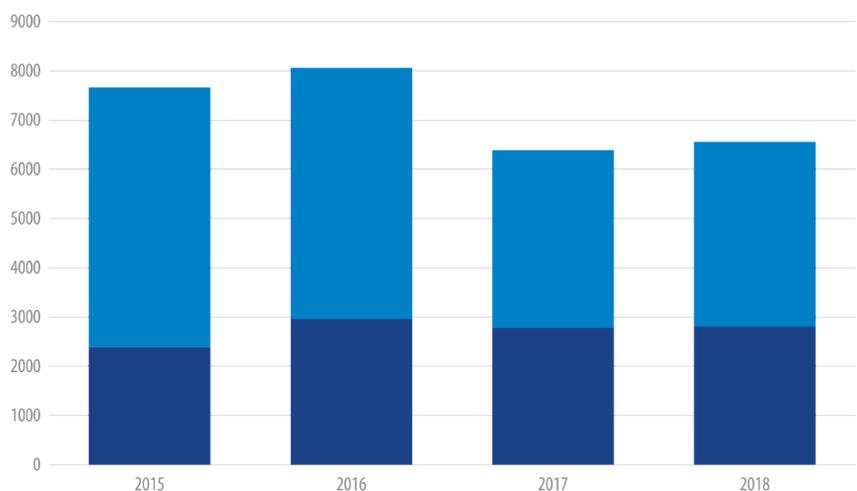


2015-2018, K tonnes

■ Slab ■ Square billet

Production of semi-products for export

While slab production is steady, square billet production considerably dropped after the loss of Yenakieve Iron and Steel Works and due to financial issues at Dniprovskiy Iron and Steel Works. Supplies within Metinvest Holding's production chain account for up to 50% of slab exports. Steel production growth expectations in 2019 are mainly related to semi-finished steel products.

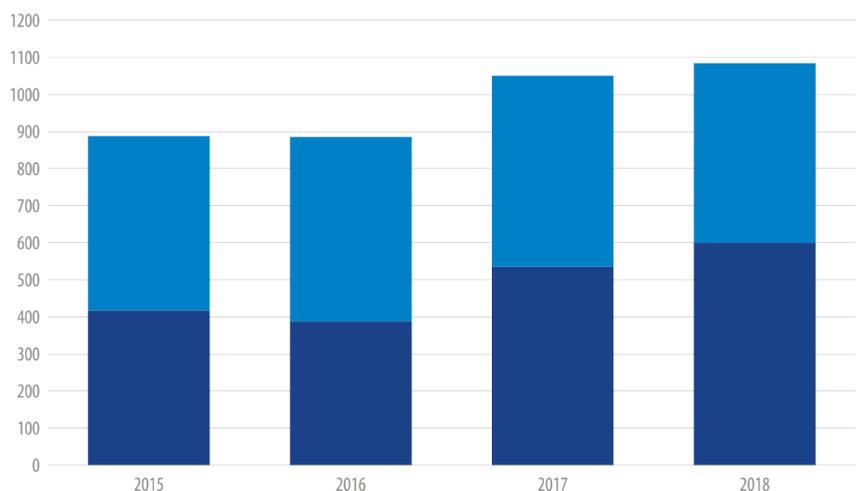


2015-2018, K tonnes

■ Seamless pipes ■ Welded pipes

Production of pipes

Pipe production increased thanks to the growth in the seamless pipes segment due to improved demand in export markets against the backdrop of oil price increase and development of the domestic pipe market to satisfy the needs of the oil & gas sector. Importantly, since 2015, pipe producers have managed to switch from the Russian market, which accounted for a substantial share of sales, towards other markets.



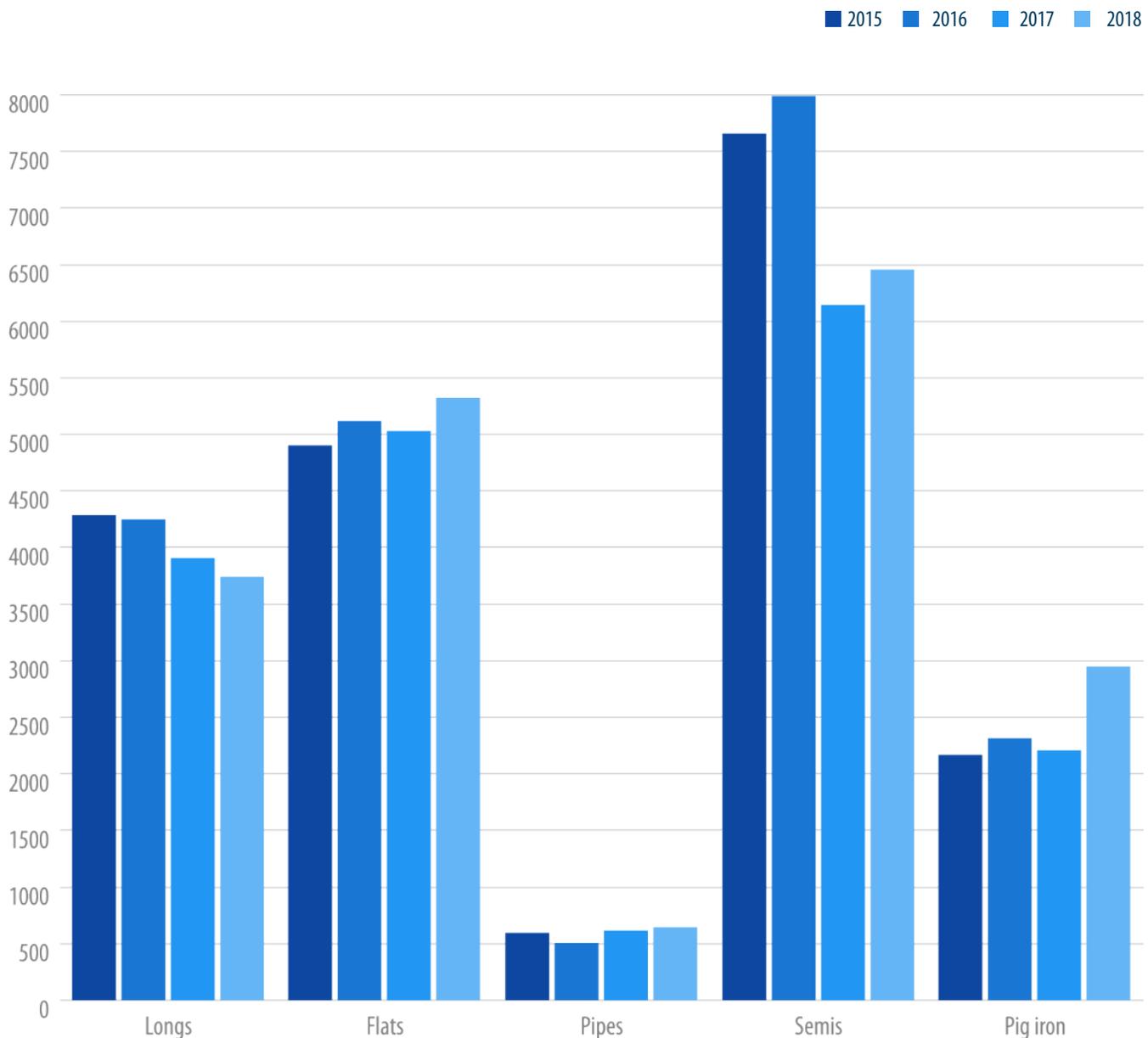
INTERNATIONAL TRADE

Export of iron and steel products from Ukraine

2015-2018, K tonnes

	2015	2016	2017	2018
Longs	4,285	4,246	3,909	3,745
Flats	4,906	5,115	5,031	5,322
Pipes	591.5	506.2	616.0	642.7
Semis	7,659	7,994	6,145	6,459
Pig iron	2,168	2,316	2,208	2,949
Total	19,610	20,177	17,909	19,118

In 2018, a price surge in the U.S. market encouraged a growth pig iron exports (+33% y/y). Pig iron and semi-finished steel products account for 48% to 52% of exports volume.

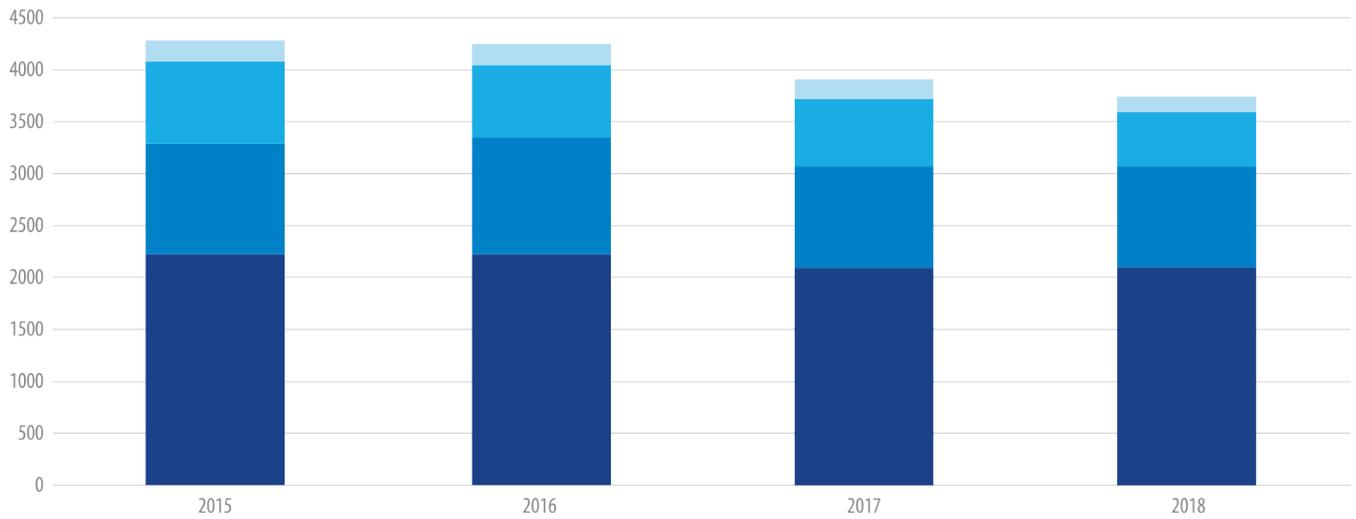


INTERNATIONAL TRADE

2015-2018, K tonnes

■ Rebar ■ Wire rod ■ Structural shapes ■ Other longs

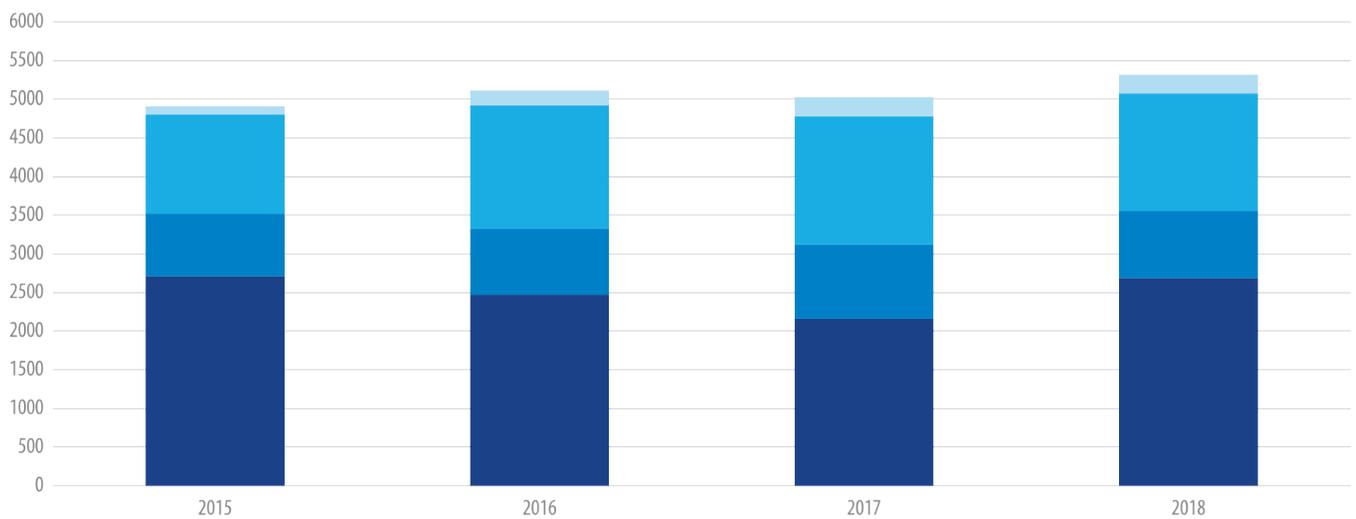
Export of long products



2015-2018, K tonnes

■ HRC ■ CRC ■ Plate ■ HDGC

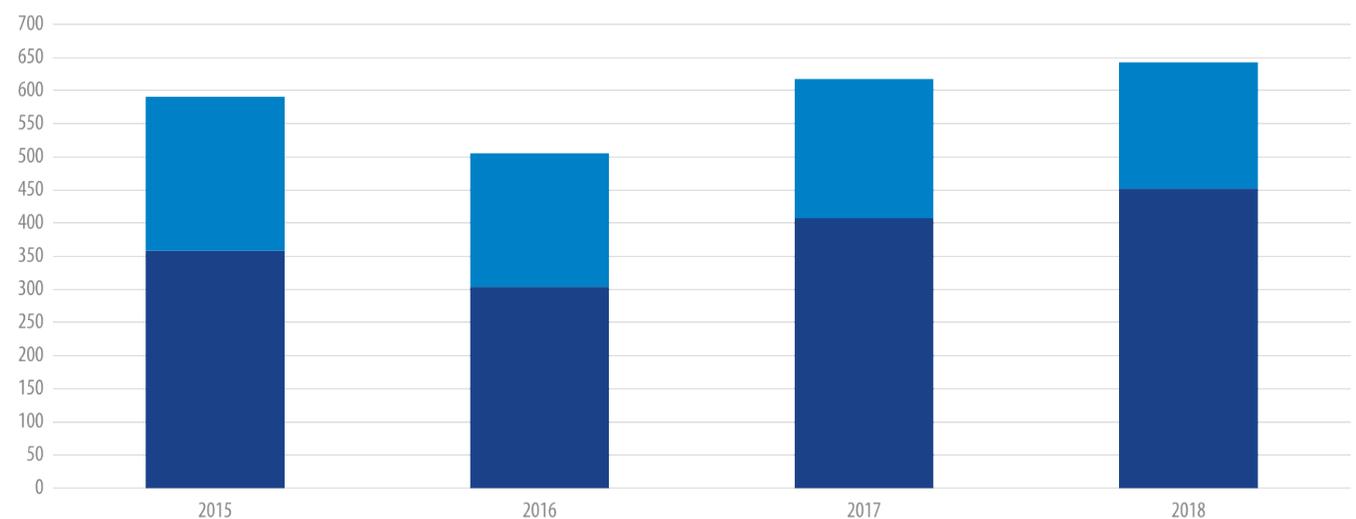
Export of flat products



2015-2018, K tonnes

■ Seamless pipes ■ Welded pipes

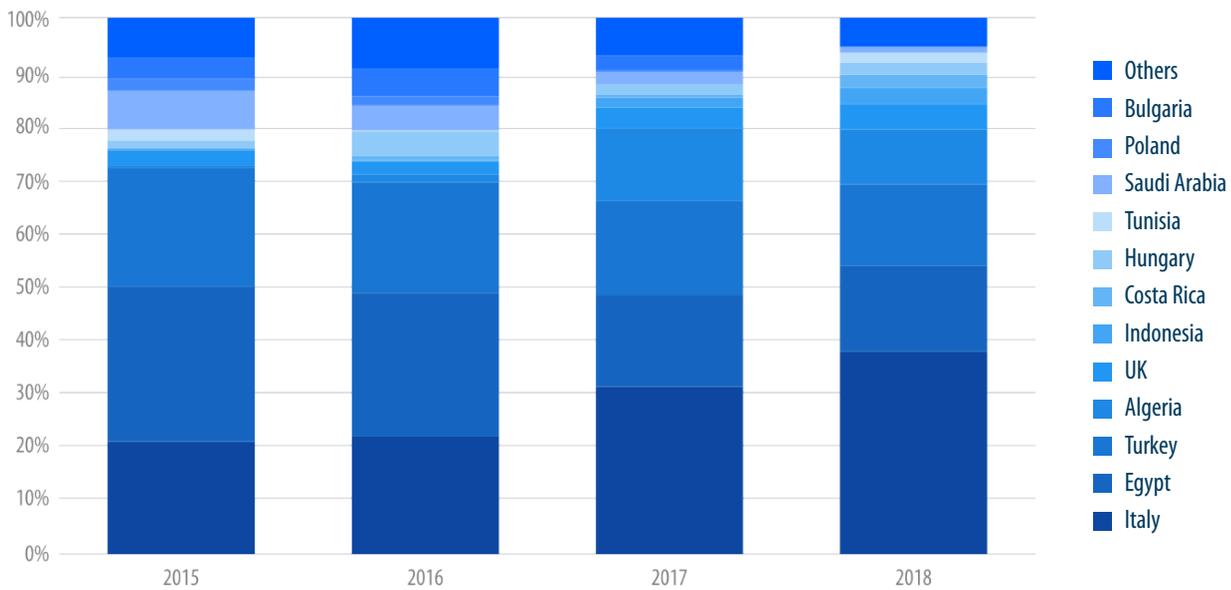
Export of pipes



INTERNATIONAL TRADE

Export of semis by country

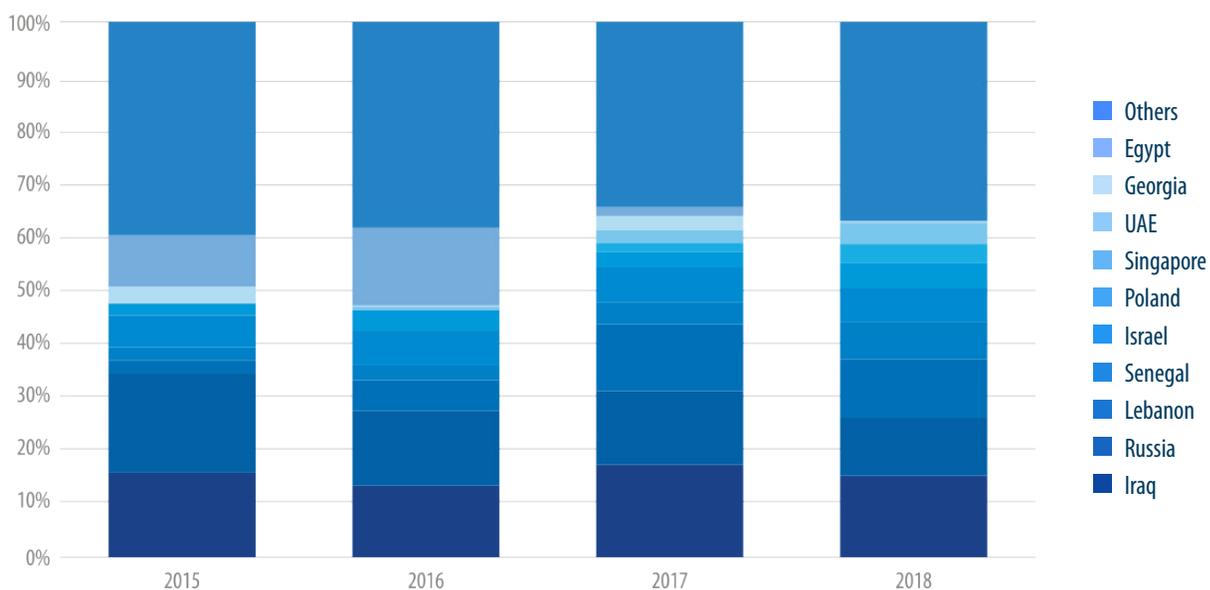
2015-2018,%



Square billet exports have substantially declined. Exports to Egypt decreased by 60% in three years due to import substitution measures. The same situation is observed in Turkey where the steel industry is in crisis. It is difficult to replace the loss of large markets with growing supplies to MENA and SEA countries. In contrast, slab exports have increased. The main importer is Italy where Metinvest Holding's steel re-rolling plants are located.

Export of longs by country

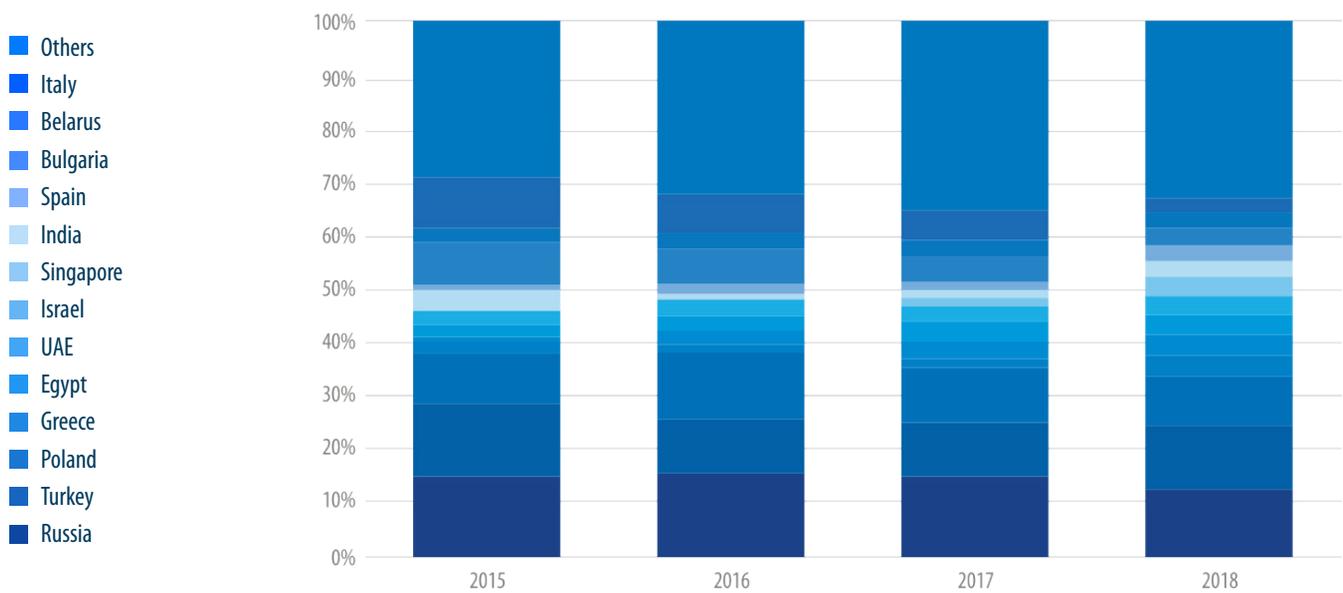
2015-2018,%



The top long product export destination for Ukraine is the MENA area with a 35% share. During the last three years, supplies have shown a drop in all key markets.

2015-2018, %

Export of flats by country

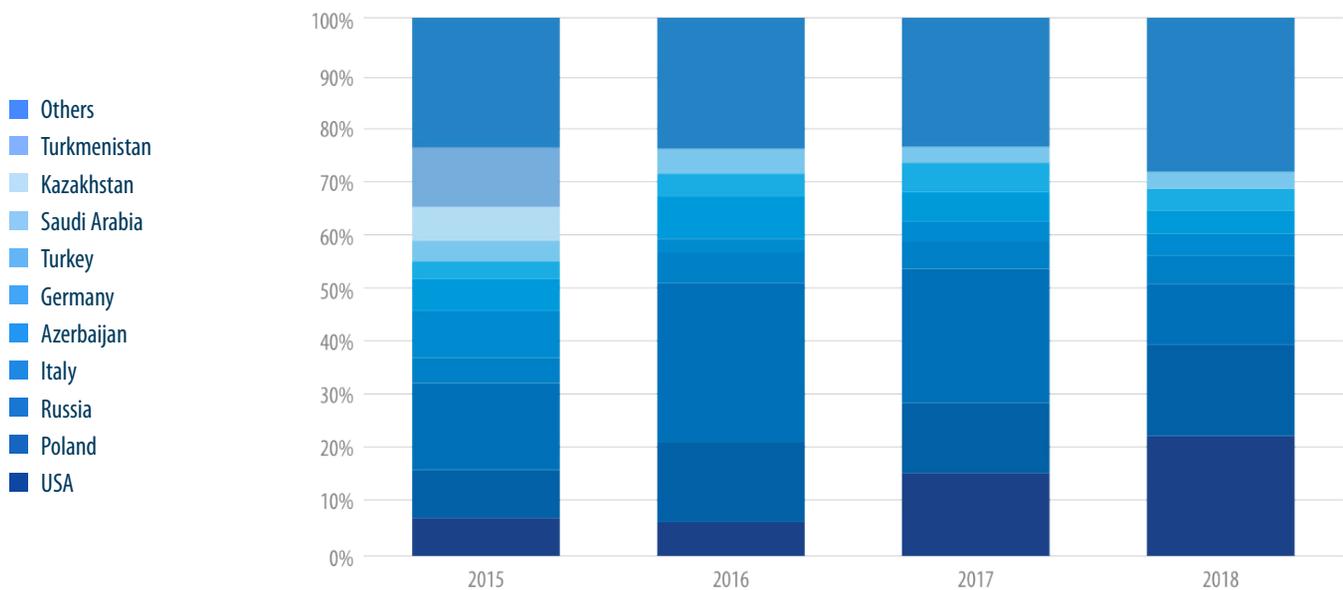


Despite a decrease in supplies, Russia remains an important flat product export destination for Ukraine.

The largest importer among regions is the EU with a 31% share.

2015-2018, %

Export of pipes by country

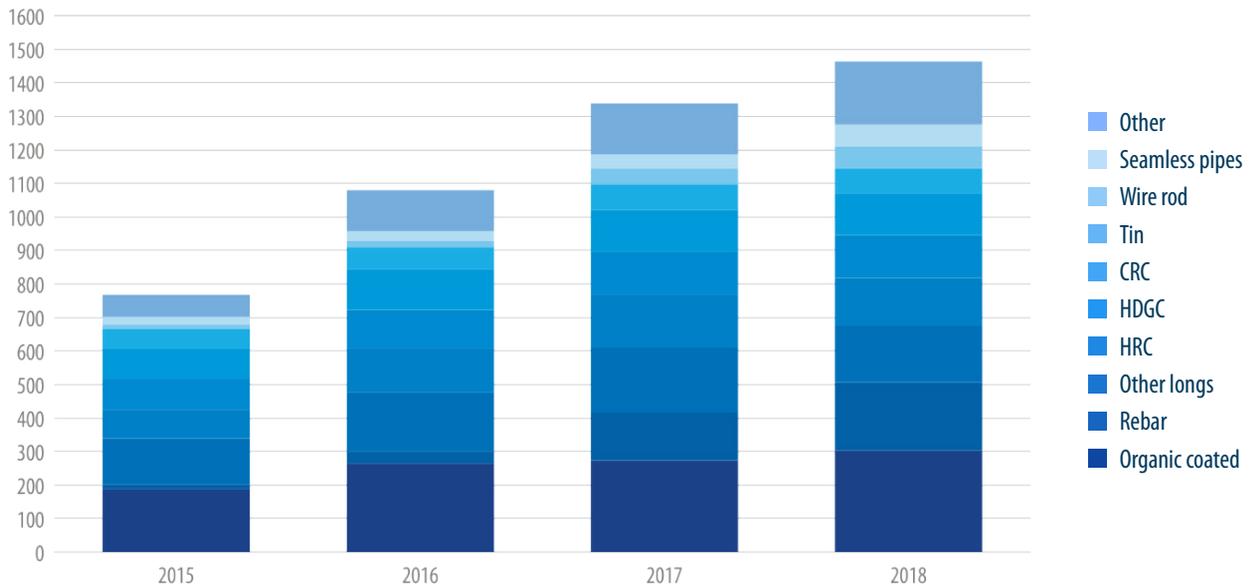


Upswing in the oil & gas market boosted pipe exports to the U.S. In 2018, exports to the U.S. increased by 45%. The U.S. accounts for 22% in total pipe exports.

In 2018, supplies to Russia dropped more than twice. In 2019, Russia banned pipe imports from Ukraine.

Import of steel products to Ukraine

2015-2018, K tonnes

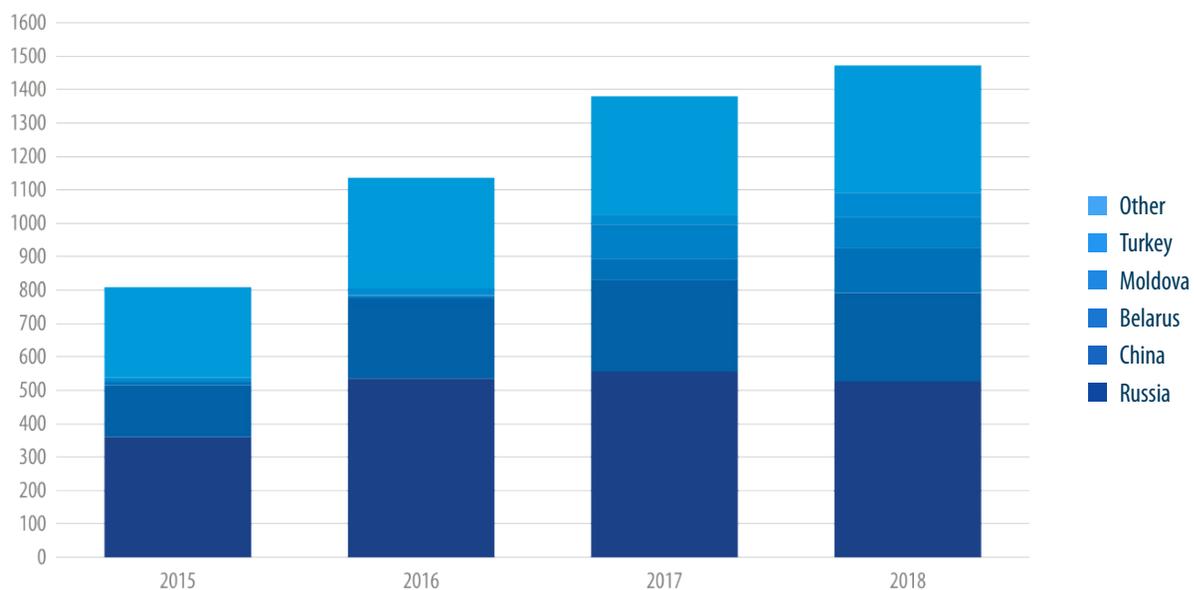


In three years, imports of steel products to Ukraine have almost doubled.

The increase is observed along the whole product line. The key drivers include polymer-coated flat products (+62%) that are underproduced in Ukraine and rebar that was scarcely imported in 2015.

Import of steel products to Ukraine by country

2015-2018, K tonnes



High added value products are imported from China, including hot-dip galvanized coil and polymer-coated steel products. Increased imports from Belarus and Moldova can be attributed to rebar and wire rod imports.

A wide range of products are imported from Russia.

2013–2018, K tonnes

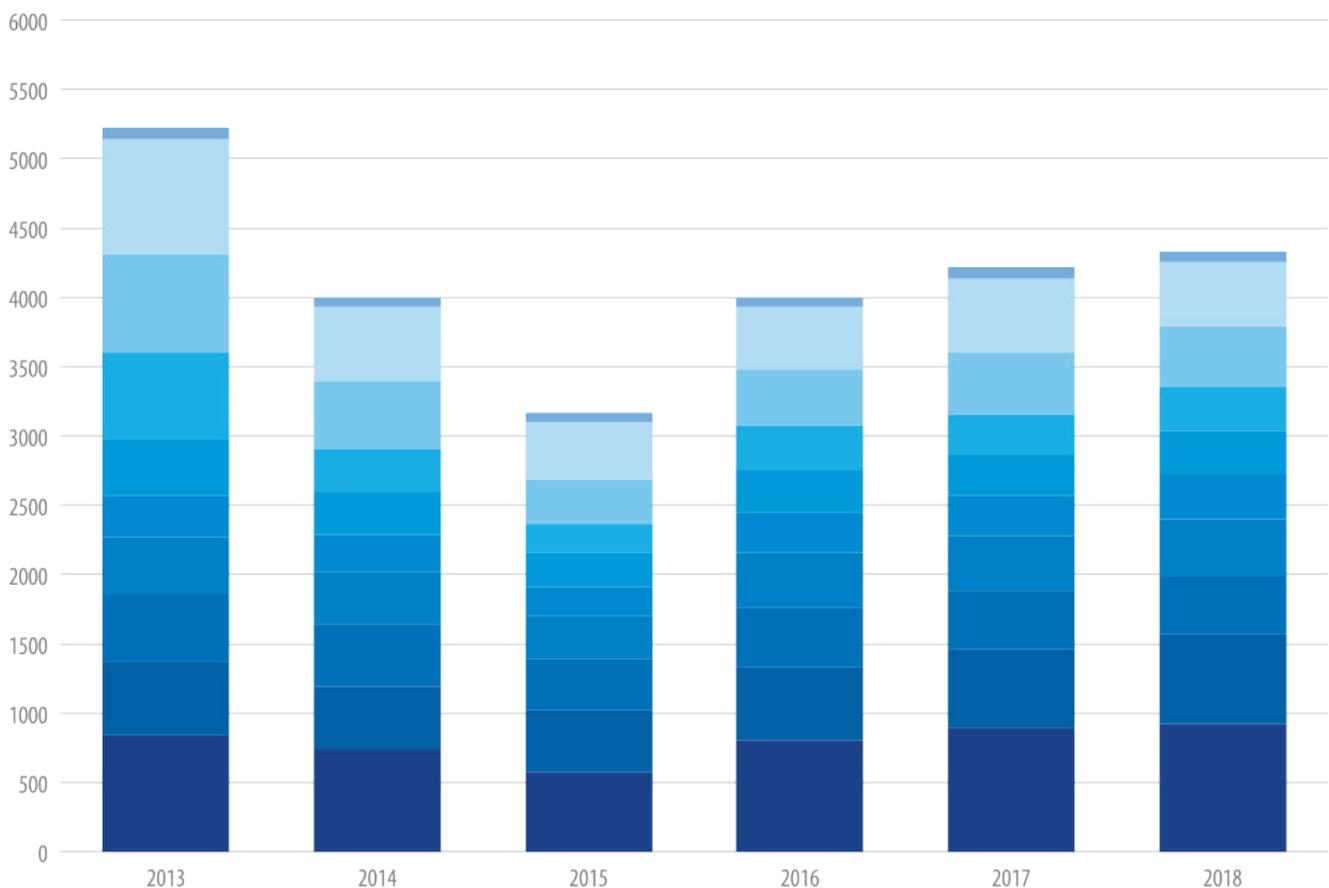
Apparent consumption of rolled products (excl. strip for tubular products)

	2013	2014	2015	2016	2017	2018
Rebar	836	738	576	806	893	926
HRC	539	457	446	526	569	643
Wire rod	483	451	368	432	423	420
CRC	410	373	313	396	392	410
Organic coated	302	268	205	284	293	324
HDGC	406	311	251	317	301	314
Plate	626	312	208	312	290	312
Structural shapes	705	485	321	406	437	443
Other longs	833	538	417	454	541	459
Tin	86	65	58	67	76	74
Total	5,226	3,997	3,164	4,000	4,214	4,324

Rolled products consumption increase is observed along the whole product line. The maximum growth is observed in the hot-rolled flat product segment, where rail car manufacturing and shipbuilding industry have been on the rise in 2018–2019.

Polymer-coated product consumption is growing. In this segment, increased demand is covered by imports.

Rebar imports have shown a much more rapid growth compared to its consumption. As a result, a market share of imports increased from 16% to 22% in 2018.



STEEL CONSUMPTION

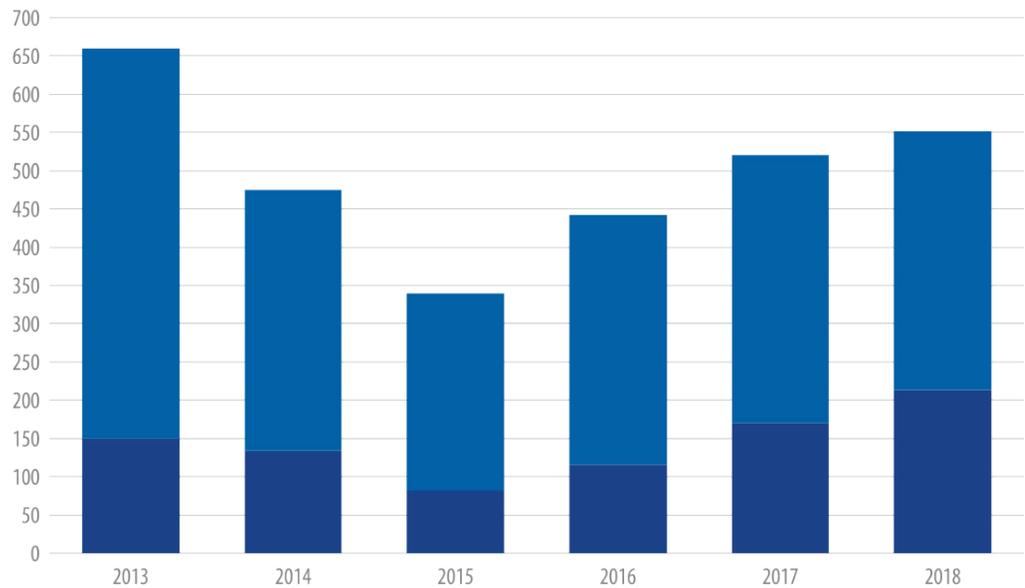
Apparent consumption of pipes

2013-2018, K tonnes

62%

Growth of pipes consumption during 2016-2018. The most growing segment.

- Welded pipes
- Seamless pipes



An increase in pipe consumption could be attributed to seamless pipes that are largely used due to activation of drilling in oil & gas sector. Welded pipe consumption has not changed since 2014.

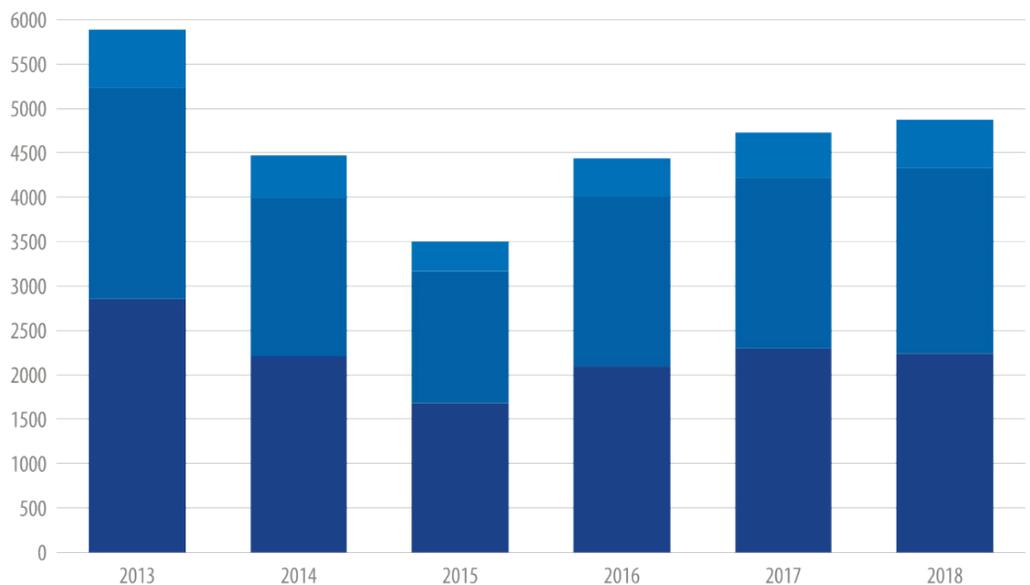
Total apparent steel consumption

2013-2018, K tonnes

3.0%

Growth of steel consumption in 2019.

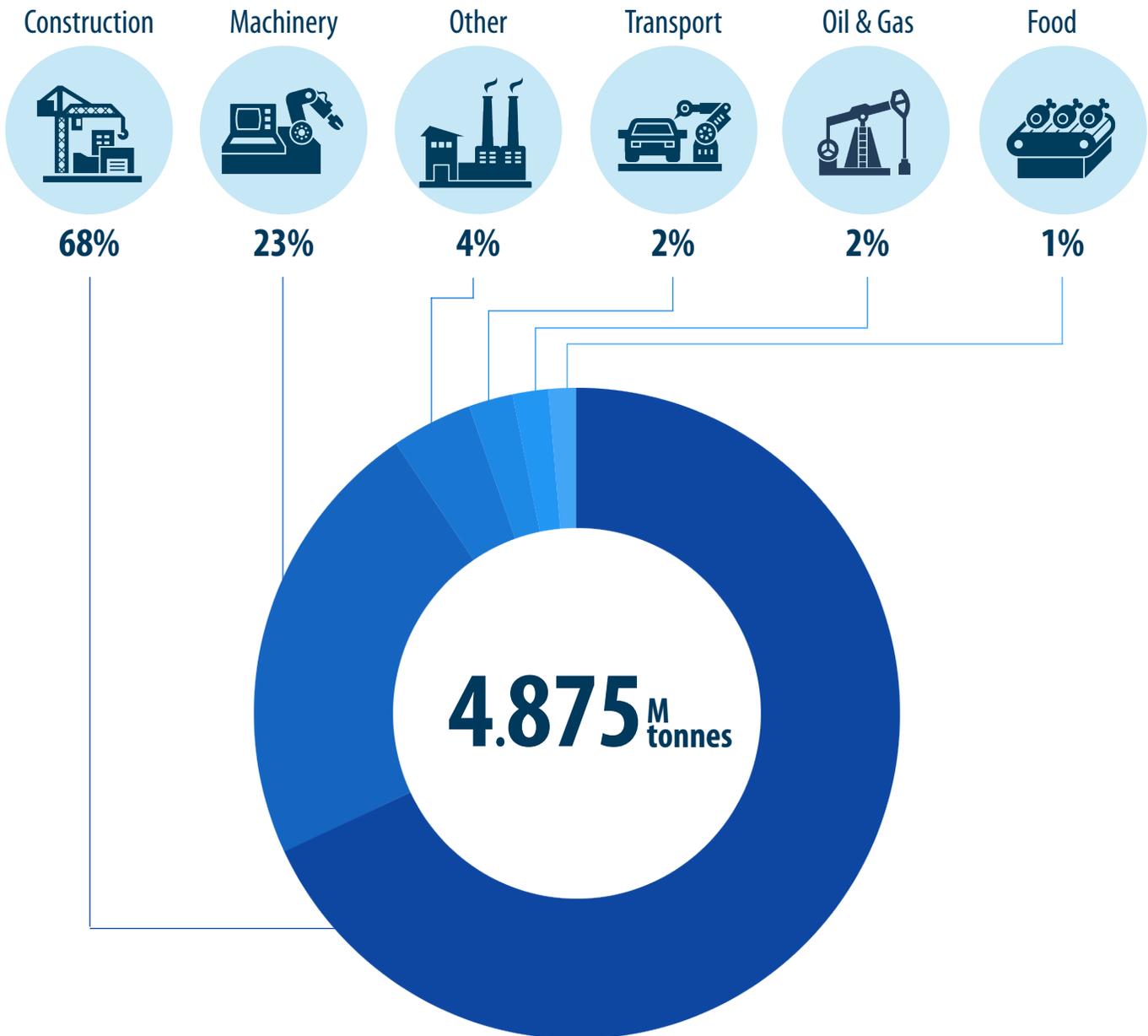
- Pipes
- Flat products
- Long products



For the third consecutive year, steel consumption increased in Ukraine in 2018. However, the rate of growth slowed down to 3.0% in 2018. It limited by weak GDP growth in Ukraine, that expected to reach 3.2% in 2019, according to National Bank of Ukraine.

2018, %

Indicative steel use by sector in 2018



Construction accounts for the greater part of steel consumption in Ukraine (68%), which is much higher than the global average (50%). It can be explained by underdevelopment of machine-building industry in Ukraine. Railcar building, shipbuilding, agricultural machinery are among the most promising machinery sectors in Ukraine.

Growth rates in construction sector were significantly higher than in machinery:

- in 2016 – 17.4% vs 2.0%,
- in 2017 – 26.3 vs 7.9%,
- in 2018 – 8.5% vs 1.6%.

Thus, construction sector increased its share in steel using structure.

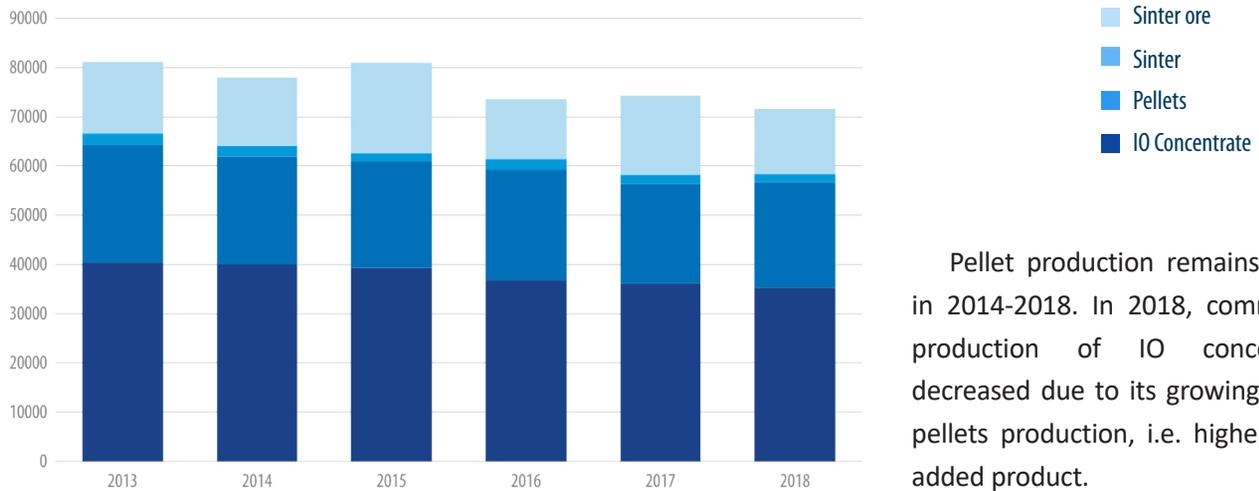
Construction performance depends from domestic demand only, instead of machinery production, that could be exported. That limits steel consumption growth in Ukraine.

Apparent steel consumption didn't show growth rates like construction sector. It means that increasing of construction works take place due to low metal consuming sectors.

RAW MATERIALS: IRON ORE

Iron ore production (commercial production by iron ore companies)

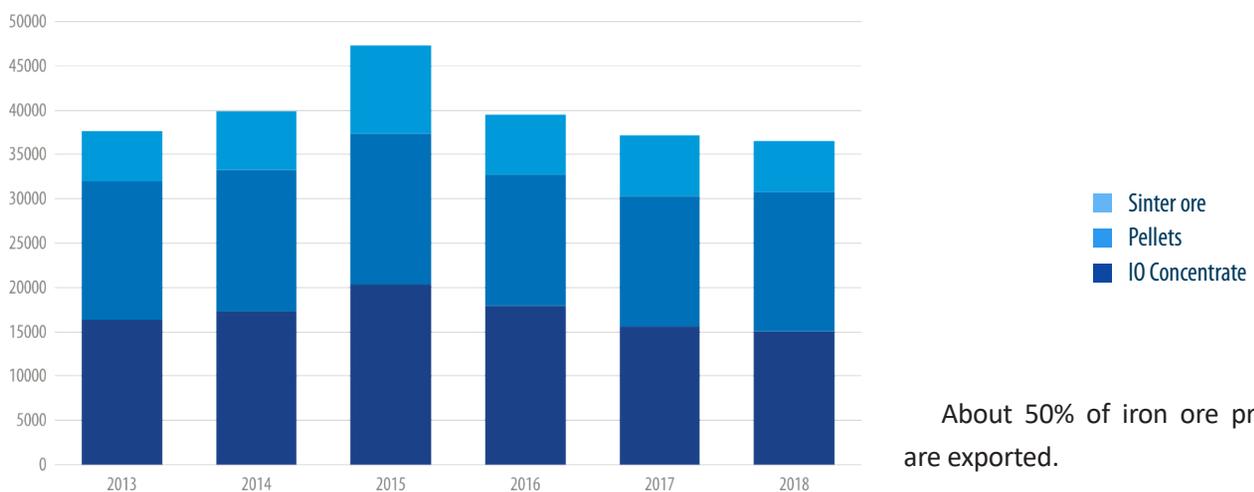
2013-2018, K tonnes



Pellet production remains stable in 2014-2018. In 2018, commercial production of IO concentrate decreased due to its growing use in pellets production, i.e. higher value added product.

Iron ore export by product

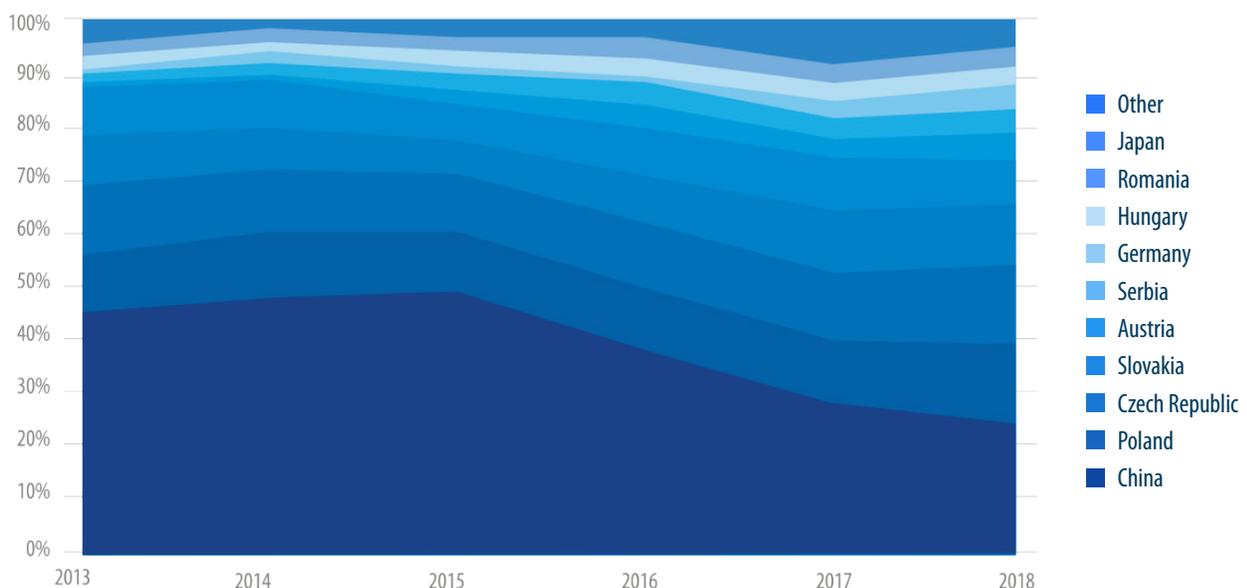
2013-2018, K tonnes



About 50% of iron ore products are exported.

Iron ore export by country

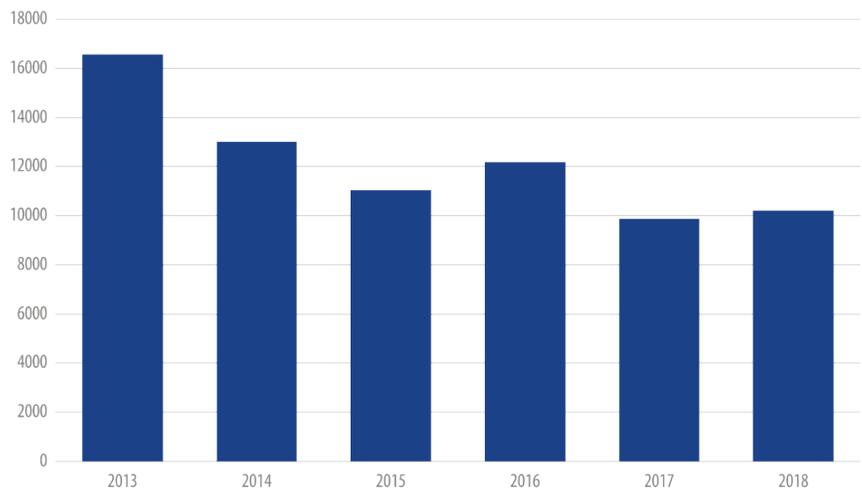
2013-2018, %



Coke production

2013-2018, K tonnes

Coke production in Ukraine fell sharply, since most of the capacity were located on the uncontrolled territory (Yasinovskyi Coke Plant, Makiivkoks, Enakievskiy Coke Plant). Coke production capacities in Ukraine were utilized as much as possible. A number of companies have announced modernization projects and the construction of new coke oven batteries. In 2018, production grew by 4%. Ukrainian coke producers are deficient in coking coal.

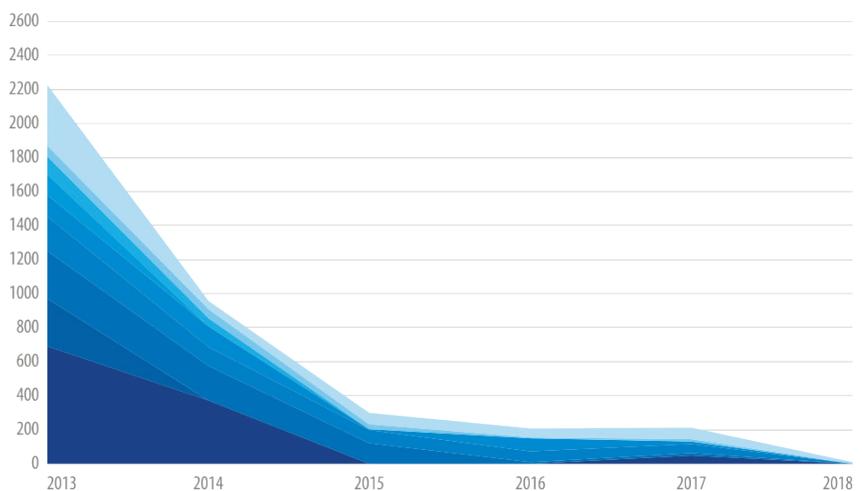


Coke export by country

2013-2018, K tonnes

- Other
- Bulgaria
- Belgium
- USA
- Georgia
- Turkey
- Russia
- Iran
- India

Given the lack of coke production capacity and coking coal, Ukraine practically stopped exporting coke in 2018. Yasinovskyi Coke Plant and Makiivkoks were major exporters, before Donbass conflict. Coke products were exported both to neighboring Russia and to far abroad countries – India and Iran.

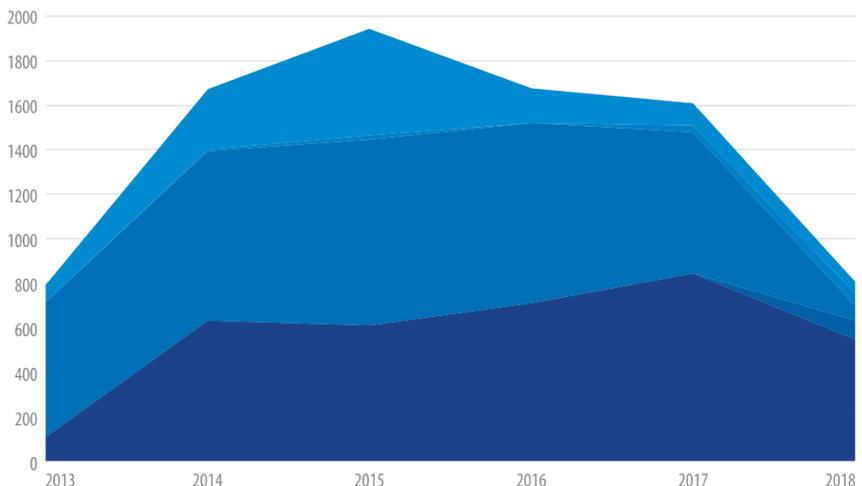


Coke import by country

2013-2018, K tonnes

- Other
- Columbia
- Poland
- USA
- Russia

Coke import was reduced in 2018 due to the expansion of its domestic production and some decreasing of demand according to steel production performance.



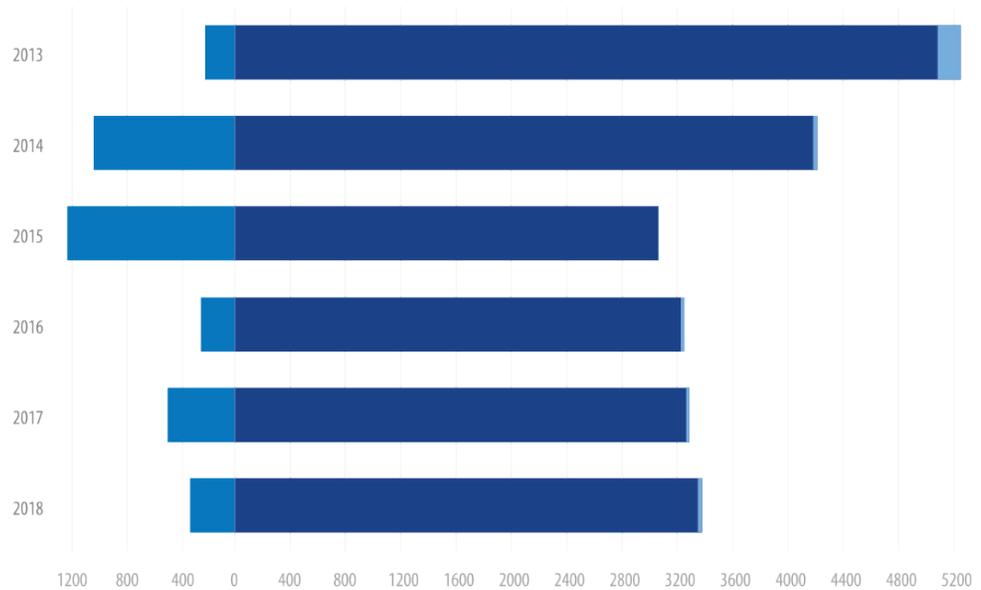
RAW MATERIALS: SCRAP

Ukrainian scrap market

2013-2018, K tonnes

By **3.7** times
scrap export decreased
during 2016-2018.

- Domestic supply
- Scrap export
- Scrap import

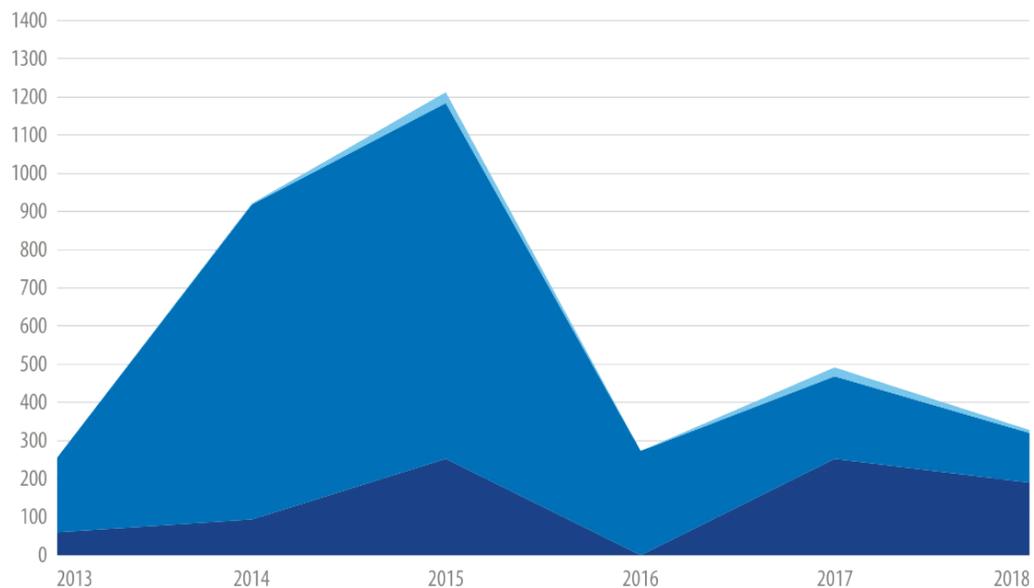


Ukrainian steel producers periodically face with lack of scrap. Restrictions of scrap exports by increasing the export duty from €10 to €30 per tonne in 2016 and from €30 to €42 in 2018 were as the response. Scrap import volumes to Ukraine is insufficient, at the same time.

Scrap export by country

2013-2018, K tonnes

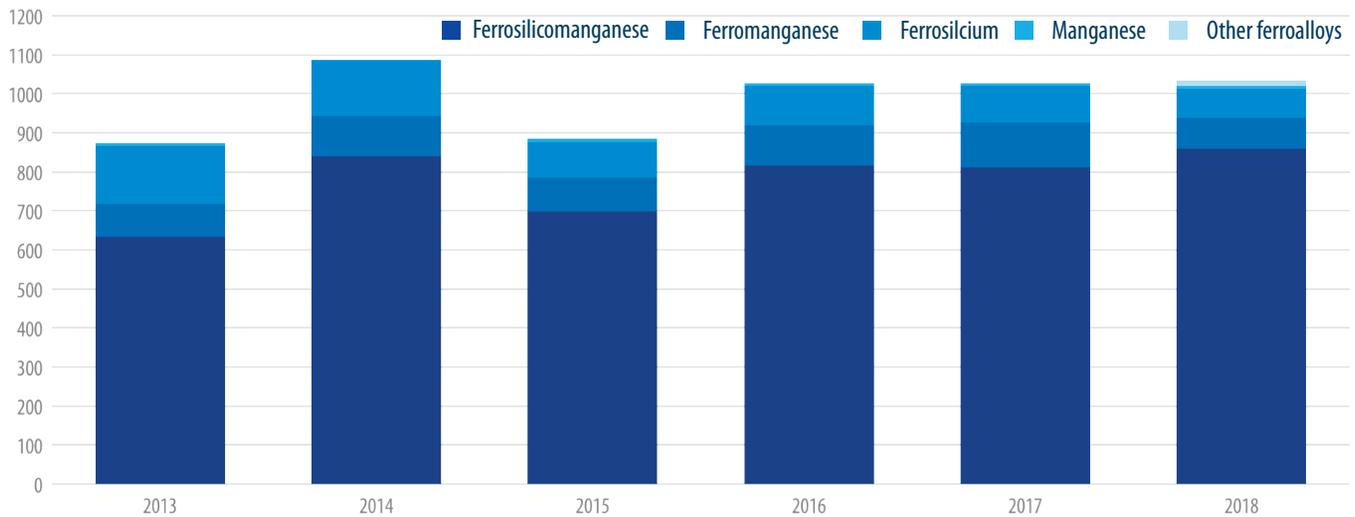
- Other
- Turkey
- Moldova



Scrap exports volume decreased significantly, as the result of a series of increases in duties on scrap exports. Local scrap companies had two main export destinations – Turkey and Moldova. In 2018, Ukraine imposed sanctions against the Moldova Steel Works, but it didn't stop scrap export to Moldova. The main volume of scrap exports in 2018 was formed before the duty was increased for the last time in June.

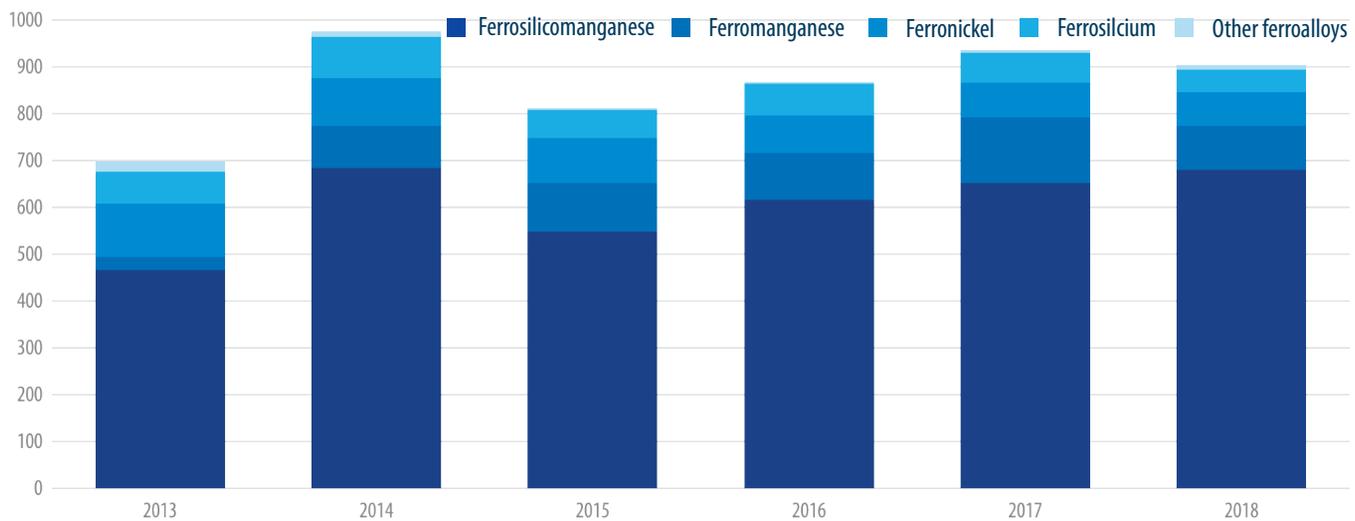
2013-2018, K tonnes

Ferroalloys production



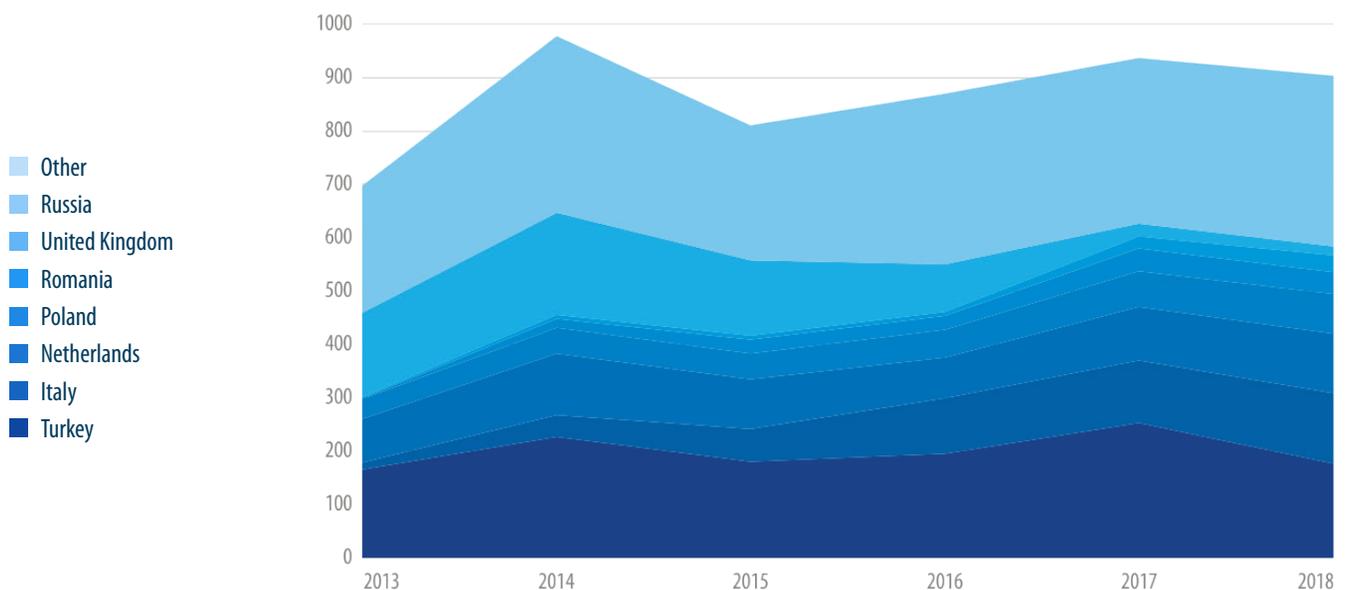
2013-2018, K tonnes

Ferroalloys export by product



2013-2018, K tonnes

Ferroalloys export by country



TOP 10 FACTS ABOUT UKRAINIAN IRON & STEEL INDUSTRY



Ukraine is the **TOP 10 member** of the largest pig iron producers



Ukraine is the **3rd** largest semiproducts exporter in the world



Ukraine is among the **TOP 10 exporters** of long products globally



Metinvest Holding is on the **8th** position among the largest pellet producers in the world



Europe`s **largest blast furnace (4 M t** capacity p.a.) operates in Ukraine in ArcelorMittal Kryvyi Rih



Ukraine is the **5th** largest producer of ferroalloys in the world with ferrosilicomanganese market share of about **8%**



Centravis is among the **TOP 10 largest** stainless steel seamless pipes manufacturers with globally market share - **3,5%**



Ferrexpo is the **3rd largest** pellet exporter in the world holding **8,5%** of global market



Interpipe is the **3rd largest** manufacturer of solid-rolled railway wheels in the world



Interpipe corporation is a member of the **TOP-10** world`s largest seamless pipe exporters

Excess capacity is among the most important challenges for global iron & steel industry.



Andrii Tarasenko
Chief analyst GMK
Center

During 2016-2018 situation has significantly improved. Excess capacity level decreased to 10 years low – 425 M tonnes of crude steel, recent OECD data shows. Capacity utilization rate also demonstrated 10-years record high – 81% as global average.

The maximum level of capacity utilization rate has China – 90%. It's unachievable level. We would not be surprised, when Chinese capacity level will be revised once more.

The least utilized among TOP 20 steel producing countries – is Ukraine with 50% only. This is the result of calculations that you could get, based on OECD data.

Ukraine is among the TOP 5 countries with largest excess capacity level, according to OECD. Nominal crude steelmaking capacity in Ukraine – 42,5 M tonnes – has been unchanged since 2013. Crude steel production in Ukraine in 2018 – 21,1 mln. tons, 35% lower than in 2013.

But, OECD data on Ukraine doesn't reflect real situation. It doesn't consider local specific, that turns the results of analysis upside down.

Why is this issue so important for Ukraine? Because OECD – is the only official source of information on steelmaking capacity.

And government authorities use it, of course, in their analysis.

Here is expected result of OECD data studying by any country official, for example from Eurocomission: "Ukraine – is the danger for any steel market. It has huge excess capacity, thus large potential to increase steel production – up to 20 M tonnes. If we allow Ukrainian producers to trade on our market,

they will overwhelm the customers with cheap steel, considering their cost advantages. Local steelmakers will hurt."

And it's not a fiction. For example, export of finished products from Ukraine to EU decreased in 2017 by 26%, in 2018 – by 3.5%, in 2019 – by 11% due to safeguard measures.

But actual excess capacity and actual abilities of Ukraine to increase steel production are far from this.

We need to make some adjustments to explore:

1. First of all, OECD assessment of crude steelmaking capacities in Ukraine (42,5 M tonnes) takes into account companies, that located on uncontrolled territories of Ukraine, as a result of Donbass conflict (appr. 11 M tonnes).

On the one hand, the facilities on the uncontrolled territory are Ukrainian de jure and are counted respectively. On the other hand, at the moment, they are not integrated into the Ukrainian economy, included in Russian raw materials supply-chains, do not supply their products to Ukrainian market, but export their products through Russia as manufactured in Russia. Nominal crude steelmaking capacity of eight Ukrainian companies is about 31,3 M tonnes.

2. OECD employs a definition of nominal crude steelmaking capacity based on maximum theoretical equipment capacity, does not consider yield losses, maintenance and other factors affecting the productivity of installed steelmaking equipment.

Effective capacity of some Ukrainian steelmakers is significantly lower than nominal capacity due to insufficient maintenance CAPEX. Nominal capacity of 31,3 mln. tons vs 28,3 mln. tons of effective capacity. So, Ukrainian companies had healthy level of utilization – 73% as an average in 2018. And it was lower than expected 77%.

Force-majeure at ArcelorMittal Kryvyi Rih negatively affected.

GMK Center forecasts crude steel production in Ukraine approx. 22,0-22,3 M tonnes in 2019, that means increasing of average utilization rate up to 78-79%.

“ **Ukrainian companies have healthy level of capacity utilization rates.**
We expect 78-79% in 2019.

ACTUAL POSSIBILITIES OF UKRAINIAN STEEL SECTOR

3. Three companies (AMKR, Azovstal and Dniprovskiy Iron and Steel Works) have bottleneck in rolling production. Actually, these three companies – the largest by nominal capacity.

Rolling production capacities limits crude steel capacity utilization rate of these companies: AMKR up to 82%, Azovstal – 73%, Dniprovskiy – 76%. Average in Ukraine – 85%.

Raising of crude steel production on these companies could be achieved due to steel semi-products only.

4. 100% level of capacity utilization rate couldn't be achieved. Customers increase their requirements to product characteristics, and steel producers expand their product range in response. For example, only Azovstal Iron and Steel Works produces more than 200 different steel grades. Different steel grades mean different melting times and changing equipment capacity. But nominal or effective capacity indicators are calculated assuming that the plant produces one steel grade only.

It should be considered in the assessment of production potential of Ukraine. We see 90% as the maximum level of steelmaking capacities utilization rate.

So, Ukraine doesn't have so significant excess capacity and large potential to increase crude steel production volume, as it's possible to conclude studying official data.

Ukrainian steelmakers have declared 23,8 M tonnes of crude steel as their plan for 2019. This level could be considered as close to the maximum for Ukrainian steelmakers in the current conditions. It means 84% utilization rate.



GMK Center is informational and analytical service aimed at the professional covering and in-depth analysis of Ukrainian and global iron & steel industry.

Our journalists cover key developments and trends in Ukrainian and global steel industry.

Our analysts forecast the situation inside the country and abroad.

Our team arrange open debates and meetings for market participants.

CEO

Stanislav Zinchenko

s.zinchenko@gmk.center

Chief analyst

Andrii Tarasenko

a.tarasenko@gmk.center

Analyst

Ph.D. Andrii Glushchenko

a.glushchenko@gmk.center

Chief editor

Oleksandr Berdinskykh

a.berdinsky@gmk.center

Designer

Mikhailo Pashynskiy

m.pashinskiy@gmk.center

This report can be used for informational purposes only.

The conclusions in the report are reliable only considering the above assumptions and restrictive conditions. The conclusions and recommendations are personal, impartial and professional judgments of employees of GMK Center. GMK Center and its staff do not have personal or financial interest in the subject of research. The report is based on information from the next sources: World Steel Association, Ukrmetallurgprom, Metal Expert, UkrFA, UAVtormet, State statistics committee of Ukraine, other public sources, including the media outlets and the Internet. GMK Center considers this information to be reliable and does not independently verify its accuracy and completeness. GMK Center is not responsible for the accuracy of the information used. The report is intended to be used solely as a whole document. Use of just a section or page or change of any section or page is forbidden and make the report invalid.

