



Chrome alloys global market - challenges and prospects

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*5th CIS Ferroalloys Conference
19-20th September 2019*

Istanbul, Turkey





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Industry data is sourced from ICDA, FerroalloyNet, LME, MB, ISSF, UN Trading Data, Eurostat, OANDA.





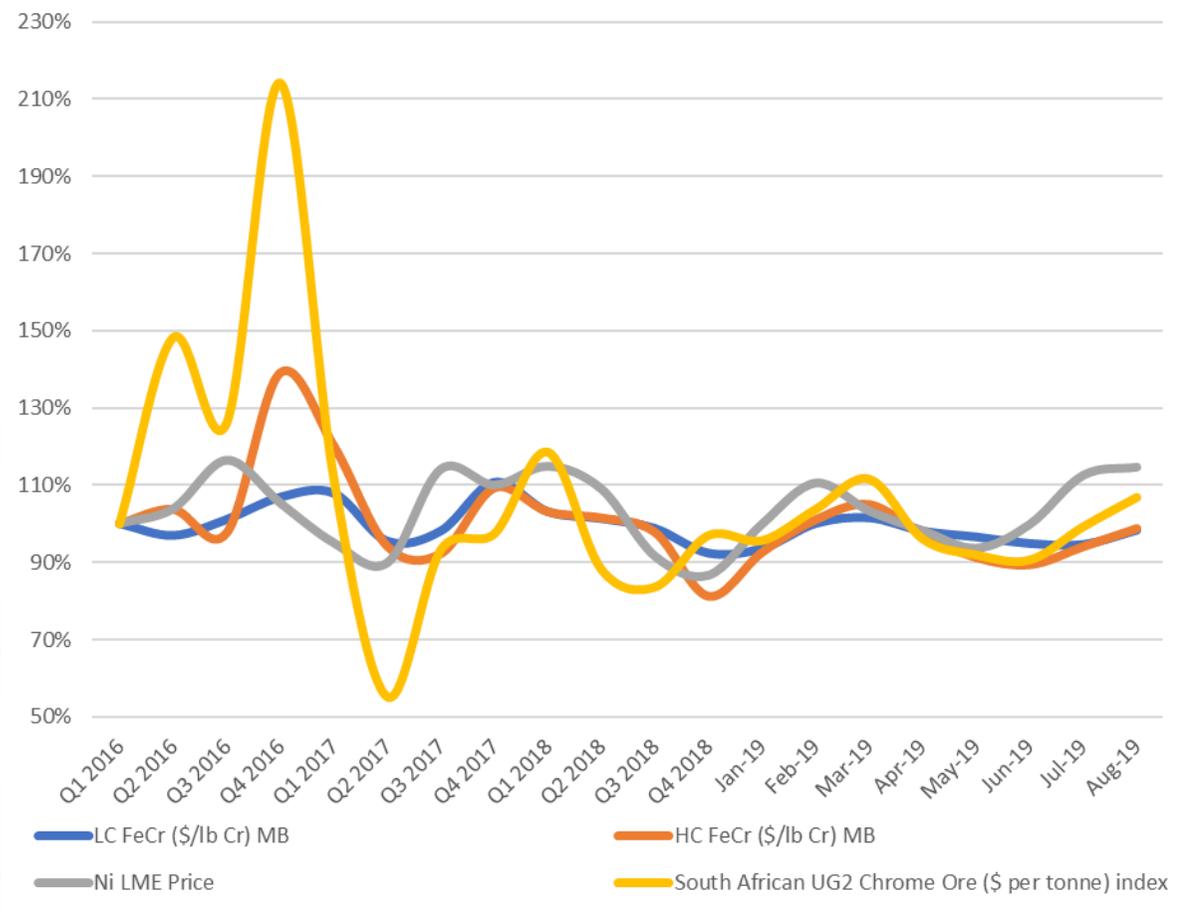
Market Overview



Chrome, ferrochrome, ferroalloys and other commodities market volatility

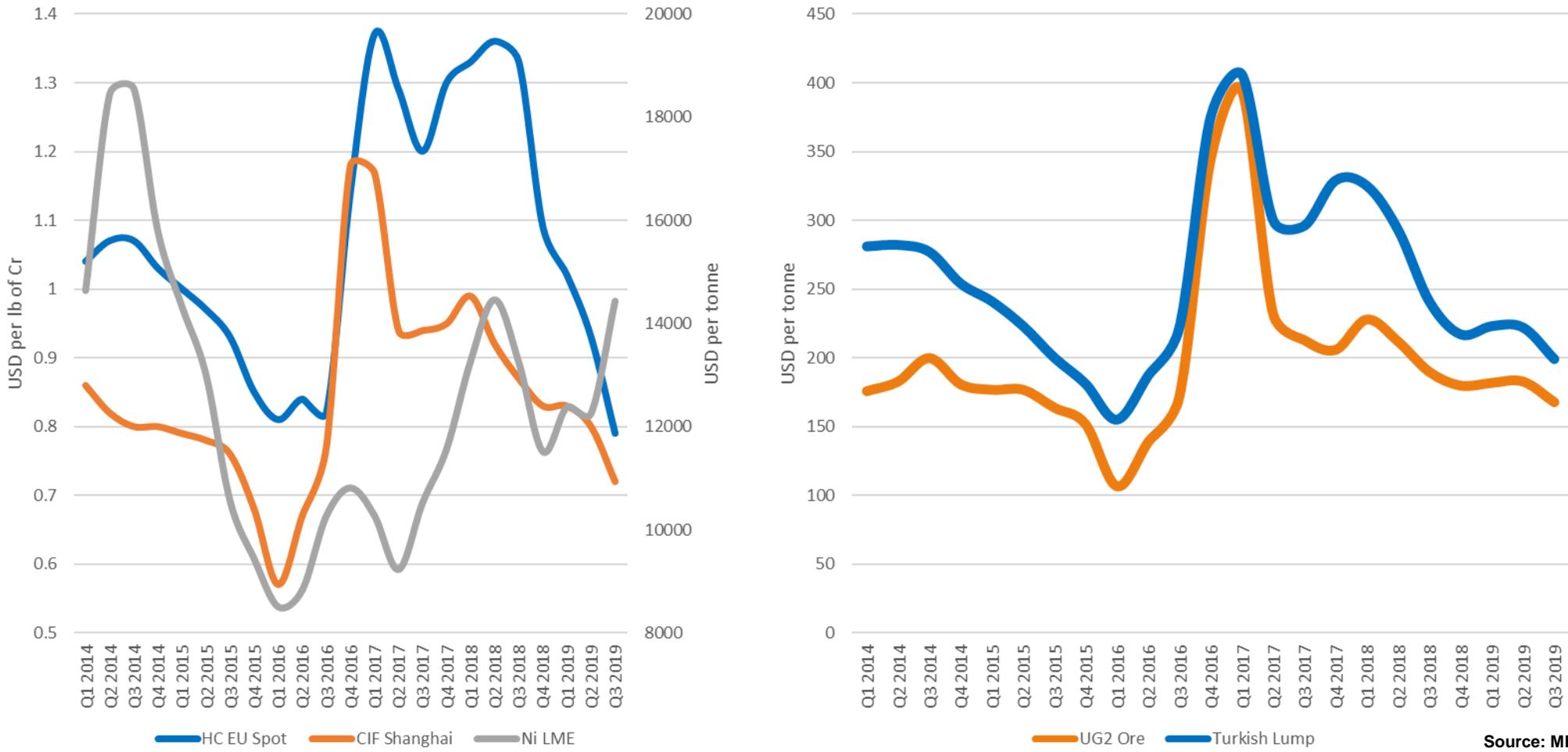
	Dec-15 YTD	Dec-17 YTD	2019 YTD
FeV EU	124%	-31%	-57%
Iron ore	119%	21%	22%
Nickel LME	106%	45%	71%
SiMn MB	65%	-5%	-3%
Crude oil Brent	61%	-10%	10%
Cobalt LME	50%	-52%	-13%
Zinc LME	49%	-28%	-3%
Gold LME	43%	13%	18%
UG2	26%	-33%	-11%
Tin LME	25%	-8%	-7%
Copper LME	25%	-17%	1%
Aluminium LME	17%	-21%	-5%
CIF Shanghai Ch Cr	14%	-19%	-10%
Average China Tender FeCr	14%	-11%	-9%
Platinum LME	6%	1%	19%
FeSi MB	5%	-42%	-26%
EU Benchmark Ch Cr	0%	-25%	-16%
HC FeCr EU MB	-7%	-41%	-24%
LC FeCr MB	-17%	-28%	-19%

Source: MB, LME, Ferroalloy.net





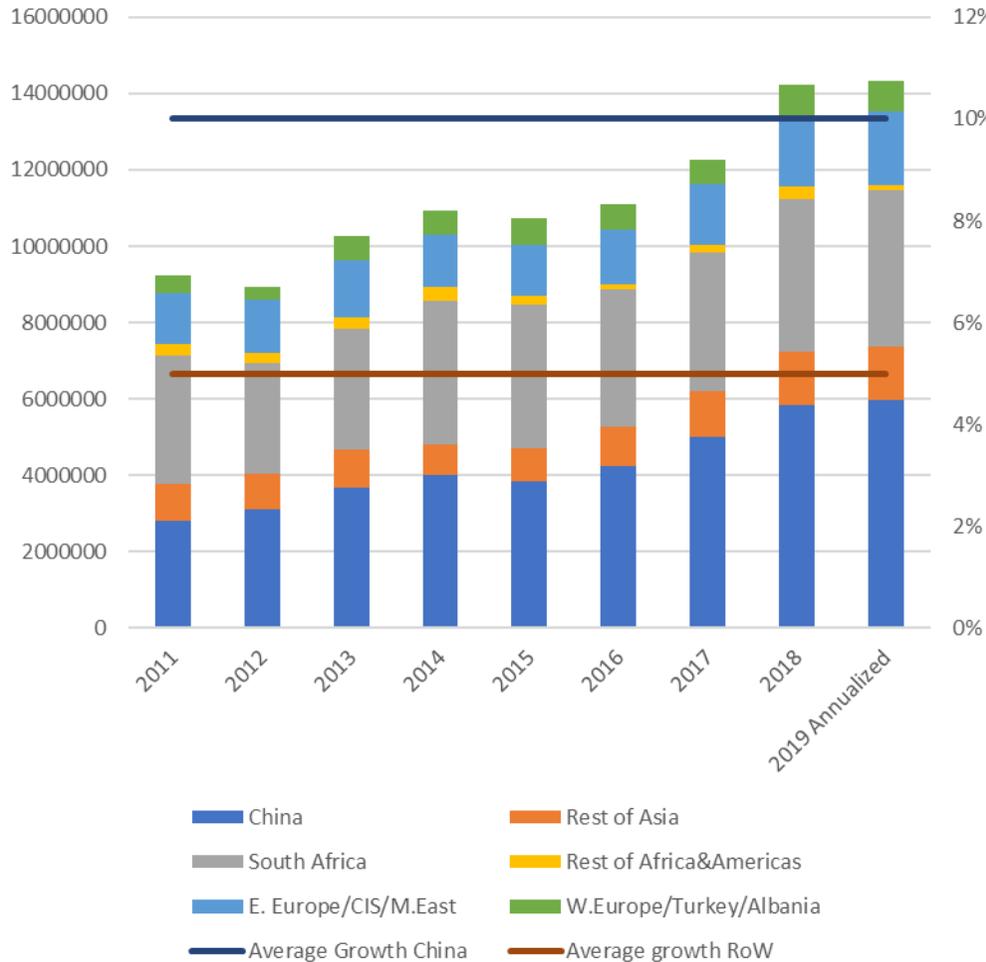
HC FeCr and Ch Cr Price history vs Chromium ore vs Ni LME



Source: MB



FeCr Production

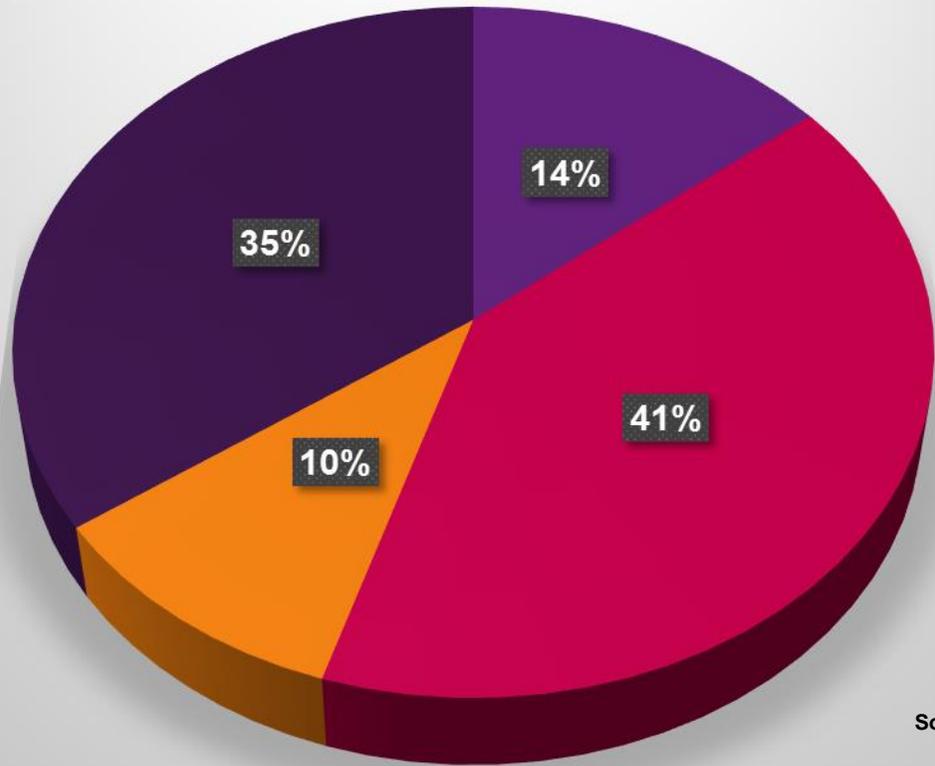


- FeCr production in China rose on average by 10% since 2011
- FeCr production in RoW rose on average by 5% since 2011
- **China**
 - 2018 capacity increase of 600,000 tonnes. Total output increased by 6.8% to 5.27 million tonnes. Expected output increase for 2019 at 5% to 5.53 million tonnes
- **Kazakhstan**
 - After completion of the new melts hop in Aksu, further expansion projects will be undertaken there.
- **South Africa**
 - Glencore/Merafe announced production cuts
 - Samancor, according to market sources is running at 50% capacity
 - Heric Ferrochrome is rumored to be prepared for dismantling
 - Production at Richards Bay (Traxys) is still idled
 - Afarak has stopped production due to maintenance
 - ESKOM expected to continue hiking electricity tariffs and load shedding
- **India**
 - According to market sources production cuts are expected
- **Turkey and Sweden**
 - Yildirim Group has announced production cuts

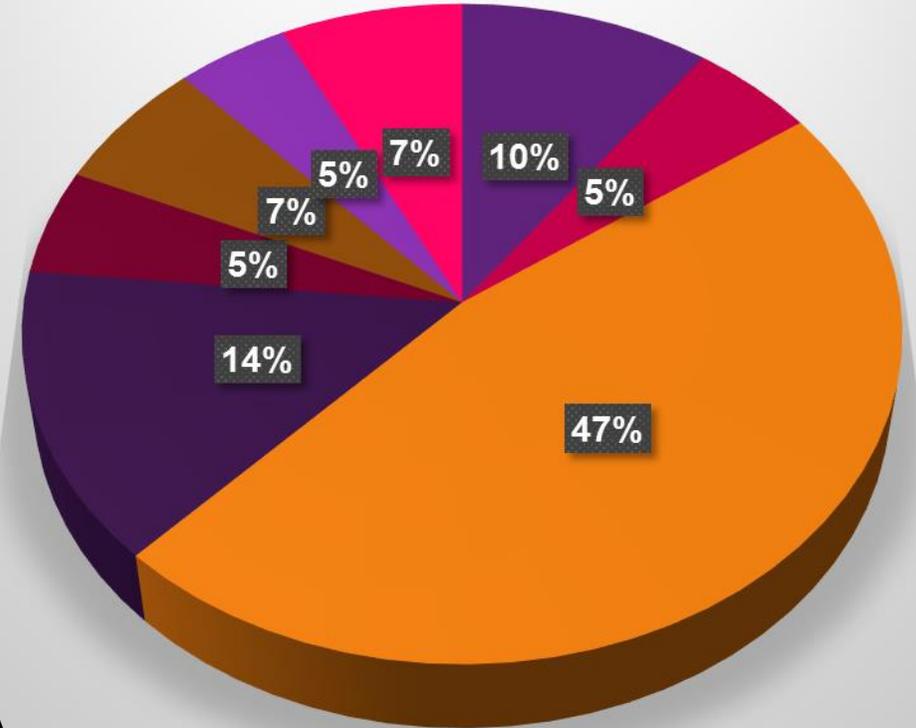
Source: ICDA



HC FeCr production 2018 by type



HC FeCr consumption 2018 annualized



Source: ICDA

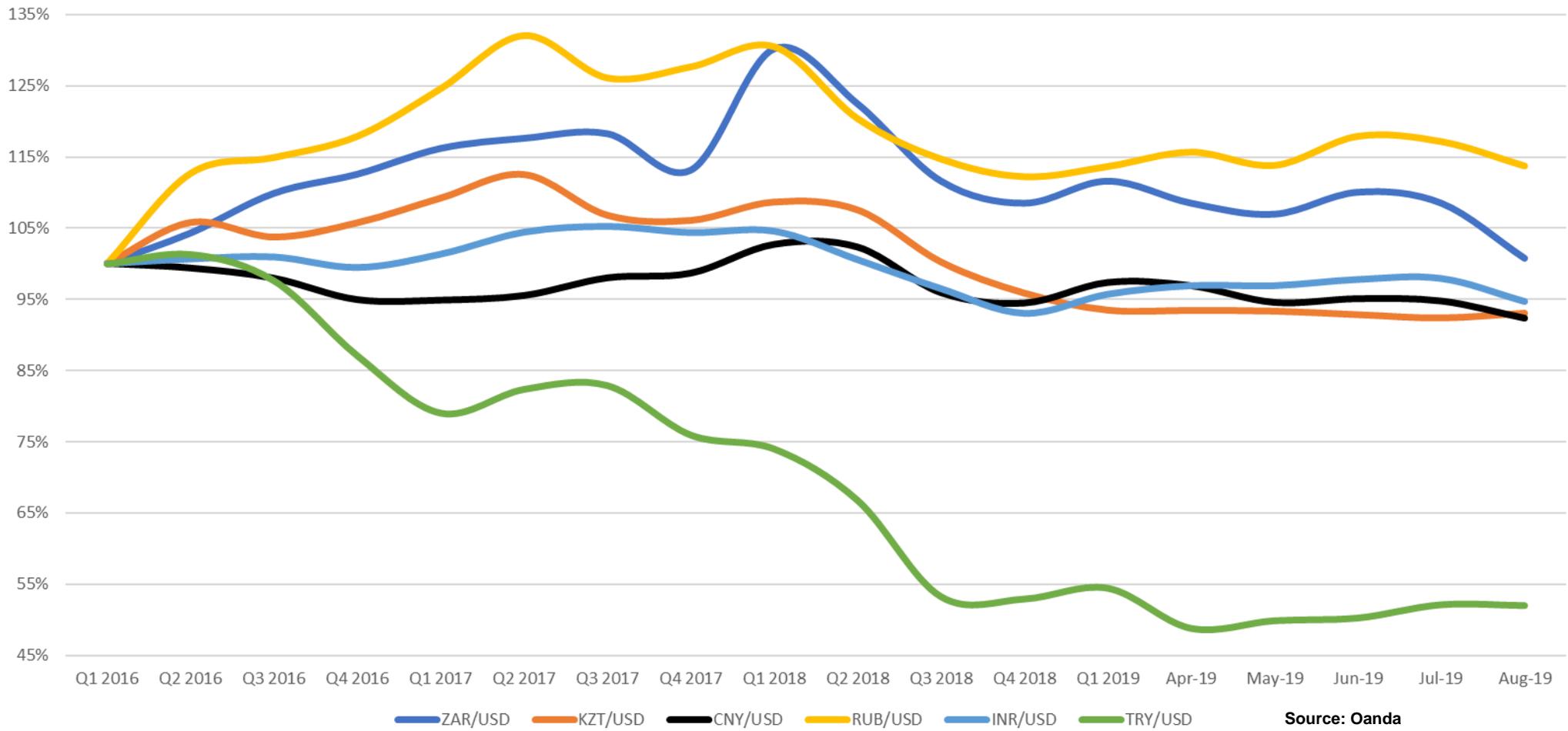
■ High Grade HC FeCr ■ Low Grade HC FeCr China
■ Low Grade HC FeCr RoW ■ Ch Cr

■ Europe ■ USA ■ China Production
■ China Imports ■ India ■ Japan
■ Korea ■ RoW





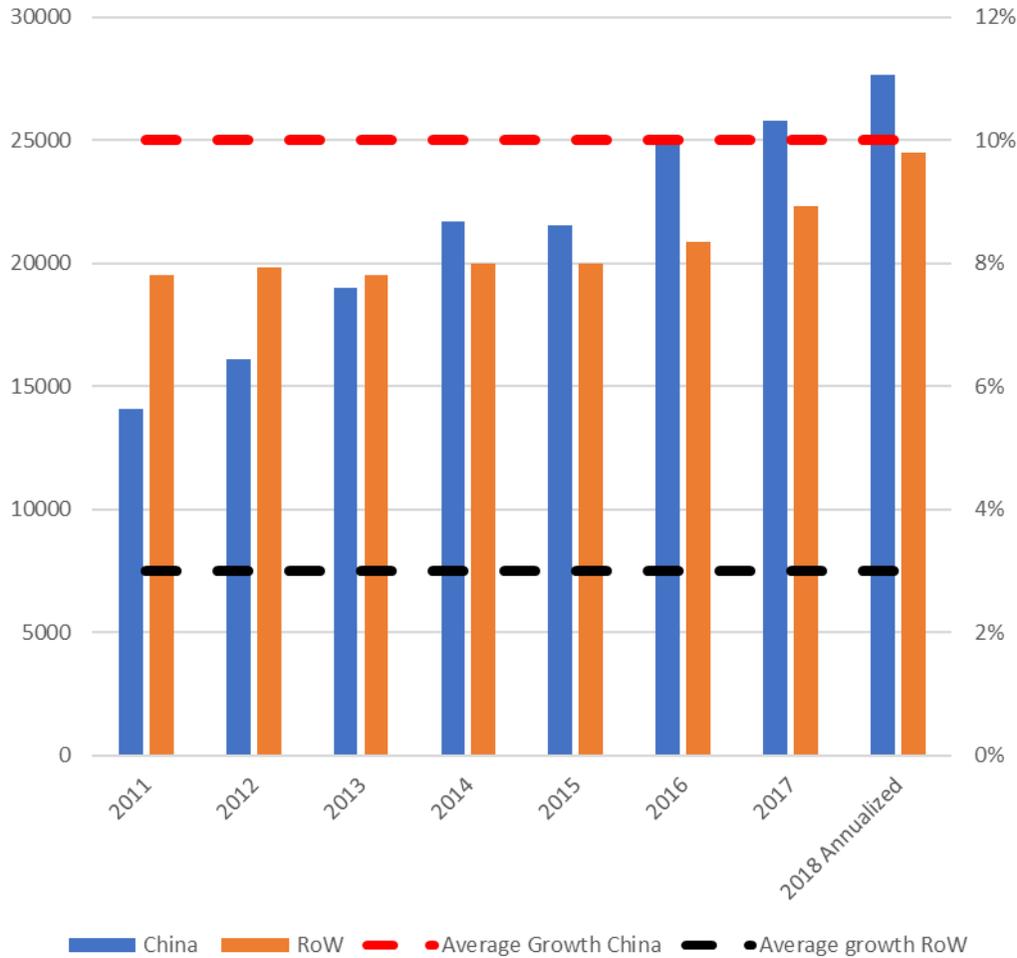
FeCr producing countries currencies exchange rate



Source: Oanda



Stainless Steel Production (in '000 mt)



- According to ISSF global stainless-steel production increased from 2017 to 2018 by 3,4 million tonnes, or 6.8%
- Indonesia accounted for 2,2 million tonnes or roughly ¾ of the total increase
- Indonesian production figures: 680,000 tonnes in 2017 to 2,860,000 tonnes in 2018 (an increase of 320%), with 2019 production forecasted at 3,550,000 tonnes (an increase of 25%)
- Despite such huge numbers, that production might have little impact on ferrochrome, since technologically the production is designed for use of inhouse liquid ferrochrome and producers will only purchase chrome ore.
- However the Indonesian stainless-steel industry must still overcome shortages of finance, environmental issues, increase in cost of projects and possibility of duties on steel produced in Indonesia.
- In H1 2019 stainless steel production in China increased 8.5% to 14.35 million tonnes
- Ban on the export of nickel ore, has moved nickel prices up by 78% since the beginning of the year
- China imports of nickel ore from Indonesia were roughly 43% of the total ore imports. On the other hand it remains to be seen if NPI production from Indonesia will come onstream fast enough.



Market Trends

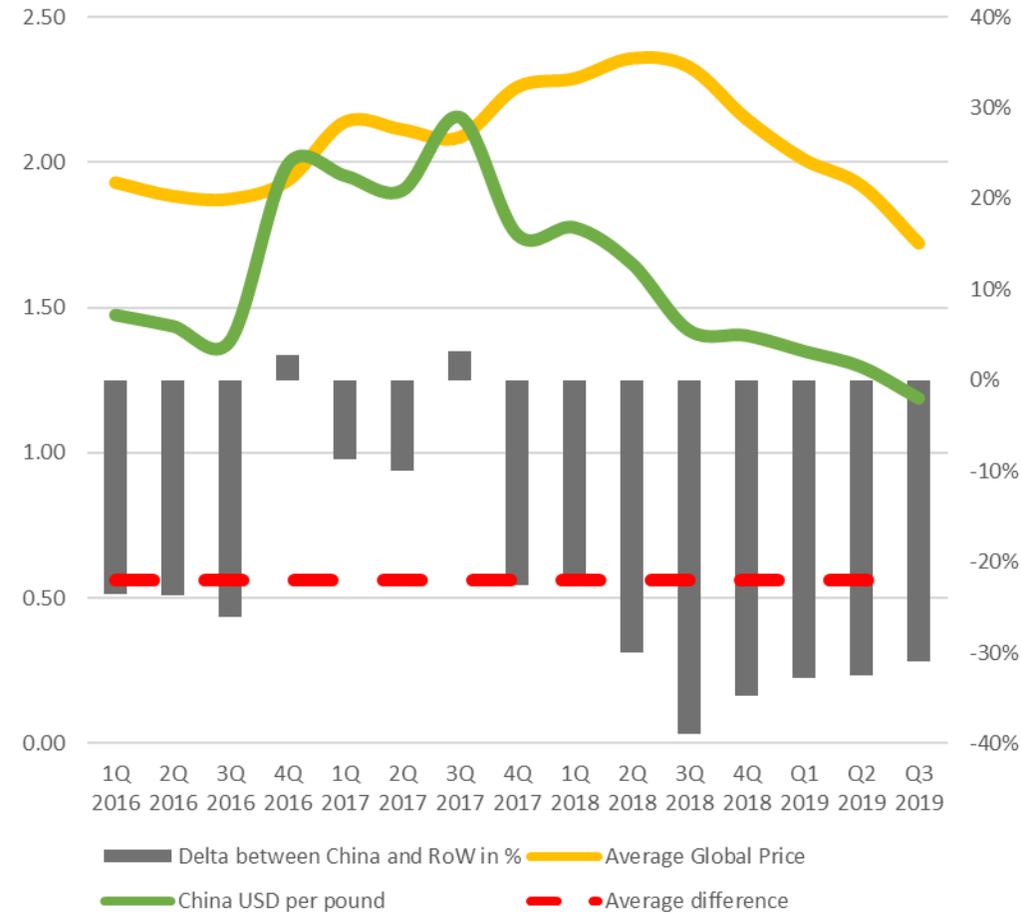
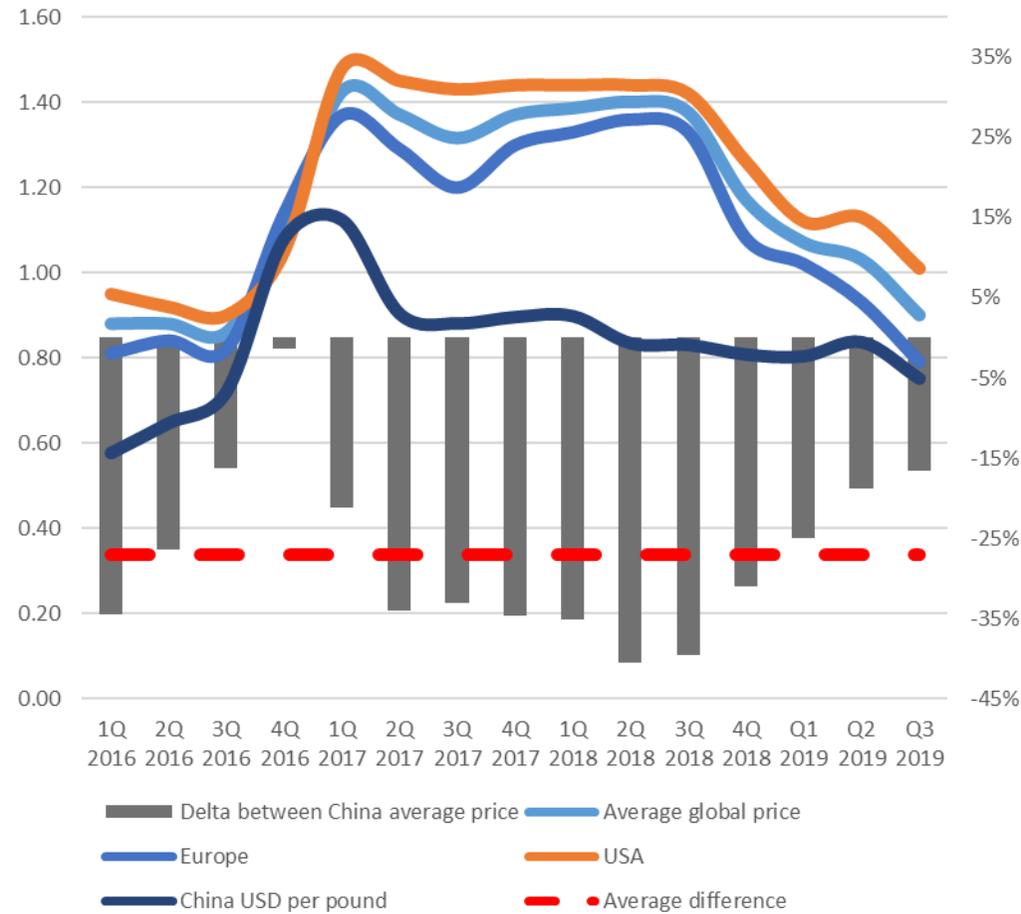


Global FeCr prices vs China domestic FeCr prices

Source: MB, Ferroalloy.net

HC FeCr Global Prices

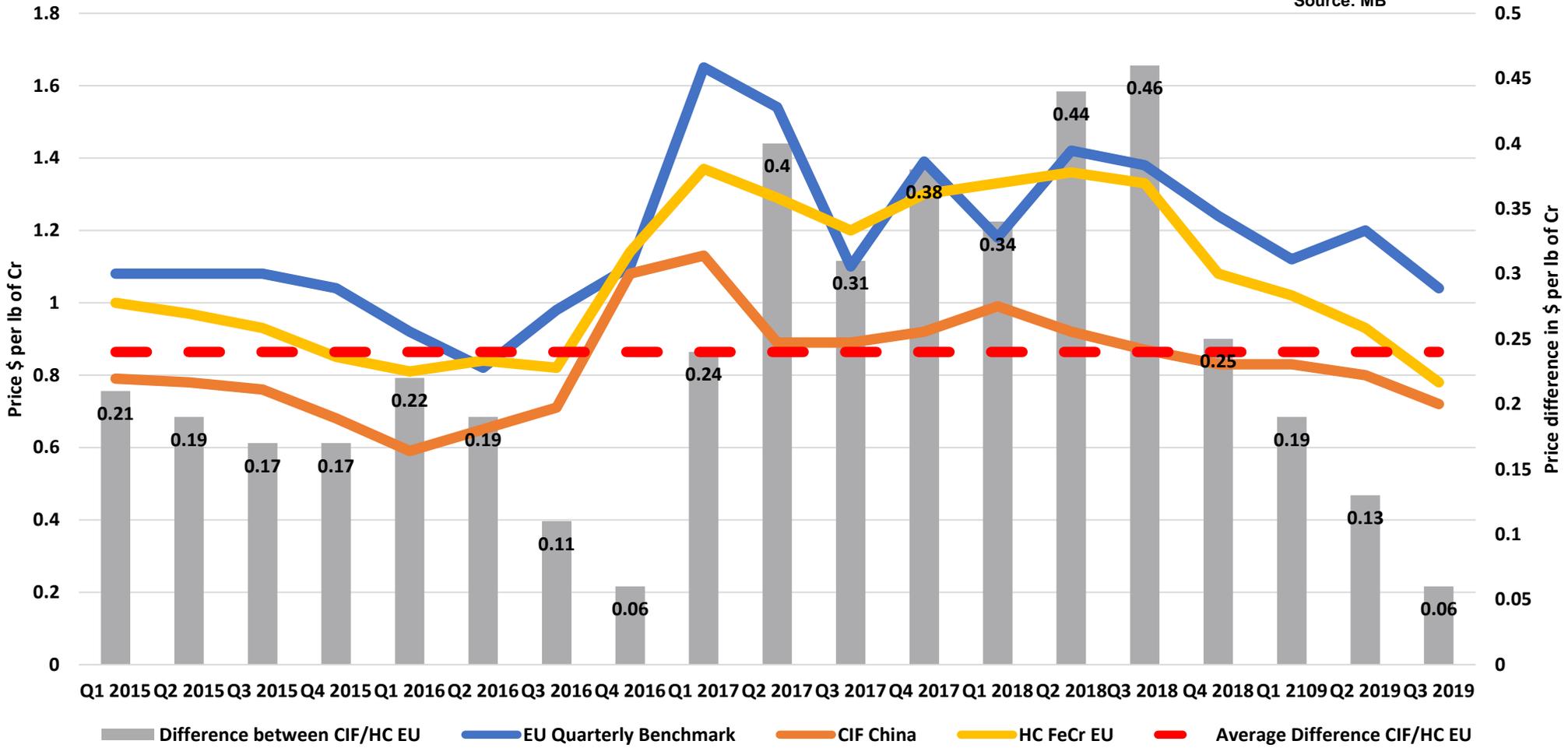
LC/MC FeCr Global Prices



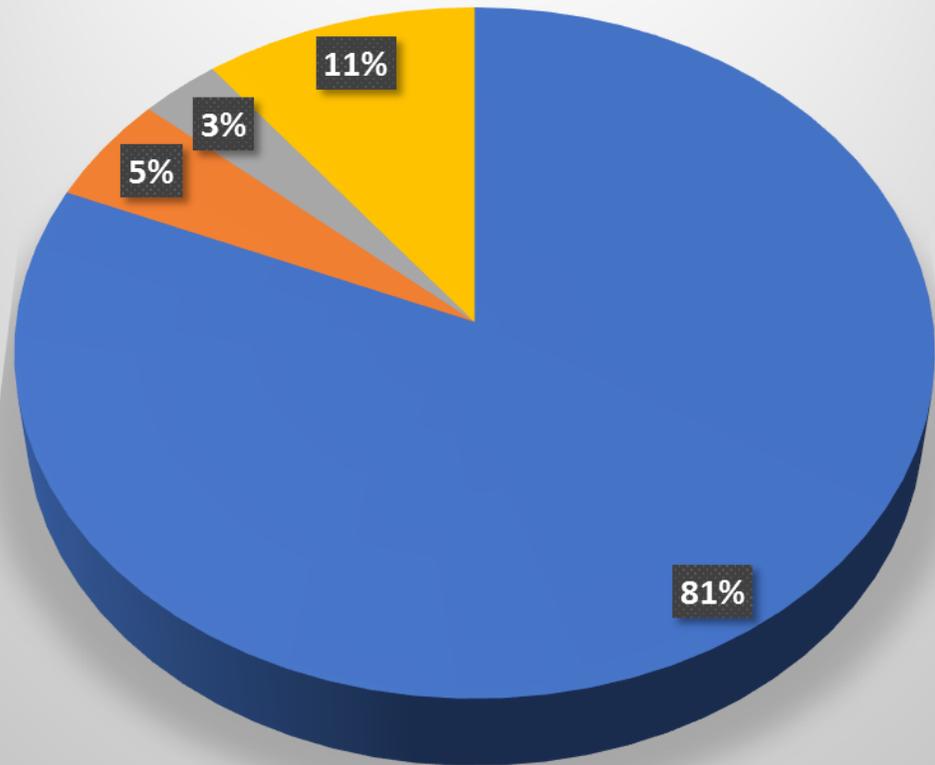


EU Benchmark vs CIF China South African CH Cr vs EU HC FeCr

Source: MB

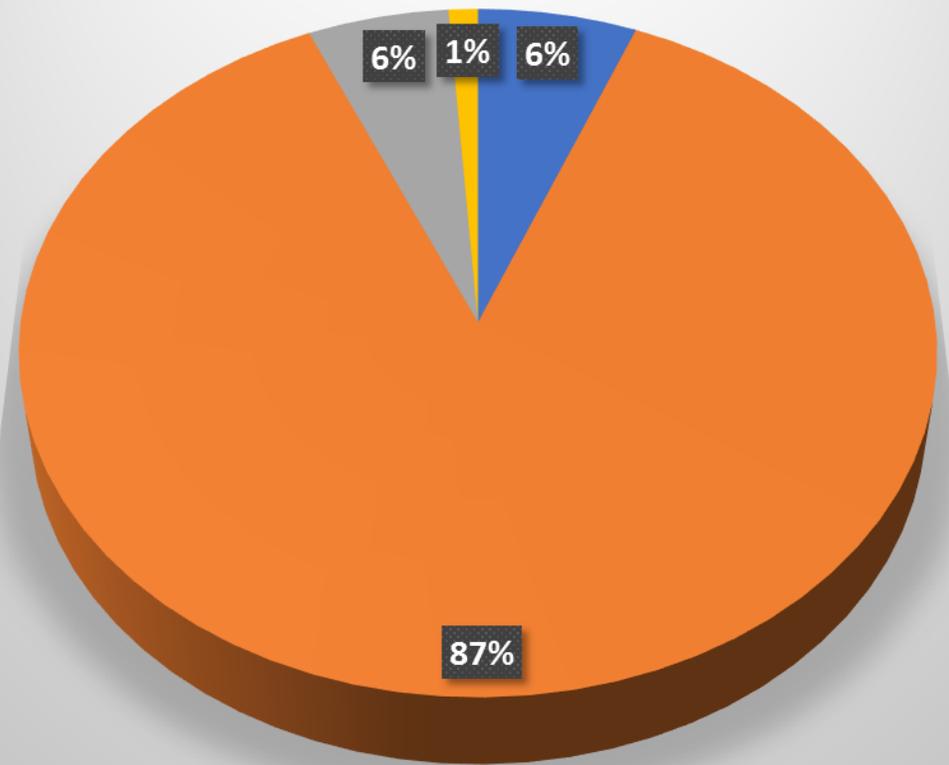


FeCr production CIS 2018



■ HCFeCr KZ ■ HCFeCr RU ■ LC/MCFeCr KZ ■ LC/MCFeCr RU

Cr ore imports CIS

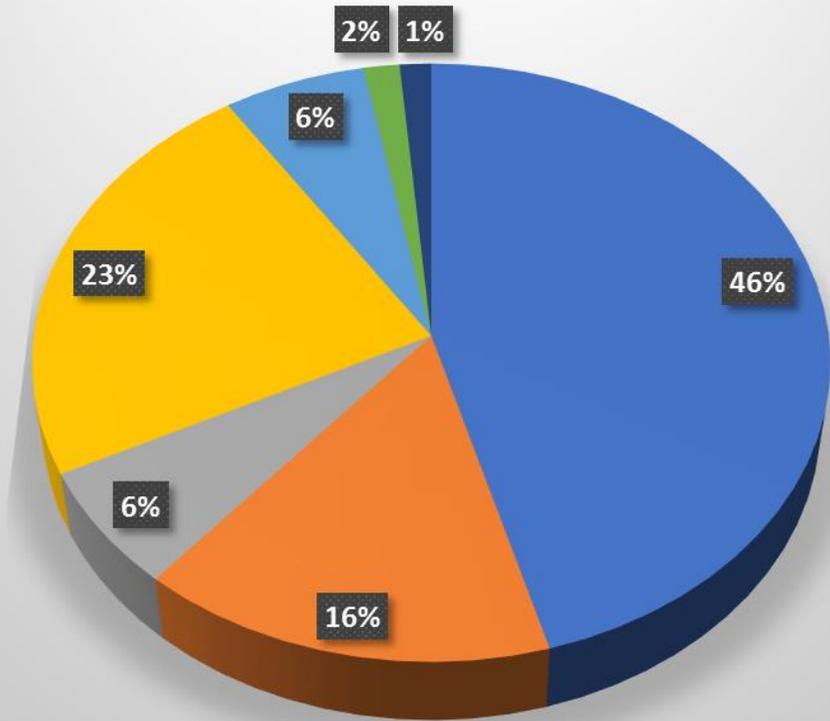


■ To Russia from SA ■ To Russia from KZ ■ To Russia from TR ■ Ukraine



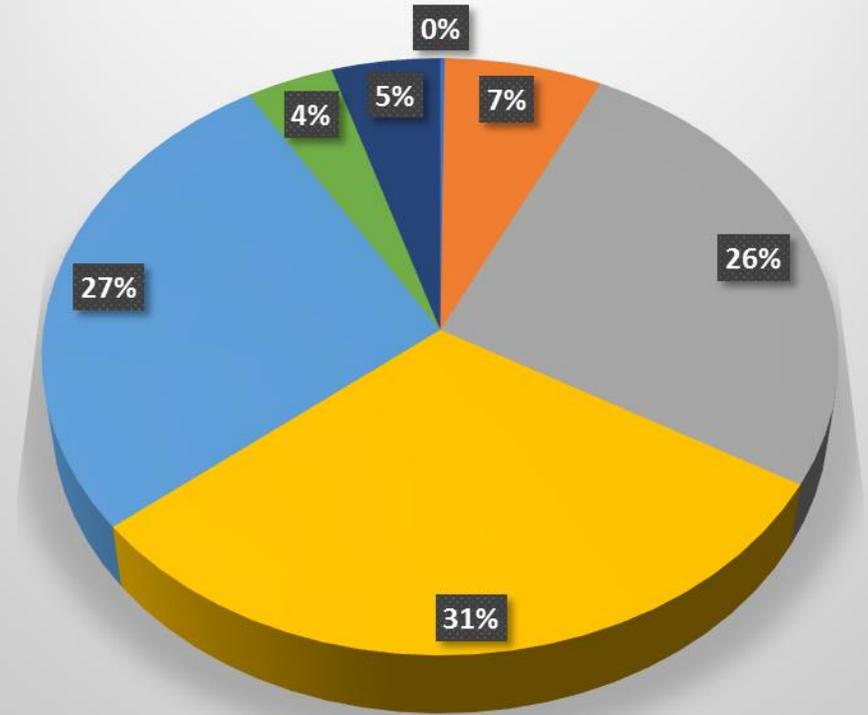
Chromium
95.0%

Global CIS HC FeCr consumption



■ China ■ Europe ■ USA ■ Japan ■ Rest of Asia ■ CIS ■ RoW

Global CIS LC FeCr consumption



■ China ■ Europe ■ USA ■ Japan ■ Rest of Asia ■ CIS ■ RoW





Pricing methodologies and their drawbacks

- Historically, the Ch Cr benchmark was the leading index to reflect the market of FeCr not only in EU but also globally
- Yet, from December 2015 (when most of the metal markets were at the pricing bottom) till today, the majority of metals posted price gains, while ferrochrome prices except China, are at their lowest level since 2009:
 - EU HC FeCr price dropped by 7% since the end of 2015 and 24% in 2019, while EU LC FeCr price dropped 17% since the end of 2015 and 19% since the beginning of 2019
 - EU benchmark is at the same level as in Q4 2015 at 1.04 USD/lb, but 7% lower than in Q1 2019
 - Average Chinese tender prices rose by 14% since end of 2015, but dropped by 9% since beginning of the year
- European HC FeCr market is driven by its own supply/demand on higher Cr-content FeCr, and only follows ChCr in general direction. Yet, in 2019 HC FeCr is being sold at a discount to Ch Cr, this is due to increased supply competition and changes in technological requirements for Cr content
- Bidding prices announced by consumers in China are becoming more and more relevant for the market worldwide.
- Ten or more years ago, FeCr in China was following a mature markets trend. After the 2008 shock it has started to show its own dynamic led by domestic supply/demand rather than ex-China factors. Ferrochrome Market in China is highly driven by domestic ferrochrome cost of production.
- Several indexes were developed on a basis of spot prices in different regions, but those indexes cover only a small portion of the market (roughly 5%).
- Over the years the ferrochrome industry has been plagued by its pricing mechanisms, which are not liquid and don't have enough credibility to become one leading price indicator.
- So far new digital technologies have very little penetration into the ferroalloys trading market. With the current technology it is possible to create a trading platform that will provide a marketplace for liquid trading with financial responsibility and price discovery transparency.
- Such platform might also be a good risk management and hedging tool.



New digital projects and way forward

Type of Platform	Counterparty search/Negotiation	Delivery Terms Variety	Delivery Execution Control	Additional Liquidity Financing Potential	Price Discovery
• Deal/Counterparty search platform	Yes	High	Offline	Offline	Offline
• Performance/Trade finance facilitation	Offline	High	Yes	Yes	Offline
• Supply Chain/ Transparency Control	Offline	High	Yes	Offline	Offline
• Trading Platform with Guaranteed Liquidity and Performance	Yes	Low	Yes	Yes	Yes



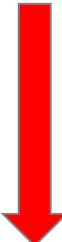


Summary

Since the beginning of 2019, there were certain general economical upsides which have supported commodities market and improved the general 2019 outlook for many metals:

- 
- Massive quantitative easing in China.
 - Steep increase in Nickel price, which in short-term could help stabilize ferrochrome prices and improve demand for ferrochrome and chromium units
 - Continuous increase in stainless-steel production

On the other hand, the ferrochrome industry faces other risks that will affect it, such as:

- 
- The trade war between China and USA is intensifying
 - No increase in new ferrochrome capacity ex-China
 - Production cuts and closures in ferrochrome production ex-China
 - Slowing FeCr demand from a large portion of the stainless-steel capacity due to a different production process (Indonesia)
 - The yuan volatility adds a new dimension to the currency risk, now combined with increased volatility of the South African rand, Turkish lira and Russian ruble
 - Currently Chinese prices for HC and Ch Cr are higher than similar prices ex-China

The ferrochrome market requires a mechanism which will allow all market participants to measure future expectations on a longer-term basis, with increased accuracy and financial responsibility than what exists today. Digital exchange platforms for physical metal with liquid pricing will be able to provide such a mechanism.





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Thank you for your kind attention



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