



Global Investment Research

GS Steel & Iron Ore chartbook (August 2022)

Prices based on the market close as of 29 August 2022, unless otherwise stated.

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All analysts listed above are members of GIR Equity Research with the exception of Nicholas Snowdon, who is a member of the GIR Commodities Research team and responsible for the GS Iron ore S/D modelling presented herein, and Lisheng Wang, who is a member of the China Economics team and is responsible for the China housing price analysis presented herein.

Big picture: Key observations in Aug'22

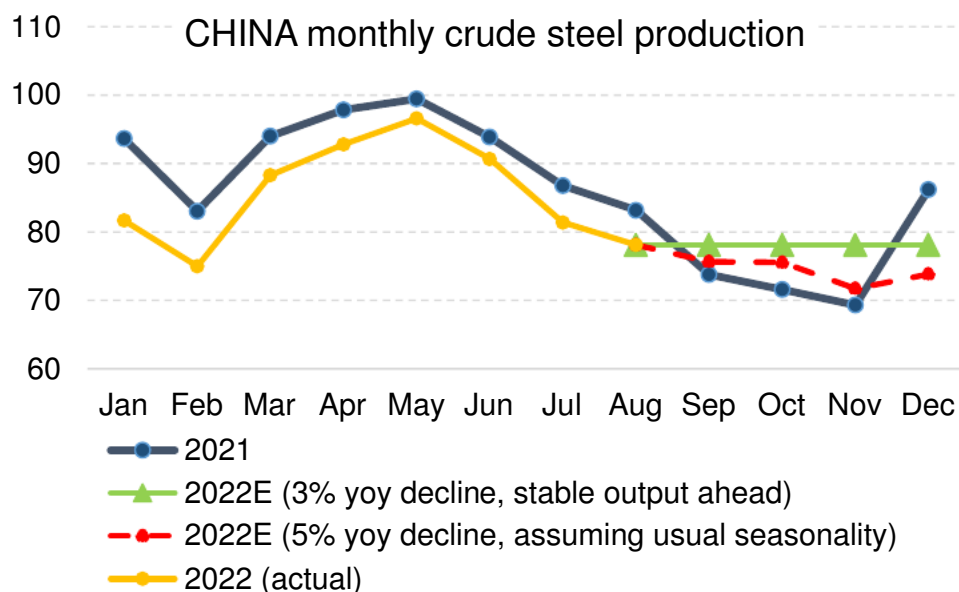
1. **Four major themes dominate discussions:** 2Q reporting season, potential consensus estimate downgrades and European energy crisis
 - **China crude steel output:** End-August crude steel output rates are down 10% vs June highs. If current rates hold through Y/E, China crude steel output'22 will decline 3% YoY.
 - **2Q reporting season:** Overall, steelmakers' earnings positively surprised the street (beats being driven by higher realised steel prices, volumes and better sales mix).
 - **Consensus downgrades:** We think the market has incorporated a downturn into EU steel projections (consensus EU HRC c.30% lower vs spot) and see limited downgrade scope unless the market anticipates a deeper macro deterioration vs GFC-type crisis.
 - **European Energy crisis** (covered in [June barometer](#)): EU countries with >10% of energy supplies dependant on Russian gas account for c.50% of EU27 crude steel output; Almost 40% of European output is EAFs; EU crude steel output down 10% in 6m22.
2. **Supply: GSS Tracker:** Production rates in China plummeted in July (China -10% MoM, ex-China – broadly stable MoM; China +5% YoY, ex-China -10% YoY) – [link](#).
3. **Demand: GSD Tracker:** Steel demand slowdown in China (PMI declined, auto production drop, lower construction activity) – [link](#).

In Focus (1): China crude steel output

1. China crude steel output and utilisation rates started to decline

- End-August daily crude steel output rates are down 10% vs June highs (yet still stand 14% above Feb'22 lows).
- Chinese output has slightly recovered post after 5 weeks of consecutive decline from June highs.

2. If current July rates hold through year-end, 2022 China crude steel output could decline 3% YoY (roughly in line with GS est of a 2% decline and state target of declining steel output).



Scenarios on daily output growth rates vs July'22 level

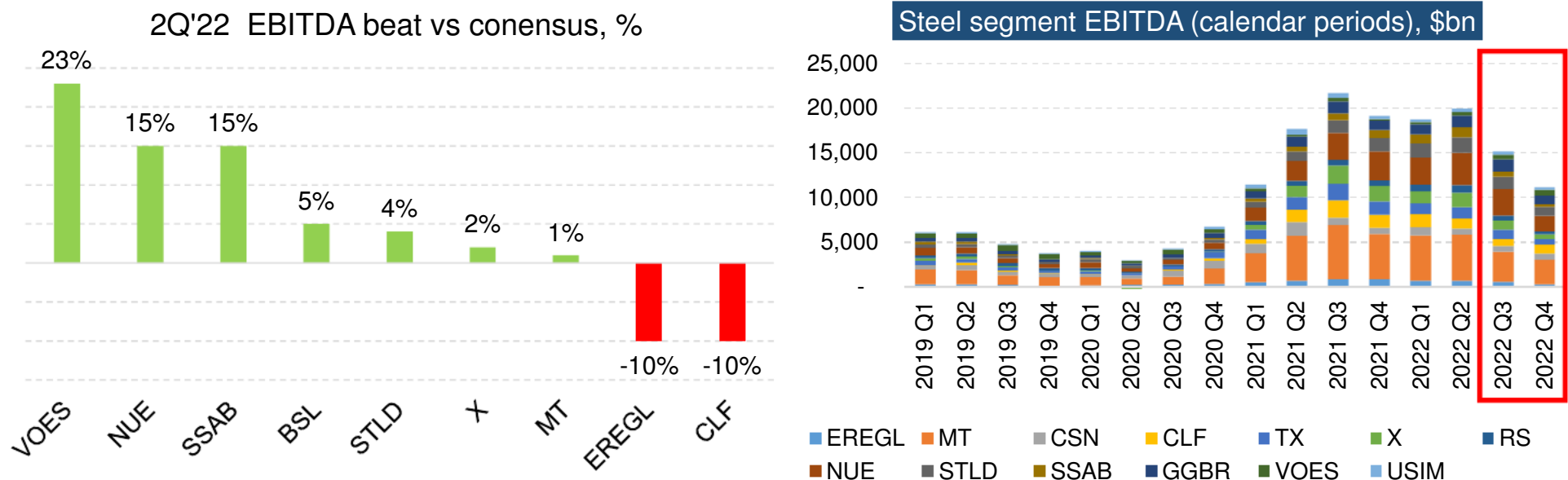
% gr vs Aug 2022 level	-15%	-10%	-5%	0%	5%	10%
mtpd	2.3	2.4	2.5	2.7	2.8	2.9
2022 full year implied crude steel production, mtpa	950	966	981	997	1,013	1,028
2022 % YoY	-8%	-6%	-5%	-3%	-2%	0%

For China crude steel production in 2022 to show moderate yoy decline average daily steel output should remain at current level

In Focus (2): 2Q22 reporting by DM steelmakers

Below we present key 2Q22 reporting highlights for steelmaking companies:

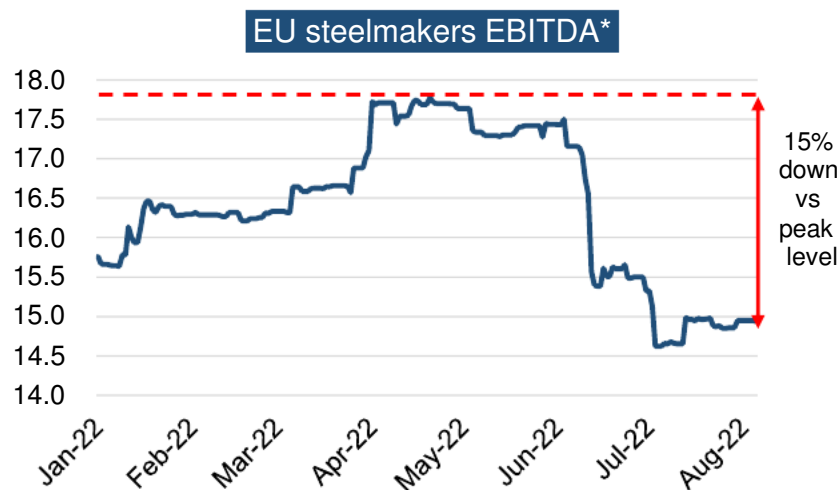
- **Profitability beats driven by higher steel prices, sales volumes and better mix:**
Steelmakers surprised the street positively on profitability, with beats mainly driven by higher realised steel prices, steel shipments and better sales mix. On the negative side, cost inflation was high, driven by higher energy and raw materials.
- Beyond 2Q22 **earnings expected to normalise** (but at higher levels vs history) on narrowing ferrous feed spread.



In Focus (3): EU steel estimate downgrades risks

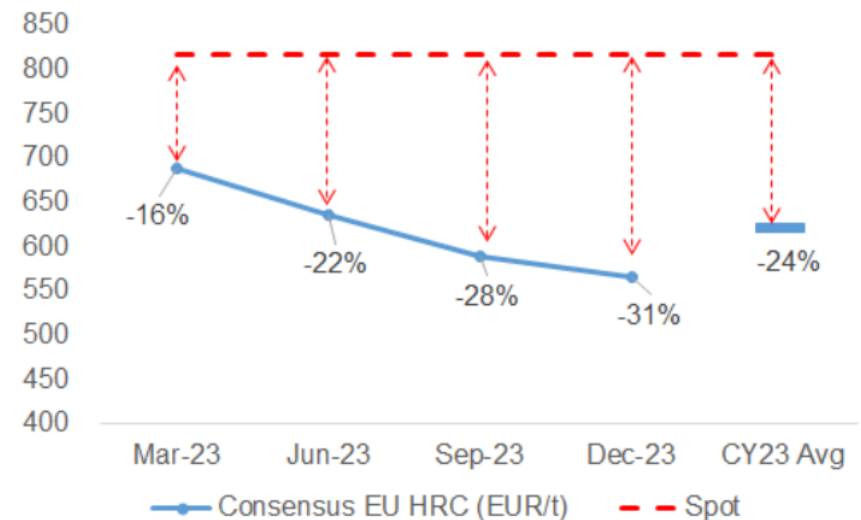
1. Estimates likely reflect a potential economic downturn: Visible Alpha (VA) FY23E EBITDA for EU steelmakers is already down c.15% from peak levels in the past 3mo.
2. VA European steel estimates are based on a >30% decline in EU steel prices in the next 12 mo to EUR 560/t (vs spot EUR 820/t and EUR 510/t average in 2013-22).
3. **We see limited scope for further downgrades** unless the market anticipates a deeper macro deterioration vs a GFC-type crisis that could bring prices down to EUR 450/t, implying c.45% downside from current spot prices.

The street already downgraded EU steelmakers EBITDA 2023 forecasts by 15% vs peak level



* contains 6 steelmakers listed in Europe

The street already forecasts EU HRC prices to decline >30% in the next 12 mo



Big picture: The steel & iron ore navigator

What was important in August

STEEL

Global view	HRC / rebar prices continued decline in key regions // Global steel output fell MoM // Auto production showed negative consecutive dynamics		
China	China crude steel output declined MoM // Steel demand showed negative MoM dynamics // Steel net exports decreased MoM		
Europe	EU Steel demand was down MoM // Steel output declined MoM // Metal spreads are high		
US	US steel production increased slightly MoM with moderate production capacity utilisation rate		
Latam	Latam steel production remained largely stable MoM // Consumption also showed broadly stable consecutive dynamics		
Black Sea	BS output slightly recovered MoM // steel consumption declined // steel exports were slightly up MoM		
<div> ROW indicators GS steel S/D model GS Steel price outlook Comps & Bookshelf </div>			

IRON ORE & COAL

Pricing	Prices, premia and margins trajectory	China	Domestic iron ore output	Met coal	Coking coal import
Stocks	China port inventories grow (~6wks of use)	Trade	Brazil & Australia IO shipments on increase		

GSS: Global Steel Supply Heatmap in August 2022

Steel supply momentum is lower MoM and YoY owing to Chinese steel production drop

Green indicates high supply vs recent history; Red indicates lower supply vs recent history

		Steel Supply												
		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22
Global steel supply momentum index (100% highest)		56%	42%	30%	30%	30%	51%	27%	34%	64%	62%	70%	60%	42%
Global crude steel production		162	157	144	146	143	159	155	143	161	163	170	158	149
China	Crude steel production	86.8	83.2	73.8	71.6	69.3	86.2	81.7	75.0	88.3	92.8	96.6	90.7	81.4
	Effective capacity utilisation	84%	74%	72%	70%	87%	82%	75%	75%	89%	93%	97%	91%	82%
	Net steel export/(import)	106	105	98	98	98	110			113	111		112	
	Inventory	1,157	1,076	926	765	630	2,022	622	1,147	1,306	1,254	1,185	1,185	1,078
EU	Crude steel production	13.0	11.6	12.7	13.4	12.9	11.1	11.5	11.7	12.8	12.3	12.9	11.8	11.7
	Effective capacity utilisation	77%	84%	89%	86%	74%	76%	78%	78%	85%	86%	90%	83%	82%
	Monthly steel import	2.4	2.5	2.4	2.6	2.0	1.3	3.7	1.4	1.8	2.2	1.7	1.5	
US	Crude steel production	7.5	7.5	7.3	7.5	7.2	7.2	7.3	6.4	7.0	6.9	7.2	6.9	7.0
	Effective capacity utilisation	98%	95%	98%	94%	94%	95%	83%	83%	91%	90%	94%	90%	91%
	Monthly steel import, '000 st	3.1	2.8	3.3	2.7	3.2	2.9	3.0	2.4	3.1	2.7	2.8		
Black Sea	Crude steel production	12.4	12.3	11.5	11.8	12.2	12.2	12.2	10.7	10.7	10.7	10.6	8.8	9.1
	Effective capacity utilisation	98%	98%	91%	94%	97%	97%	97%	85%	85%	85%	84%	70%	72%
	CIS net export	3.6	3.1	3.1	3.3	3.4	3.2	3.3	2.9	2.2	2.4	2.6	1.9	2.3
LATAM	Crude steel production	3.8	4.0	3.9	4.0	3.9	3.5	3.7	3.3	3.7	3.6	3.8	3.7	3.6
	Effective capacity utilisation	96%	100%	98%	100%	98%	88%	93%	83%	93%	90%	95%	93%	90%
	Brazil's inventory, kt	1,272	1,334	1,254	1,229	1,081	1,160	1,189	1,047	1,202	1,185	1,124	1,129	1,207
	Brazil net export, mnt	- 267	- 107	- 66	40	- 1	116	78	94	85	148	32	178	11

Global steel supply momentum index shows global steel supply dynamics (based on statistics in key regions) within LTM period

GSD: Global Steel Demand Heatmap in August 2022

Steel demand momentum showed signs of slowdown with falling PMI, auto production and lower construction activity

Green indicates high demand vs recent history; Red indicates lower demand vs recent history

		Steel Demand												
		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22
Global steel demand momentum index (100% highest)		56%	38%	34%	46%	42%	42%	37%	62%	53%	35%	47%	75%	64%
China	Credit Impulse	-5.3	-7.1	-8.5	-8.8	-8.5	-7.1	-5.6	-6.8	-3.1	-2.6	-0.4	1.0	1.3
	Manufacturing PMI	50.3	49.2	50	50.6	49.9	50.9	49.1	50.4	48.1	46	48.1	51.7	50.4
	Auto production, mn	1.8	1.7	2.0	2.3	2.5	2.9	2.3	1.8	2.2	1.2	1.9	2.5	2.3
	Auto sales SAAR, mn	19	17	16	19	17	4	4	23	18	14	18	25	
	FAI, YTD YoY %	10%	9%	7%	6%	5%	5%		12.2%	9.3%	6.8%	6.2%	6.1%	5.7%
	New property starts, mn sqm	0.2	0.2	13.9	11.8	10.5	8.6	8.6	2.0	1.6	-1.5	-2.4	-5.1	-6.6
Europe	Construction index	111	110	111	112	112	112	115	116	116	115	115	113	
	Manufacturing PMI index	62.5	61	58.3	58	58.2	57.9	58.5	57.9	56.3	55.3	54.2	51.6	49.3
	Auto production, mn	1.1	0.7	1.2	1.2	1.5	1.3	1.2	1.4	1.3	1.2	1.3	1.4	1.2
	Auto sales SAAR, mn	12.0	12.3	10.3	10.6	11.0	12.1	5.5	5.6	9.4	9.9	10.3	10.8	
US	Non-residential spend SAAR, \$mn	796	807	807	822	833	832	843	846	839	844	833		
	Residential spend SAAR, \$mn	785	790	787	805	810	836	876	882	891	900	947		
	Auto production, mn	0.9	1.1	0.9	1.1	1.2	1.0	1.1	1.1	1.4	1.1	1.2	1.2	1.0
	Auto sales SAAR, mn	14.8	13.1	12.2	13.0	12.9	12.4	15.0	14.1	13.3	14.3	12.7	13.0	13.4
Brazil	Auto production, k units	164	165	173	178	206	211	145	166	185	186	206	204	219
	Auto new registration, k units	151	149	133	140	148	178	108	117	129	128	164	151	159
	Sao Paulo Real Estate launches, units	7.4	8.6	7.9	7.8	7.3	23.1	1.4	3.9	8.2	4.9	9.8		
	White goods and sales volume index	86.7	82.5	79.9	76.5	100.6	100.8	79.5	69.4	81.6	74.8	82.6	74.5	

Global steel demand momentum index shows global steel demand dynamics (based on statistics in key regions) within LTM period

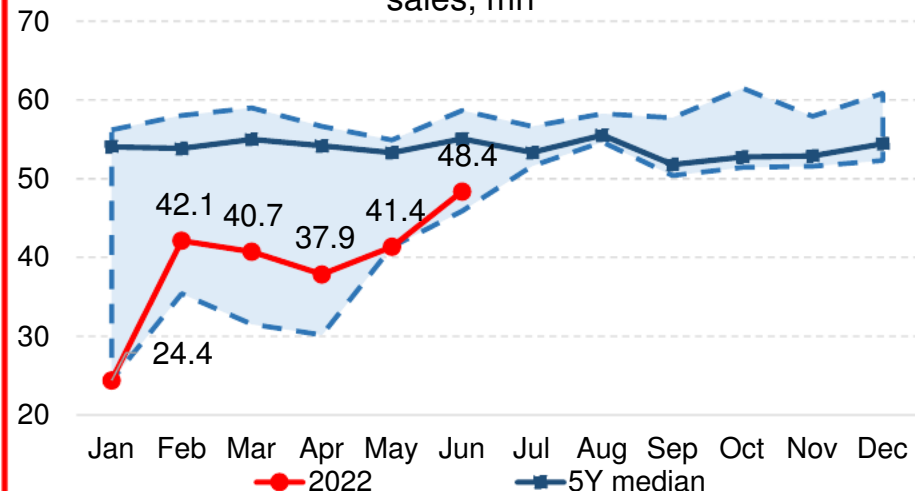
Source: ACEA, CISA, Mysteel, Bloomberg, Goldman Sachs Global Investment Research

Global Investment Research

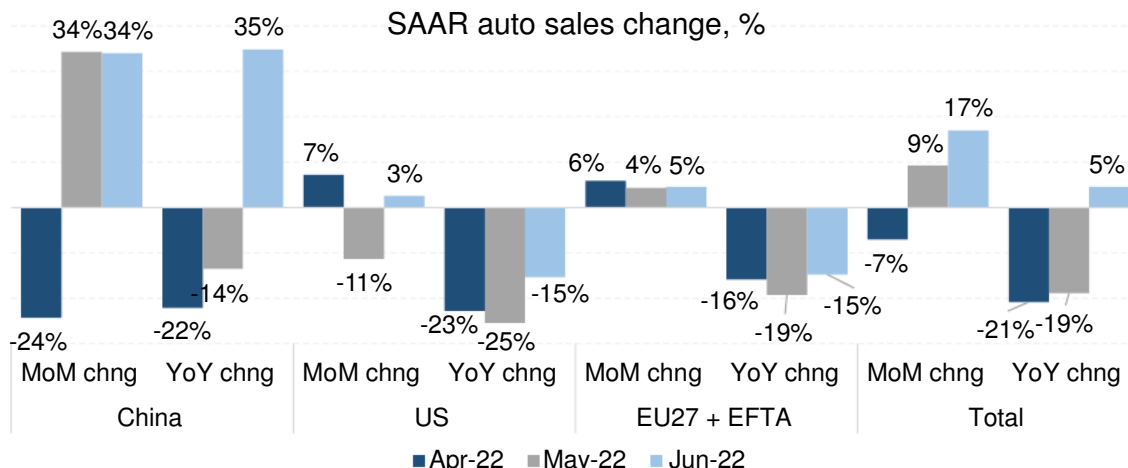
Global: Auto Corner: Demand

Strong auto sales momentum in Jun'22: sequential growth in all key regions

Top-3 regions* (c.60% share) SAAR auto sales, mn



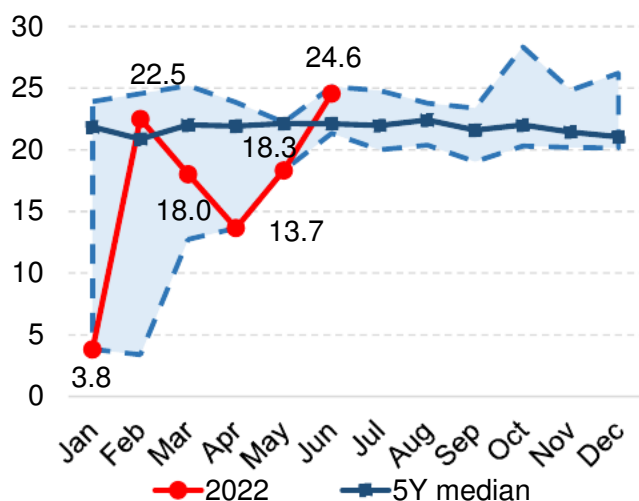
SAAR auto sales change, %



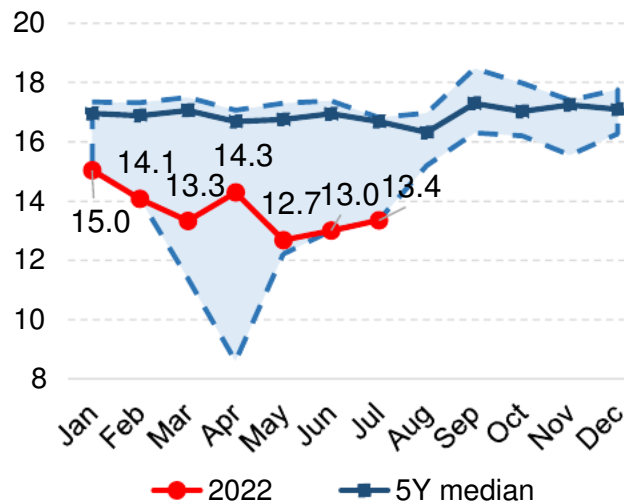
5 year median steel demand breakdown, %



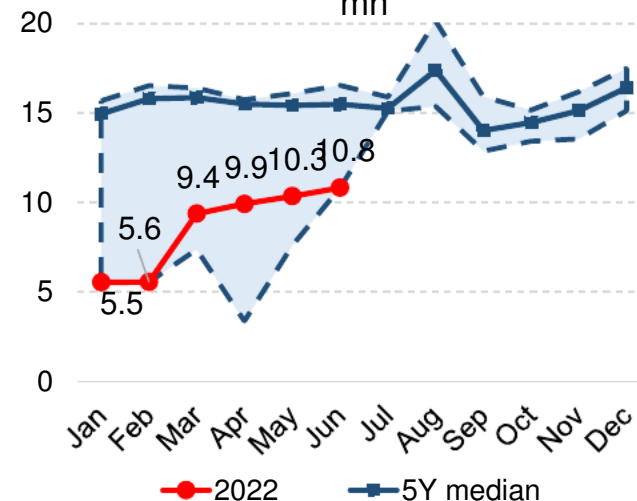
China SAAR auto sales, mn



US SAAR auto sales, mn



EU27+EFTA SAAR auto sales, mn



Source: ACEA, Bloomberg, Goldman Sachs Global Investment Research

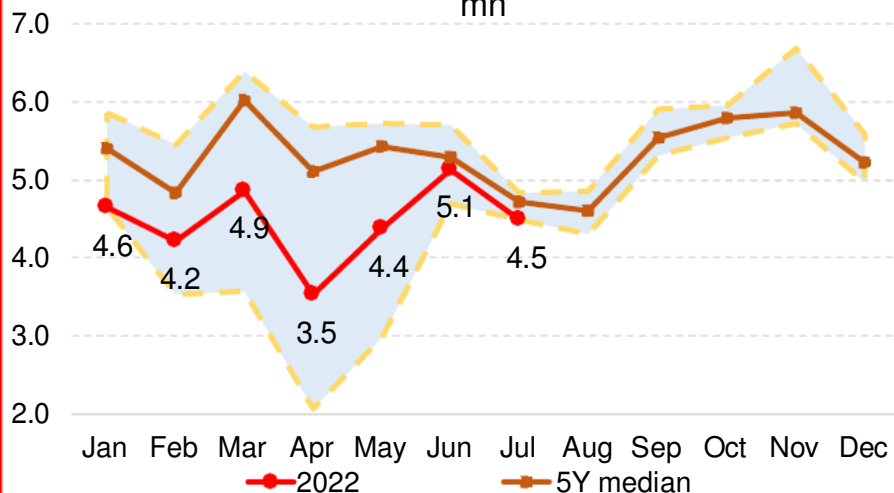
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* China, US, EU27; EFTA (EFTA: Iceland, Liechtenstein, Norway and Switzerland)

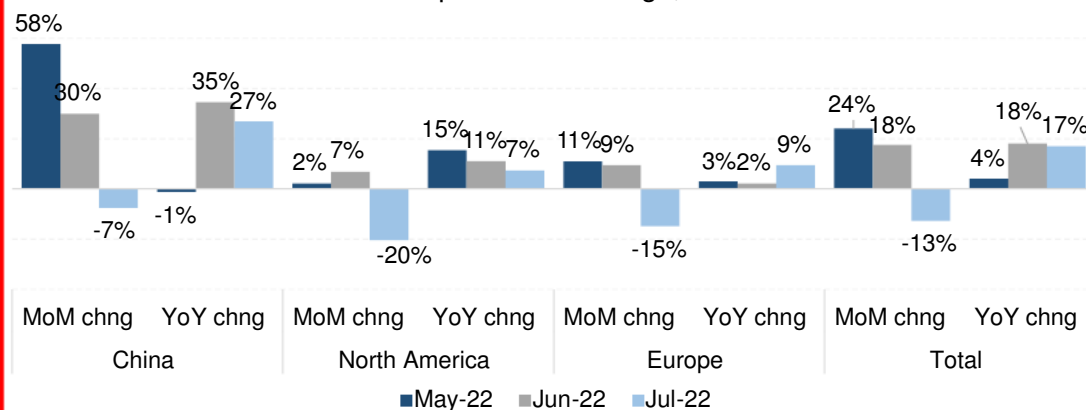
Global: Auto Corner: Production

Top 3 regions* auto production showed slowdown in July

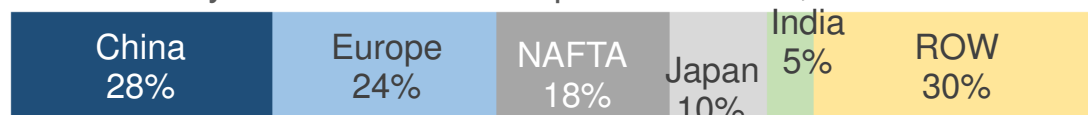
Top-3 regions* (c.70% share) auto production, mn



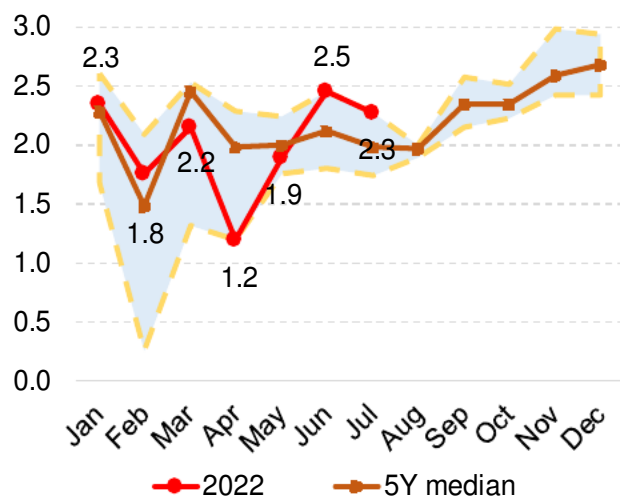
Auto production change, %



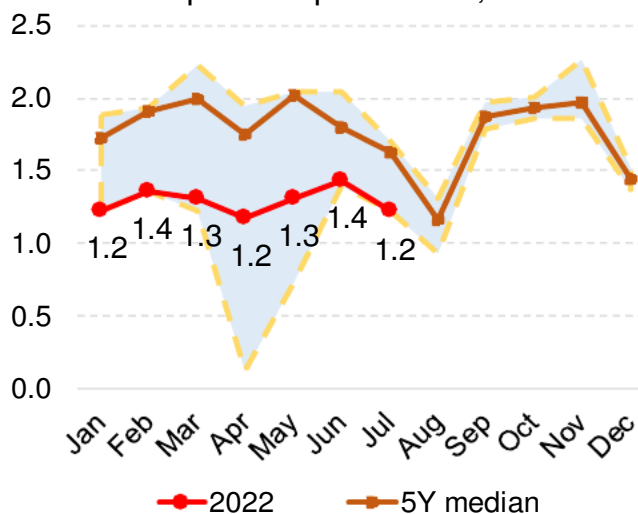
5 year median steel output breakdown, %



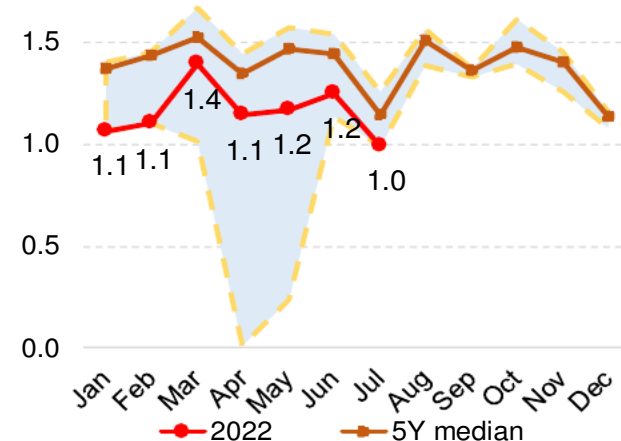
China auto production, mn



Europe auto production, mn



North America auto production, mn

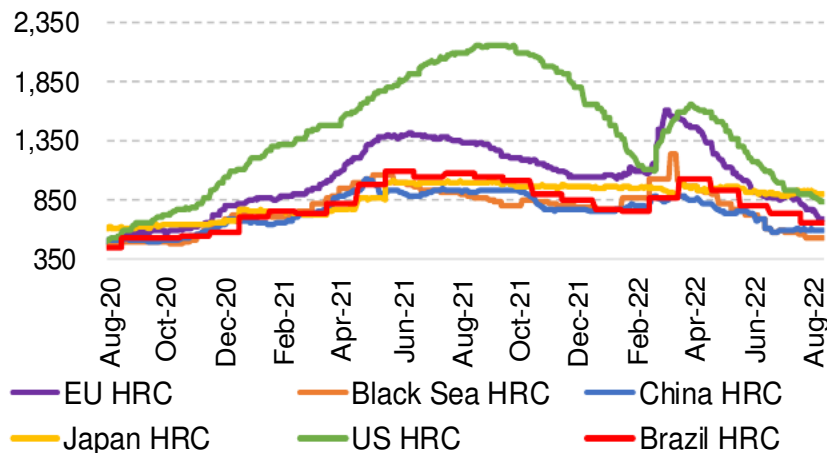


Source: Bloomberg, Goldman Sachs Global Investment Research

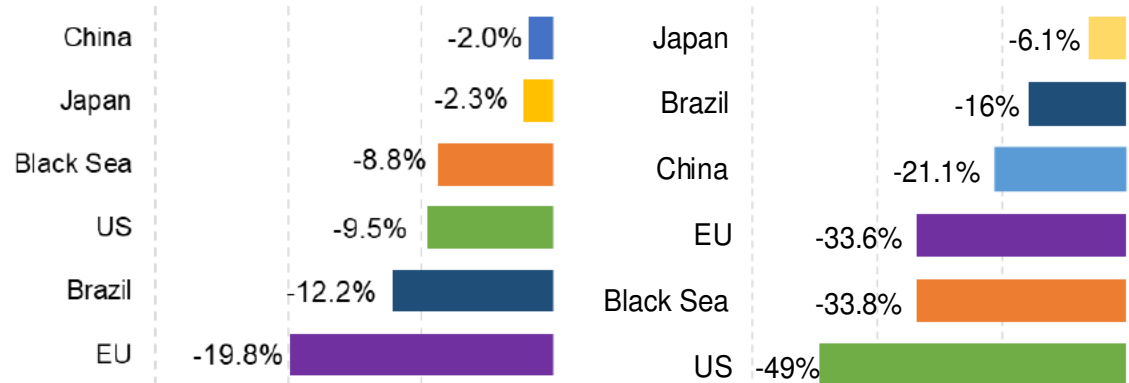
Global: Steel prices: Flat steel highlights

HRC prices: Negative dynamics with close to double-digit declines in key regions

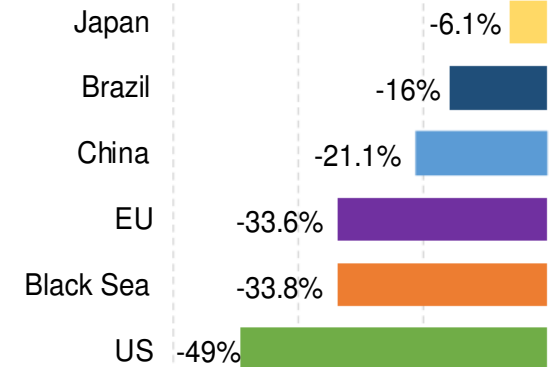
HRC prices in major regions, \$/t



HRC 1m price performance (\$ terms)

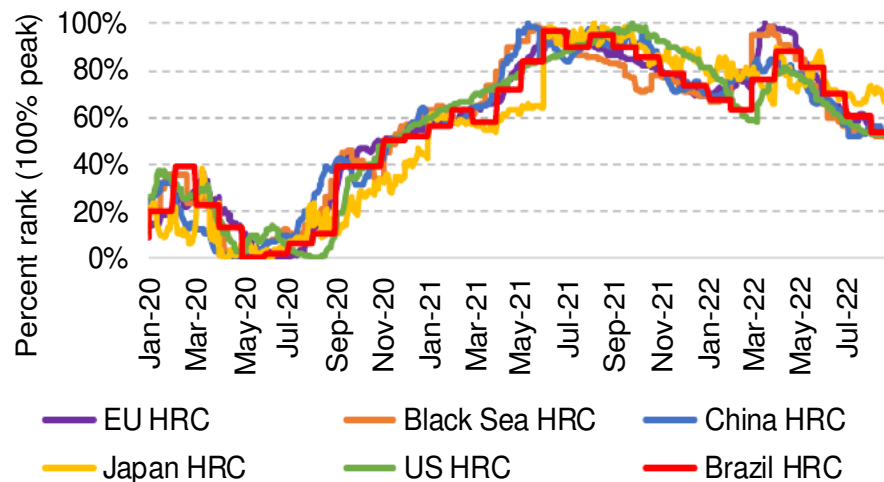


HRC YTD price performance (\$ terms)

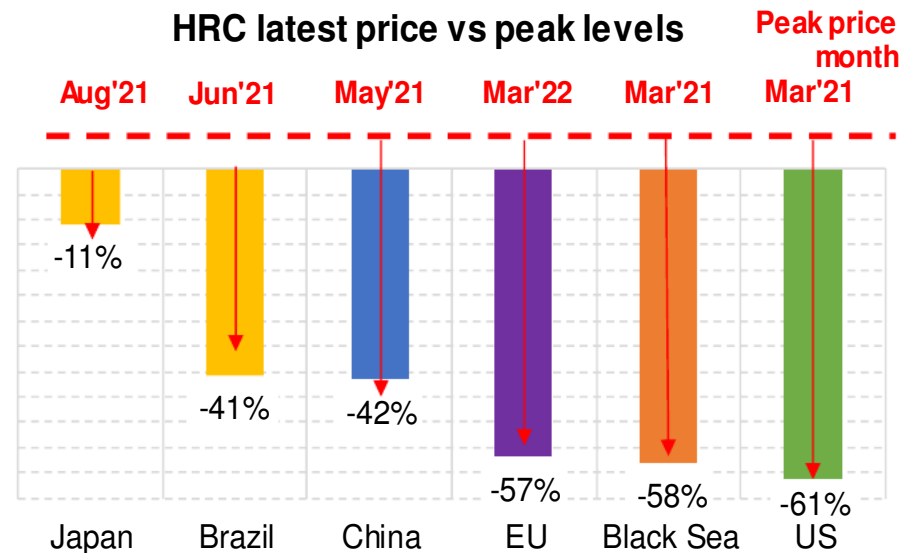


Flat steel prices are well below historical highs in all regions

HRC prices percentile vs. history



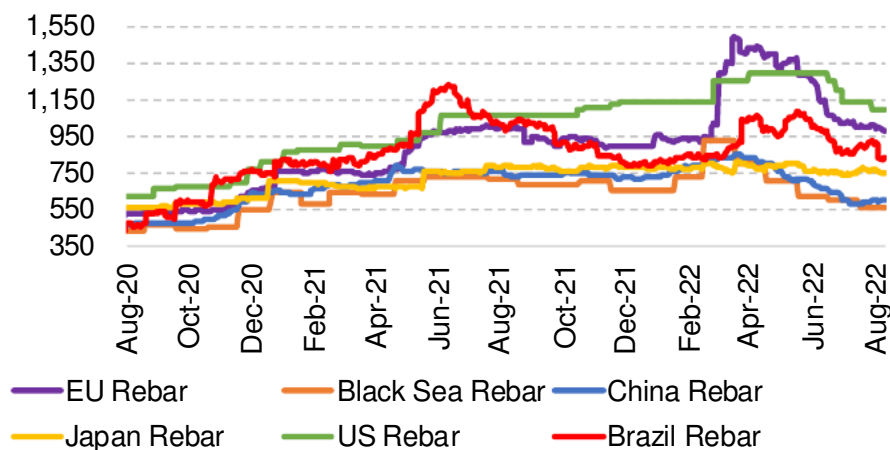
HRC latest price vs peak levels



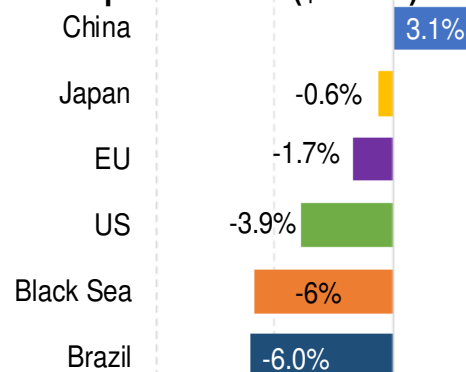
Global: Steel prices: Long steel highlights

Rebar prices: Mostly negative dynamics in key regions

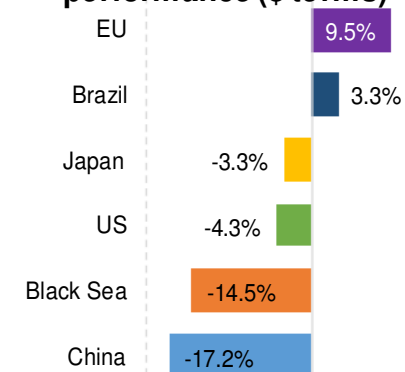
Rebar prices in major regions, \$/t



Rebar 1m price performance (\$ terms)

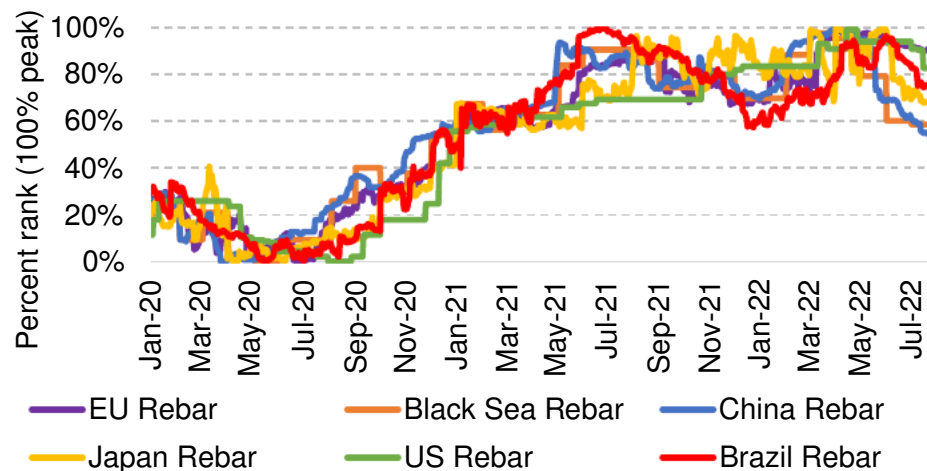


Rebar YTD price performance (\$ terms)

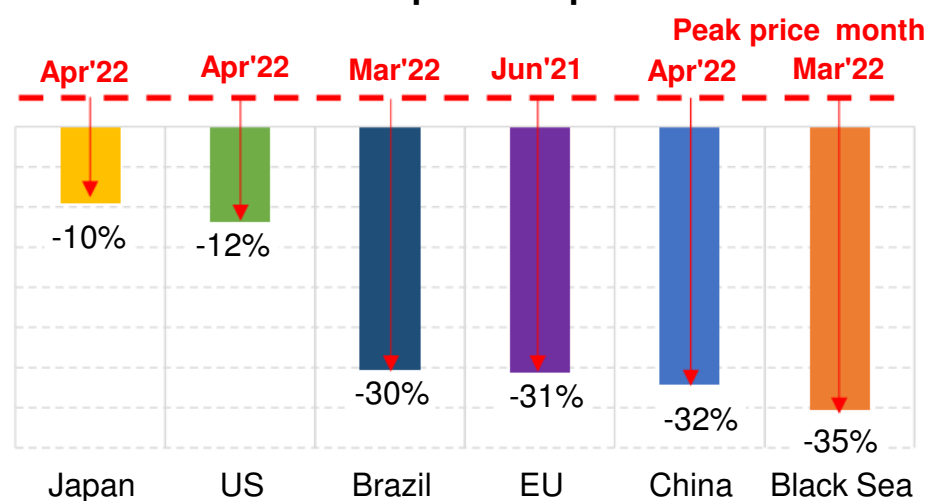


Rebar prices stand well below peak levels observed in 2021 and 2022

Rebar prices percentile vs. history



Rebar latest price vs. peak levels



Global output

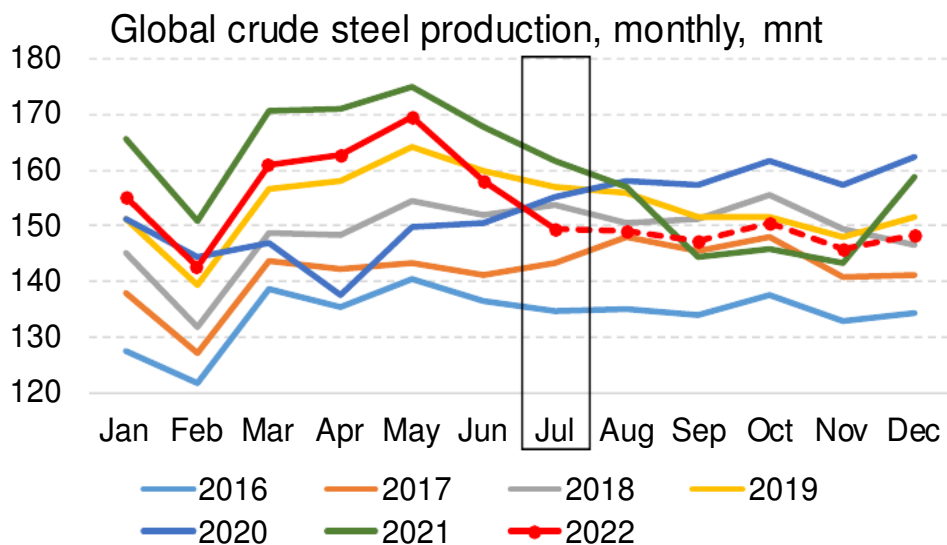
July'22 global crude steel output

- **-6% MoM** steel output decline, CHI -10%, Ex-China +1% MoM
- On a YoY basis, July'22 steel output is **down 8% YoY** (-6% yoy China and -9% yoy ex-China)

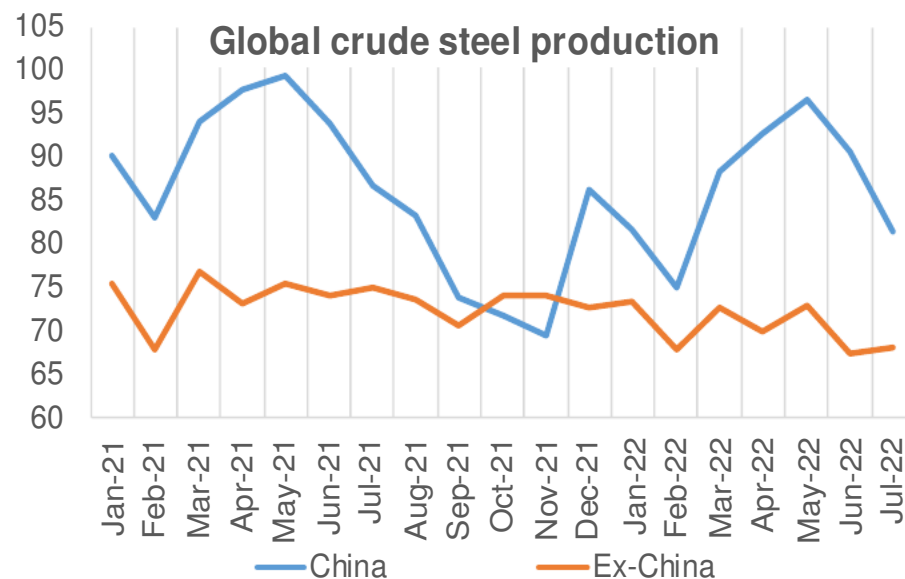
On a YTD basis, **global crude steel output**

- -6% YoY globally, **CHI down 6% yoy, ex-China down 5% yoy**

Usual seasonality implies **declining steel output** in 2H



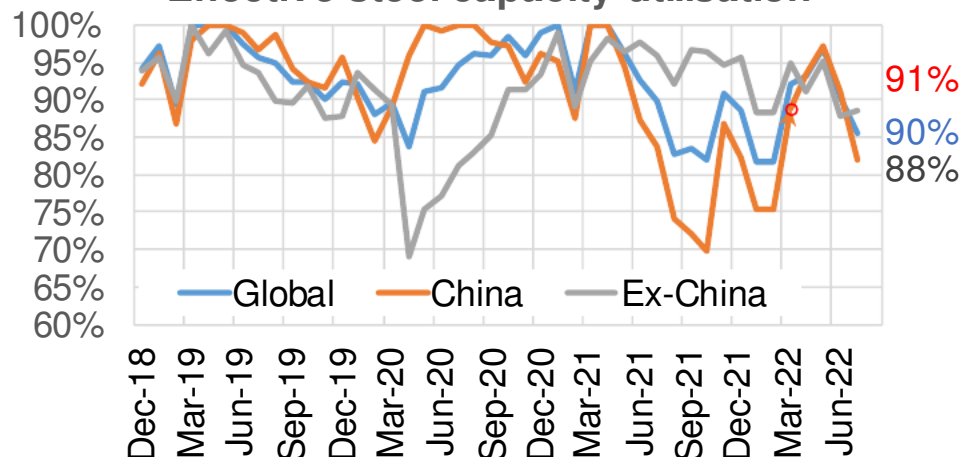
Dotted line shows crude steel dynamics in line with usual seasonality



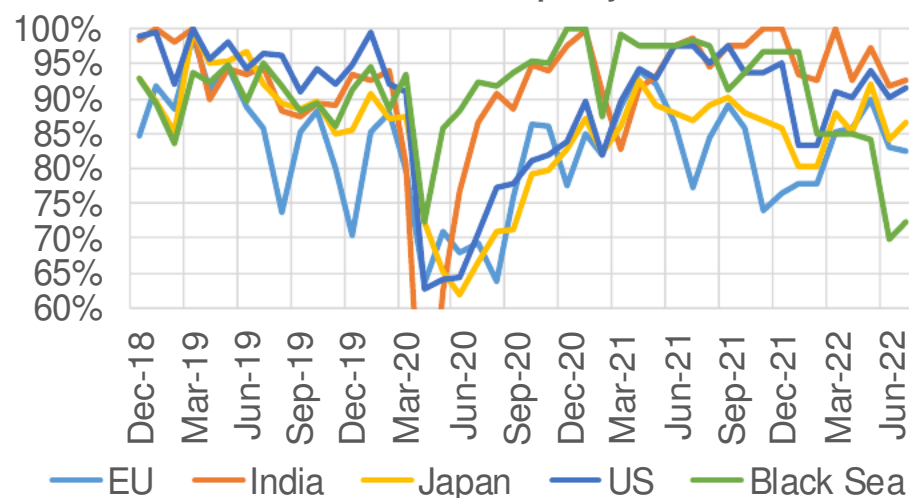
Global: Capacity

Chinese capacity utilisation declined in July (82% in July vs 91% June vs 97% in May and 82% in LTM). Ex-China capacity utilisation remained roughly stable MoM (89% in July vs 88% in June vs 95%/93% in May/LTM).

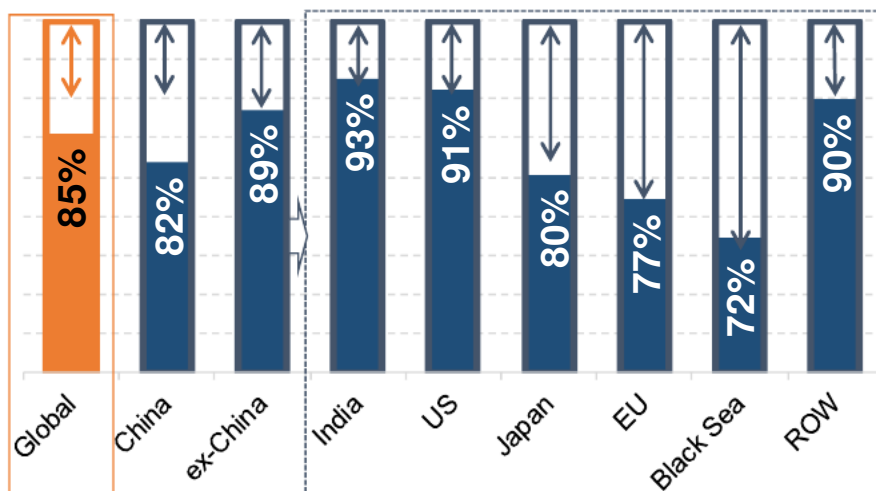
Effective steel capacity utilisation*



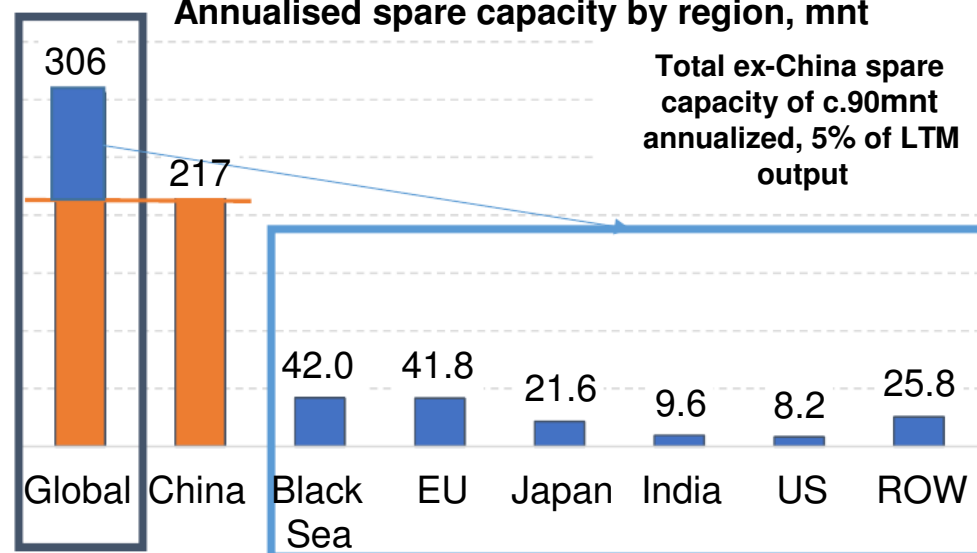
Ex-China effective steel capacity utilisation*



Effective steel capacity utilization in June*



Annualised spare capacity by region, mnt



* Effective steel capacity is calculated as latest monthly output as % of peak output in last 3 years

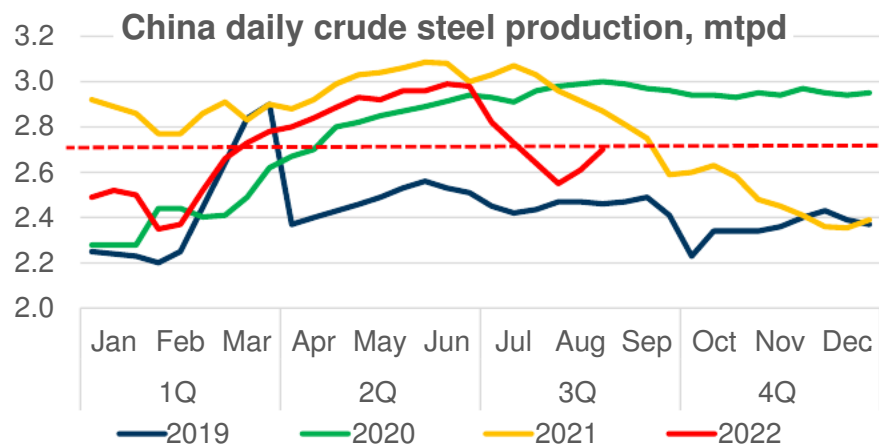
Source: World Steel Association, Goldman Sachs Global Investment Research

China: Steel output

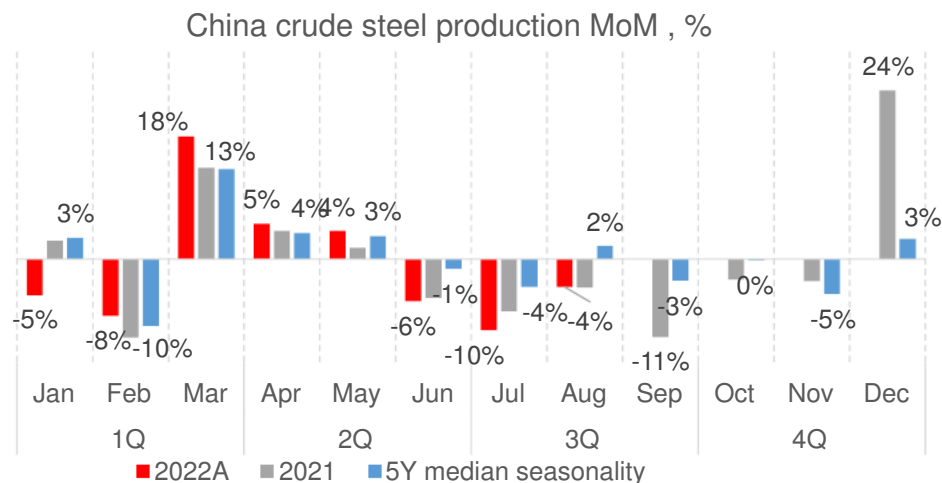
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August daily steel output in China recovered in August, but still 12% higher vs Feb'22 lows

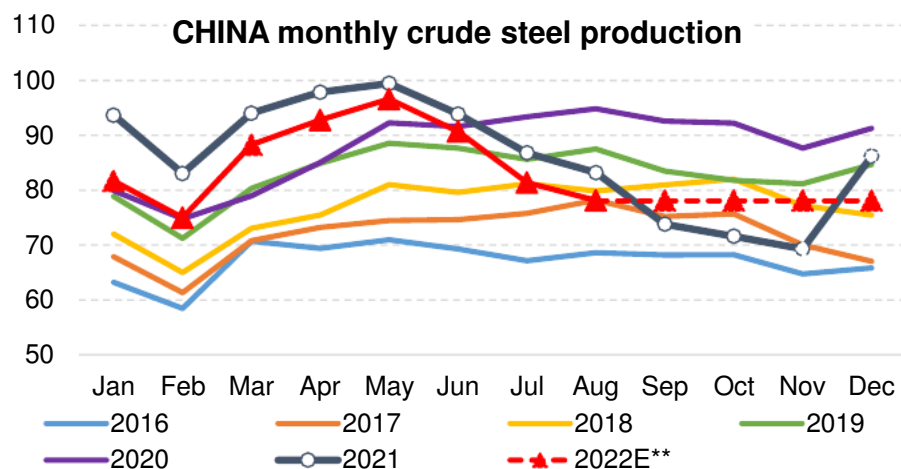


2022 output trajectory in Apr-Aug is similar to 2021



To reach state target of declining steel output, Chinese steel production needs to remain stable vs current levels

By end-August'22, China's BF capacity utilisation rates increased to 85% from 81% level recorded in July'22



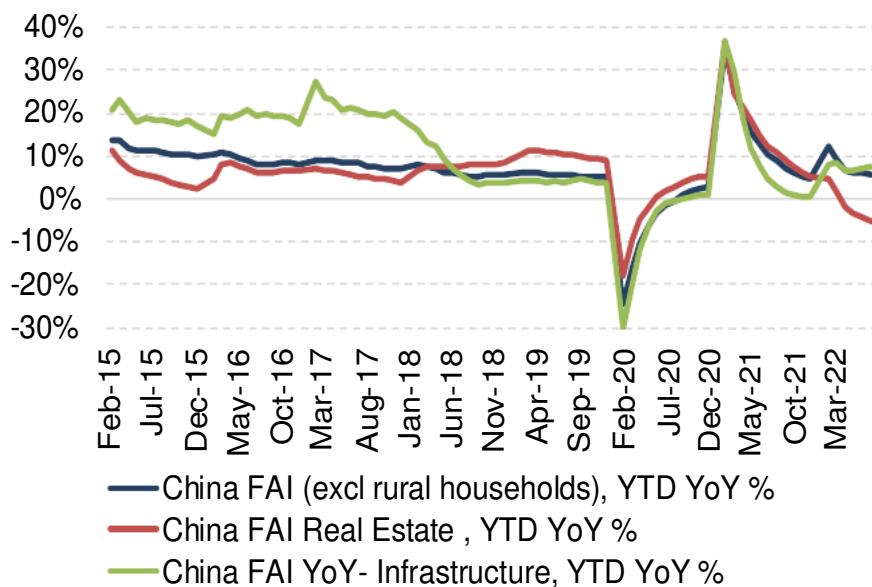
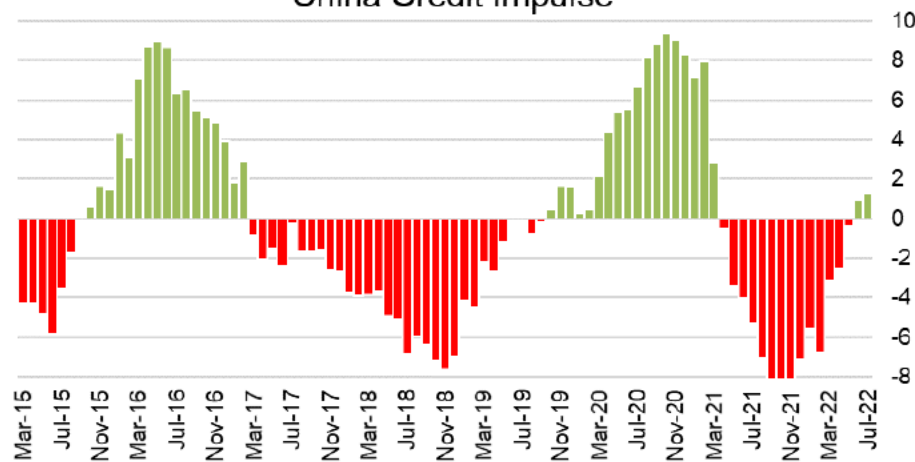
* 2016-20 average ; **: Assuming monthly seasonality in line with last 5Y average

China: Macro indicators

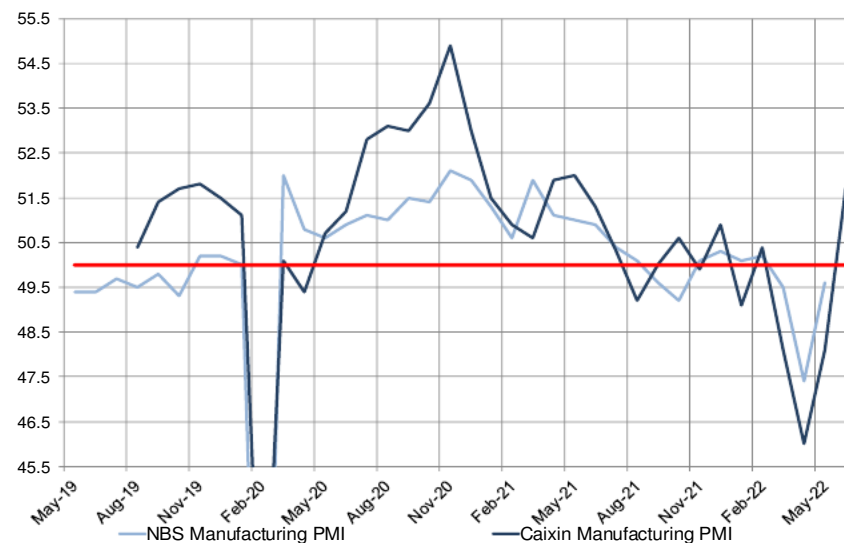
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China Credit Impulse



China Manufacturing PMI



China Infrastructure Investment YoY 3 Months Moving Average, %



China: Steel demand: Property

GS China Basic Materials Team contacts

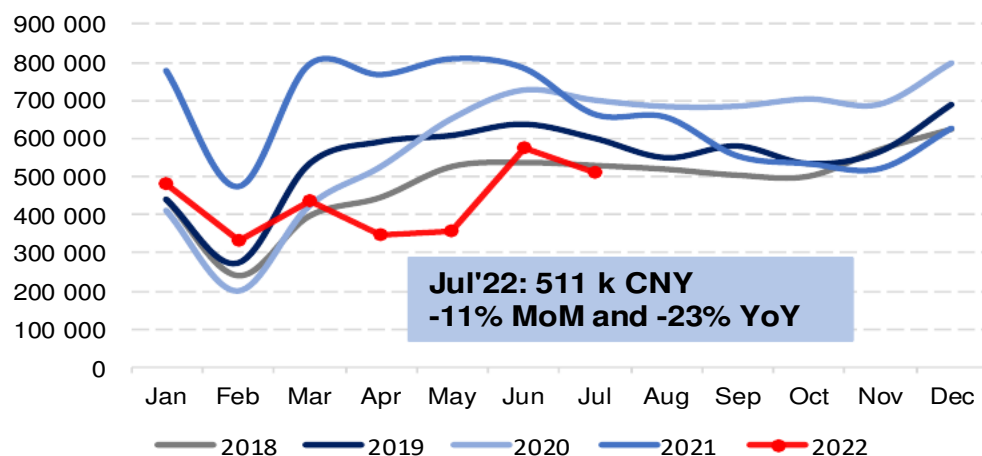
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GS China Property Team contacts

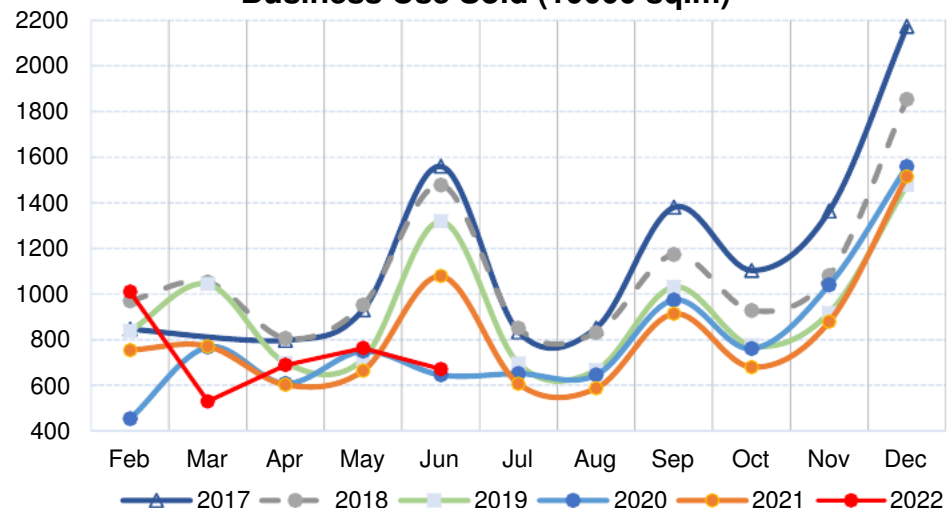
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In China, home sales decreased 11% MoM in July

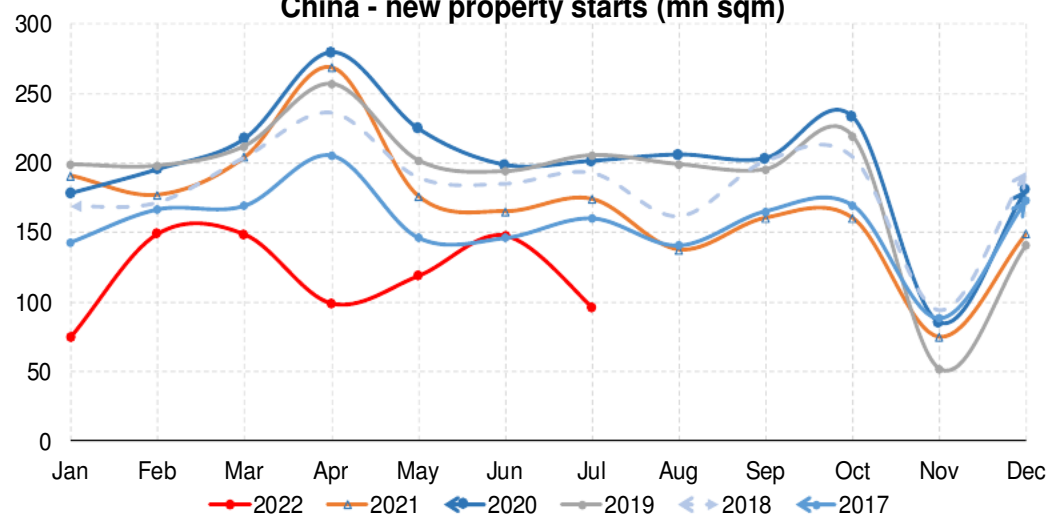
China real estate sales value, CNY



Monthly total Floor Space of Houses for Business Use Sold (10000 sq.m)



China - new property starts (mn sqm)



China: Steel demand: Property

GS China Basic Materials Team contacts

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GS China Economics Team contacts

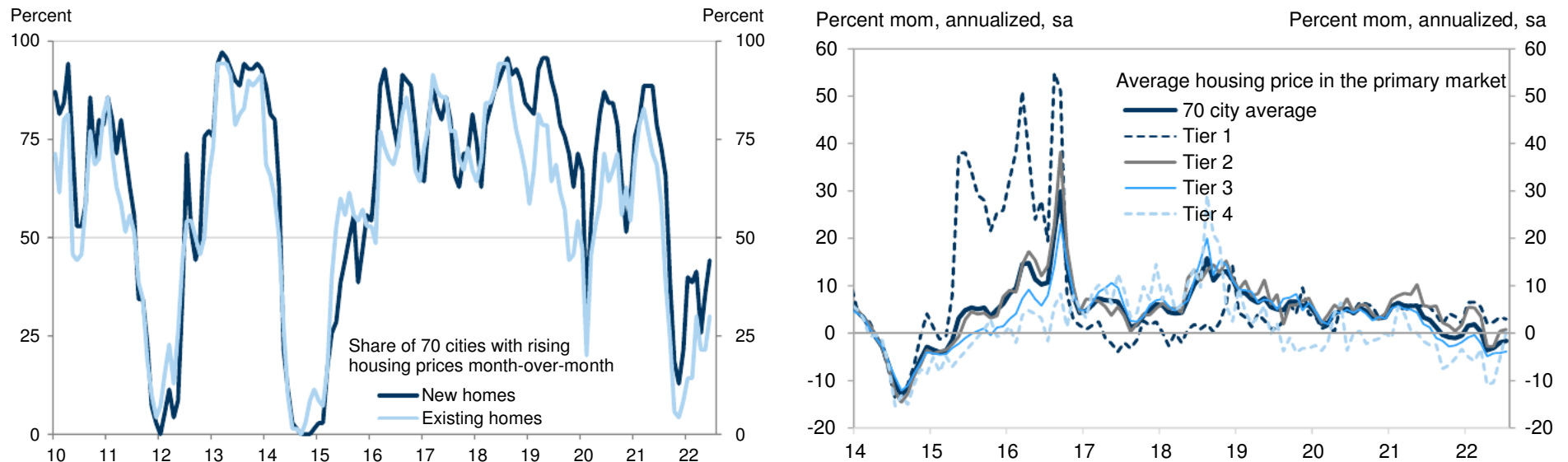
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GS China Property Barometers team -- [link](#), 22 August 2022

- The long-awaited recovery of property transactions in June faded in July and Aug. We now have lower expectation on property activities in the next selling season that will kick off in Sept.
- Although the number of mortgage boycott incidents has not grown much in the past weeks, we believe the occurrence of the incidents could suggest completion risk that the government/developers/other relevant parties are facing.

GS China Financial Services team -- [link](#), 21 July 2022

- We believe risks in the mortgage book are manageable, given 1) mortgage loans in China are recourse in nature, and fully amortized (up to 30Y), and 2) household deposits more than cover total household borrowing (1.5X as of FY21).
- Household leverage deteriorated in the latest cycle: Borrowing rose to 62% of GDP as of 2021 vs. 49% in 2017.
- Stress more likely in lower-tier cities and non-mortgage loans: Rising Debt Service Ratio (DSR) in lower-tier cities with: 1) higher mix of property sales; and 2) falling property prices in 2022 suggests lower-tier cities could see stress.



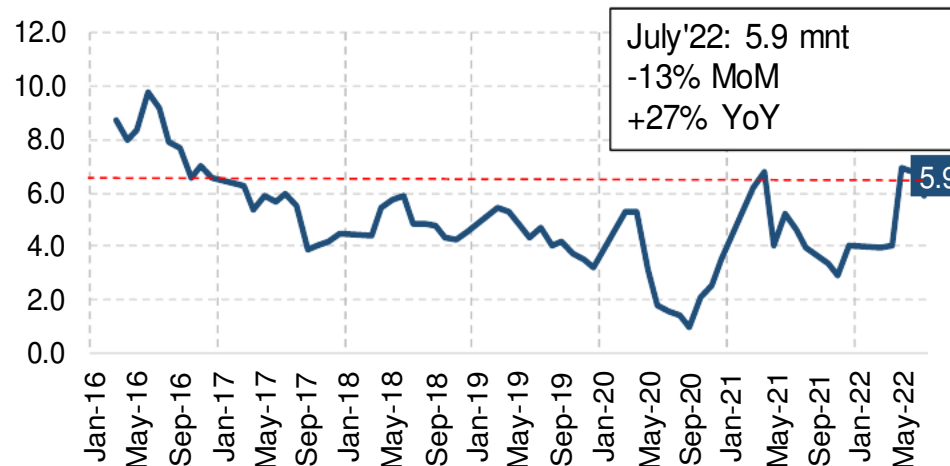
China: Steel trade

GS China Basic Materials Team contacts

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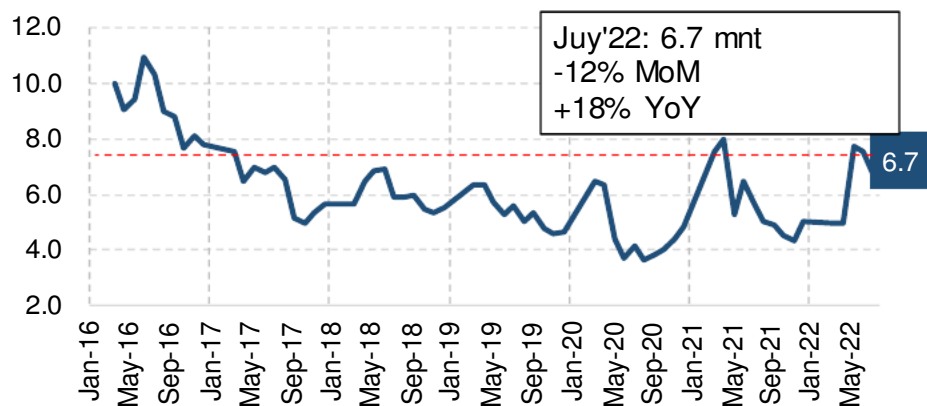
China has maintained high net export in July (+27% YoY) as high domestic production happened amid slow domestic buying activity

China Steel net trade (export-import), mnt

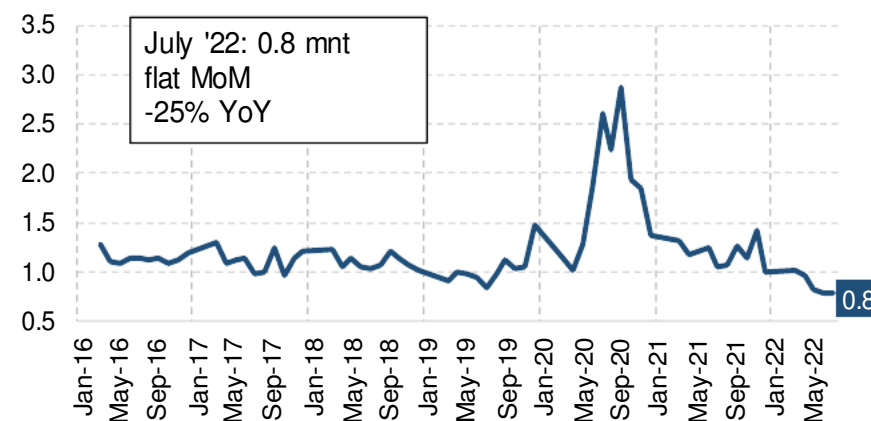


In July China exports remained at one of the highest levels in past 5 years, while imports are close to multi-year lows

China Steel Export, mnt



China Steel Import, mnt

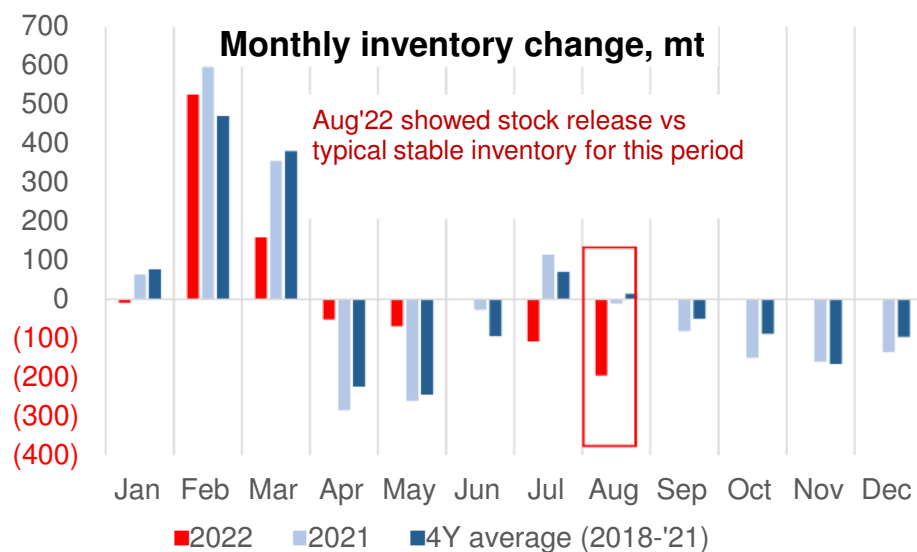


China: Steel inventory

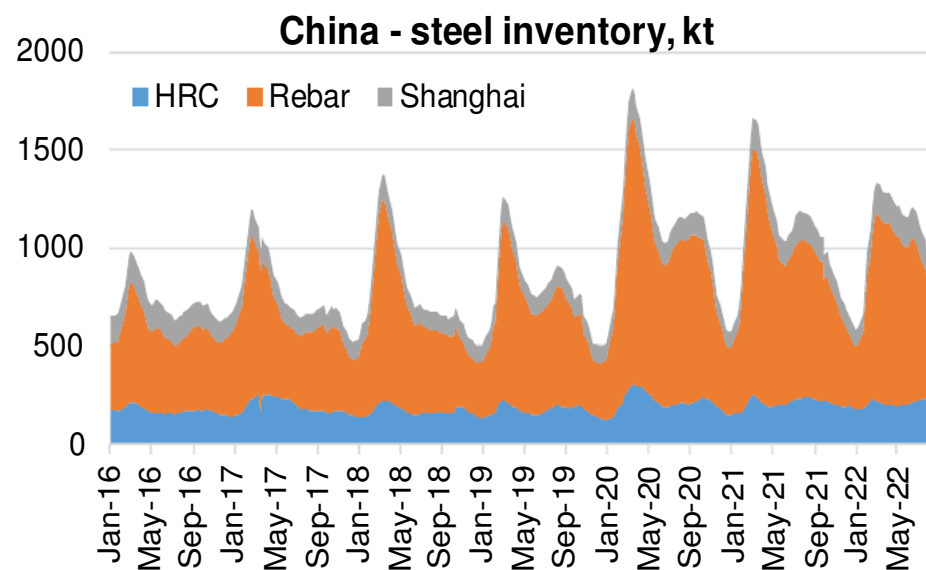
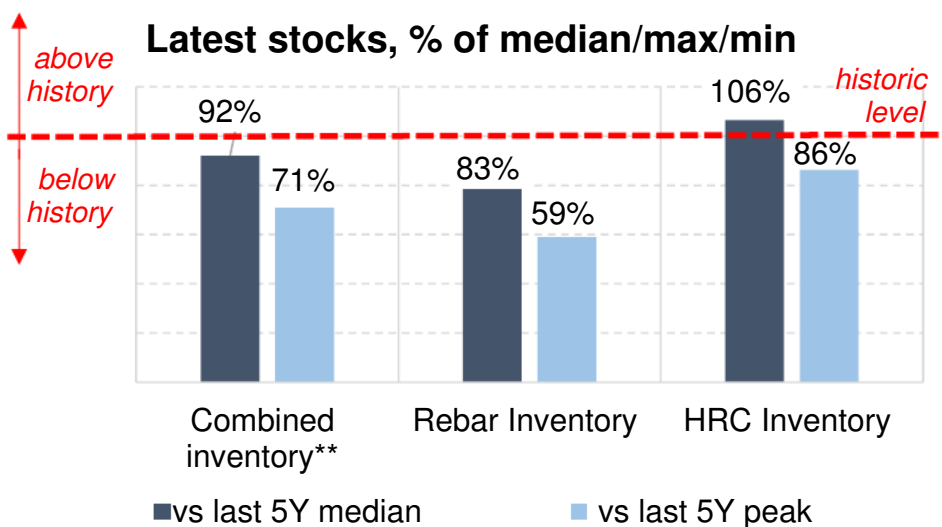
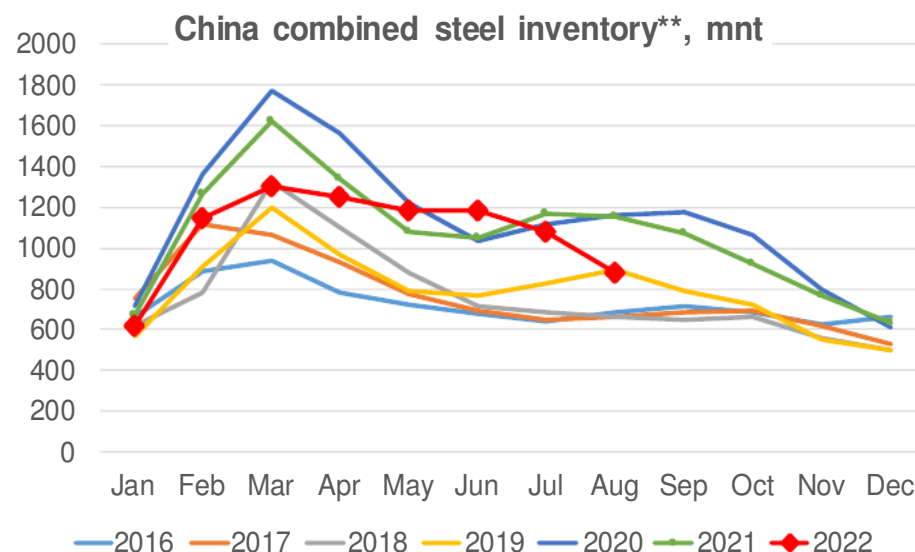
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De-stocking in July vs typical stable inventory levels



Inventories stand at 2020-21 levels

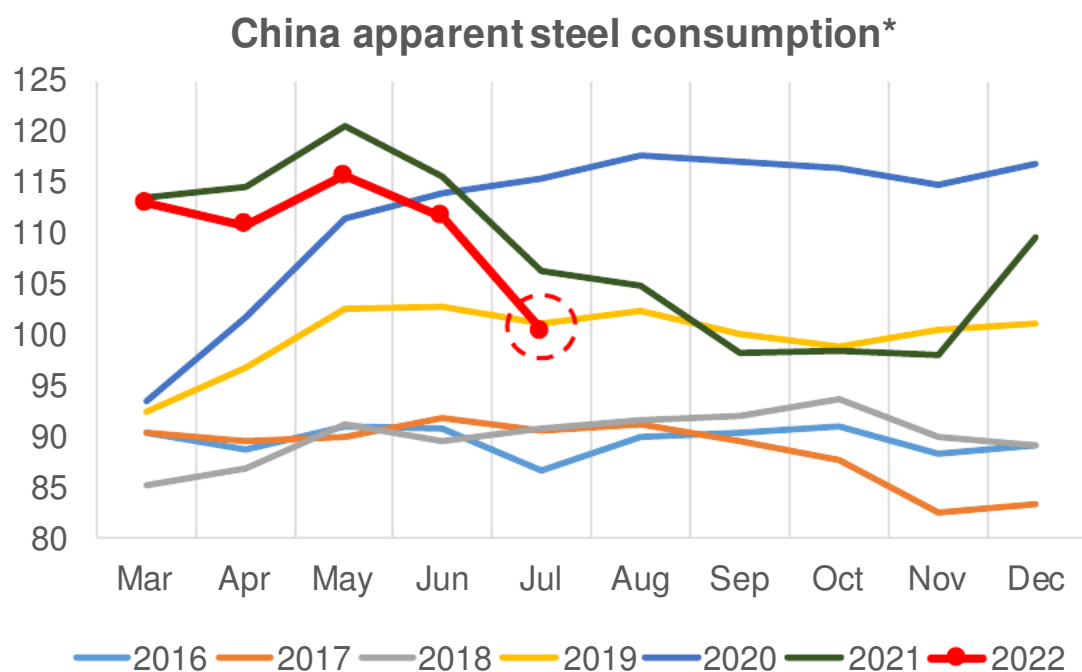


China: Steel demand

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July China apparent steel consumption was weaker MoM, well below 2021 levels and in line with the mid-cycle



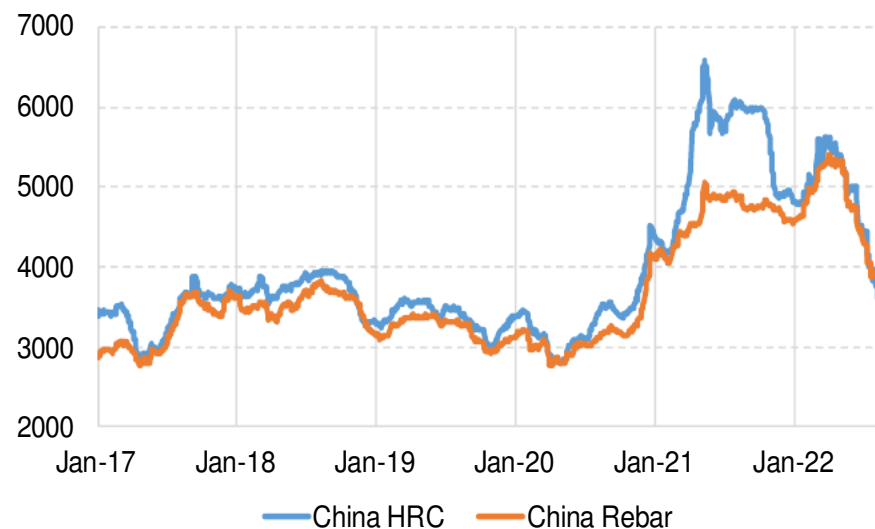
* Apparent Steel consumption = Output – Export + Import

China: Steelmakers' profitability

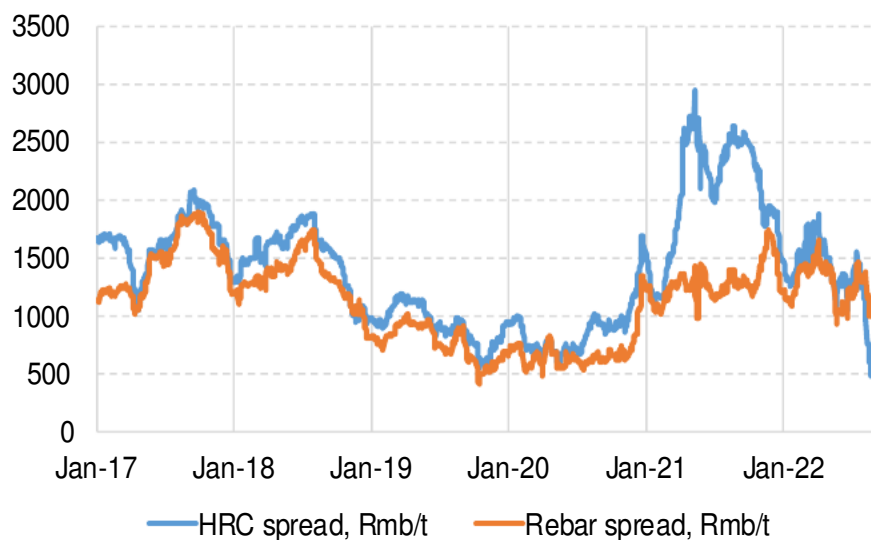
GS China Basic Materials Team contacts

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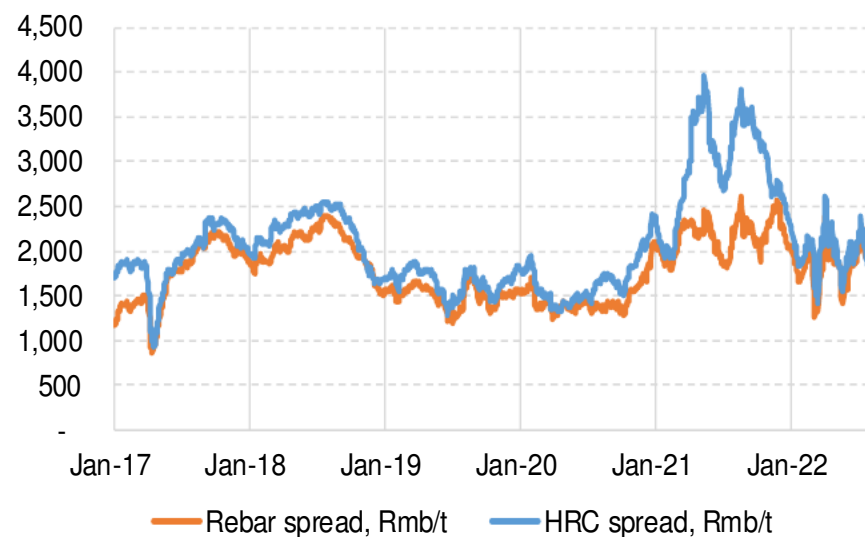
China steel prices, RMB/t



China EAF ferrous feed, RMB/t



China BF ferrous feed, RMB/t



Europe: Steel indicators

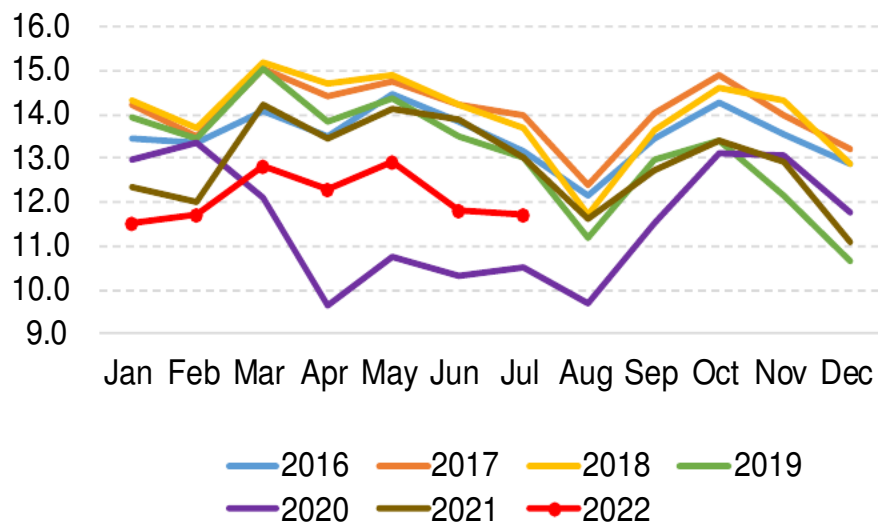
GS EU team contacts

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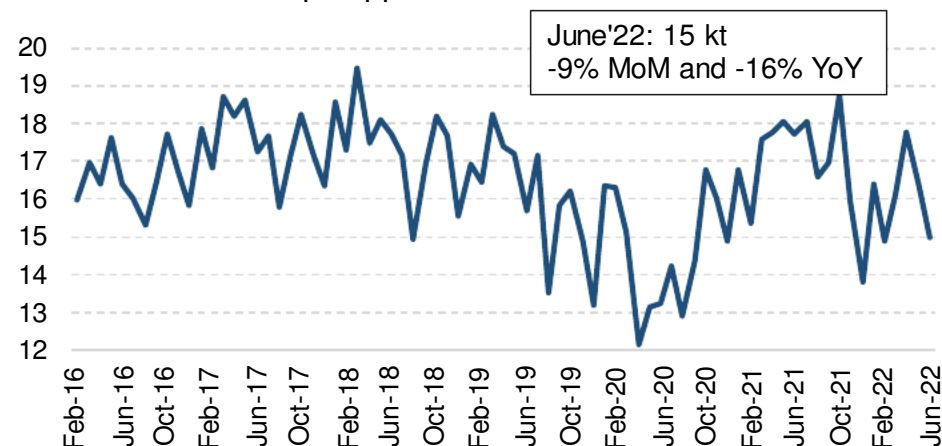
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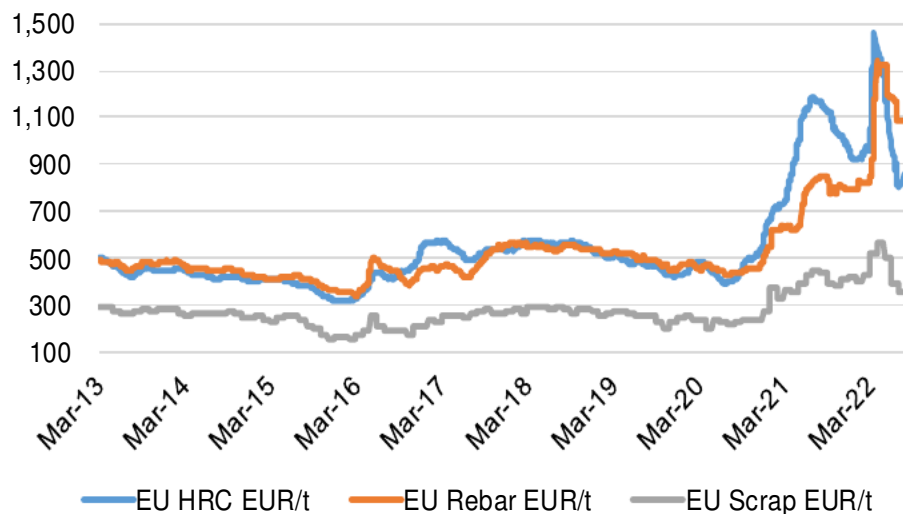
EU crude steel production, mnt



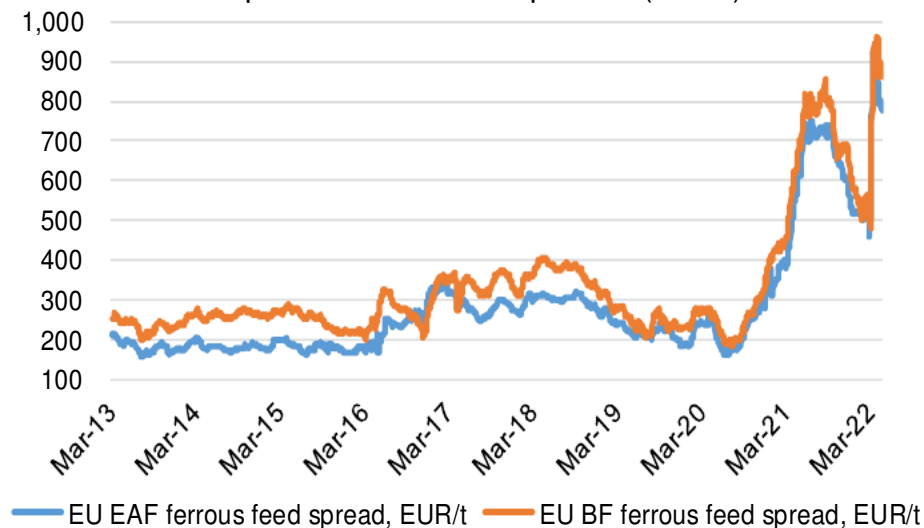
Europe apparent steel demand



European steel prices (EUR/t)



European ferrous feed spreads (EUR/t)



Europe: Steel indicators

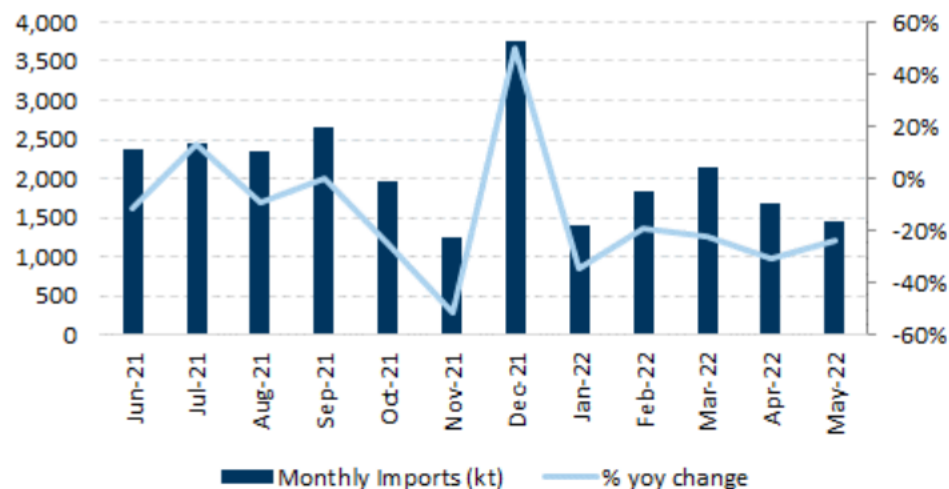
GS EU team contacts

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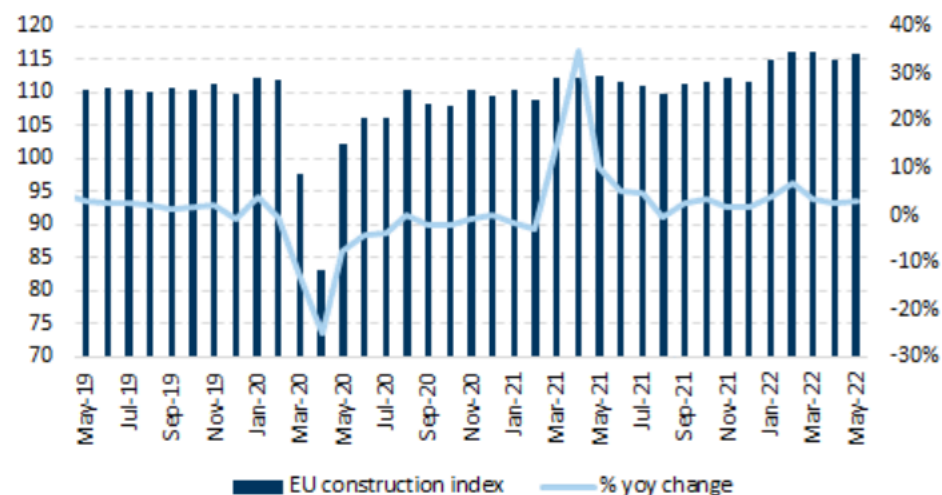
+74956454230

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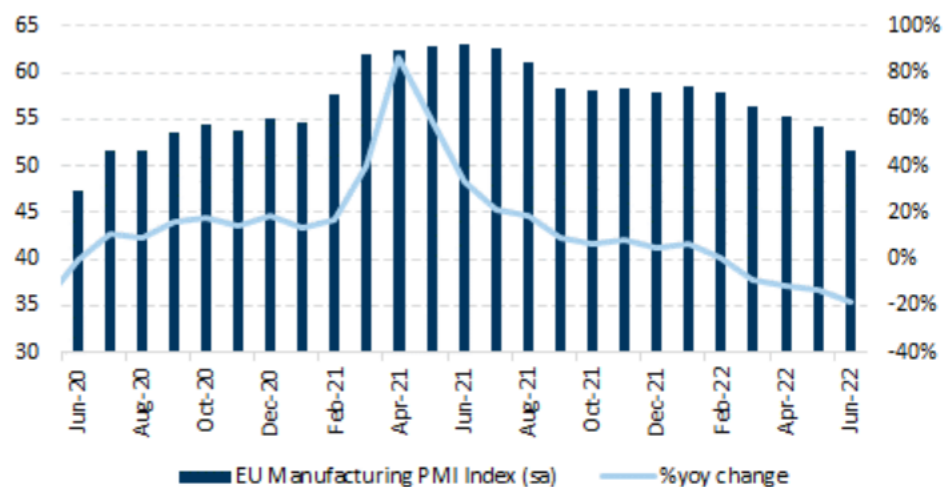
EU Monthly Steel Imports (kt)



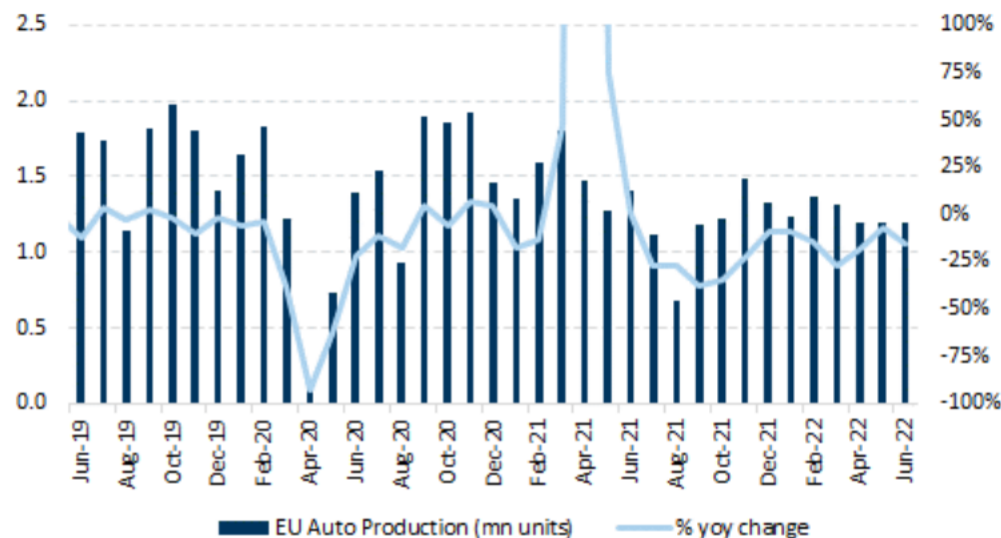
EU Construction Index



EU Manufacturing PMI Index



EU Monthly Auto Production (mn units)



US: Steel indicators

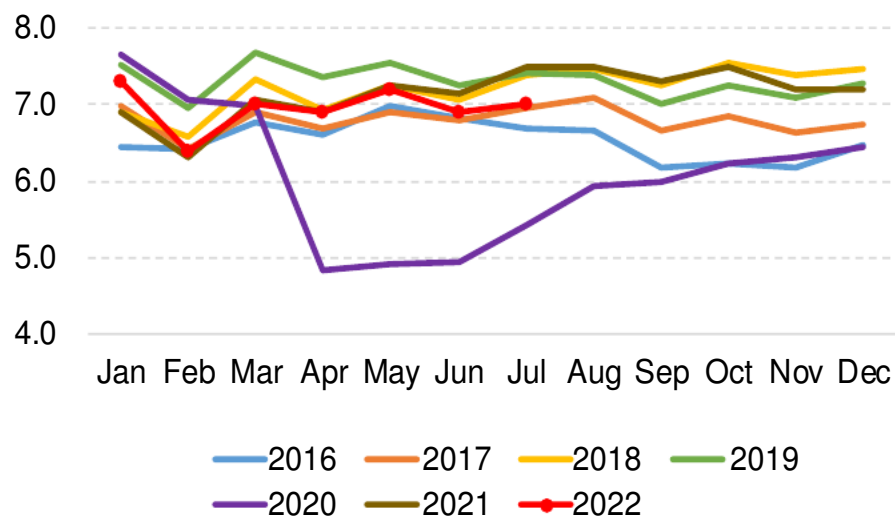
GS US team contacts

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Emily.chieng@gs.com

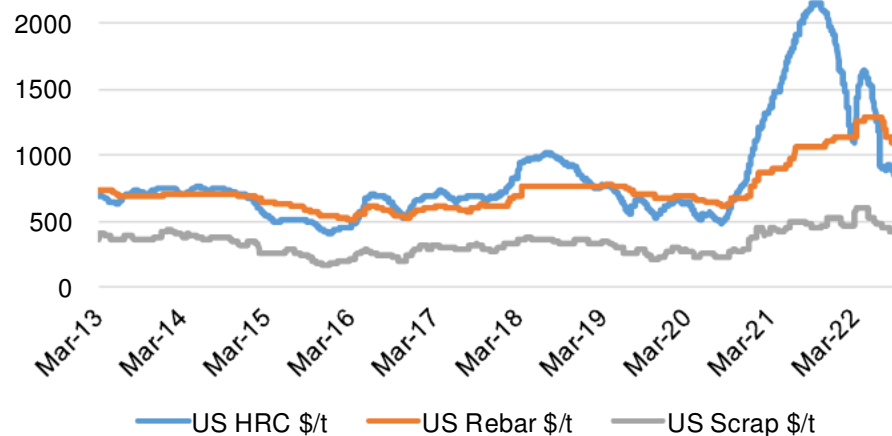
US crude steel production, mnt



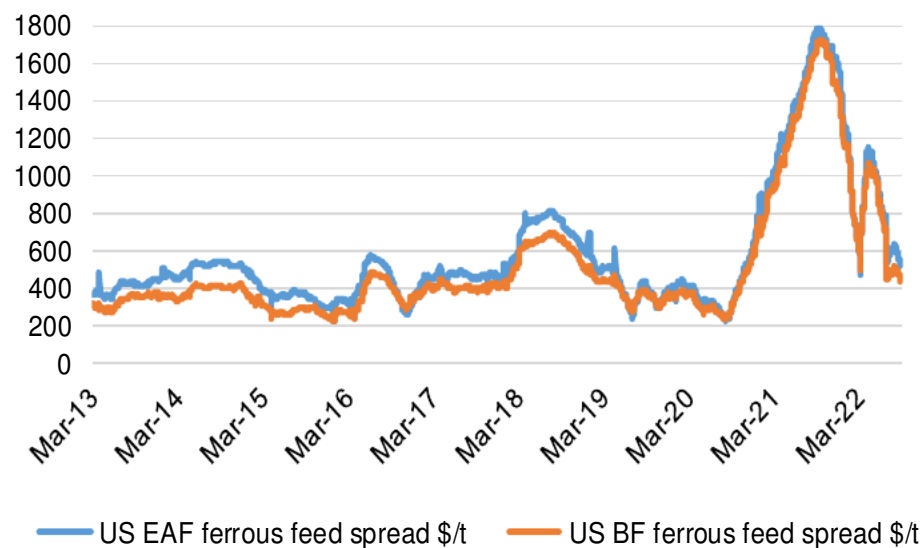
US Steel production capacity utilisation, %



US steel prices (\$/t)



US ferrous feed spreads (\$/t)



US: Steel indicators

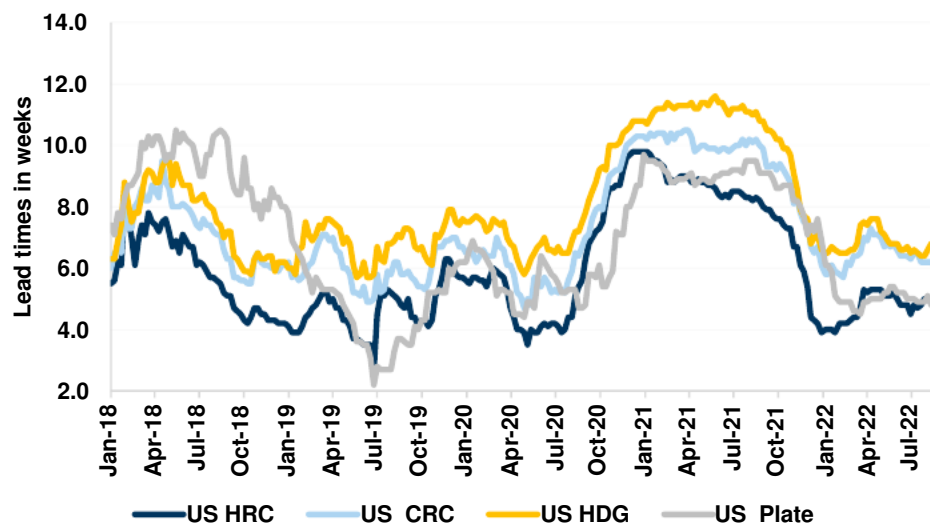
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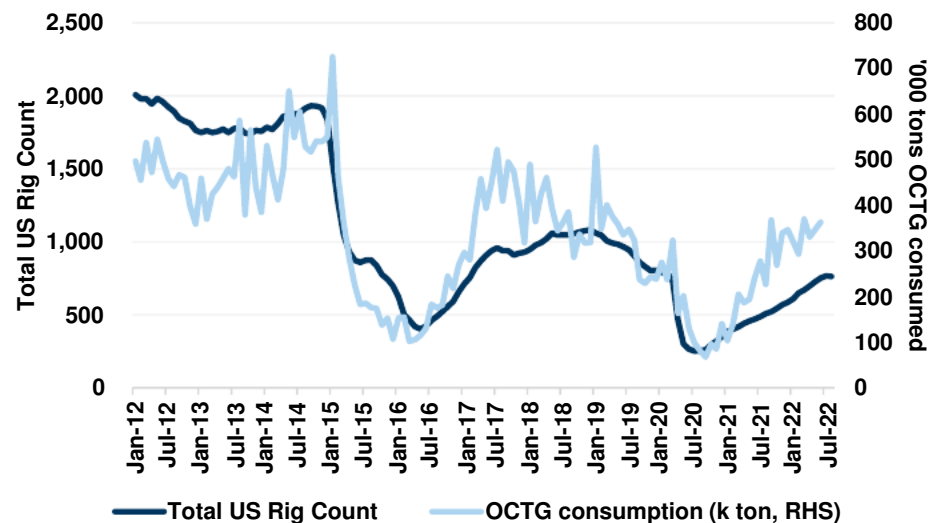
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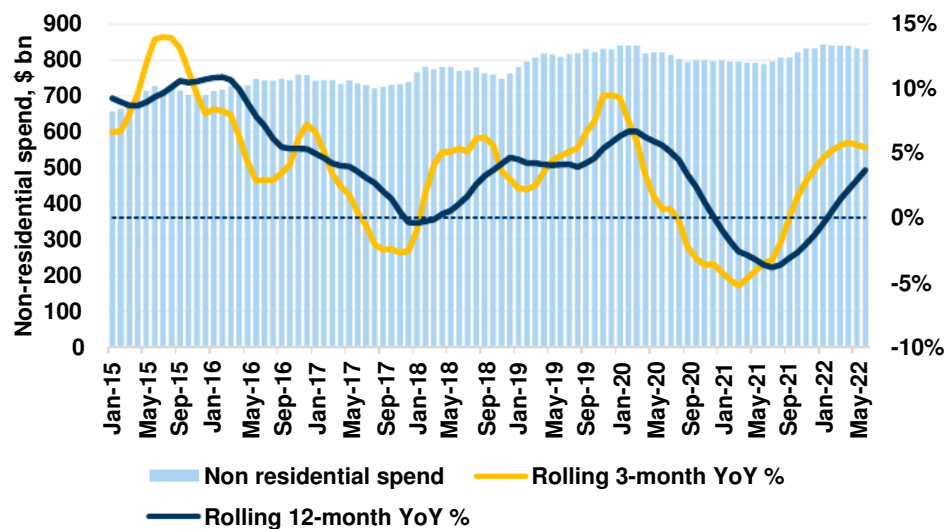
Steel Mill Lead Times



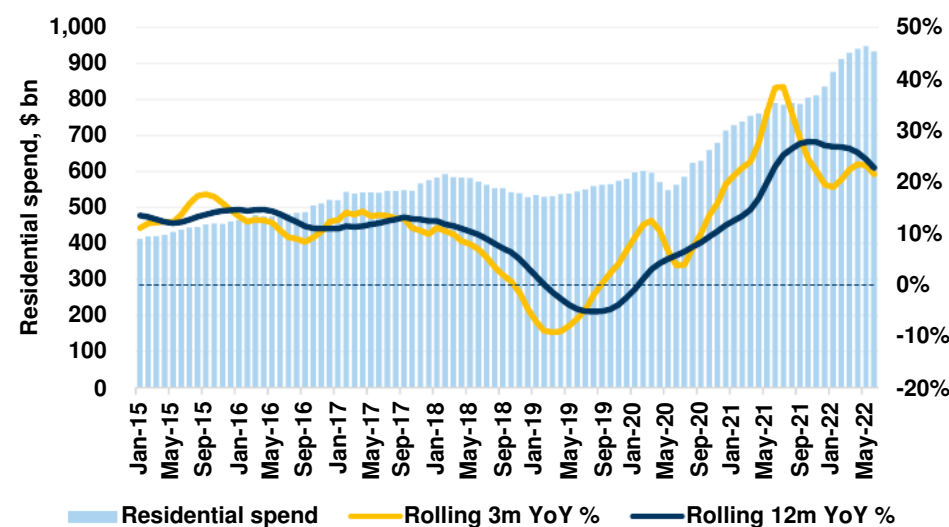
Rig Count vs OCTG Consumption



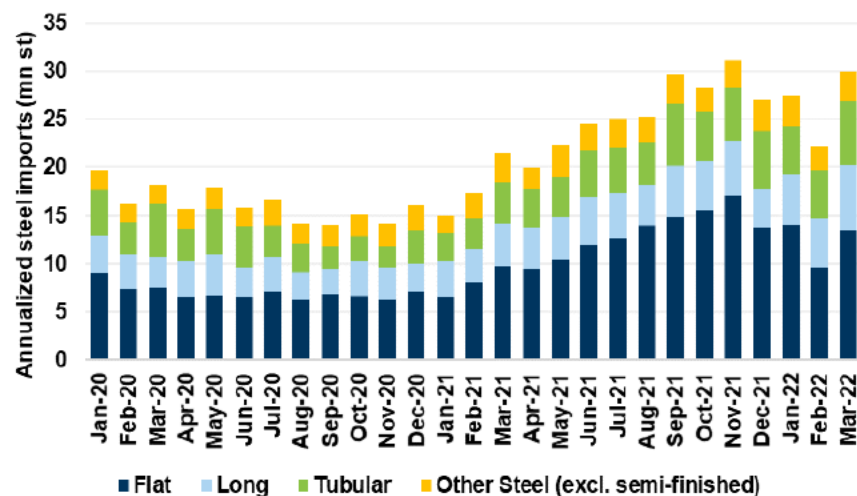
Non-Residential Construction Spend



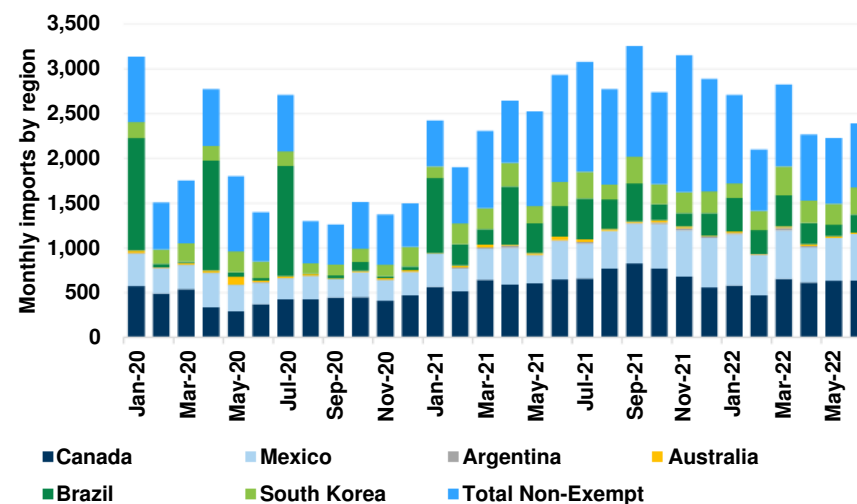
Residential Construction Spend



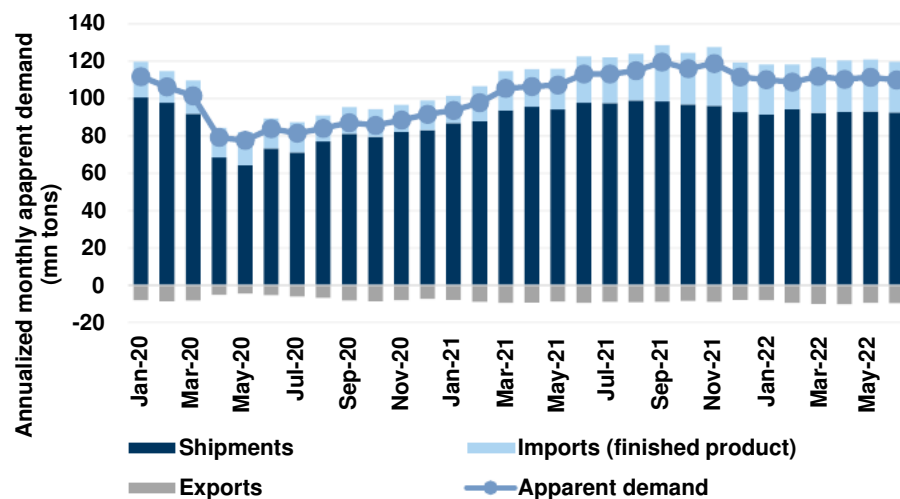
Monthly steel imports by product



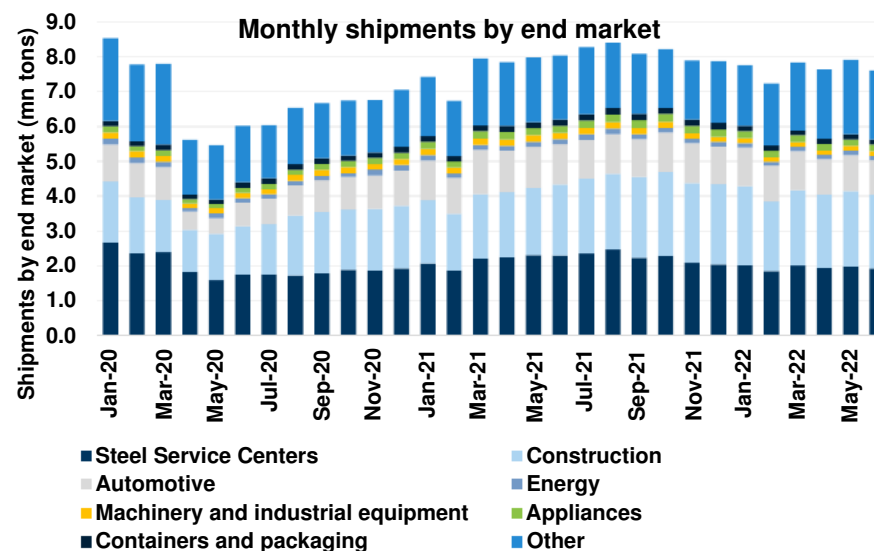
Monthly steel imports by region



Annualized monthly apparent demand



Monthly shipments by end market



Latin America: Steel indicators

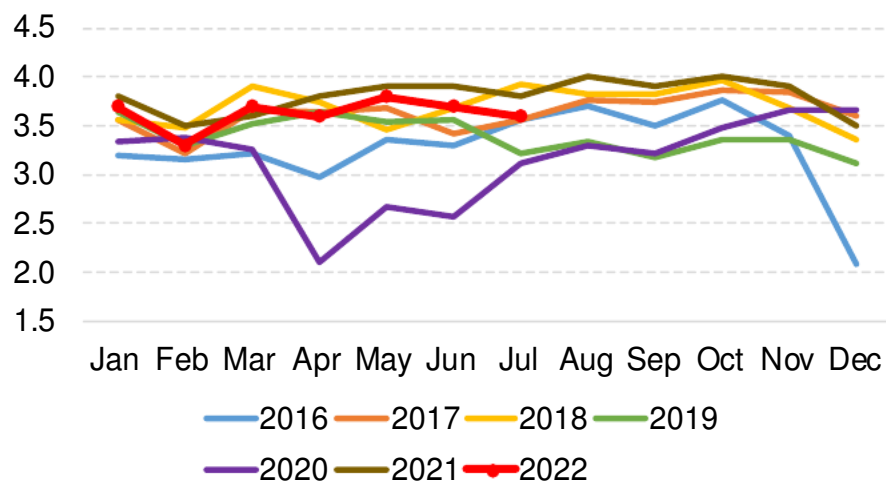
GS Latin America team contacts

Marcio Farid

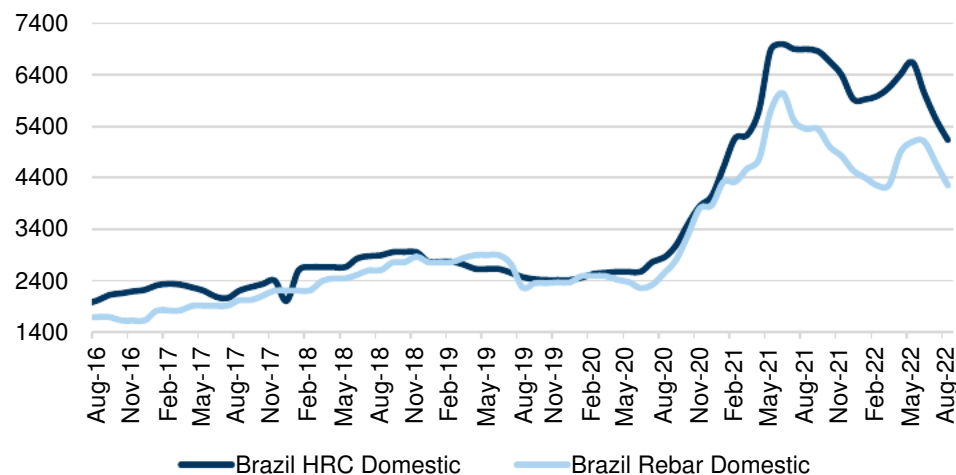
+55-11-3371-4580

Marcio.farid@gs.com

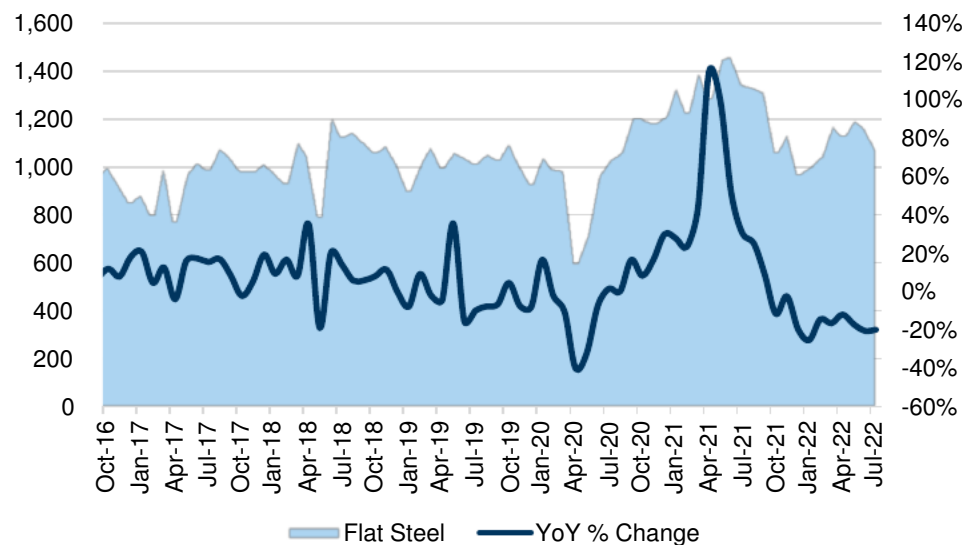
Latin America crude steel production, mnt



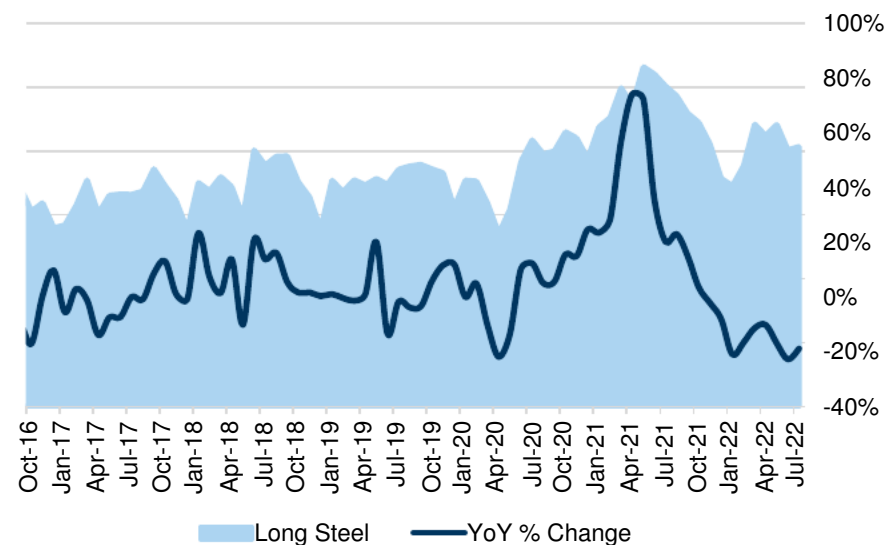
Brazil steel prices (R\$/ton)



Brazil's Flat Steel Apparent Consumption (kt)



Brazil's Long Steel Apparent Consumption (kt)



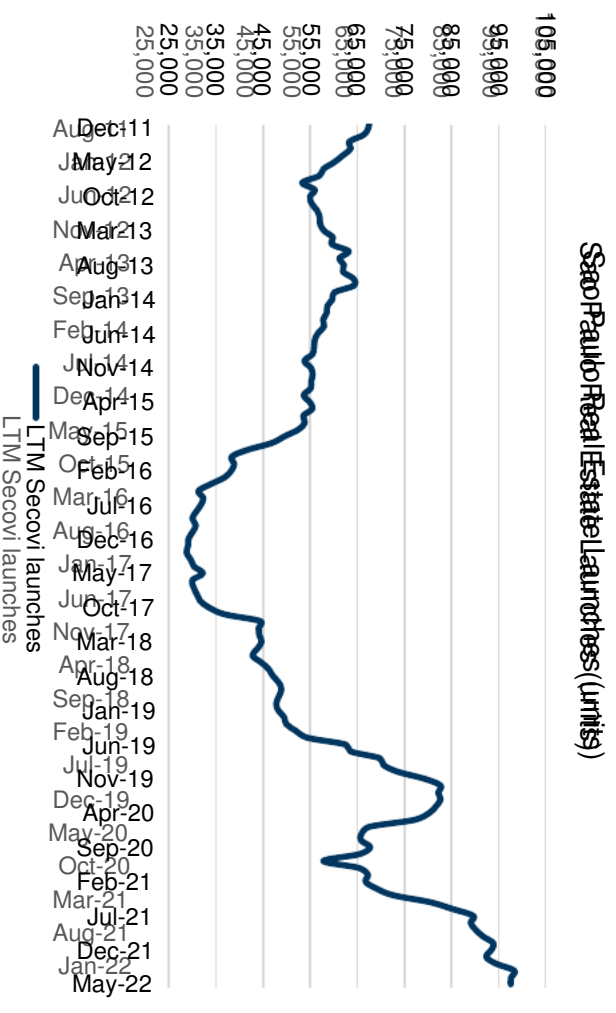
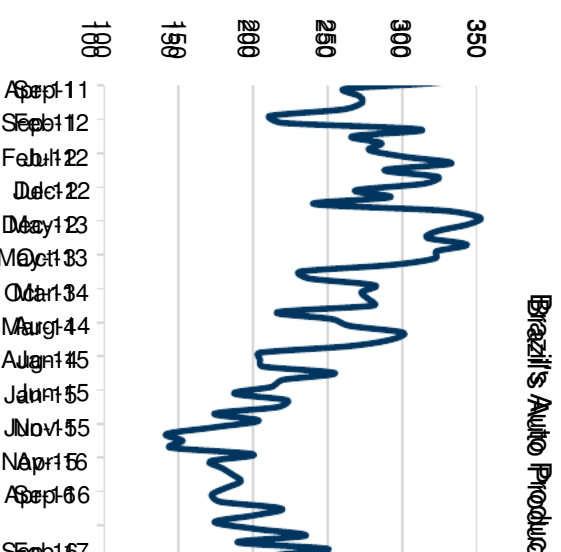
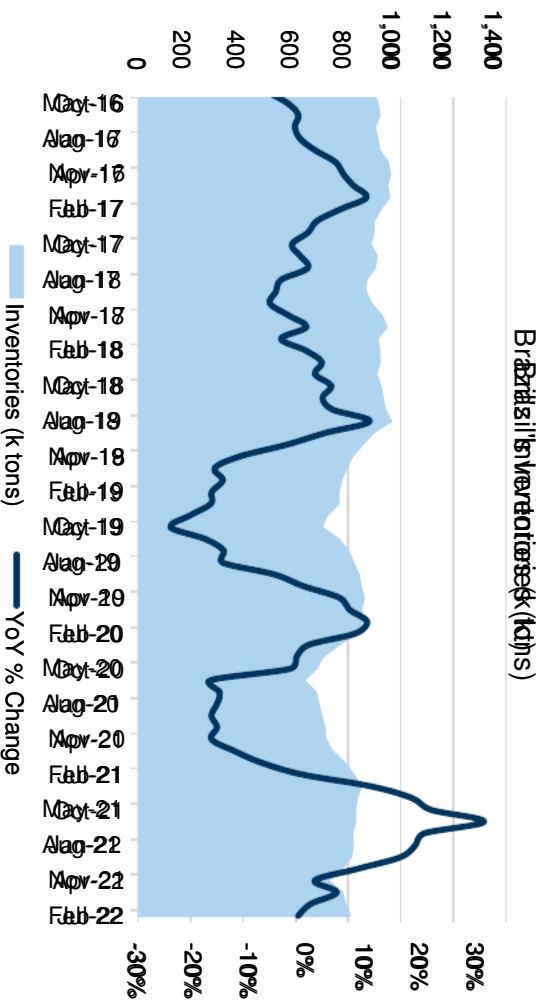
Latin America: Steel indicators

GS Latin America team contacts

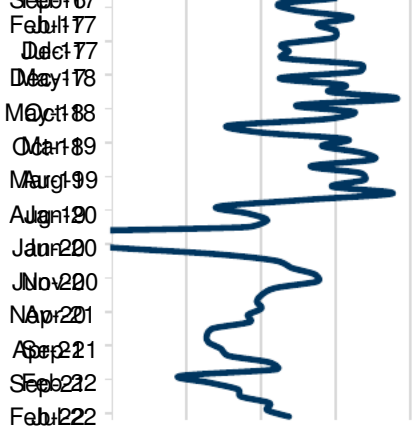
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ation (k units)



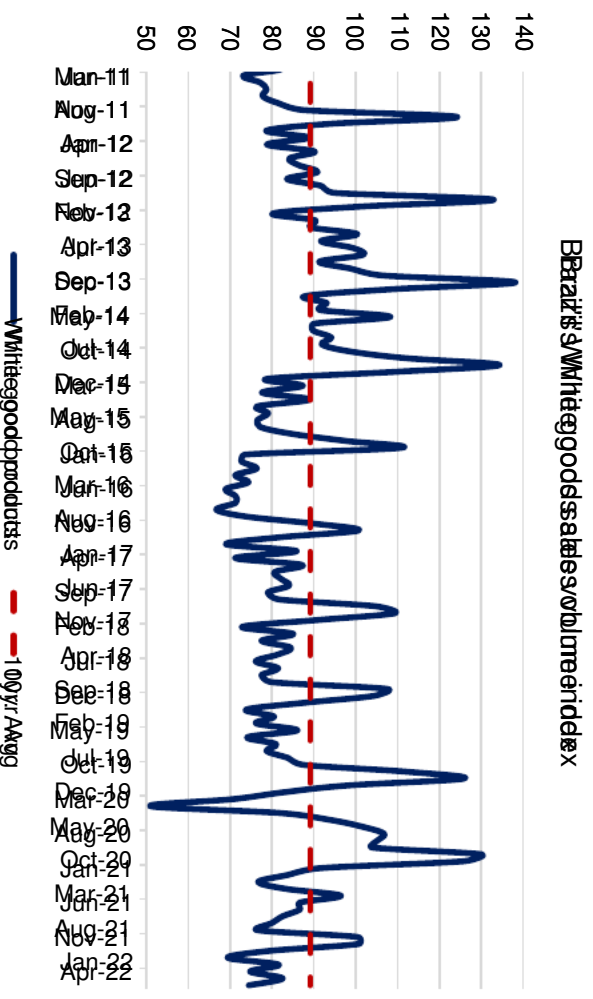
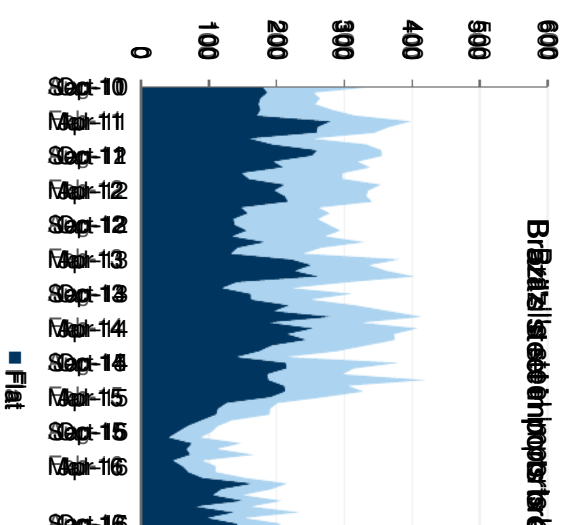
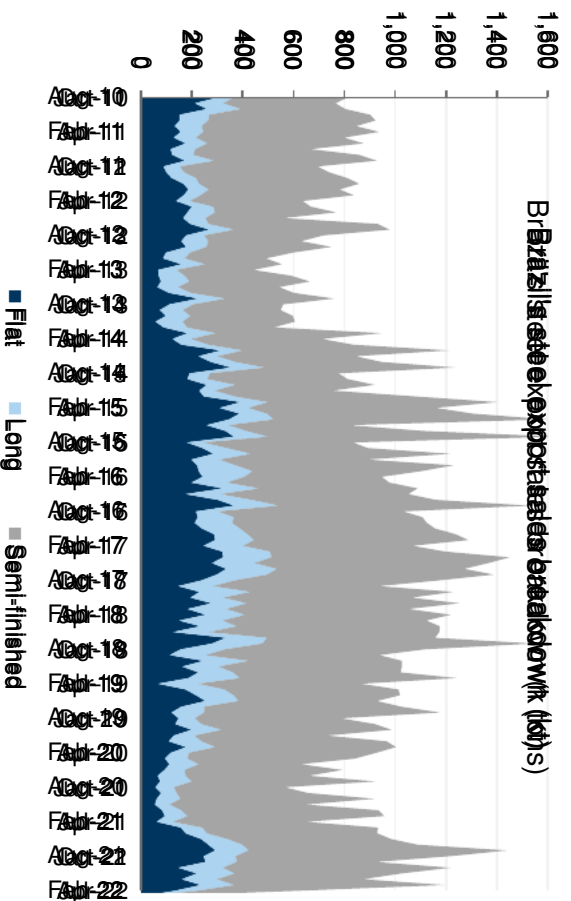
Latin America: Steel indicators

GS Latin America team contacts

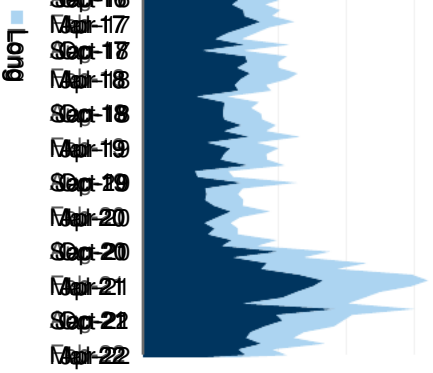
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zestawienie (tys.)



Long

Black Sea region: Steel indicators

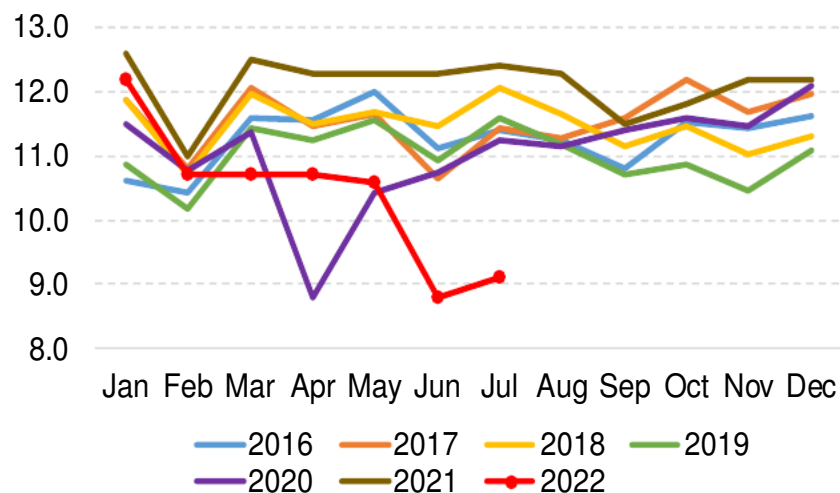
GS Black Sea region contacts

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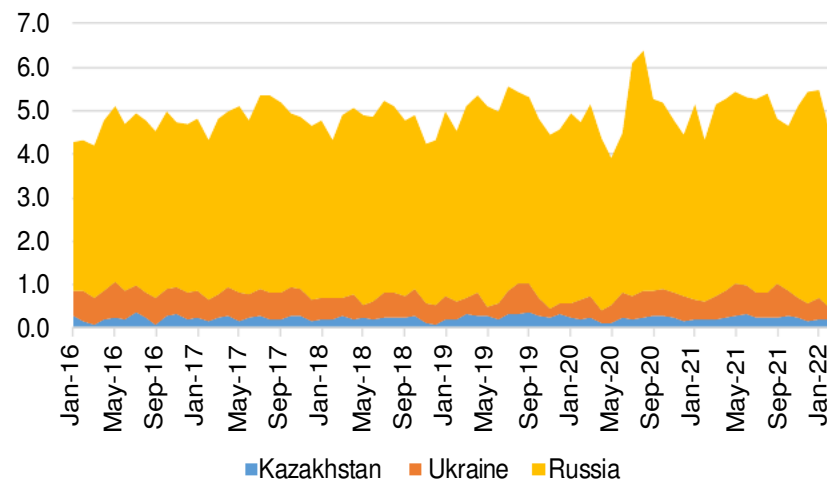
+7-495-645-42-30

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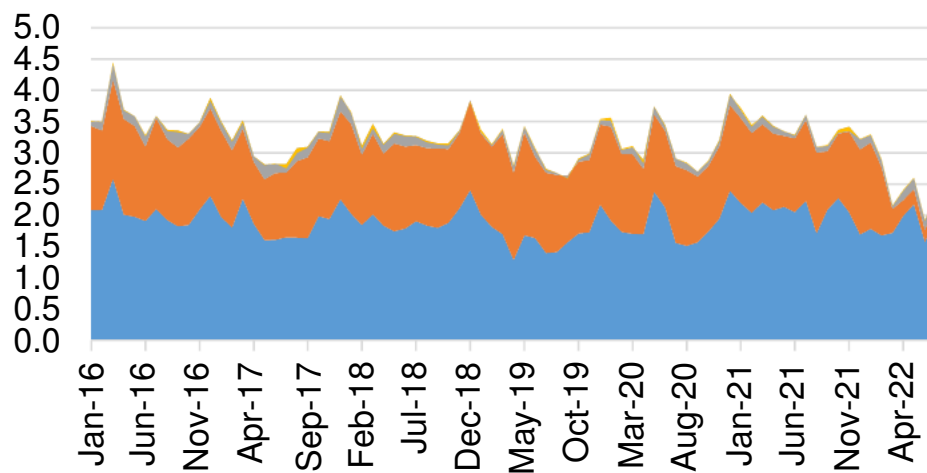
Black Sea crude steel production, mnt



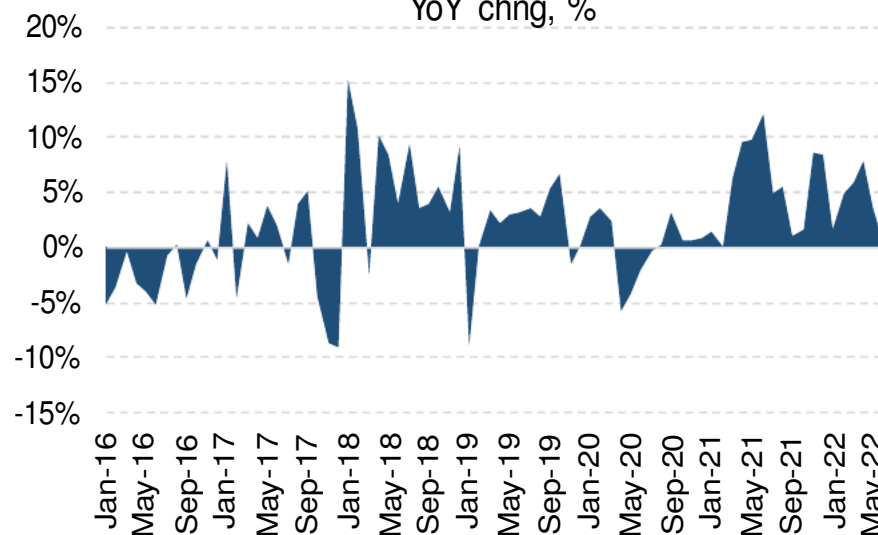
Apparent steel consumption, mnt



Steel net export, mnt



Russia Real Construction contracts, YoY chng, %



Black Sea region: Steel prices

GS Black Sea region contacts

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Rebar FOB Black Sea steel prices, \$/t



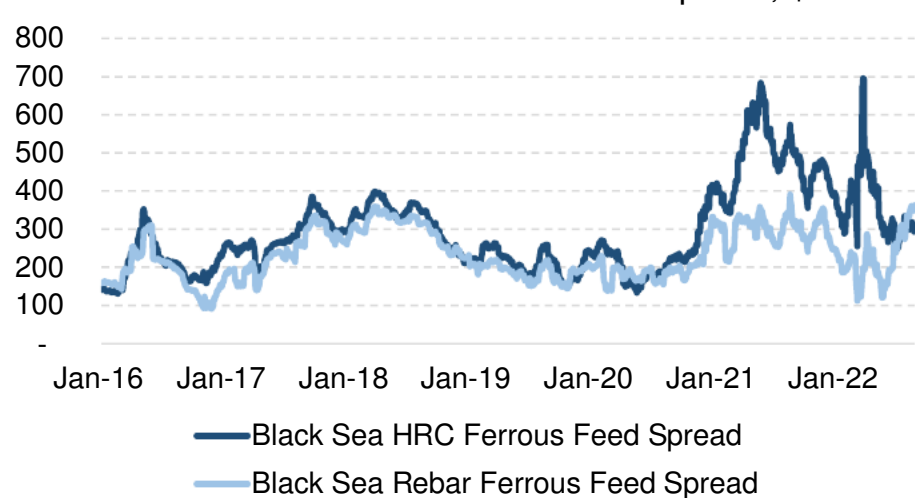
Black Sea and Russia HRC prices, \$/t



Adjusted* domestic HRC premia (Russia), \$/t



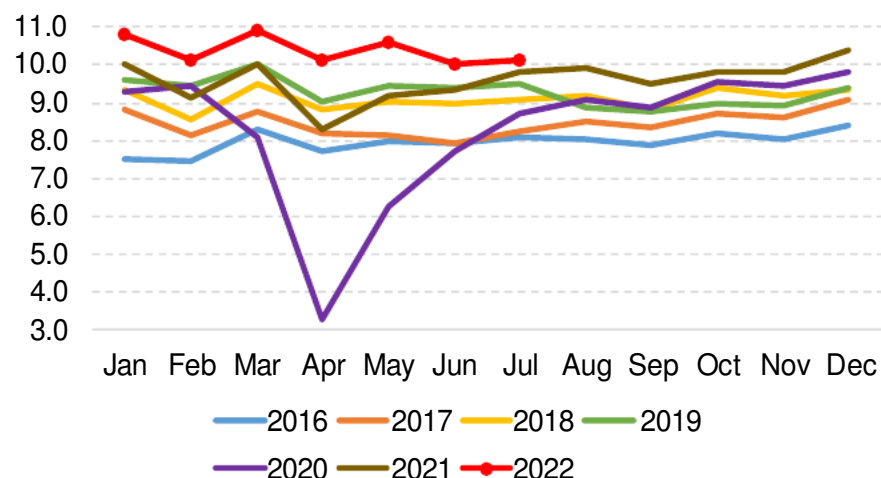
Black Sea HRC and Ferrous Feed spread, \$/t



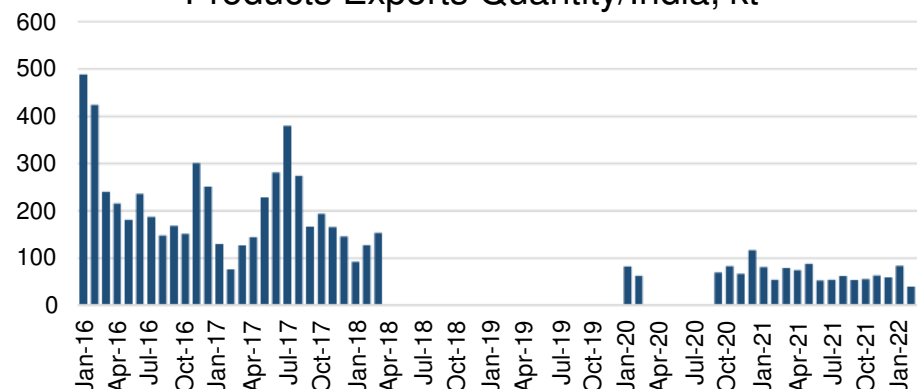
* adjusted for export duty, VAT and transportation costs

ROW: Japan & India steel indicators

Indian crude steel production, mnt

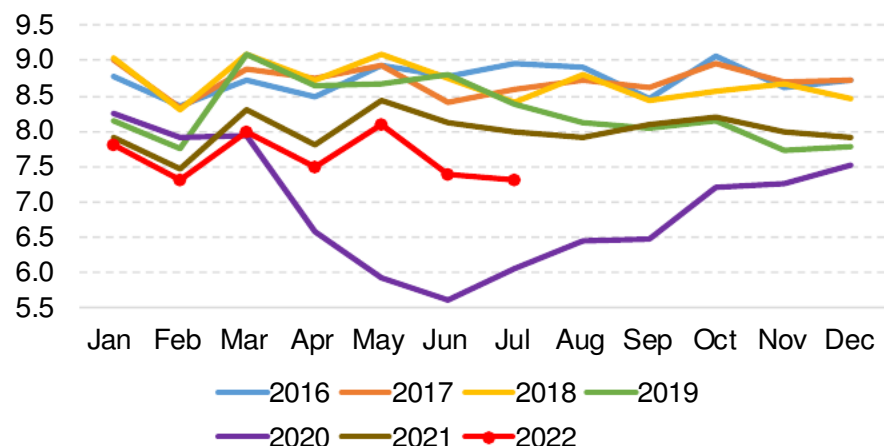


China Customs Iron & Carbon Steel Products Exports Quantity/India, kt

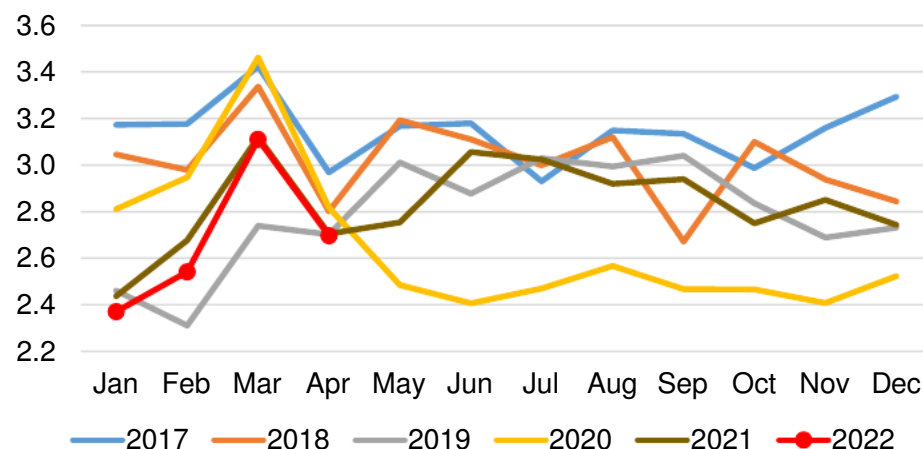


* Zero reported on this series implies there is not enough information to publish a number

Japanese crude steel production, mtpm



Japan monthly steel exports (mtpm)



Bulks (iron ore, coking coal)

Iron ore: TOP-5 output

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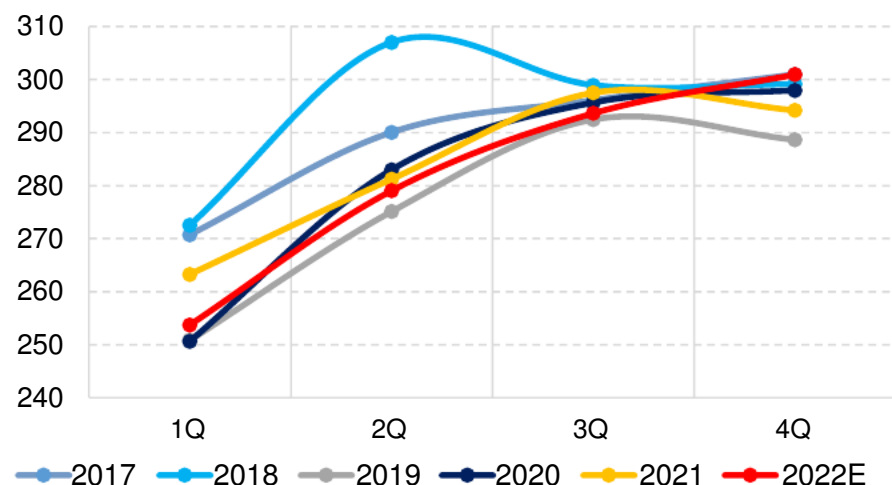
Nicholas.snowdon@gs.com

Marcio.farid@gs.com

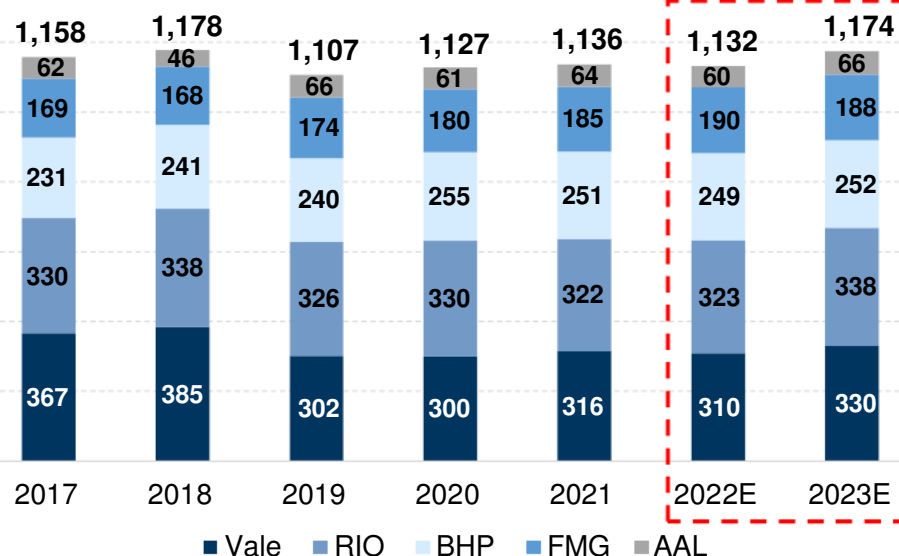
After 10% QoQ output growth in 2Q GS sees further +5% QoQ in 3Q (stable YoY) and another +2% in 4Q

Overall in 2022 TOP-5 miners' production is expected stable YoY

mn tonnes **TOP-5 iron ore production by quarters**



Top-5 iron ore company producers by years, mnt



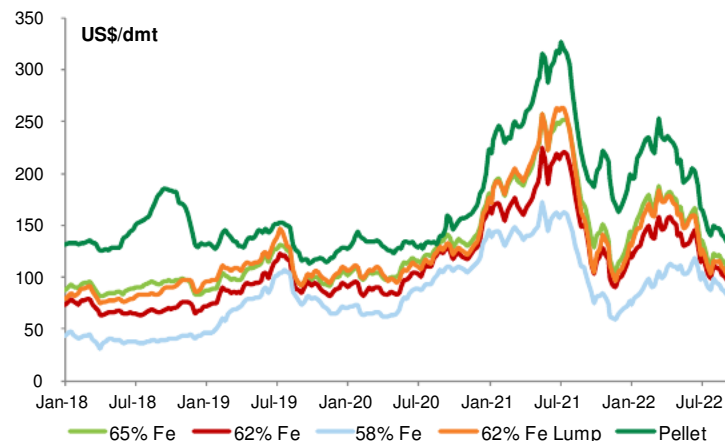
Production guidance for 2022								
Company	Unit	2022 guidance		YoY, %		YoY, Mct		Guidance change
		Min	Max	Min	Max	Min	Max	
Rio Tinto	Mn t	320	335	-1%	4%	-2	13	Confirmed in July'22
Vale	Mn t	310	320	-2%	1%	-6	4	Downgraded from 320-330 mn t in July'22
Anglo American	Mn t	60	64	-6%	0%	-4	0	Confirmed in July'22
Fortescue Metals Group*	Mn t	187	192	1%	4%	2	7	Released in July'22
BHP*	Mn t	278	290	11%	16%	27	39	Released in July'22
TOP-5 combined	Mn t	1,155	1,176	2%	4%	18	49	

* FY23 guidance (Jul'22-Jun'23) for FMG and BHP; For FMG it represent the shipments

Iron Ore

Pricing and penalties

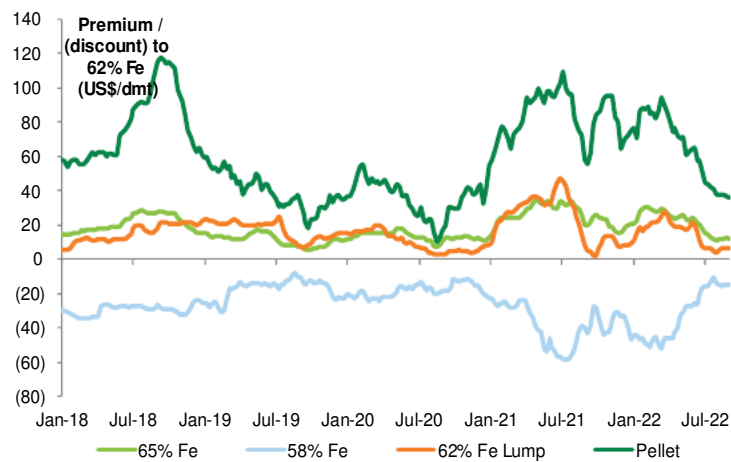
Seaborne iron ore and pellet prices (CIF China)



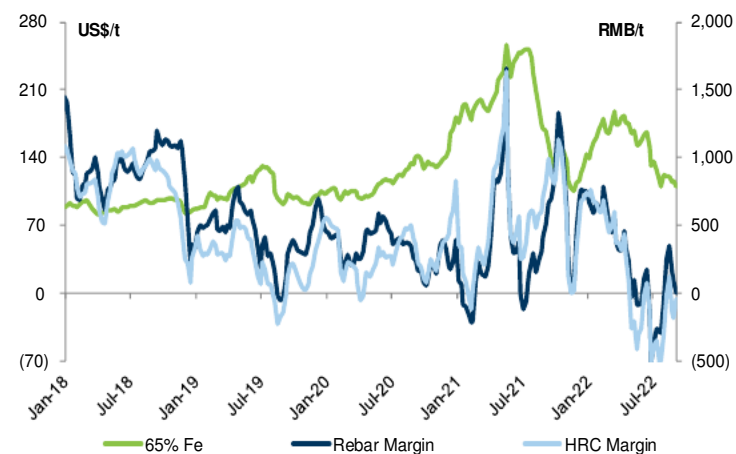
58% Fe price realisations



High / low grade iron ore premiums / vs 62% Fe



Iron ore pricing vs. Rebar and HRC Margin



Source: Platts, Bloomberg, Goldman Sachs Global Investment Research.

Iron Ore: Seaborne trade

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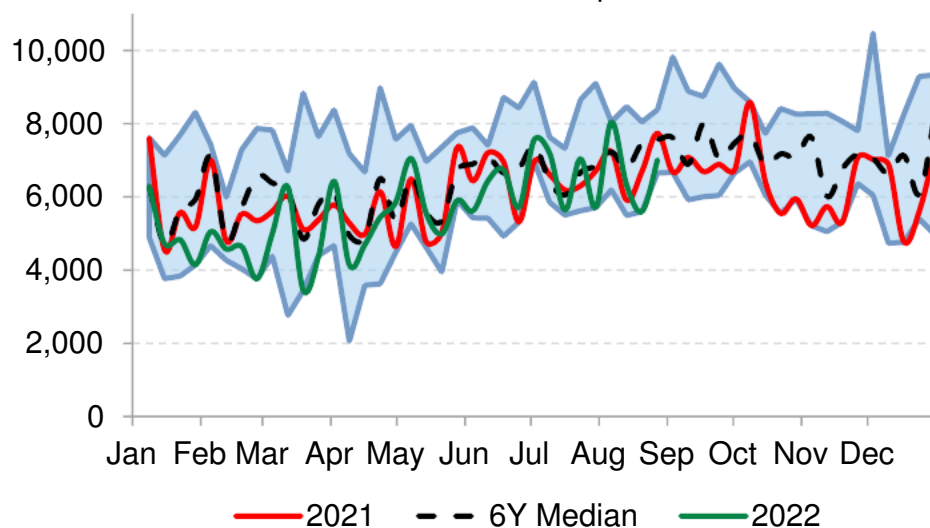
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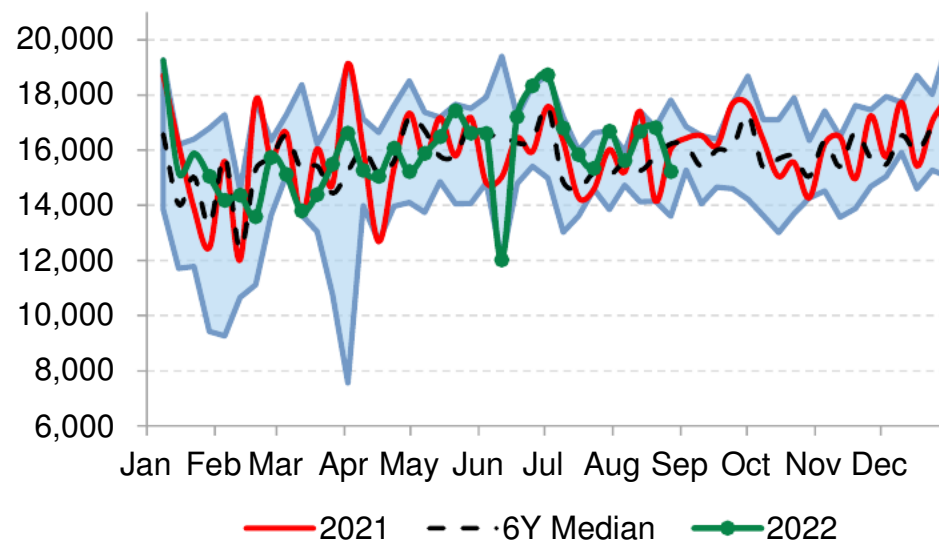
Nicholas.snowdon@gs.com

Marcio.farid@gs.com

Brazilian iron ore shipments, kt



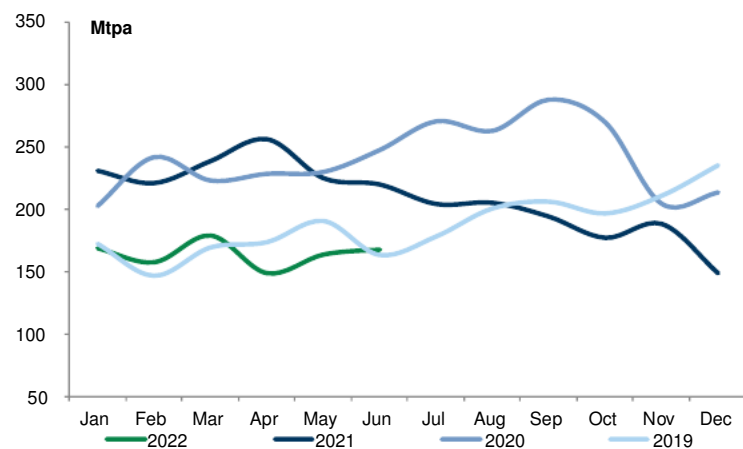
Australia iron ore shipments, kt



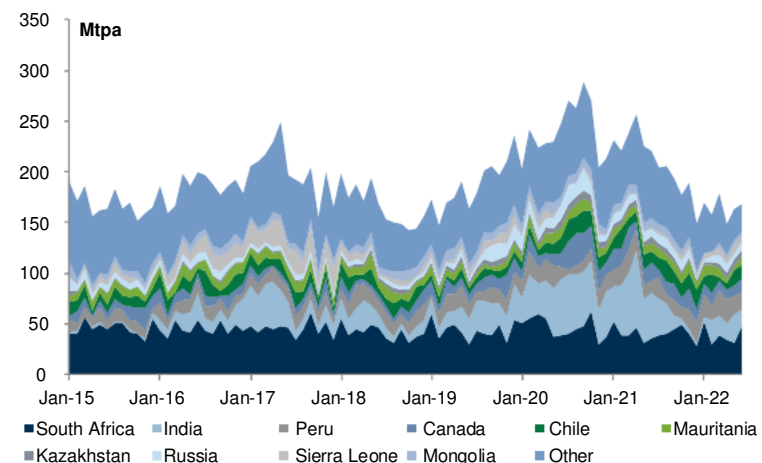
China Iron Ore

Imports (ex Aus/Brazil) and domestic production and stocks

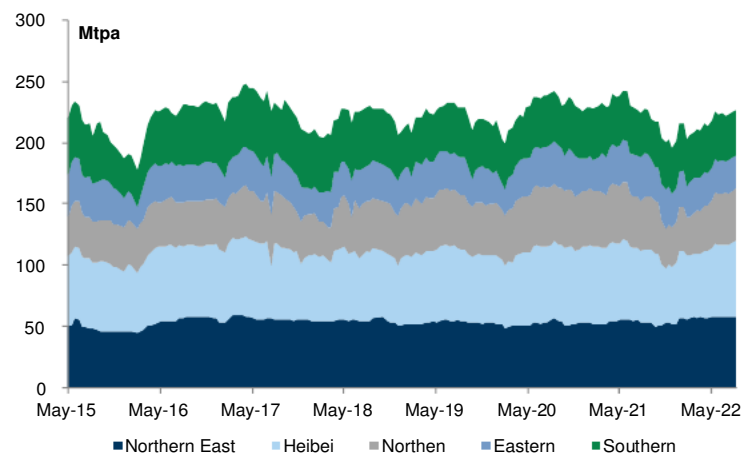
Chinese imports - ex Aus/Brazil



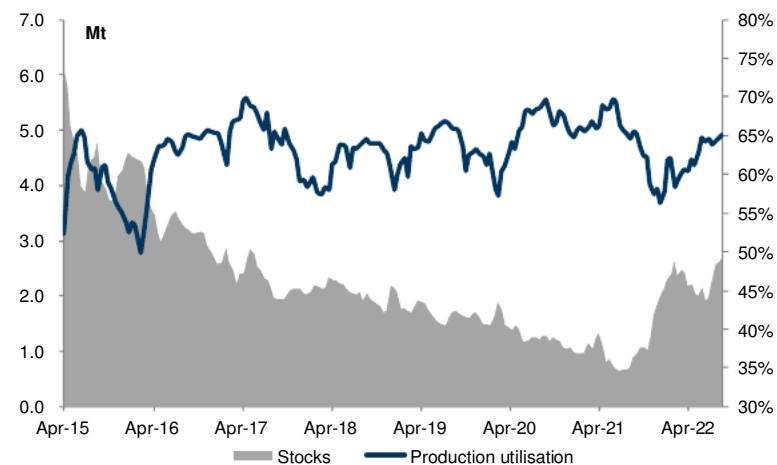
China Ex Aus/Brazil iron ore imports by Country



China domestic iron ore production by region (62% FeEq)



Domestic miner iron ore stocks and utilisation rates

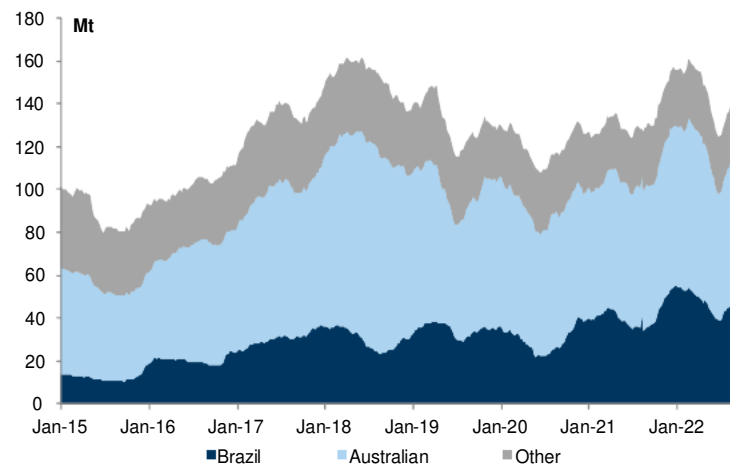


Source: Mysteel, China NBS, Bloomberg, Goldman Sachs Global Investment Research.

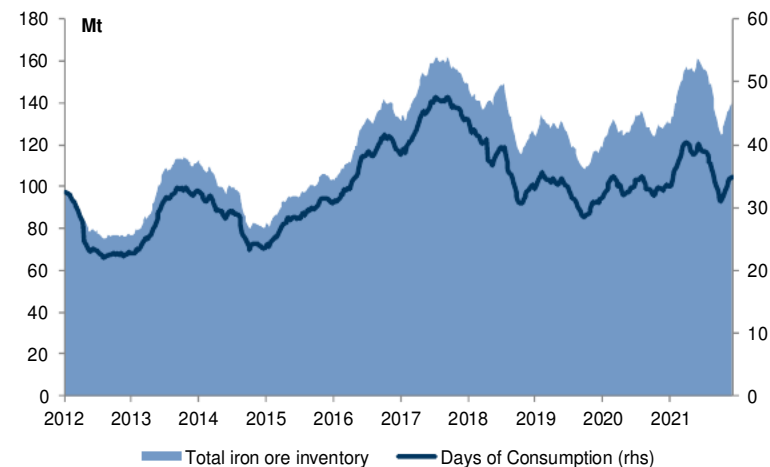
China Iron Ore

Chinese port inventories

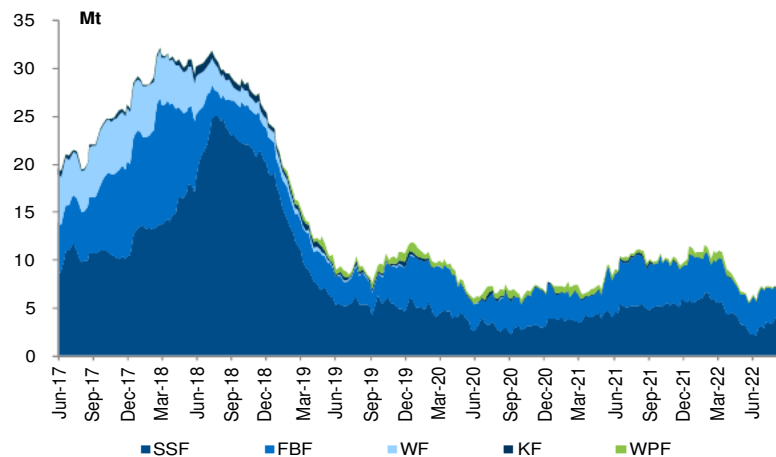
China portside iron ore stockpiles



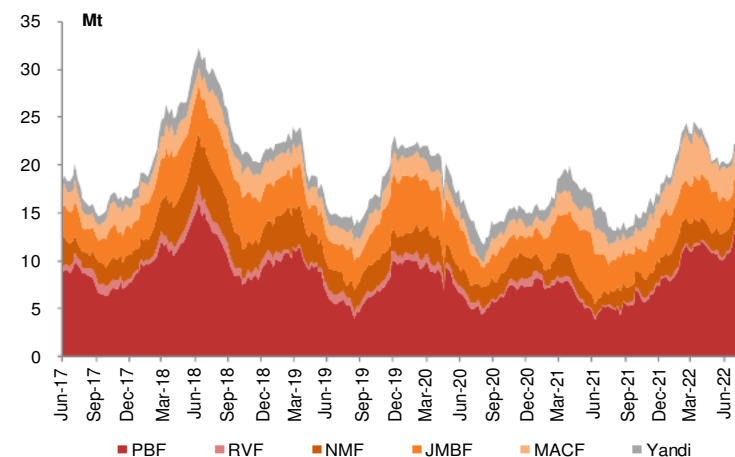
We calculate around 5 weeks of inventory



FMG branded fines stockpile



BHP & RIO branded fines stockpile



Source: Mysteel, Steelhome, Bloomberg, Goldman Sachs Global Investment Research

Steel margins and coking coal prices

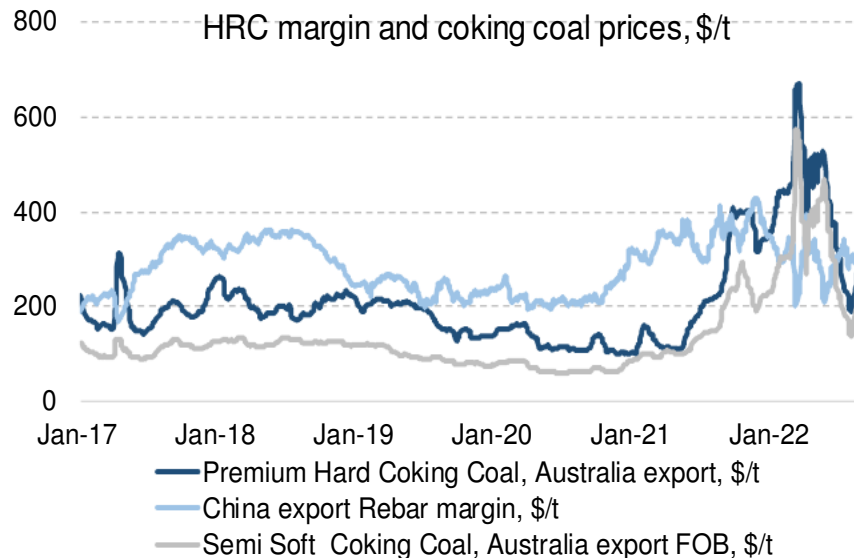
Premium Hard Coking Coal, Australia export, \$/t



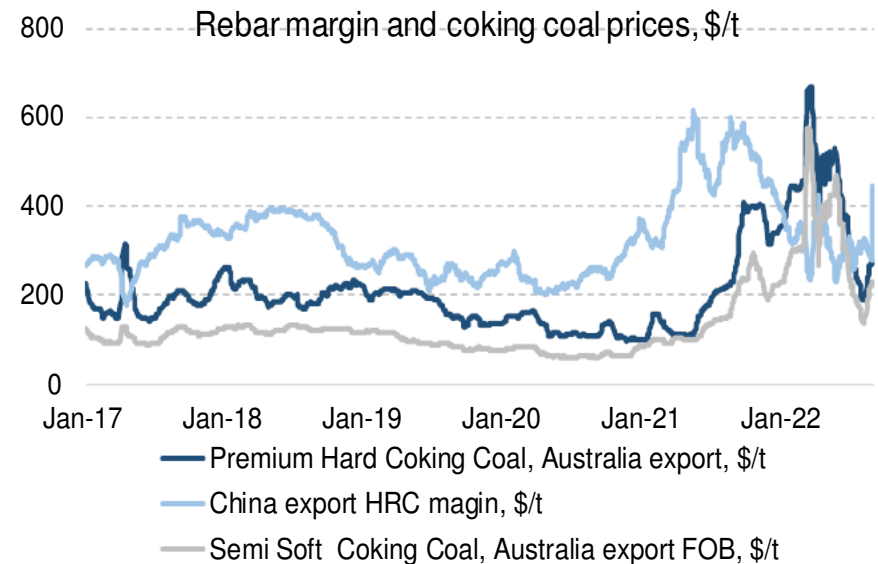
Semi Soft Coking Coal, Australia export FOB, \$/t



HRC margin and coking coal prices, \$/t



Rebar margin and coking coal prices, \$/t



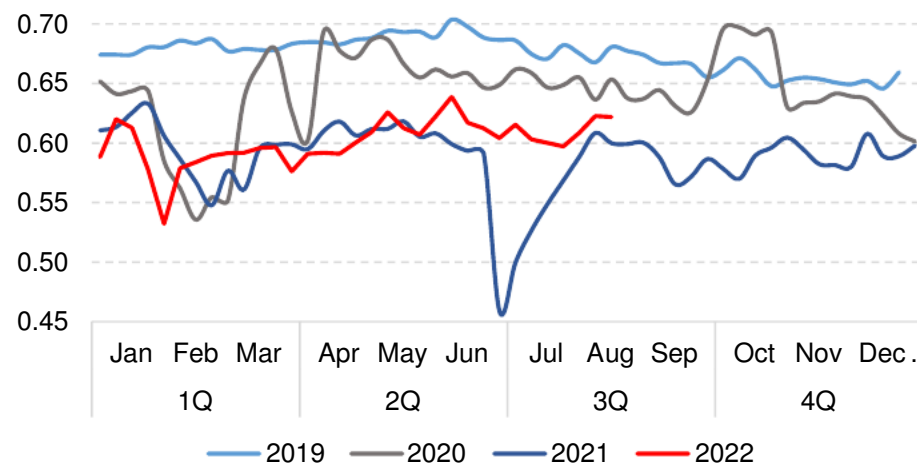
Coking coal: Production

GS China Basic Materials Team contacts

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China daily coking coal output remained roughly stable MoM in August, c.15% higher vs Feb lows and 4% higher vs 2021 – has room to grow back to 2019-20 levels.

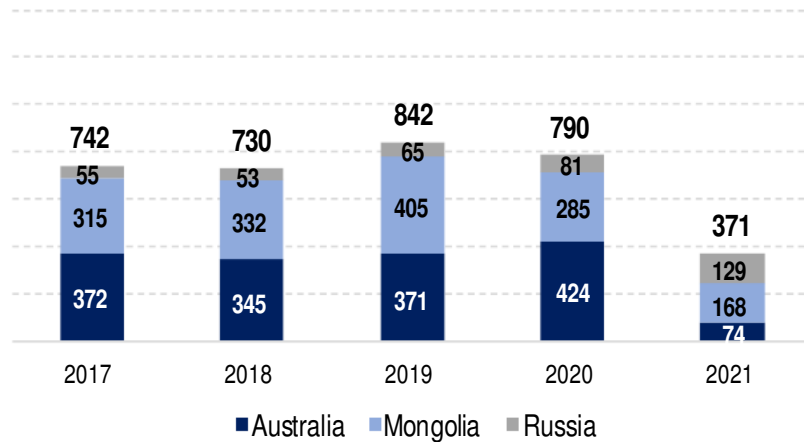
China's coking coal weekly production*, mnt/d



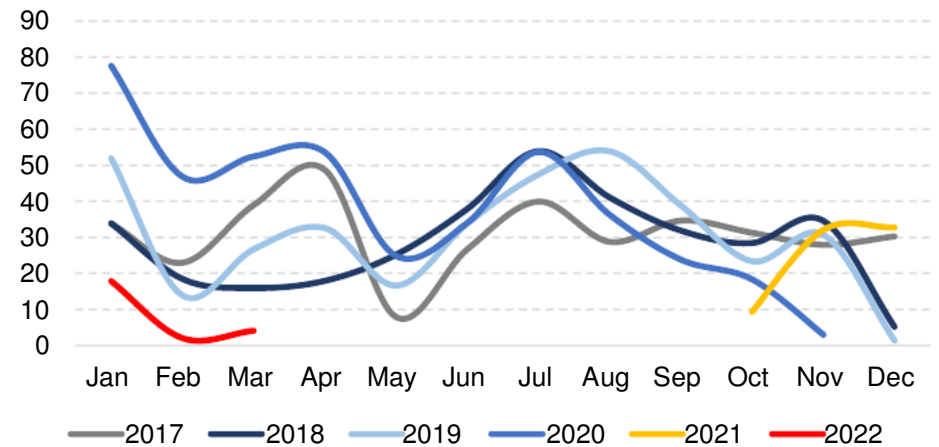
**Output of processed coking coal from the 110 independent and affiliated Chinese wash plants*

Coking coal: China imports

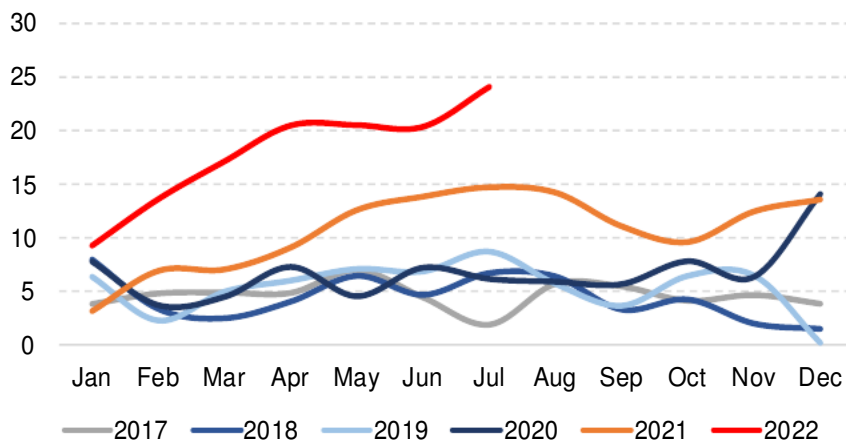
China met coal imports (annualised), Mtpa



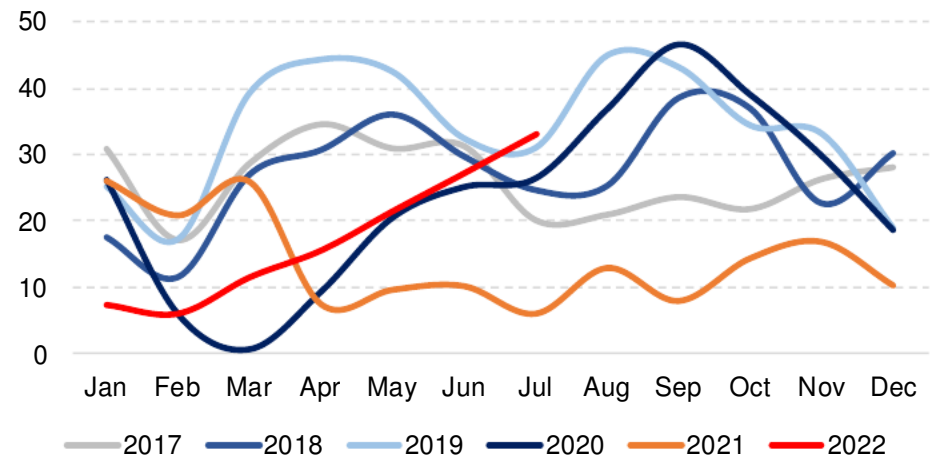
China met coal imports from Australia (annualised), Mtpa



China met coal imports from Russia (annualised), Mtpa

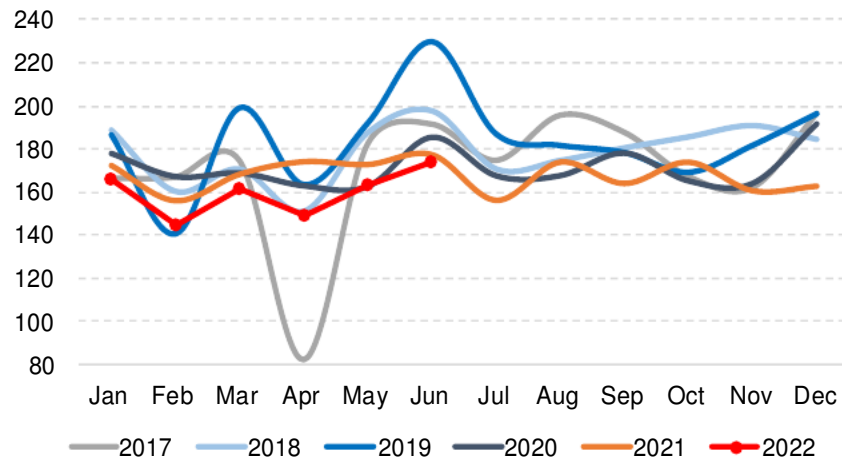


China met coal imports from Mongolia (annualised), Mtpa

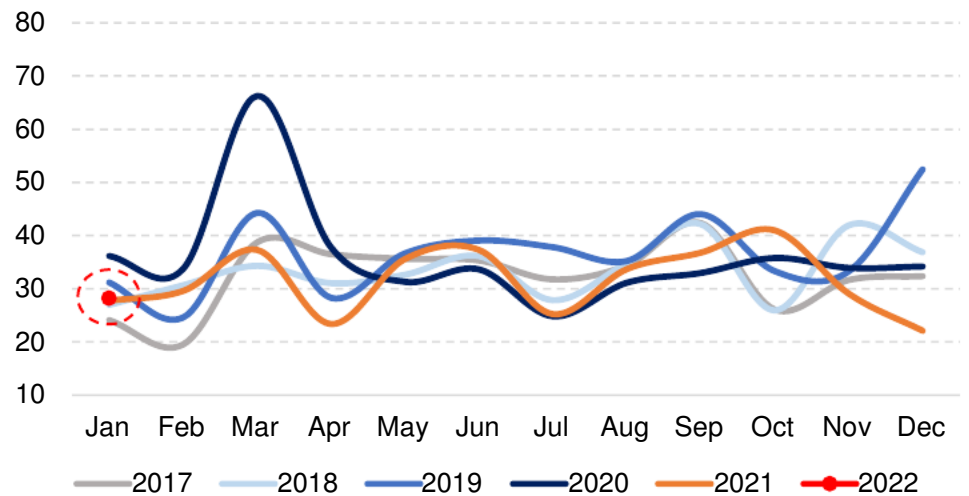


Coking coal: International trade: Exports

Australian met coal exports (annualised), Mtpa



Canada met coal exports (annualised), Mtpa



GS Projections, S/D models, equity view

/S

GS global steel prices outlook

	Units	SPOT	2018	2019	2020	2021	2022E	2023E	1Q22	2Q22	3Q22E	4Q22E
China												
HRC	Rmb/t	3,900	4,182	3,856	3,898	5,420	4,383	4,022	4,997	4,997	3,768	3,768
YoY / QoQ	%		8%	-8%	1%	38%	-14%	-5%	-4%	0%	-25%	0%
Rebar	Rmb/t	4,160	4,124	3,885	3,718	5,042	4,375	3,778	4,852	4,852	3,898	3,898
YoY / QoQ	%		8%	-6%	-4%	35%	-12%	-5%	-5%	0%	-20%	0%
US												
HRC EXW Indiana	US\$/st	780	835	601	586	1,601	1,087	700	1,246	1,301	1,000	800
YoY / QoQ	%		34%	-28%	-2%	173%	-32%	-36%	-30%	4%	-23%	-20%
Rebar EXW US Southeast	US\$/st	990	678	662	609	904	1,024	700	1,079	1,169	1,000	850
YoY / QoQ	%		24%	-2%	-8%	48%	13%	-32%	8%	8%	-14%	-15%
European												
HRC, EXW South and North Europe domes	EUR/t	755	544	463	465	955	905	600	1,035	1,087	800	700
YoY / QoQ	%		4%	-15%	0%	105%	-5%	-34%	10%	5%	-26%	-13%
Merchant bar, Europe domestic delivered	EUR/t	1,045	584	522	477	772	1,023	600	1,012	1,279	1,000	800
YoY / QoQ	%		11%	-11%	-9%	62%	32%	-41%	19%	26%	-22%	-20%
Black Sea												
HRC, Black Sea exports FOB	US\$/t	520	550	460	467	860	719	567	885	777	570	643
YoY / QoQ	%		10%	-16%	2%	84%	-16%	-21%	-2%	-12%	-27%	13%
Rebar, Black Sea exports FOB	US\$/t	590	526	439	428	673	633	517	765	680	595	493
YoY / QoQ	%		15%	-17%	-2%	57%	-6%	-18%	8%	-11%	-13%	-17%
Russia domestic												
Adjusted* HRC, Russia FCA	US\$/t	641	578	551	495	866	722	570	850	796	584	659
YoY / QoQ	%		5%	-5%	-10%	75%	-17%	-21%	-18%	-6%	-27%	13%
Domestic / Export spread	US\$/t		28	91	28	6	4	3	(34)	19	14	16
Rebar, Russia FCA	US\$/t	629	509	486	422	684	621	507	769	660	577	478
YoY / QoQ	%		12%	-5%	-13%	62%	-9%	-18%	1%	-14%	-13%	-17%
Brazil												
HRC	RS\$/t	5,000	2,789	2,576	2,941	6,170	6,165	5,153	6,020	6,339	6,300	6,000
YoY / QoQ	%		23%	-8%	14%	110%	0%	-16%	-5%	5%	-1%	-5%
Rebar	RS\$/t	4,250	2,546	2,726	2,762	5,076	5,000	4,889	4,300	4,967	5,538	5,193
YoY / QoQ	%		321%	7%	1%	84%	-2%	-2%	-14%	16%	12%	-6%

* Domestic HRC price is adjusted for VAT and transportation costs

GS global steel S/D Model

GS Steel Supply and Demand Summary									2022 yoy	2023 yoy
(Million tonnes)	2018	2019	2020	2021	2022E	2023E	2024E	2025E	chng, %	chng, %
Crude steel production										
US	87	88	73	86	87	92	93	98	2%	5%
Japan	104	99	83	96	92	98	100	102	-4%	6%
Western Europe	167	157	139	160	144	144	149	150	-10%	0%
Other DM	36	35	32	22	22	23	23	24	0%	2%
Total DM	394	379	327	364	345	356	365	373	-5%	3%
China	935	1012	1065	1033	1016	1006	1004	1000	-2%	-1%
South Korea	72	71	67	71	73	75	80	81	4%	2%
India	109	111	100	115	124	133	145	155	8%	8%
Black Sea	138	134	137	142	126	145	145	145	-11%	15%
Other EM	154	146	147	188	158	173	176	180	-16%	9%
Total EM	1409	1475	1517	1549	1497	1533	1551	1561	-3%	2%
Total crude steel production	1803	1854	1844	1913	1843	1888	1917	1935	-4%	2%
% growth (yoy)		2.8%	-0.5%	3.7%	-3.7%	2.5%	1.5%	0.9%		
Steel consumption										
China	879	963	1050	1026	1015	1010	1012	1014	-1%	0%
India	97	103	89	106	112	116	119	123	6%	3%
US	101	99	82	100	99	100	102	104	0%	1%
Japan	65	63	53	56	59	61	62	64	5%	3%
South Korea	54	53	49	52	53	54	56	58	3%	3%
Black Sea	80	78	81	85	76	85	86	88	-10%	11%
Other	435	408	370	450	468	477	482	487	4%	2%
Total steel consumption	1711	1767	1772	1874	1882	1903	1920	1937	0%	1%
% growth (yoy)		3.3%	0.3%	5.8%	0.4%	1.1%	0.9%	0.9%		
Balance	92	88	73	39	-39	-14	-4	-3		
Net steel export/(import)										
China	55	49	15	6	1	-4	-9	-14	-77%	n/a
India	13	9	12	9	12	18	26	32	28%	53%
US	-15	-11	-9	-14	-12	-9	-9	-6	n/a	n/a
Japan	39	36	31	40	34	37	37	37	-16%	11%
South Korea	54	53	49	52	53	54	56	58	3%	3%
Russia	59	57	57	57	50	61	59	57	-13%	22%

GS Iron Ore S/D Model

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(Million tonnes)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E
Crude steel production - DM											
US	87	88	79	78	82	87	88	73	86	87	92
Japan	111	111	105	105	105	104	99	83	96	92	98
Western Europe	166	169	166	162	169	168	160	135	152	144	146
Other DM	20	21	20	20	21	22	22	19	22	21	22
Sub-DM	384	389	380	375	385	380	369	311	356	344	358
Crude steel production - EM											
China	775	813	801	805	868	923	996	1054	1029	978	994
South Korea	66	71	70	69	71	72	71	67	71	71	75
India	81	83	90	95	101	109	111	100	115	121	130
Russia	69	71	71	70	71	72	72	73	77	68	66
Other EM	203	200	195	201	221	232	225	223	257	261	266
Sub-EM	1194	1238	1197	1213	1290	1409	1475	1517	1549	1498	1531
Global crude steel production	1578	1627	1577	1588	1674	1789	1844	1828	1905	1843	1888
y/y growth	4.1%	3.1%	-3.1%	0.7%	5.4%	6.8%	3.1%	-0.9%	4.2%	-3.3%	2.5%
Iron ore demand											
Global iron ore demand 62% Fe	2043	2099	2063	2055	2084	2081	2229	2216	2223	2146	2196
y/y growth	9.9%	2.7%	-1.7%	-0.4%	1.4%	-0.1%	7.1%	-0.6%	0.3%	-3.5%	2.3%
China	1239	1254	1242	1228	1242	1237	1342	1404	1346	1279	1300
ex-China	804	845	821	827	842	845	887	812	877	867	896
Seaborne iron ore demand											
Global iron ore seaborne demand 62% Fe	1236	1377	1388	1452	1504	1475	1583	1597	1581	1507	1571
y/y growth	8.4%	11.4%	0.8%	4.6%	3.5%	-1.9%	7.3%	0.9%	-1.0%	-4.7%	4.3%
China	806	916	940	1011	1059	1046	1117	1169	1125	1070	1115
ex-China	430	460	449	441	445	428	466	428	456	437	456
Iron ore seaborne supply											
Australia	605	748	799	846	870	887	887	912	910	916	928
Brazil	326	339	361	359	356	371	361	331	367	354	395
South Africa	60	64	15	15	64	64	60	61	60	57	59
Canada	39	47	12	14	47	47	53	57	58	66	74
Other (India, Mexico, Bosnia, Kazakh, Ukraine etc)	212	181	212	235	171	142	146	188	176	124	137
Global seaborne supply	1243	1379	1399	1468	1507	1512	1507	1550	1571	1518	1593
y/y growth	11.9%	10.9%	1.5%	4.9%	2.7%	0.3%	-0.3%	2.9%	1.4%	-3.4%	5.0%
Global Balance	7	2	11	16	3	37	-76	-47	-10	11	22
Seaborne price - Iron ore 62% Fe Price (annual average)											
Current Dollars (\$/t)	135	98	55	57	70	69	93	107	160	113	100

Source: CRU, Wood Mackenzie, Goldman Sachs Global Investment Research

Global Investment Research

47

GS covered Steel and Iron Ore Comparables

Steel																	
Region	Company name	Analyst name	Curr	Price	PT	Upsd	Rating	MCap US\$mn	EV 22 US\$mn	EV/EBITDA 2022E	2023E	Dividend yield 2022E	2023E	Buyback yield 2022E	2023E	FCF yield 2022E	2023E
CEEMEA	Erdemir	Nina Dergunova	TRY	29.2	31.0	6%	Neutral	5,621	6,993	2.5x	4.3x	25.7%	17.2%	0.0%	0.0%	10.4%	9.9%
	CEEMEA Average									2.5x	4.3x	25.7%	17.2%	0.0%	0.0%	10.4%	9.9%
Europe	ArcelorMittal	Nina Dergunova	€	24.2	28.0	16%	Neutral	24,645	42,610	1.8x	3.2x	1.8%	1.9%	16.0%	9.6%	35.2%	16.4%
	Voestalpine	Nina Dergunova	€	20.4	22.0	8%	Sell	3,562	11,595	2.8x	3.8x	7.1%	5.4%	0.0%	0.0%	12.7%	5.5%
	SSAB	Nina Dergunova	Skr	52.1	71.0	36%	Buy	4,892	4,658	1.2x	3.1x	16.3%	5.2%	0.0%	0.0%	29.4%	17.6%
	Europe Average									1.9x	3.4x	8.4%	4.2%	5.3%	3.2%	25.8%	13.2%
North America	Nucor Corp.	Emily Chieng, CFA	\$	139.6	127.0	-9%	Neutral	36,805	31,050	3.6x	6.8x	1.4%	1.5%	8.9%	9.7%	20.6%	11.8%
	Steel Dynamics Inc.	Emily Chieng, CFA	\$	86.2	89.0	3%	Neutral	16,191	13,641	3.0x	5.8x	1.6%	1.6%	10.8%	8.1%	20.8%	15.1%
	Reliance Steel and Aluminum Co.	Emily Chieng, CFA	\$	195.8	218.0	11%	Buy	12,256	11,037	4.8x	6.7x	1.8%	2.0%	3.6%	1.8%	16.3%	10.5%
	United States Steel Corp.	Emily Chieng, CFA	\$	25.4	21.0	-17%	Sell	7,279	7,620	1.7x	5.0x	0.8%	0.8%	15.4%	5.2%	22.9%	-11.7%
	Cleveland-Cliffs Inc.	Emily Chieng, CFA	\$	18.6	23.0	24%	Buy	9,785	15,497	3.0x	3.6x	0.0%	0.0%	3.8%	1.3%	22.4%	24.1%
	Commercial Metals Co.	Emily Chieng, CFA	\$	42.5	41.0	-4%	Neutral	5,220	4,311	4.0x	4.6x	1.3%	1.3%	2.6%	3.3%	9.5%	14.9%
	Schnitzer Steel Industries	Emily Chieng, CFA	\$	35.3	45.0	27%	Buy	1,046	1,421	3.4x	2.5x	2.1%	2.1%	2.1%	1.4%	13.5%	29.3%
	North America Average									3.4x	5.0x	1.3%	1.3%	6.7%	4.4%	18.0%	13.4%
Latin America	Gerdau	Marcio Farid	R\$	24.0	37.0	54%	Buy	8,105	10,617	1.7x	2.0x	3.7%	6.1%	0.0%	0.0%	26.8%	24.2%
	Usiminas	Marcio Farid	R\$	8.2	18.0	119%	Buy	2,005	4,290	1.9x	2.2x	22.1%	10.5%	0.0%	0.0%	10.8%	17.3%
	Ternium	Marcio Farid	\$	32.7	60.0	83%	Buy	6,425	8,545	1.3x	1.7x	14.9%	9.9%	0.0%	0.0%	37.4%	22.3%
	CSN	Marcio Farid	R\$	14.5	25.0	72%	Neutral	3,990	12,080	2.7x	4.2x	5.5%	3.6%	0.0%	0.0%	-14.0%	-3.3%
	CSN Mineracao	Marcio Farid	R\$	3.8	5.5	45%	Sell	4,123	7,098	3.3x	3.4x	5.3%	3.9%	0.0%	0.0%	-19.1%	0.5%
	Latin America Average									2.2x	2.7x	10.3%	6.8%	0.0%	0.0%	8.4%	12.2%
Asia	Baoshan Iron & Steel	Trina Chen	Rmb	5.4	7.9	47%	Neutral	17,246	33,937	3.5x	3.3x	9.8%	10.4%	0.0%	0.0%	9.5%	14.8%
	Angang Steel	Trina Chen	HK\$	2.5	4.3	71%	Buy	3,008	5,700	3.0x	1.8x	3.7%	7.3%	0.0%	0.0%	12.2%	20.9%
	Maanshan Iron & Steel	Trina Chen	HK\$	2.1	2.3	12%	Sell	2,012	5,494	4.2x	3.7x	10.8%	14.0%	0.0%	0.0%	-14.6%	5.5%
	Asia Average									3.5x	2.9x	8.1%	10.5%	0.0%	0.0%	2.4%	13.7%
Australia	Sims Metal Management Ltd.	Paul Young	A\$	15.6	16.7	7%	Neutral	2,091	2,497	4.3x	4.9x	3.4%	3.1%	-2.1%	0.0%	11.4%	8.7%
	BlueScope Steel	Paul Young	A\$	17.0	24.3	43%	Buy	5,513	7,780	2.3x	3.1x	3.0%	2.9%	-7.5%	-3.6%	18.8%	14.4%
	Global Median									3.0x	3.6x	3.7%	3.6%	0.0%	0.0%	13.5%	14.8%
Bulks																	
Region	Company name	Analyst name	Curr	Price	PT	Upsd	Rating	MCap US\$mn	EV 21 US\$mn	EV/EBITDA 2022E	2023E	Dividend yield 2022E	2023E	Buyback yield 2022E	2023E	FCF yield 2022E	2023E
Global	Rio Tinto Ltd.	Paul Young	A\$	95.5	121.5	27%	Buy	106,810	136,269	4.1x	3.8x	7.4%	7.8%	-0.1%	-0.1%	8.9%	10.0%
	Rio Tinto Plc	Geydar Mamedov	£	4,980	5,700	14%	Buy	95,349	122,241	3.7x	3.4x	8.3%	8.7%	-0.1%	-0.1%	10.0%	11.2%
	Fortescue Metals Group	Paul Young	A\$	19.0	12.1	-36%	Sell	40,635	46,857	4.8x	7.2x	8.8%	4.5%	0.2%	0.0%	6.6%	3.2%
	Coronado Global Resources Inc.	Paul Young	A\$	1.7	1.9	12%	Buy	1,905	1,100	0.7x	3.9x	47.9%	15.8%	0.0%	0.0%	61.2%	19.8%
	Whitehaven Coal Ltd.	Paul Young	A\$	8.1	7.6	-6%	Neutral	5,134	1,714	1.8x	2.0x	9.7%	10.8%	6.0%	15.0%	31.1%	20.4%
	New Hope Corp.	Paul Young	A\$	5.1	3.6	-29%	Sell	2,900	1,005	2.1x	2.6x	19.1%	15.5%	0.0%	0.0%	28.0%	21.1%
	Champion Iron Ltd.	Paul Young	A\$	5.2	6.8	31%	Buy	1,873	2,055	3.3x	2.9x	5.2%	7.2%	1.8%	0.0%	3.2%	13.4%
	Deterra Royalties Ltd.	Paul Young	A\$	4.3	4.5	6%	Neutral	1,547	1,665	8.8x	10.6x	7.7%	6.4%	0.0%	0.0%	7.7%	8.6%
	Vale	Marcio Farid	\$	13.3	14.0	6%	Neutral	60,834	102,078	3.9x	4.1x	13.8%	15.6%	7.2%	0.0%	9.1%	12.0%
Average									3.8x	4.8x	13.1%	8.7%	1.0%	1.9%	17.6%	11.8%	

Source: Company data, FactSet, Goldman Sachs Global Investment Research

Global Investment Research

Bookshelf: Latest GS reports on steel and bulks

Sector	Report link	Quote
LATAM steel	Latin America Metals & Mining: From CSNA3 and CMIN3 2Q22 Earnings Calls: Some Operational Improvement Expected for 2H22 16 August 2022	CSN and CSN Mineração management expects steel volumes to improve in Brazil sequentially, while prices are expected to be relatively stable. CSN also expects production cost to improve from here. On the mining side, however, production and cost guidance were revised negatively, driven by operational challenges and ongoing inflation pressure. But CSN expects sequential improvement from the lows in 1H22. CSN adopted a more prudent approach on the capital allocation side, and noted that the current macro uncertainty leads management to be less aggressive on project pipeline and buy backs and focus on returning to below 1x Net Debt/EBITDA as it digests recently acquired assets. However, management noted that growth projects are still the strategic plan, both organic (e.g., mining), but also inorganic (e.g., gain exposure to international and more stable markets in North America and in Europe).
China Basic Materials	China Basic Materials Monitor August 2022: One of the better Augusts 16 August 2022	After a very weak June and July, on the ground demand saw mild improvement sequentially in August, making the orderbook trend one of the better ones versus the historical seasonal pattern. Combined with more supply cuts, the negative margins for basic materials are being repaired to breakeven levels. Specifically, demand pickups have been seen in steel, cement, and copper, while aluminum further softened. For end demand, the trends in air conditioner, auto and state grid are positive, while property completion has started to deteriorate.
CEEMEA steel	Erdemir: Third consecutive profitability miss in 2Q22: weaker profits amid cash generation improvement ahead; remain Neutral 10 August 2022	Erdemir posted 2Q22 results which came in below our/Visible Alpha Consensus Data consensus expectations for the quarter (Erdemir also missed profitability expectations in 4Q21 and 1Q22) with US\$ EBITDA being stable qoq (revenue growth offset by higher raw materials and energy costs) and FCF turning negative (on NWC build-up and higher capex). Our key observations from 2Q22 Erdemir financial results center on three topics: (1) Sales volumes (stable qoq with rising domestic sales, indicating healthy domestic market demand), (2) Cost inflation pressure (mainly, energy, coal and scrap costs), and (3) ongoing investment programme.
Commodity	Iron Ore - From scarcity to glut 25 July 2022	The iron ore market is set to swing into significant surplus over the second half of this year. We now project the market to be in a 67Mt surplus over the remainder of 2022 (vs. 34Mt previously) after a 56Mt deficit in H1. Crucially, this sharp swing into oversupply reflects a combination of both extended property related onshore demand weakness and a sharp deceleration in ex-China steel demand, compounded by a largely unchanged supply path. Given more organic end demand headwinds than a year ago and so far limited supply adjustments, this surplus swing is unlikely to be as short-lived as last year's. In this context, we see a more severe downturn in iron price over the rest of this year, adjusting our 3/6M targets to \$70/85/t from \$90/110/t previously.
Europe Steel	SSAB: Strong earnings, favorable geo and product exposure, limited scope for earnings revisions; reiterate Buy 25 July 2022	We have received several questions from investors on whether 2Q earnings will trigger further consensus estimate downgrades. Whilst we remain cognisant of macro climate downside risks to the steel industry, we believe the market has already incorporated a moderate economic downturn into macro projections, with consensus pricing in EU HRC ~31% lower vs spot (on a 12-month-forward basis). Further, we note that 2023 EBITDA expectations have already fallen ~15% from their April peaks. We see limited scope for further downgrades unless the market anticipates a deeper regional macro deterioration, a GFC-type crisis (i.e., EU-27 GDP down 4.2%, EU steel demand down 21%).



Global Inves
The Goldman Sachs Gr

Disclosure Appendix

August 31, 2022

Investment Research

Group, Inc.





Disclosure Appendix

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We, Nina Dergunova, Paul Young, Trina Chen, Emily Chieng, CFA., Geydar Mamedov, Yi Wang, Marcio Farid, and Ilya Dmitriev hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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Growth is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACF) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

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Goldman Sachs Investment Research global Equity coverage universe

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