

- Genesis was approached by members of Chrome SA to provide an independent economic assessment of the likely impact of the proposed export tax on chrome ore
- The key departure point for our assessment was the TIPS report which ultimately recommended an export tax to DTIC
- We appreciate the difficulties facing the ferrochrome sector and are not necessarily against the use of export taxes *in principle*
- However, in this particular instance our analysis suggests the tax to be a high-risk intervention which will likely impose a significant cost on non-integrated chrome producers while delivering uncertain benefits for the ferrochrome sector
 - As a result of market responses to the tax there is a material probability of significant job losses in SA non-integrated chrome mines, with no compensating increase in employment in the integrated mines
 - Whilst the ferrochrome sector may benefit to some degree, this impact is highly uncertain and likely much more muted than anticipated

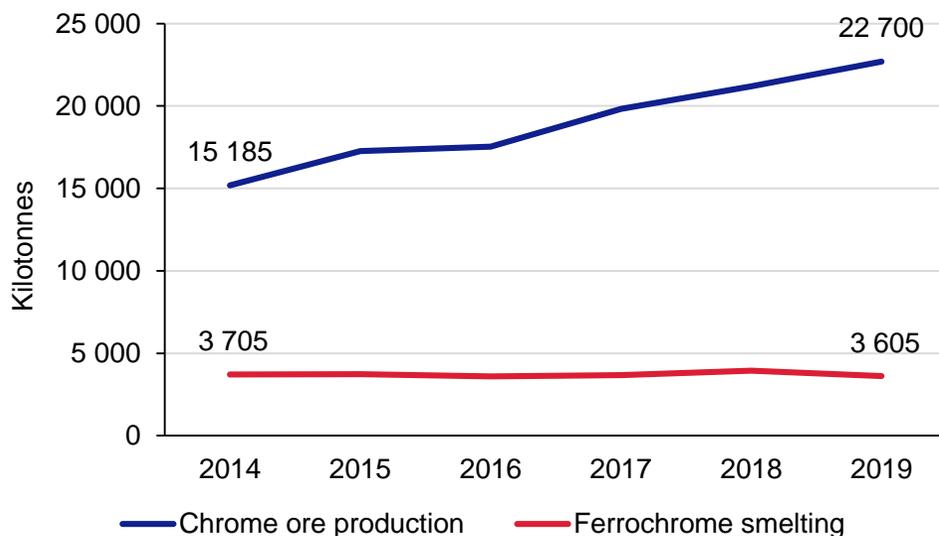
CHROME ORE MINING

- Chrome ore production has seen significant growth in recent years :
 - Approximately 50% growth in production over last five years
 - Production split: integrated-41%; non-integrated prime-33%; UG2-26%;
 - SA currently exports 13.6 million tonnes of chrome ore: mainly sold into China and accounts for 76% of global chrome ore exports.
- Non integrated producers almost entirely export focused: integrated players also export substantial volumes.
- Chrome ore mining employs ~ 22,904 individuals, of which ~**10,808** are employed by non-integrated chrome ore producers

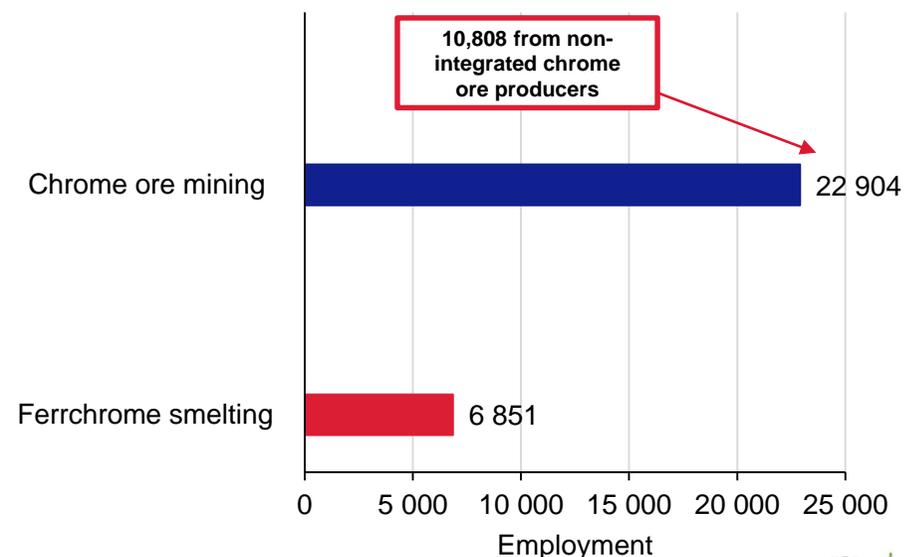
FERROCHROME SMELTING

- Production stagnant over the last few years and significant consolidation with 99% of production now attributable to 2 integrated players (Glencore and Samancor)
- Share of global production has dropped from approximately 40% in 2010 to only 24% in 2019
- Losses in international competitiveness and export market share mainly due to: (i) steep electricity price increases, and (ii) aggressive Chinese ferrochrome expansion
- Has resulted in the industry experiencing a significant reduction in employment – currently at ~**6 851**

Chrome ore vs ferrochrome production



Chrome ore vs ferrochrome direct employment, 2019



G: Many of the arguments in support of the proposed chrome ore export tax are either flawed or highly speculative

Logic of the tax: attempt to leverage global position of SA chrome ore exporters in order to raise the cost of Chinese ferrochrome and thereby increase the relative competitiveness of SA ferrochrome (See Appendix A for economic theories of export tax)

Outcome of the proposed tax critically depends on the complex chain of responses by other players in the global chrome value chain. Many of the extreme assumptions which underpin the proposed logic of the export tax are either highly uncertain or simply do not hold :

Assumption 1: SA chrome ore producers have sufficient market power to increase the chrome ore price without losing market share in the export market Thus no harm to SA chrome ore miners is assumed.

Potential leakages:

- a) International chrome ore producers have excess capacity to displace material volumes of SA chrome ore
- b) Chinese ferrochrome producers have significant countervailing power.

Assumption 2: Increased chrome ore prices will reduce the relative competitiveness of Chinese ferrochrome producers and lead to a shift in Chinese stainless steel preferences in favour of SA chrome ore.

Potential leakages:

- Various responses by China are likely to dilute the impact of the export tax:
- a) State supported ferrochrome/stainless steel in China absorb additional cost to retain market share
 - b) Retaliatory trade policy aimed at SA

Assumption 3: The export tax will lead to a significant increase in the achievable revenue for SA ferrochrome producers – this will improve the sustainability of these operations.

Potential leakages:

- a) Only SA's exports to China and Indonesia can expect any form of benefit (i.e. only 48%-60%* of exports).
- b) Other international ferrochrome producers who are not reliant on SA chrome ore will provide a competitive constraint on prices in China/Indonesia.
- c) Rising electricity prices will erode any potential benefit in a couple of years

** 48% figure based on official SARS data – although ferrochrome sector suggest it may be closer to 60%*

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Impact on South African chrome ore producers and ferrochrome producers

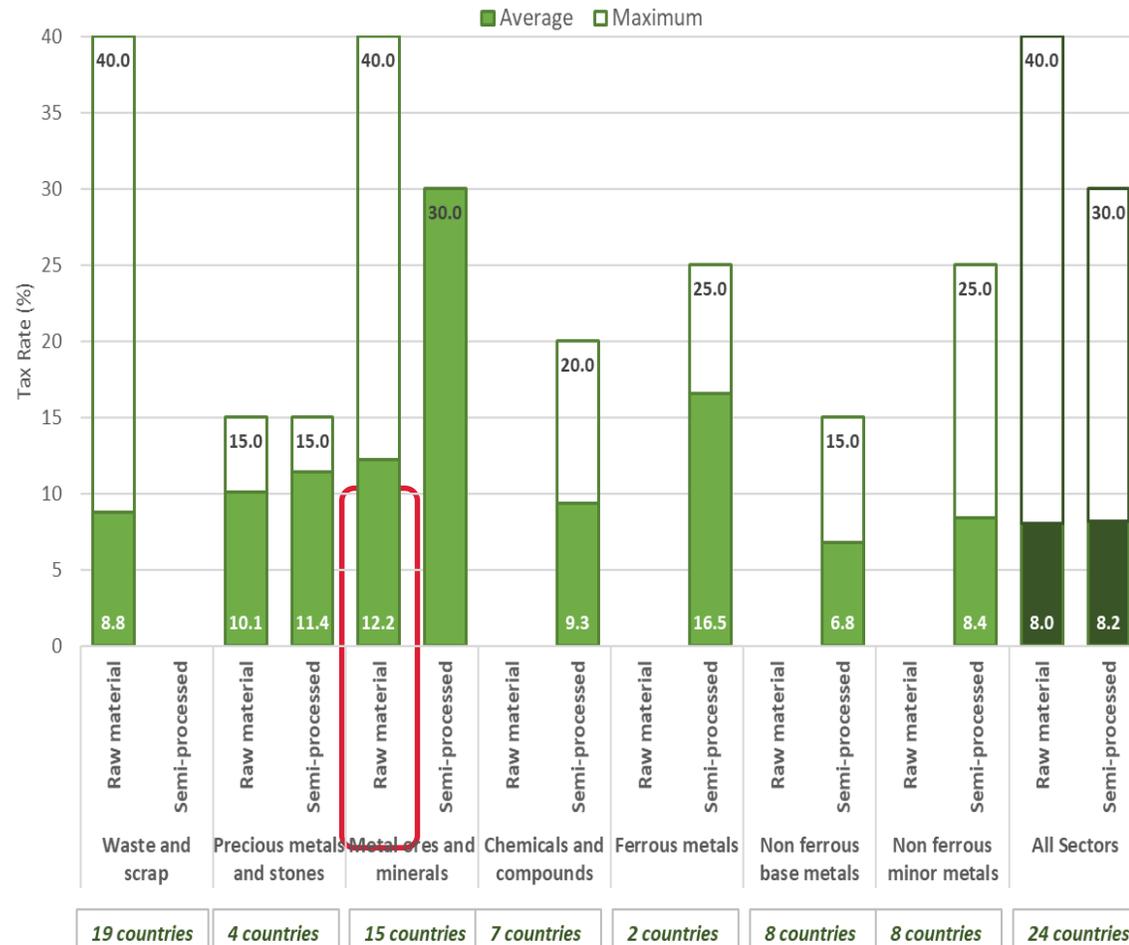
Conclusion

G: Finding #1: Export taxes can work – but only under limited circumstances

International experience:

- Mostly used to secure domestic supply for downstream industries and not generally aimed at disadvantaging international downstream competitors.
- Therefore, the objective of the proposed export tax is fairly novel.
- Upper end of considered tax scenarios of 30% is significantly higher than export taxes applied across other sectors (average 8%).
- Impact in practice (based on case studies):
 - Primary raw material producers – **almost always negative**
 - Downstream processing – **mixed**
- Recognition in practice that export taxes require a trade-off across linked industries in a value-chain

Average and maximum export tax rates by sector, 2017

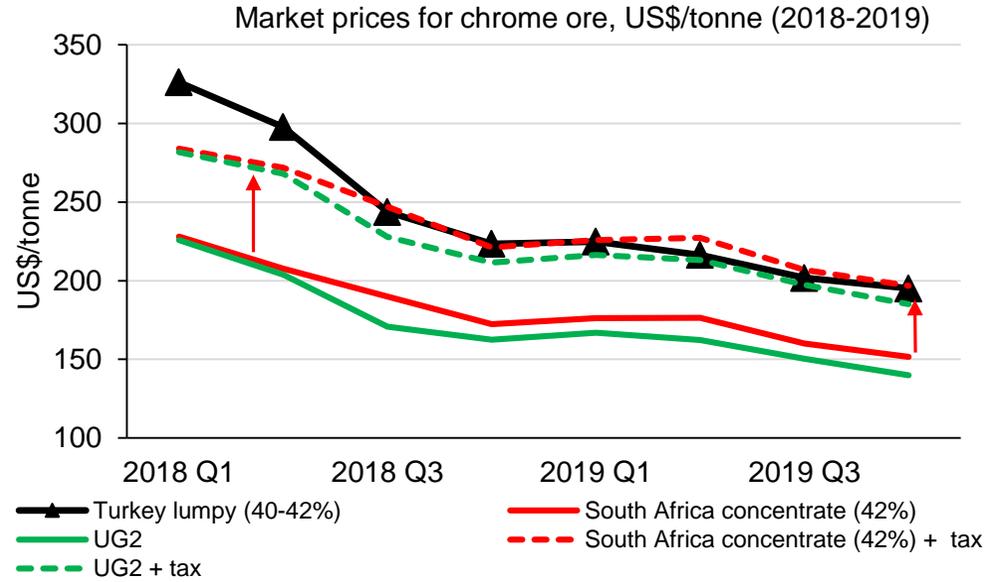


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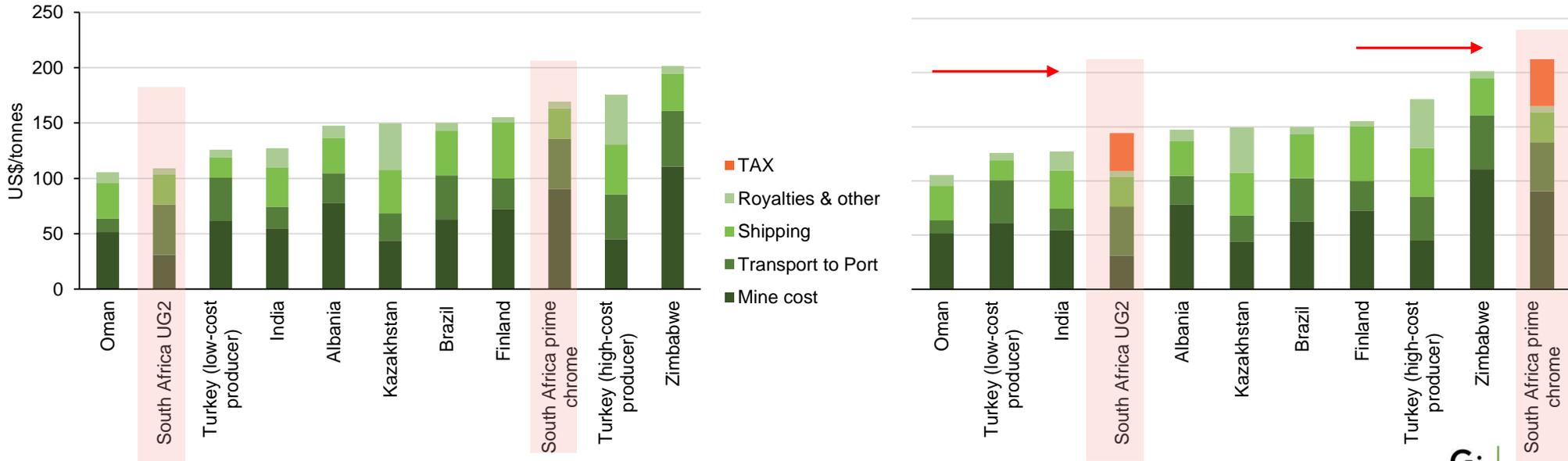
Finding #2: Significant portion of SA chrome ore exports vulnerable to displacement

- SA chrome ore will become less competitive if the tax is implemented – in terms of both cost (below) and price (right) basis.
- Some international chrome ore producers can increase production levels in response to this and displace SA chrome ore.
- Estimated that **22% to 32%** of SA current supply to China would be vulnerable to displacement. (See Appendix A for detail)

Implication: *Extreme assumption that SA has sufficient market power to pass on the tax and avoid displacement of exports is misplaced. Instead likely that exporters would need to absorb a significant portion of tax to avoid losing export volumes*



Pre tax Cash cost of production of chrome ore, CIF China (US\$/tonne) **Post tax**



G: Finding #3: Chinese ferrochrome producers have very strong countervailing power

China's countervailing power stems from:

- Its ability to displace significant volumes of SA chrome ore with supply from other sources;
- SA's almost complete dependence on China as a buyer of export chrome ore;
- China's unified buying patterns (including close relationships between ferrochrome and stainless steel producers, and the state);
- Significant Chinese stockpiles of chrome ore.

Implication: *The countervailing power held by Chinese ferrochrome producers counteracts any market power that SA chrome ore producers may have – at least to some degree. This contributes to SA chrome ore exporters being unlikely to be able to pass through the full tax amount, meaning that the chrome ore producers in SA will need to bear part of the cost of the tax.*

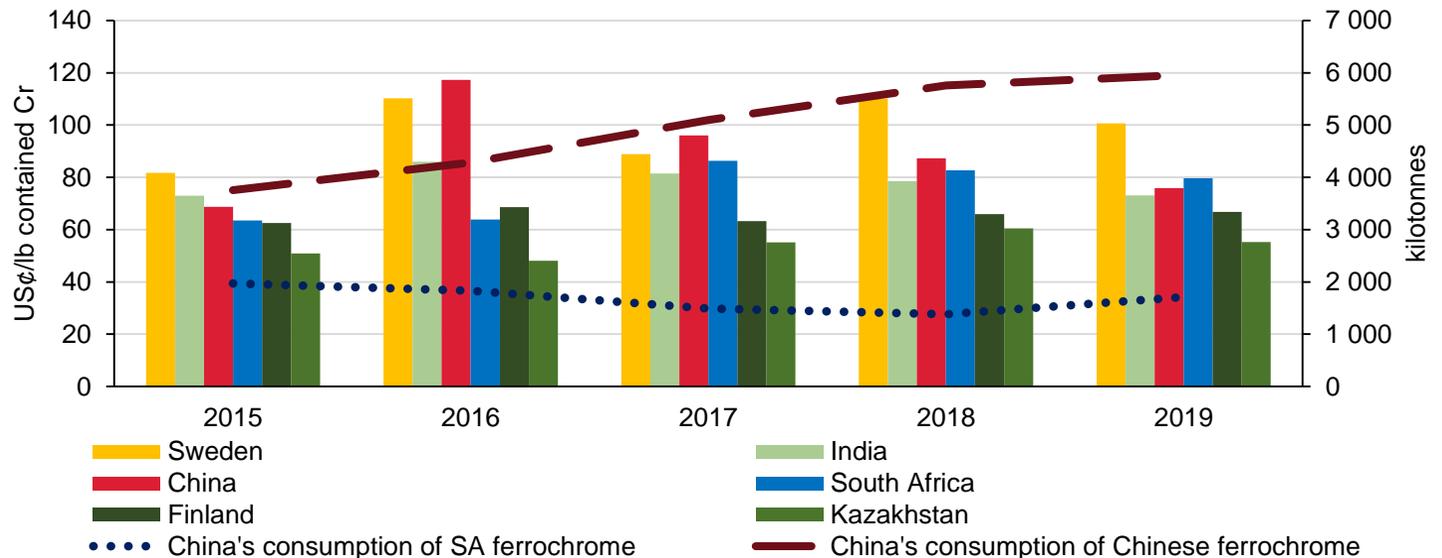
G: Finding # 4: Response of China highly uncertain

It is not possible to predict with certainty how Chinese policy makers, and the ferrochrome and stainless steel players will respond to the export tax. However, there are a number plausible and rational responses that exist, which would dilute the impact of the export tax:

- Increased subsidies and other forms of support for ferrochrome industry.
- Trade policy directed at South African ferrochrome industry e.g. import tax on South African ferrochrome coming into China.
- Stainless steel producers may absorb the small increase in price (approximately 1%-3%) for strategic and political reasons.

Implication: *There is great uncertainty as to whether the proposed tax will harm Chinese ferrochrome competitiveness to the point where the Chinese stainless steel sector shows a substantial increased preference of ferrochrome from SA instead of local ferrochrome producers in China. [TIPS reach a similar conclusion]*

Delivered cost of ferrochrome into China by country 2015-2019, US¢/lb contained Cr

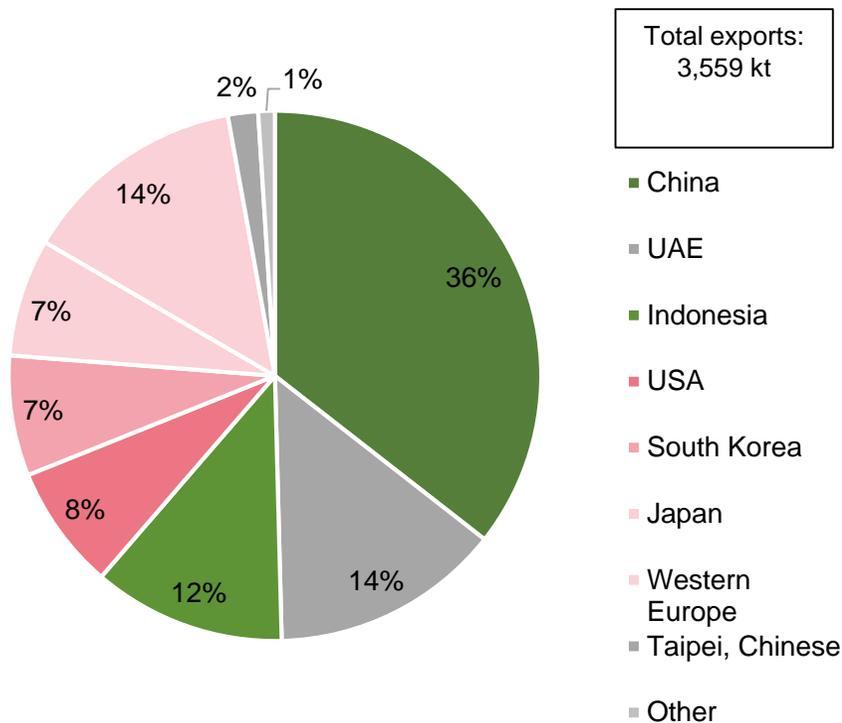


Evidence of Chinese stainless steel's willingness to absorb higher costs to support domestic ferrochrome

Finding #5: Any potential benefit to SA ferrochrome exports limited to China & Indonesia

- Tax only directly impacts Chinese and (to a lesser degree) Indonesian ferrochrome producers as these are the only international players reliant on SA chrome ore – all other major ferrochrome producers have own chrome ore supply.
- A significant proportion (between 40%-52%) of South African ferrochrome is exported to major markets unaffected by the tax.
- Any decreases in Chinese and Indonesian competitiveness also benefits other international ferrochrome competitors. Therefore potential gains for SA further diluted by vertically integrated competitors from Kazakhstan, India etc also supplying into China

Share of South African ferrochrome exports by destination, 2019



Share of Chinese ferrochrome imports by producer, 2019

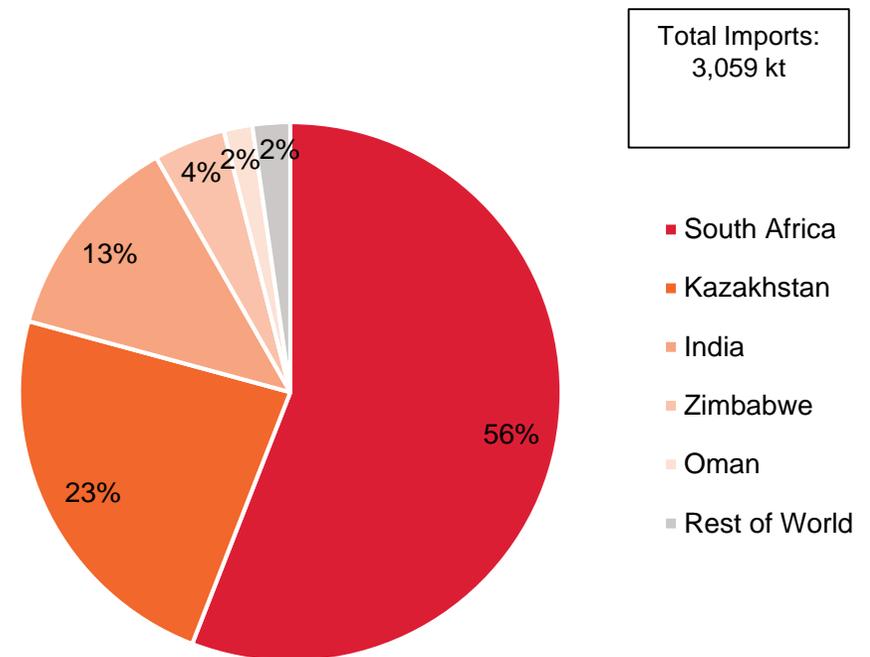


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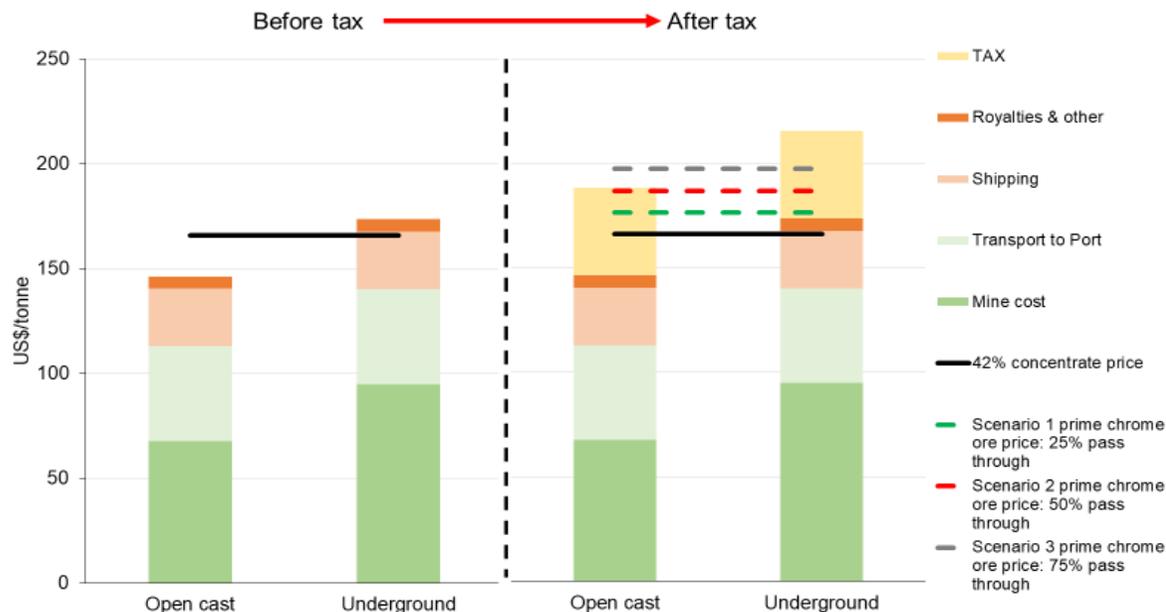
Impact on South African chrome ore producers and ferrochrome producers

Conclusion

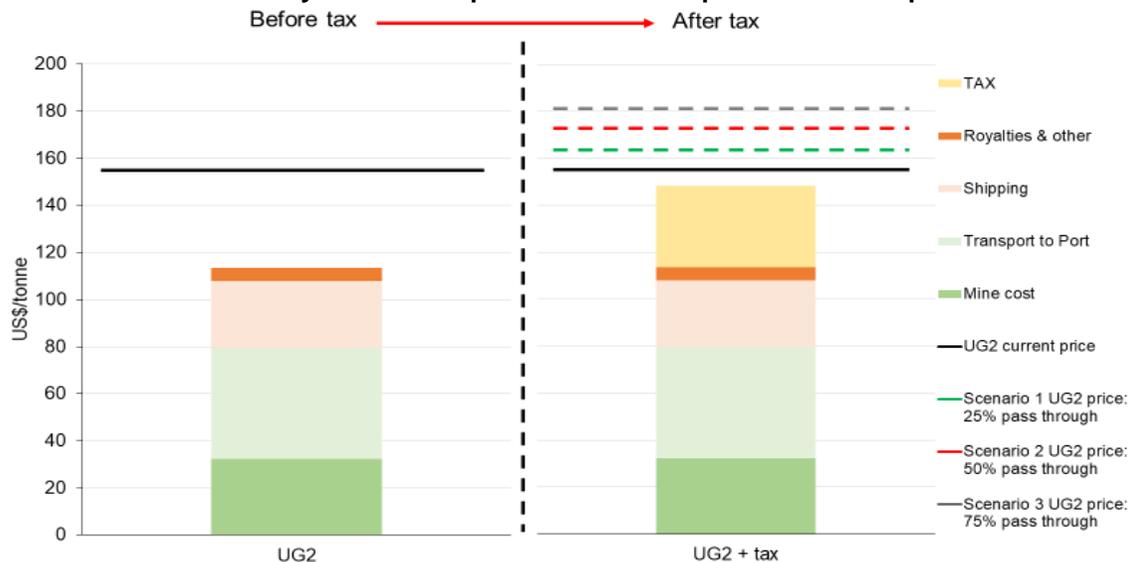
G: Impact on South African chrome ore producers

- The tax will force chrome ore exporters to reduce effective export price due to a) potential displacement at higher prices, and b) Chinese countervailing power.
- Chrome ore operations serve as vital economic hubs in non-metropole towns across Limpopo, Mpumalanga and the North West. Many of the chrome recovery projects are done through JVs with the local communities.
- Non-integrated primary chrome producers** will be most impacted - reliant on exports and highest production costs.
 - Effective prices likely to drop significantly below cash costs (2019)
 - Makes mining operations vulnerable and up to **9,528 direct jobs (+ 33,496 indirect jobs) at risk.**
 - Consistent with financial information from sample of producers
- Integrated primary chrome ore producers** will also be impacted but they are less exposed as the bulk of their sales are to their own ferrochrome smelters.
- UG2** cost advantage reduced (is a low-grade ore in international terms) – these sales are important to the platinum industry who employ ~100,000 miners in operations linked (in part) to chrome ore production.
- Since 2019 chrome ore price has dropped between 10% and 20% further.

Scenario analysis of the impact of the 30% export tax on primary chrome ore producers



Scenario analysis of the impact of the 30% export tax on UG2 producers



Impact on South African ferrochrome producers is, at best, highly uncertain

- Rationale is to increase the cost of Chinese ferrochrome producers and so improve the ferrochrome price and South African ferrochrome competitiveness;

However

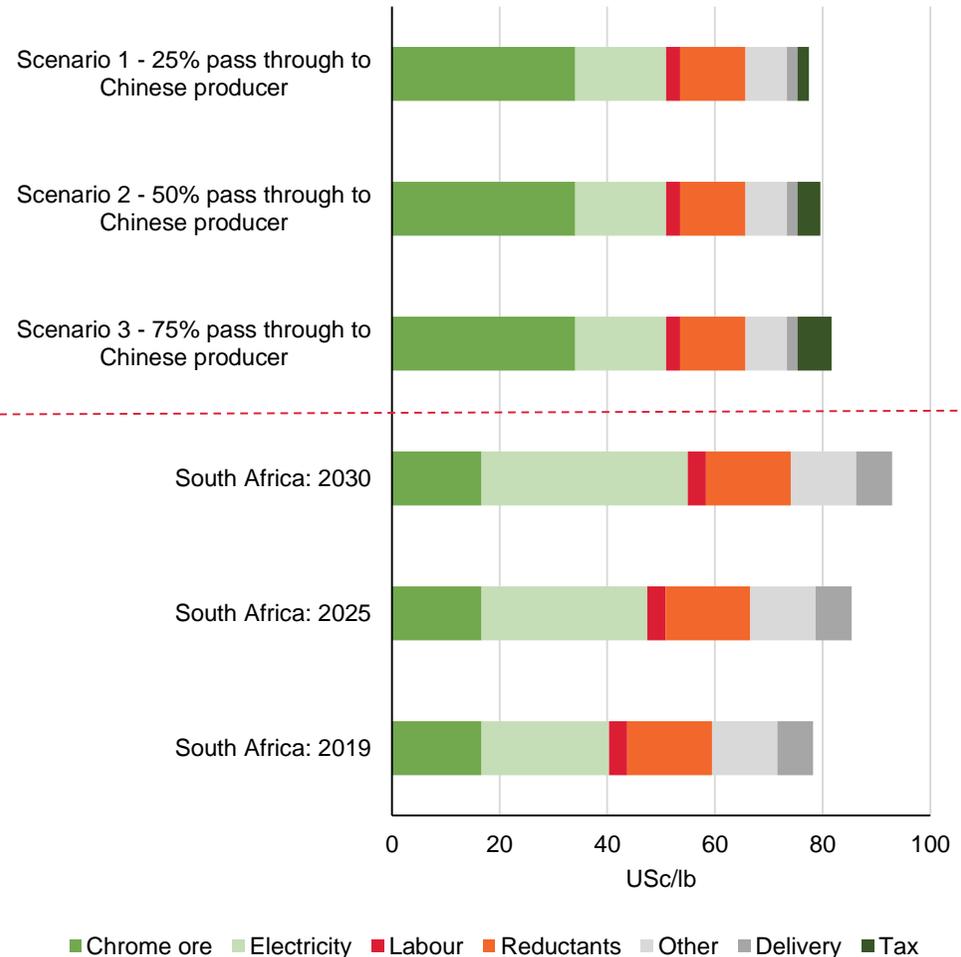
In short-run the benefit to SA will be highly diluted due to multiple leakages:

- Forced absorption of tax by SA chrome exporters;
- Ability of China to respond strategically to undermine logic of the tax;
- Benefit only in relation to SA ferrochrome exports into China and Indonesia (i.e. 48%-60%)
- Even in China part of the benefit will be competed away by the other global integrated ferrochrome producers e.g. Kazakhstan, India etc

Any competitive advantage will be lost in the long-run due to rising real energy prices.

Implications: *It is highly uncertain whether the proposed tax will achieve the desired benefits for the ferrochrome producers.*

Medium to long-term impact of energy prices on competitiveness of South African ferrochrome producers (assuming a 30% tax)



Source: CRU, Eskom, Statistics South Africa, Genesis analysis

G: Conclusion: Weighing the cost and potential benefit

Conclusions

1. Tax will likely impose a significant cost and risk on chrome ore producers – especially non-integrated prime producers

- Non-integrated prime chrome ore producers account for as much as a third of chrome ore production
- Non-integrated prime chrome ore producers have 9,528 direct employees (and 33,496 indirect jobs) which will be at risk
- UG2 producers will also be negatively impacted and will lose their cost advantage – these sales are important to the platinum industry

2. Extent of benefits to the ferrochrome sector are highly uncertain

- Various leakages in logic of the proposed tax which will heavily dilute any benefits
- Trajectory of energy prices imply any gains in relative competitiveness for SA ferrochrome likely eroded over time

In sum, the extreme assumptions which underpin the proposed logic of the export tax are either highly uncertain or simply do not hold.

The proposed export tax would be a high-risk intervention that would impose significant cost on non-integrated chrome ore producers, while delivering (at best) uncertain benefits for the South African ferrochrome sector

As a result of the assessed market responses, there is a material probability that the introduction of an export tax on chrome ore would lead to significant job losses in South African non-integrated chrome mines, with no compensating increases in employment in integrated mines. Whilst the ferrochrome sector may benefit, it will likely be more muted than anticipated, with a negative net effect on overall employment a material possibility.



G:ENESIS
UNLOCKING VALUE

Economic theory indicates that there are potentially two logical frameworks by which an export tax can drive beneficiation

1. Tax is used to secure access to raw materials for the domestic downstream beneficiating sector e.g. lower domestic price of raw material

Is not applicable here and has not been the rationale for the tax to date

2. Tax leverages global market power on the part of the upstream exporter to raise the cost of foreign downstream competitors

Primary logic put forward for the export tax on chrome ore

- SA ferrochrome producers are vertically integrated and have access to significant volumes of chrome ore in excess of own downstream requirements. They export significant chrome ore volumes.
- Implication: tax will not result in diversion of additional chrome ore to the integrated producers nor lower chrome ore costs for the SA ferrochrome.
- SA ferrochrome producers already enjoy a substantial cost advantage in terms of its chrome ore cost relative to international competitors (i.e. roughly half the cost of their Chinese counterparts).

G: Appendix B: Breakdown for potential to displace South African chrome ore exports

- At higher prices, international producers have underutilized capacity to increase supply (estimated at 32% of exports to China in table below).
- Confirmed against maximum export volumes over last decade (estimated at 22% of exports to China).
- Therefore estimated **22% to 32%** of SA current supply to China would be **vulnerable**

	Capacity (kt)	Production (kt)	Utilisation	Remaining capacity / viable supply to China (kt)
Turkey	2 391	1 007	42%	1 384
Zimbabwe	1 790	1 525	85%	265
Oman	1 445	707	49%	738
Albania	800	299	37%	501
Pakistan	600	328	55%	272
Iran	500	122	24%	378
Brazil	860	429	50%	431
UAE	200	135	67%	65
Total	8 586	4 552	53%	4 035

Conservative assumptions:

- only rely on existing spare capacity (no expansions)
- excludes unused capacity from Kazakhstan, India and Finland (due to significant level of vertical integration)
- assume Turkey can only increase up to historical max (not full spare capacity)