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RISKS, UNCERTAINTY AND CHALLENGES IN THE UK METALS SUPPLY-CHAIN

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Supply chains are increasingly “risk on” with questions on supply-surety becoming as pertinent as price reduction

1. Globalisation and outsourcing

- **Extended supply chains:** Australia → China → Europe → UK
- **Low redundancy in supply chains:** Effect of the Suez Canal blockage

2. Lost self-sufficiency

- **Reduced metals’ manufacturing** in the UK & Europe, with a focus on specialised materials for export
- **Poor mineral deposits** through Europe, partly offset by secondary sources (“urban mines”) – NB Development of critical minerals



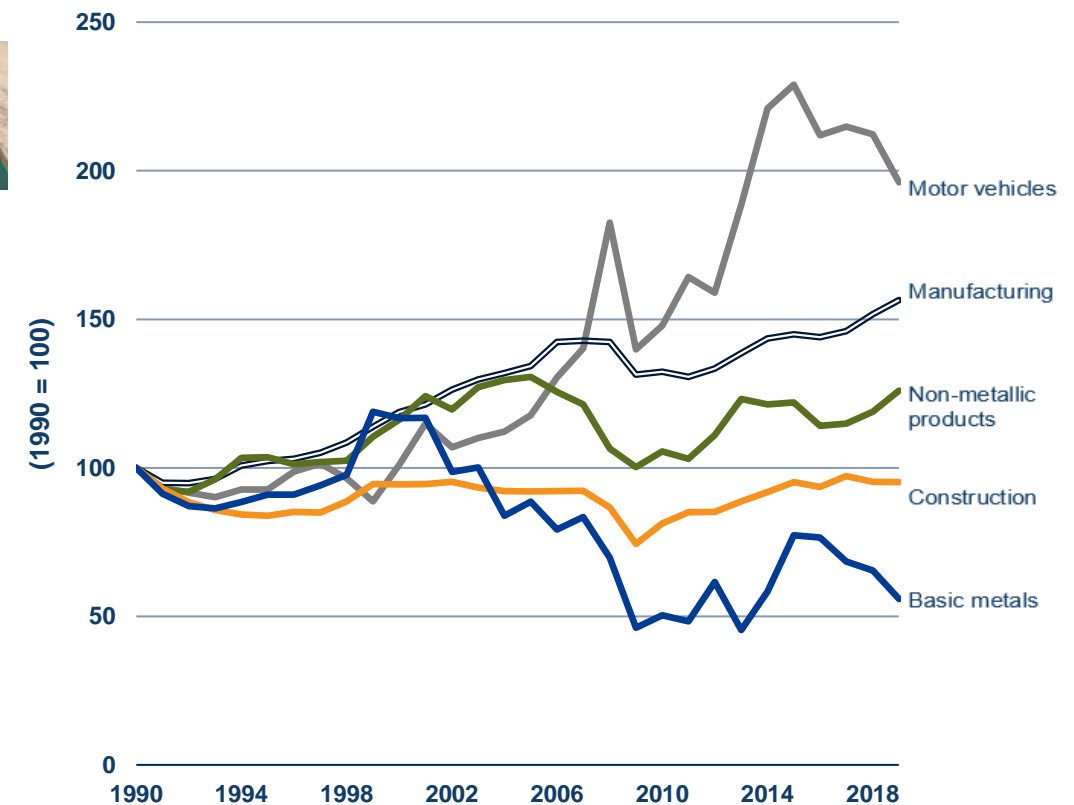
3. Focus on headline profitability

- **Low inventories/Just-In-Time:** Trading off profitability for resilience

4. Economic, political and social developments

- **Environmental/ESG regulation:** Adding costs/Production shifting to less controlled regions (CBAM seeks to address “carbon leakage”)
- **Increasing trade frictions:** Trading bloc isolation, resource nationalism, protectionism and export duties (US Section 232), Brexit
- **Geopolitical changes:** Ukraine-Russian war, Chilean mining code

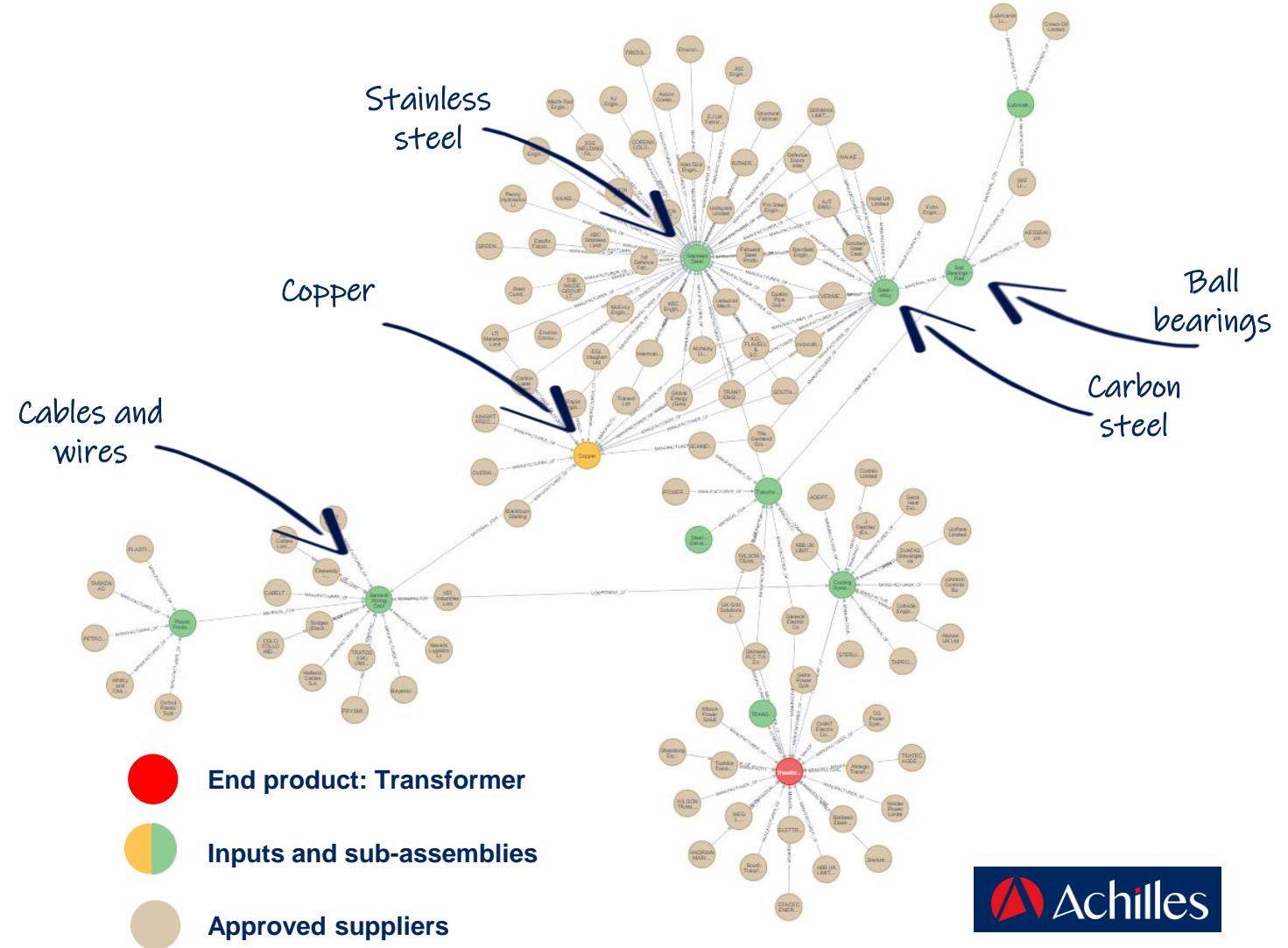
UK manufacturing gross value added by sector



Source: ONS

Relying on suppliers to provide can obscure the risks – Not removing and undermining the ability to control them

- Whether metal is imported directly or within components, the risks are maintained
- Treating upstream suppliers as an internal department allows risk reductions
- Open, clearer communications
- Understanding their constraints, so preparing or pre-empting problems
- **Stepwise approach to mapping down the supply-chain - A huge undertaking, but crucial:**
 - To understand logistical frictions and chokepoints
 - To recognise areas with poor resilience
 - To prepare for upsets and changes



While not solvable, applying existing tools allows adaption to the risks and options for mitigation when issues arise

1. Adopt a structured, company-wide approach

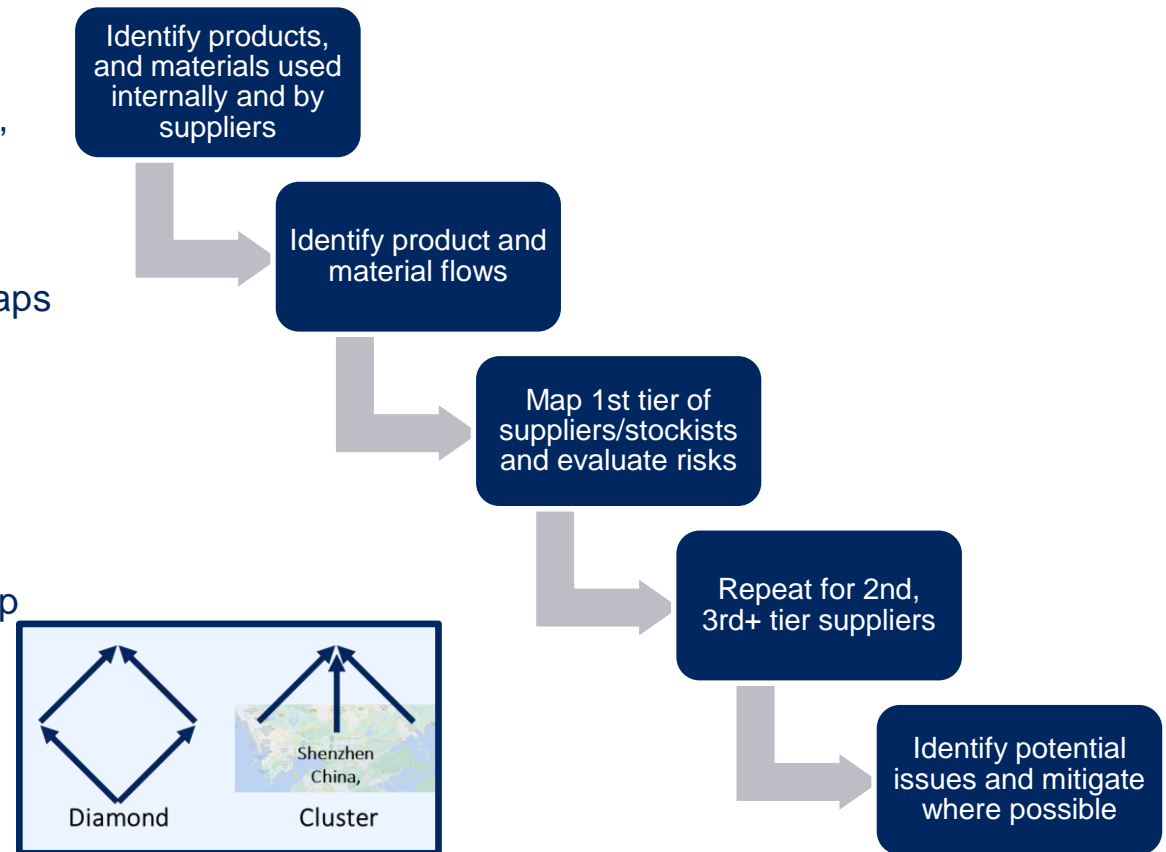
- Work backwards to identify the flows of products and materials
- Quantify the ‘cost-resilience’ trade-off
- Agree at the highest level, “What risk are we prepared to accept?”

2. Adapt supplier base and working practices to reduce impact

- **Stratify and add suppliers:** China the main supplier; Some from Eastern Europe; A local job-shop certified for one-offs and stop-gaps
- **Build inventories to appropriate levels:** Quantify holdings and restocking cycle times
 - If one/two deliveries are lost, how would production be affected?
 - How many deliveries have not been received over last 10 or 20 cycles?

3. Increase oversight of supply-chain

- **Map through your supply-chain:** Iterate and enlist specialist help
- **Increase market intelligence:** Develop a warning system, add metrics, schedule communication and supplier updates
- **Avoid geographical and topological problems:** Be wary of “Diamonds” and “Clusters”



“No solutions, only trade-offs”

Conclusion: **Higher risks to UK metal supply need not affect industry, but probably will**

- UK metals supply are increasing due to a plethora of economic and social reasons, and shifting manufacturing practices
- Companies can quantify and reduce risks by understanding flows through the supply-chain...
- ...and are able to minimise the impact of unexpected events through communication and monitoring...
- ...but risks will persist
- Understanding the trade-off between resilience and costs allows informed decisions

**Raise agility, clarify developments, build understanding and add protection
to better cope with increasing VUCA**