Wilton Park

Report

Critical minerals information – sharing initiative

Monday 20 – Wednesday 22 March 2023 | WP3087

Wilton Park

Report

Critical minerals information – sharing initiative

Monday 20 – Wednesday 22 March 2023 | WP3087

In association with Cabinet Office

Critical minerals markets are vital for shared aims such as clean energy transition to net zero and Sustainable Development Goals, but are often opaque and volatile. Inconsistent data reporting and asymmetries of information characterise such markets. Data discrepancies, gaps, limited traceability, and poor pricing mechanism transparency are commonplace in this context. Barriers to change result from policy, regulatory, legislative, economic and cultural constraints. International governance is lacking. Policy could drive beneficial change through efforts to improve interoperability, digitalisation and streamlining to reduce transaction costs, support for public / private cooperation, and multi-stakeholder coordination. To help address such challenges, which go beyond the scope of any single institution, this conference aimed to design a bespoke process to enable trial of a critical minerals markets information-sharing initiative with global reach (CriMMIS).

The conference convened stakeholders from governments, international organisations, the private sector, civil society and research communities. Discussions centred on resource classification and reporting standards, information-system design and technology, data reporting for companion products, ESG standards, price mechanisms, market indicators, data licensing, and terms of reference for a trial. Wider considerations included varied possible incentives to share data, issues of labelling, circular economy for trade, international standards, trust among market participants, the value of remote sensing, and other recent information-related initiatives. The conference made a range of recommendations. A fuller report available through the Critical Minerals Intelligence Centre and Wilton Park details the background.

Information uncertainty & asymmetry characterise critical minerals markets globally. Refinement of trade codes coupled with use of “materials passports” and strategic partnerships could help. Further work is needed to address data gaps and quality issues through improved granularity, consistency, and accuracy including by standard-setting designed for consistent terminology and metrics. International collaborations, including across disparate trading blocs, are needed to enhance market transparency.

Varied **resource classification & reporting** systems complicate the current information landscape. Work with multiple stakeholders across sectors could encourage data-sharing, deepen understanding, and help to fill resource inventory data gaps. Use of the United Nations Resource Management System could further facilitate data-sharing orientated towards a common purpose, such as net zero and related Sustainable Development Goals.

Potential solutions include innovative **information system design and standards**. Arrangements such as data pooling networks could play an important incentivising role by enabling consistency and reliability of reporting, reducing trade frictions and associated costs, enhancing clarity on liabilities, and building trust. Such developments could also help identify mutual data gaps throughout value chains for all stakeholders. Tiered data systems with clear objectives could encourage data-sharing only when necessary. Distributed ledger technologies and synthetic data could also play significant roles by enabling safe, pre-competitive and trustworthy environments for data pooling.

Digital disciplines enabling data standardisation through **data-driven technologies and system design** can help to shape policy, principles and protocols through a joint approach with stakeholders. These could also support better use of existing data sources.

Specific information challenges characterise **companion products** of which extraction tends to be driven by major primary commodities. There is a need to handle uneven granularity, varied reporting frequency and timeliness of data. Detailed reporting on all such companion products is unlikely to be feasible in markets characterised by structural scarcity. Work is needed to define a minimum viable set for which the data can be credibly validated. Initial attention could, for example, focus on Cobalt and / or Tellurium.

There is clear need for a more unified framework for **ESG standards** designed to build efficiency, including through simple and pragmatic solutions that accommodate the minimum and set priorities while meeting primary objectives. Use of relative baselines and improved baseline data could help. Multi-stakeholder and participatory approaches are essential to address issues of trust in this context.

Use of **price mechanisms** could help to manage volatility and reduce market opacity by enabling a greater share of long-term fixed-price contracts, and encouraging price reporting agencies to expand portfolios to cover non-commercially viable commodities. Liquid exchange-traded futures contracts could help to build deeper liquidity pools and facilitate industry use. Market weighting in price mechanisms could facilitate prioritisation of ESG issues. Such steps could improve data availability and reflection of market fundamentals. For small and illiquid markets governed by producer pricing, an independent entity mandated to aggregate and anonymise data could improve data availability. Encouraging producers to use a spot-trading platform for a specified fraction of transactions would enable anonymous real markets to shape prices. In this context, the private sector and governments should avoid a “one-dimensional approach” to supply.

Transparent, comparable, reliable and dynamic **market indicators** are needed. These should cover the full life-cycle of mining costs to drive sustainability, including management of legacy mines. Longer term decision-making time horizons need to go beyond annual or short-term political cycles. In this context, stakeholders need to understand the causes of inertia. Appropriate indicators should use expected standards of ESG competence and could extend to sector financial liquidity throughout value chains. Needed are alignment and harmonisation of sustainability ratings across agencies, including the full positive impact of mining throughout value chains to significant end products, such as off-shore wind turbines.

On **licensing and IP issues**, user feedback on data quality should encourage industry associations and data suppliers to lower their prices or to donate data for the good of both the public and the business sector globally. Appropriate steps should support due diligence to reduce industry costs and flag the benefits of linking industry with government data. Cross-cutting stakeholder engagement is essential for achievement of these objectives.

The **general approach to CriMMIS and its Terms of Reference** should recognise the existence of different business models. Steps enabling policy and trade coordination should frame a common global purpose. This should recognise needs both for sustainable and resilient supplies, and for cost reductions to ensure private sector engagement. A CriMMIS should specify data selection criteria and processes, enable data validation, and include use of five-year rolling timescales for forecasts such as for potential choke points. It should cover whole value chains and reflect the extent of market circularity. Scope for improved reporting should include ESG indicators and Sustainable Development Goals. Tiering of data could allow variable levels of engagement and help to differentiate standardised from bulk data-sharing. The role and capabilities of market consultancies need understanding in this context. Balanced ownership of a CriMMIS, including both private and public sectors, should allow parallel research and other forms of collaboration.

1. The conference convened multiple stakeholders from governments, international organisations, private sector, civil society and research communities (see Annex A). Discussions centred on resource classification and reporting standards, information-system design and technology, data reporting for companion products, ESG standards, price mechanisms, market indicators, data licensing, and terms of reference for a trial critical minerals information-sharing initiative with global reach. The recommendations indicate ways to develop critical minerals data standards and information-sharing. By supporting efforts to build a transparent and “level playing field” in critical minerals markets worldwide, this initiative will contribute to global governance in this field

Recommendations

On market information uncertainty and asymmetry

2. Action on technical and standards issues for market information to include:
    - Adoption of consistent terminology, and making better connections between existing datasets.
    - Data on trade at required granularity, plus clarity and consistent on the approach to key metrics used, such as currency and weights, to increase data accuracy.

3. Consideration of relative merits of evolving existing codes and standards, versus tweaking existing schemes such as HS codes, through:
    - Collaboration as a key strategy to tackle significant imbalances in power and markets.
    - Strategic partnerships between allied countries or regions while recognising the importance of a ‘just transition’.
    - Importance of acting – and therefore having information available - at a global scale, with input from BRICS and other blocs.
    - Consideration of the degrees and interoperability of data required to support differing degrees of international cooperation – from trade agreements to minerals cooperation agreements to bilateral MoUs.

4. Consideration of specific initiatives or aspects of proposals, such as:
    - The role of the proposed EU Observatory in data around future technologies.
    - The role of the World Customs Organisation to better differentiate / aggregate HS codes
    - Material passports.

On resource classification and market reporting systems

5. Relevant stakeholders – governments, industry, investors, academia, NGOs, indigenous communities and the public – should work closely to establish ways to incentivise data sharing.

6. Need to engage experts when compiling resource inventories to ensure that data gaps are understood and, if possible, additional data are incorporated.

7. Principles are not enough: data sharing, for example via a global database based on UN Resource Management System principles, could underpin outcomes as expressed in the Sustainable Development Goals as implemented in industries, such as textiles and timber.

On information system design, indicators and standards

8. There is a need to:
   - Encourage consistent and wider use of a unified product classification system.
   - Identify data gaps in value chain and concentrate on market products level.
   - Incentivise parties from industry to support reliability data.

9. .Industry should be incentivised to reduce friction on trade. For example, the Ecosystem of Trust Programme[1] shows that distributed ledger technologies can enable operations to run faster than paper-based systems. Significant incentives to industry participation include deciding where liabilities lie, having a "frank conversation", avoiding costly delays, and having a disruptive business model.

10. Introducing a tiered data system, in which data are exchanged only where necessary and of which the purpose is clearly stated, can also offer good incentives.

11. For a Data Pooling Network, a safe, pre-competitive and trusted environment can incentivise sustained participation by industry partners. Such a Network could be formed using synthetic data with distributed technologies.

12. At the level of critical products in the value chain, an understanding of data gaps, and a focus on mutual knowledge gaps for both government and industry, can help save significant cost and effort where the approach is to pool as much data as possible.

13. Encouraging as many partners as possible to use the same "resource map" or classification system, such as UMIS[2], and to bridge any data gaps using Bayesian Material Flow Analysis, would be a more future-proof approach.

On data driven technologies to improve information system design

14. To help improve information system design, there is a need for:
   - Digital discipline" to include standardised data generation.
   - Better use of existing sources, not necessarily more or different data.
   - Principles & Protocols as well as incentives.
   - Data-driven policy design.
   - A joint approach by both markets and governments.
   - Follow-up on "forensic" evidence of design efficacy and take-up by industry

15. New technology can provide good outcomes for data management. While this is a necessary contributor, it is not sufficient. Standards, policy, economic and diplomatic or international efforts need to go hand-in-hand with the technology.

---

[1] https://www.gov.uk/government/news/transformational-border-pilots-to-create-an-ecosystem-of-trust

[2] R.J. Myers et al. 2018. Unified Materials Information System (UMIS). An integrated material stocks and flows data structure. *Journal of industrial ecology* 2018 doi:10.1111/jiec.12730. R. Myers et al. 2019. YSTAFDB, a unified database of material stocks and flows for sustainability science. *Nature Scientific Data* doi/10.1038/s41597-019-0085-7.

7. https://www.fao.org/policy-support/mechanisms/mechanisms-details/en/c/428659/

On lessons from experience with the Agricultural Markets Information System

16. Any critical minerals market information system:
    - Requires strong international political support (at G7 / G20 level) and secure funding if it is to establish trust, effective collaboration and deliver timely and impactful analysis for policy- and decision-makers.
    - Requires the development of a team to ensure effective working with national authorities and both the public and private sectors to enable data collection and collation, recognising the difficulties of accessing and sharing commercially sensitive or proprietary information.
    - Should have an agreed and clear mandate and scope, with tightly defined deliverables and outputs, if it is to be successful.
    - The national and international response to a crisis will be the "acid test" of any system in terms of providing timely, transparent, quality analysis for policy- and decision-makers.

On consistency and clarity of reporting on companion products

General approach to a CriMMIS

17. Important considerations include:
    - Specification of a process to select data sets for inclusion, use, primacy and / or visibility.
    - System validation e.g. using at least one (or more) well-understood mineral.
    - Recognition of different business models for critical vs. strategic minerals.
    - Scope for parallel geo-metallurgy research and / or collaborations.
    - Scope for better reporting e.g. World Customs Organisation reclassification.

Co-product=specific recommendations for a CriMMIS

18. Important points to recognise include:
    - A need for "low-hanging fruit" to enable a CriMMIS launch.
    - Unlikely feasibility of detailed reporting on all co-products at onset.
    - Need for system to handle co-products even if initial focus cannot cover all or update with the granularity or frequency possible for other minerals.
    - Value in obtaining a minimum viable set of reporting about all minerals, not just those of immediate concern.
    - Need for corporate buy-in for reporting of low tonnage materials.
    - An initial co-product focus could be on (1) Cobalt and / or (2) Tellerium.

"

On consistency and clarify of reporting on ESG standards

19. Consideration of mandatory procurement standards to encourage stronger ESG supply chains or to ensure that wider regulations drive change in specific sectors. Precedents include:
    - Minimum levels of recycled plastic to be used in bottles.
    - Anti-bribery legislation influencing company behaviour over time.
    - Water quality regulation by setting minimum standards.

20. Development of a more unified standards framework to enhance efficiency. Risks include:
    - A "race to the top" in which "big brands" unintentionally and negatively affect both supply chains and ESG standards adoption.
    - Smaller producers being side-lined and selling to other markets.
    - Companies using vertical integration to ensure supply and standards but with associated inefficiencies.

21. A more flexible approach to Artisanal and Small-Scale Miners to encourage suppliers to engage in risk management e.g. by providing assurances that they will avoid penalty for identifying risks. This could

- Enable a fair price e.g. for the reported 20% of cobalt from ASMs in DRC.
- Support safety management and capacity building, including to finance.
- Require continuous due diligence engagement, not a one-off process.

22. Focus on the opportunity ESG standards offer e.g. through Just Energy Transition priority for net benefits and fair distribution. This should:
    - Avoid falling below critical thresholds for mining.
    - Avoid overloading operations with inefficient ESG standards.
    - Consider the end-goal.
    - Provide simple and pragmatic solutions.
    - Avoid impracticable “one-size-fits-all” approaches.
    - Accommodate lowest as minimum but allow headroom for the capable.

23. Improve assurances by using new technology including satellites and appropriate incentives. Recognise that ESG is a differentiator and that there is a need for multi-stakeholder approaches.

24. Consider use of sustainability-linked loans (SLLs) to provide an incentive. Banks do little to focus on these but prefer a “green” label when deeper engagement is needed. Lack of engagement leads to “greenwashing”. For companies, brand protection is more important than Intellectual Property (IP). ESG is not an issue of IP concern: if done properly, the whole sector would gain equitable benefit.

25. Use a multi-stakeholder approach to overcome trust issues in ESG standards. There is a wide range of ESG standards with variable effectiveness, in part because those who bear costs may not participate in their development. Such unilateral approaches can affect small producers who are eventually priced out.

26. Consider incentives, such as grants to ESG standards providers, to attract private capital. The Towards Sustainable Mining (TSM) commitment of the Mining Association of Canada works well because mining companies participated in its design, although it has had mixed traction with investors as some groups were not involved in the process.

27. Look to ensure that ESG approaches go beyond specific projects or companies. Currently ESG standards predominantly focus on mines (opening, operation, closing), rather than on improving surrounding areas. To support a wider focus, baseline data quality needs to improve. Any new ESG framework should consider how it contributes to the COP15 Biodiversity Commitment.

28. Consider sector-specific ESG standards data, which could support a Critical Minerals Information Sharing initiative. The plethora of current ESG standards, with varying impact and metrics, hampers overall data utility.

29. Look to simplify the current ESG system around critical minerals, including through:
    - Identification of the ESG standards that are most impactful and bringing these under a single umbrella that encourages common baseline and data points.
    - Considering, for the longer term, a new mining standard that works for industry, consumers, investors, civil society and has the backing of governments, and has built-in flexibility ensure cultural and country specific baselines are recognised

30. Form a group able to convene discussions on standards with resource-rich countries. Existing groups could include the Mineral Security Partnership or the Canada-led Sustainable Critical Minerals Alliance.

On price mechanisms

31. Critical minerals should have a greater share of long-term fixed price contracts (e.g. 50%). Long-term fixed price contracts are the main method for overcoming price volatility. Both parties must accept that this may not give the optimal price at any given moment, but will provide security for both producer and consumer.

32. Prioritise ESG considerations / weighting for pricing mechanisms. Beyond pricing, governments and the private sector need to move away from a uni-dimensional approach to supply. Consumer economies cannot compete (e.g. with China) solely on price.

33. Improve data availability to reduce notional market fluctuations and better reflect market fundamentals. Speculation will, however, result in some degree of volatility even in markets that are fully transparent or as good as the information can be.

34. Mandate an independent entity to aggregate and anonymise data to improve transparency in small, illiquid markets for critical minerals governed by producer pricing. This could be a role involving governments.

35. Incentivise Price Reporting Agencies to expand their portfolios to cover commodities which are currently not commercially viable.

36. Governments could look to incentivise market actors to use liquid exchange-traded futures contracts to hedge and speculate. These would provide deeper liquidity pools, enable such contracts to be useful to industry, and reduce both price volatility and market opaqueness. Some such contracts exist (e.g. for cobalt and lithium) through the London Metal Exchange.

37. Governments could look to encourage producers and consumers to place a certain percentage of their transactions on a spot-trading platform to discover prices based on transactions. This allows buyers and sellers to match their transactions and therefore to form an anonymised price based on physical market transactions.

On clarity and consistency of reporting on market indicators

38. Create transparency and comparability on the full life-cycle cost of mining. Current market-led indicators are not driving sustainable mining. It can be difficult to compare different type of business. ESG ratings industries cannot meaningfully evaluate companies where ratings are not mining-specific, or focus primarily on operating businesses.

39. Create sustainability ratings specifically for mining. There is a need for harmonisation across all ratings agencies. “Green financing” does not tend to appreciate the full positive impact of mining projects.

40. Develop dynamic indicators. Historically most data evaluation has focused on credit assessment and ability to recover investment. Such evaluation has been neutral, professional, and expert-led using empirical and structured methods and empirical. Legal areas are more difficult to evaluate, more subjective, and serious in potential repercussions. ESG assessments now increasingly include gap analysis on expected standards of competence along with a path to alignment.

41. Recognise and use indicator knowledge as quickly as necessary. Sophisticated mid- / long-term indicators of industry trends, supply / demand gaps, and scenarios exist. Substantive knowledge exists on mid- / long-term market fundamentals and commodities issues (e.g. energy transition metal demand vs supply shortfalls known for >5 years); but attention and action are scarce.

42. Policy-makers, investors and others should encourage a change in horizons for decision-making beyond the next annual announcements or political cycles to reach over the longer-term, and should understand the causes of inertia.

On data licensing and IP issues

43. Data suppliers / third party suppliers or industry associations can be incentivised to sell data at a reduced cost / donate, for example by:
    - feedback on quality of their data (benchmarking);
    - feedback how their data will be used;
    - application for public good and industry good;
    - support to complete due diligence in reduced cost to industry (e.g., modern slavery in supply chain); and
    - benefits in data linkage with government data.

On adapting AMIS Terms of Reference for critical minerals

44. AMIS terms of reference could be adapted for CriMMIS along the following lines:
    - Report “potential choke points” rather than; “abnormal market conditions.
    - Include timescales with rolling annual forecasts looking 5 years out.
    - Incorporate the SDGs and ESGs.
    - Reflect circularity of markets and whole value chains.
    - Use policy and trade coordination as the framing principle and a global common purpose, recognising the challenge as ensuring supply is sustainable and resilient.
    - Include refining and processing as well as production in scope.
    - Draw together public and private sector actors.
    - Balance ownership of the mechanism.
    - Note the incentive to draw in private sector through cost reduction.
    - Note the main players:
        - Private sector: producers, processors, end-users
        - Intermediates (e.g. Geological Surveys)
        - International organisations
        - Governments as enablers
    - Use data tiering to differentiate bulk data and standardised data, so as to recognise different levels of engagement and data-sharing across private and public sectors.
    - Include waste, recycling, and reuse along with “design to recycle”.

ANNEX A. PARTICIPATION IN 2023 WILTON PARK CONFERENCE ON A CRITICAL MINERALS INFORMATION-SHARING INITIATIVE

National authorities	International organisations	Private enterprise / civil society	Research / think-tank communities
Argentina	International Council on Mining and Metals	Société Générale	British Geological Survey
Chile	OECD	Satarla	United States Geological Survey
France	UN Economic Commission for Europe	Rolls Royce	University of Exeter
Germany	World Trade Organisation	Teck Resources	Imperial College London
Japan	Extractive Industries Transparency Initiative	Critical Minerals Association	Institute of Urban Environment, Chinese National Academy of Sciences
South Korea	Agricultural Markets Information System	Everledger	Politecnico di Torino, Italy
United States	UN Economic Commission for Africa	Johnson Matthey	
United Kingdom	World Economic Forum	London Metal Exchange	
		Mines to Markets, PACT	
		Rare Earth Industry Association	
		Benchmark Mineral Intelligence	
		Chainvine	
		Trafigura	

HMG participation comprised representatives from the following Government Departments: BEIS, CO, DEFRA, DIT, FCDO, HMRC, MOD, and ONS.