

From competition to a sustainable raw materials diplomacy: pointers for European policymakers

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SWP Research Paper

Melanie Müller, Christina Saulich, Svenja Schöneich and Meike Schulze

From Competition to a Sustainable Raw Materials Diplomacy

Pointers for European Policymakers



Stiftung Wissenschaft und Politik
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International and Security Affairs

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- German and European businesses are highly dependent on metals. Demand for these raw materials is expected to grow even further as they will be needed for the green energy and electric mobility transition, digitalisation and other emerging technologies.
- Geopolitical developments influence security of supply. China's central role in mineral supply chains is a major factor of uncertainty in this context.
- The European Union has set ambitious sustainability targets. Implementing these in complex multi-tier metal supply chains is no easy matter, given the magnitude of environmental and human rights risks.
- Nevertheless, sustainability should not be sacrificed for security of supply. Instead, the European Union should pursue a strategic raw materials policy that reconciles the demands of both.
- The two biggest challenges in sustainability governance are: firstly, the diversity of standards and their inconsistent implementation and enforcement; and secondly, power asymmetries and lack of transparency along metal supply chains.
- A sustainable raw materials policy must seek to reduce dependency through strategic diversification and partnerships with countries that share European values. Transparency-enhancing measures and a regulatory "smart mix" will be decisive elements.

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From Competition to a Sustainable Raw Materials Diplomacy: Pointers for European Policymakers

European businesses depend heavily on imported metals as the bloc possesses very limited reserves of its own and recycling cannot satisfy demand. Given the pace of developments in green energy, electromobility and digitalisation, demand for metals is expected to increase significantly in coming years. The International Energy Agency (IEA) expects global demand for critical metals for green energy technologies to quadruple by 2040.

The discussion has been driven by rapid real-world developments. First the Covid-19 pandemic starkly exposed the structural risks associated with supply chains. Then the Russian invasion of Ukraine disrupted supplies of metals such as nickel, as well as food and energy. Making matters worse, great uncertainty has arisen over China – a central actor in the supply chains for many critical metals. We are currently observing growing geopolitical rivalry over access to metals.

These developments are playing out in parallel to growing pressure for companies to comply with corporate due diligence obligations and improve the sustainability of their business practices. A series of initiatives to minimise negative human rights and environmental impacts of corporate activity in global supply chains has been launched over the past ten years. While standards were initially private and voluntary, we now see a mix of voluntary standards and mandatory regulation. Multi-stakeholder initiatives play an important role, bringing together state actors, civil society organisations, the private sector and state-owned enterprises. Some EU member states committed to the path of binding regulation, for instance Germany with the passage of the Act on Corporate Due Diligence Obligations in Supply Chains in 2021. The member states of the European Union have also agreed to introduce a European Corporate Sustainability Due Diligence Directive.

Geopolitical challenges now threaten to undermine support for longstanding sustainability efforts. It would, however, be short-sighted to prioritise security of supply over human rights and sustainability. A succession of recent studies demonstrate that sus-

tainability standards are in fact integral to security of supply, because they prompt corporate and state actors to think more strategically and act to preempt supply chains risks. On the other hand, the technical and geopolitical characteristics of metal supply chains limit the possibilities for European actors to influence sustainability. As customers they generally lack direct influence on the initial stages of production such as mining and refining.

The present study therefore explores the question of which governance approaches European actors can apply to improve sustainability in metal supply chains, and how they can influence other actors and the upstream stages of the supply chains to that end. The term “sustainability” is employed in the sense laid out in the United Nations Sustainable Development Goals.

The study is based on in-depth analyses of two metal supply chains: copper from the Andes and platinum from Southern Africa. It focuses on – and supplies policy recommendations for – the issue of supply chains in industrial mining.

The empirical material stems from more than 130 discussions and interviews with interlocutors from politics and administration, industry, civil society and academia, conducted in 2021 and 2022 as part of the research project on “Transnational Governance of Sustainable Commodity Supply Chains in the Andean Region and Southern Africa”, funded by the German Federal Ministry for Economic Cooperation and Development (BMZ). The centre of interest lay in the mining nations of Chile, Peru, South Africa and Zimbabwe, the trading centres of Switzerland and the United Kingdom, and the implications for Germany and other EU countries as major importers.

Comparing the two supply chains permitted us to conduct a systematic analysis and reach conclusions considering both metal-specific and contextual factors. We were able to identify *two major challenges* for governance of metal supply chains:

First, the multitude of voluntary and compulsory sustainability standards that have emerged over recent years is confusing and frequently also inadequately implemented and enforced. While some of the sustainability standards are certainly complementary, there are issues with competing systems, diverging priorities and contradictory definitions of sustainability. Inadequate sustainability governance especially in the financial sector and commodity hubs fosters opacity in metal supply chains and constrains the regulatory influence of downstream actors.

Second, power asymmetries grant specific actors great influence over sustainability governance. The research perspective must take into account that each metal follows a different path, and that the supply chains and the (networks of) actors involved in them are metal-specific. Within any supply chain a small number of firms and states can play a very important role in implementing sustainability by setting and enforcing standards. The ability of civil society organisations and trade unions to influence supply chain governance is much more limited.

Lack of transparency in metal supply chains hampers the identification of power asymmetries. “Choke-points” – smelters/refiners and traders – make it hard to trace material flows and supplier relationships.

In order to advance the cause of sustainable and effective supply chain governance, the EU and its member states must take action to expand diversification. The goal must be to reduce excessive dependency on individual countries, especially China. That means fostering dependable partnerships with resource-rich countries that seek high sustainability standards. Such arrangements should take into consideration the partners’ needs and offer corresponding support. Sustainable supply chain governance should also work to improve transparency and reduce power asymmetries. This can be supported by targeted measures, such as promoting multi-stakeholder processes in order to achieve a “smart mix” of voluntary and mandatory governance instruments.

Starting Situation: Dynamics in Security of Supply

A secure supply of metals is a matter of central economic importance for the EU. Growing global demand for metals will exacerbate geopolitical rivalries in the coming years, while pressure increases to ensure sustainability in procurement. European businesses face a challenge here: Having little involvement in mining and initial processing, they generally lack influence over the initial stages of supply chains.

Growing demand and import-dependency

Industrial demand for metals in Europe is already considerable. In 2021 the EU imported metals, minerals and rubber worth €59.6 billion. These imports increased in total value by 6.7 percent between 2002 and 2021.¹ The EU is almost self-sufficient in non-metallic minerals but remains a net importer of metals, with varying levels of dependency for individual metals and stages in the value chain. Demand within the EU will continue to grow because metals are central to green energy, e-mobility and digitalisation, and thus to implementing the European Green Deal.²

The International Energy Agency (IEA) calculates that consumption of minerals for green energy technologies must quadruple by 2040 if the Paris climate targets are to be met. The accelerated transition required to achieve global net zero by 2050 would

require a six-fold increase by 2040.³ The International Renewable Energy Agency (IRENA) identifies five metals that will be especially crucial for limiting global warming to 1.5°C: copper, lithium, nickel, and two rare earths, neodymium and dysprosium.⁴ The EU began listing economically relevant raw materials subject to significant supply risks in 2011. The current – fourth – list of critical raw materials comprises thirty items.⁵

The idea of satisfying European demand for metals through domestic mining and recycling will remain unrealistic for the foreseeable future, even if the EU's circular economy action plan (updated in 2020) and major investments under the EU Critical Raw Materials Act are rapidly implemented. That path, which is also highly relevant for achieving greater EU autonomy in the long term, would require enormous technological progress and a massive expansion of the circular economy, on a scale that cannot be accomplished in a short space of time.⁶

³ International Energy Agency (IEA), *The Role of Critical Minerals in Clean Energy Transitions: World Energy Outlook Special Report*, Flagship report (Paris, May 2021), 8, <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions> (accessed 1 August 2022).

⁴ International Renewable Energy Agency (IRENA), *World Energy Transitions Outlook: 1.5°C Pathway* (Abu Dhabi, May 2022), <https://irena.org/publications/2022/Mar/World-Energy-Transitions-Outlook-2022> (accessed 1 August 2022).

⁵ Viktoria Reisch, *The Race for Raw Materials: Contributions to the Debate on the EU's Raw Materials Policy Following the Publication of the Fourth Critical Raw Materials List and the 2020 Action Plan*, SWP Journal Review 1/2022 (Berlin: Stiftung Wissenschaft und Politik, June 2022), <https://www.swp-berlin.org/publikation/the-race-for-raw-materials> (accessed 28 November 2022).

⁶ Christian Hagelüken et al., "The EU Circular Economy and Its Relevance to Metal Recycling", *Recycling* 1, no. 2 (2016): 242 – 53.

¹ Eurostat, "Extra-EU Trade in Raw Materials", 2022, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Extra-EU_trade_in_raw_materials&oldid=562723#Raw_materials_by_product_group (accessed 20 February 2023).

² European Commission, *3rd Raw Materials Scoreboard: European Innovation Partnership on Raw Materials* (Luxembourg, May 2021), <https://op.europa.eu/de/publication-detail/-/publication/eb052a18-c1f3-11eb-a925-01aa75ed71a1> (accessed 14 September 2022).

Germany – as the EU’s biggest economy – is especially dependent on metal imports, and has no meaningful domestic extractive industry of its own. Its reserves of strategic metals are meagre and the legislative and technological preconditions for extraction lacking. No other EU member state has any significant mining sector either. The same applies to processing operations such as refining.⁷

For certain metals European import dependency is 100 percent.

European manufacturers import most of their metals from other regions of the world; import-dependency for many lies between 75 and 100 percent.⁸ Many of the imported primary raw materials originate from countries in the Global South. Initial processing is often conducted there, before the material is transported to European countries for final processing (in many cases with an intermediate stage in China).

Geopolitical dynamics and strategic raw materials policy

Various geopolitical shocks have disrupted metal supply chains in recent years. The Covid-19 pandemic and associated shutdowns in various regions created global supply bottlenecks. The situation was exacerbated by an energy crisis in China, which in 2021 for example caused a global magnesium shortage that also affected German firms.⁹ Altogether there are growing concerns over China’s reliability as a key supplier of critical metals, for instance due to export restrictions in response to international frictions (as in the trade conflict with the United States), its on-

going domestic energy shortage, or other domestic or foreign policy-related reasons.¹⁰

The Russian invasion of Ukraine has brought further shifts in the global markets, as Russia – an important exporter of metals such as nickel and palladium – became a political and economic risk. For instance, in 2020 German companies imported metals worth €2.8 billion from Russia.¹¹ Since the beginning of the war many companies have ceased doing business with or in Russia, and imports of metal products have fallen considerably. However many metals (ordered before the sanctions) continued to be imported into the EU.¹² At the same time political attention has turned to Europe’s enormous dependency on China for mineral raw materials (see info box “China’s dominance” and Figure 1, p. 10).¹³

European efforts to secure raw materials have been stepped up since the pandemic, in response to multiple emerging challenges. The German government for example adopted its first raw materials strategy in 2010. A revised version naming seventeen measures was presented in January 2020.¹⁴ In January 2023, in

⁷ Johannes Perger, *Wirtschaftsmächte auf den metallischen Rohstoffmärkten: Ein Vergleich von China, der EU und den USA*, DERA Rohstoffinformationen 46 (Berlin: DERA, November 2020), https://www.deutsche-rohstoffagentur.de/DE/Gemeinsames/Produkte/Downloads/DERA_Rohstoffinformationen/rohstoffinformationen-46.pdf?__blob=publicationFile&v=2 (accessed 18 January 2021).

⁸ European Commission, *3rd Raw Materials Scoreboard: European Innovation Partnership on Raw Materials* (see note 2).

⁹ Eric Onstad, “EU in Talks with China on Magnesium Shortages”, *Reuters* (online), 22 October 2021, <https://www.reuters.com/article/metals-magnesium-eu-idUSKBN2HC19Y> (accessed 15 September 2022).

¹⁰ Keith Johnson and Elias Groll, “China Raises Threat of Rare-Earths Cutoff to U.S.”, *Foreign Policy* (online), 21 May 2019, <https://foreignpolicy.com/2019/05/21/china-raises-threat-of-rare-earth-mineral-cutoff-to-us/> (accessed 25 October 2022); Yun Schüler-Zhou et al., *Einblicke in die chinesische Rohstoffwirtschaft*, DERA Rohstoffinformationen 41 (Berlin: DERA, 2020), https://www.deutsche-rohstoffagentur.de/DERA/DE/Aktuelles/rohstoff_china.html?nn=2361168 (accessed 16 December 2020).

¹¹ DERA, *Deutsche Metallimporte aus Russland*, Berlin, Februar 2022 (Chart des Monats, Februar 2022), https://www.deutsche-rohstoffagentur.de/DERA/DE/Downloads/DERA%202022_cdm_02_Metallimporte%20aus%20Russland.pdf?__blob=publicationFile&v=3 (accessed 10 November 2022).

¹² David Parsley, “UK and Europe Imported Metals Worth Billions from Russia Month after Ukraine War Began”, *I For Open Minds*, 8 February 2023, <https://inews.co.uk/news/uk-europe-imported-metals-russia-after-ukraine-war-2135962> (accessed 6 February 2023).

¹³ Jörg Lau et al., “An der goldenen Kette”, *Zeit online*, 14 August 2022, <https://www.zeit.de/2022/33/china-handels-partner-politik-wirtschaft-abhaengigkeit> (accessed 13 September 2022); Max Haerder et al., “Deutschlands Schicksalspartner. Raus aus China!?” *Wirtschaftswoche* (online), 25 August 2022, <https://www.wiwo.de/my/politik/ausland/deutschlands-schicksalspartner-raus-aus-china/28624758.html?ticket=ST-2977890-KeepIg4IOE9gfDhPg5lv-cas01.example.org> (accessed 13 September 2022).

¹⁴ Bundesministerium für Wirtschaft und Energie (BMWi), „Rohstoffstrategie der Bundesregierung. Sicherung einer

China's dominance in metal supply chains

China dominates the supply chains for many critical metals. Over recent decades it has massively expanded its domestic mining sector and opened up numerous reserves. In 2021 China was the largest producer of 42 percent of the mining products (industrial minerals, metals and coking coal) listed by the German Mineral Resources Agency (Deutsche Rohstoffagentur, DERA) as subject to high price and supply risks. For another almost 25 percent China was second or third.^a

Furthermore, the Chinese government has committed to a “Going Global” strategy and expanded the influence of Chinese enterprises in various metal supply chains, in particular through its Belt and Road Initiative. The participation of Chinese enterprises in all stages of these supply chains has secured strategic advantages in the global competition for raw materials.^b Chinese investment flows directly into overseas prospecting and mining.^c This process has also seen China investing specifically in transport infrastructure, for example financing ports and railways.^d

As well as investing in domestic and foreign mining and transnational infrastructure, Beijing has prioritised promoting domestic smelting and refining. According to data from DERA, China accounted for 93 percent of refined products with a high supply risk in 2021. This global dependency also affects the wider group of high-risk trade products, which includes semi-finished products. Here China is the biggest net exporter with a 41 percent share of the global market.^e

response to current geopolitical developments, the German Federal Ministry for Economic Affairs and Climate Action (BMWK) presented three pillars for a revised raw materials strategy: 1) circular economy, resource efficiency and recycling; 2) diversification, including monitoring and crisis management in critical supply chains, and increasing international and European cooperation, including the strengthening of mining and production capacities within and outside the EU; and 3) ensuring a fair and sustainable (international) market framework.¹⁵

nachhaltigen Rohstoffversorgung Deutschland mit nicht-energetischen mineralischen Rohstoffen“ (online), https://www.bmwk.de/Redaktion/DE/Publikationen/Industrie/rohstoffstrategie-der-bundesregierung.pdf?__blob=publicationFile&v=4 (accessed 20 February 2023).

15 Bundesministerium für Wirtschaft und Klimaschutz (BMWK), “Wege zu einer nachhaltigen und resilienten Rohstoffversorgung” (online), https://www.bmwk.de/Redaktion/DE/Downloads/E/eckpunktepapier-nachhaltige-und-resiliente-rohstoffversorgung.pdf?__blob=publicationFile&v=6 (accessed 16 February 2023).

Such strategic dependencies are, as the Russian invasion of Ukraine demonstrates, associated with great risks. They weaken European economic sovereignty. China's preeminence — in mining and processing of metal ores, in manufacturing, and as an international commodity trading centre — represents a risk that businesses must address — with political backing.^f

a DERA, *DERA-Rohstoffliste 2021*, DERA Rohstoff-Informationen 49 (Berlin, 2021), 5, https://www.deutsche-rohstoffagentur.de/DE/Gemeinsames/Produkte/Downloads/DERA_Rohstoffinformationen/rohstoffinformationen-49.pdf?__blob=publicationFile (accessed 8 February 2022).

b Schüler-Zhou et al., *Einblicke in die chinesische Rohstoffwirtschaft* (see note 10), 8.

c *Ibid.*, 52–56.

d *Ibid.*

e DERA, *DERA-Rohstoffliste 2021* (see a).

f Jane Nakano, *The Geopolitics of Critical Mineral Supply Chains: A Report of the CSIS Energy Security and Climate Change Program* (Washington, D.C.: Center for Strategic and International Studies [CSIS], March 2021), https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/210311_Nakano_Critical_Minerals.pdf.

Similar initiatives are also under discussion in other European countries — first and foremost France¹⁶ — and at the EU level. The German and French governments have already presented joint proposals for a European Critical Raw Materials Act.¹⁷ The European Commission intends to publish a first legislative draft in spring 2023.¹⁸

16 *Rapport d'information de Mmes Sophie Primas, Amel Gacquerre et M. Franck Montaugé, fait au nom de la commission des affaires économiques*, Paris: Sénat, 6.7.2022 (n° 755 [2021–2022]), <https://www.senat.fr/notice-rapport/2021/r21-755-notice.html> (accessed 26 November 2022).

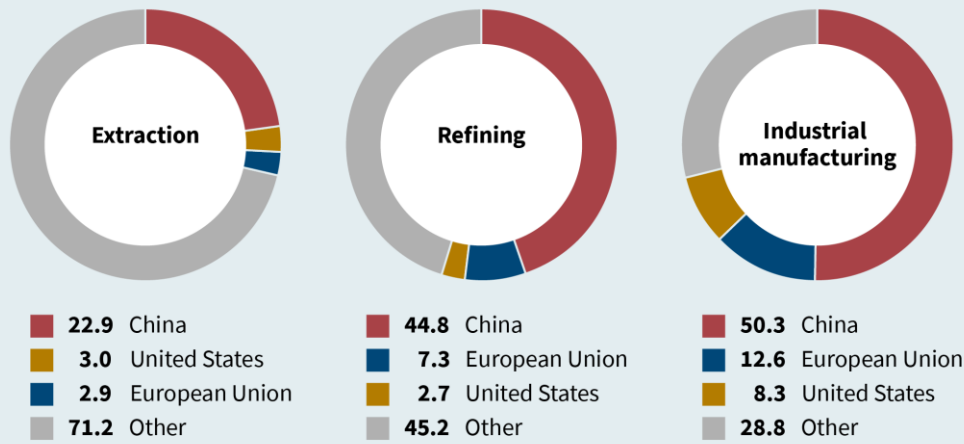
17 Bundesministerium für Wirtschaft und Klimaschutz (BMWK), “Franco-German Position on an EU Critical Raw Materials Act” (online) <https://www.bmwk.de/Redaktion/EN/Pressemitteilungen/2022/09/20220929-franco-german-position-on-an-eu-critical-raw-materials-act.html> (accessed 10 February 2023).

18 European Commission, “Initiative Details”, 2022, https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13597-European-Critical-Raw-Materials-Act_en (accessed 3 February 2023).

Figure 1

National and regional shares of extraction, refining and manufacturing for selected metals

%; base metals (aluminium, lead, nickel, tin, zinc); 2019



Source: DERA, ROSYS, n. d.

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Source: Deutsche Rohstoffagentur (DERA), ROSYS – Rohstoffinformationssystem, <https://rosys.dera.bgr.de> (accessed 22 August 2022).

The Critical Raw Materials Act is part of the EU’s newly unveiled Green Deal Industrial Plan, in which the EU Commission has set itself the goal of strengthening its strategic autonomy, by reducing its dependencies in strategic sectors. In January 2023, Commission President Ursula von der Leyen further strengthened this approach, by announcing a Sovereignty Fund to boost investment in European industries of strategic interest.¹⁹

The US government has also since 2020 intensified its measures to increase resilience and diversify mineral supply chains.²⁰ Considering critical minerals as economic as well as national security concerns, the Defence Production Act (DPA, June 2022) gives the President authority to use economic incentives to boost supplies of critical minerals. The Inflation Reduction Act (IRA) of September 2022 provides for such investments and grants tax credits under certain conditions

(for example where raw materials for production are sourced in the United States or from countries with which the United States has free trade agreements). These provisions are viewed critically in the EU. Yet the Biden administration is proactively fostering international cooperation in the minerals sector. In June 2022 the latter launched an international initiative called the Minerals Security Partnership (MSP). Together with major mineral-exporting and industrial economies (including the EU), the MSP seeks to enhance security of supply for crucial metals required for the “clean energy transition”.²¹ The initiative’s members have recently identified concrete projects that will be promoted along mineral supply chains (all stages, including circular economy).

All these strategic initiatives formulate strict sustainability requirements for the mining and processing of mineral raw materials. As such they build on diverse initiatives for creating sustainable supply chains that have been set in motion in recent years.

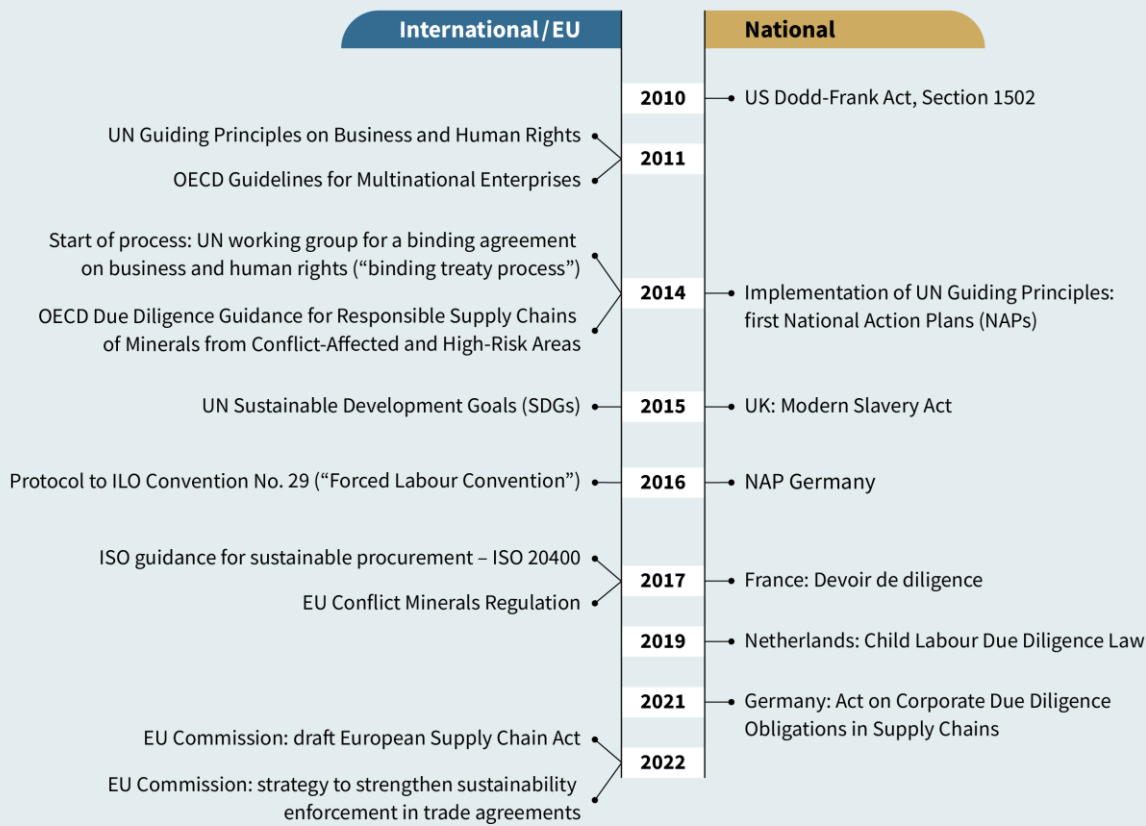
¹⁹ European Commission, “A European Sovereignty Fund for an Industry “Made in Europe”, blog of Commissioner Thierry Breton, https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_22_5543 (accessed 09 February 2023).

²⁰ The White House, *Executive Order on America’s Supply Chains: A Year of Action and Progress* (Washington, D.C., February 2022), <https://www.whitehouse.gov/wp-content/uploads/2022/02/Capstone-Report-Biden.pdf> (accessed 10 November 2022).

²¹ U.S. Department of State, “Minerals Security Partnership Convening Supports Robust Supply Chains for Clean Energy Technologies”, press release, 22 September 2022, <https://www.state.gov/minerals-security-partnership-convening-supports-robust-supply-chains-for-clean-energy-technologies/> (accessed 10 November 2022).

Figure 2

Timeline for international standard-setting: Sustainability in supply chains



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Source: own compilation.

Human rights and sustainability obligations

A string of initiatives at the international level have emerged since publication of the United Nations Guiding Principles on Business and Human Rights in 2011. The OECD Guidelines for Multinational Enterprises and the norms of the International Labour Organisation (ILO) and the International Organisation for Standardisation (ISO) are all now broadly recognised (see Figure 2).

Moves to define sustainability standards have also emerged during the past decade at the EU level and in individual member states. Legislation to impose corporate due diligence obligations is planned or has already been enacted, encompassing general measures as well as initiatives specifically for mineral

supply chains.²² In 2017 the European Union adopted its first legislation requiring corporate due diligence in metal supply chains; this was the Conflict Minerals Regulation for gold, tin, tantalum and tungsten.²³

In March 2022 the EU Commission presented the Corporate Sustainability Due Diligence Directive (CSDDD), which will apply to minerals sector as a whole. In comparison to the German LkSG, the CSDDD

²² European Coalition for Corporate Justice (ECCJ), "Map: Corporate Accountability Legislative Progress in Europe" (Brussels, 2022), <https://corporatejustice.org/publications/map-corporate-accountability-legislative-progress-in-europe/> (accessed 13 September 2022).

²³ Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas, 19 May 2017, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32017R0821> (accessed 13 September 2022).

draft covers the entire value chain, expansion of environmental and climate-related due diligence obligations, and corporate civil liability.²⁴ On the basis of this draft, so-called trilogue negotiations between the Commission, the Parliament and the Council are currently taking place. A final draft law is expected by next year. Germany and France have already adopted cross-sector supply chain due diligence laws. The German Act on Corporate Due Diligence Obligations in Supply Chains came into force in 2023 and the French Duty of Vigilance Law in 2018. Similar legislative proposals are currently being discussed in other EU member states, such as Italy, Denmark and Sweden.²⁵

The German government has been very active, acknowledging its international obligations under the Sustainable Development Goals (SDGs). Germany has also accepted the UN Guiding Principles and in 2016 adopted its first National Action Plan for Business and Human Rights (NAP). An update to the NAP is currently in preparation.

24 Council of the European Union, “Council Adopts Position on Due Diligence Rules for Large Companies”, press release, Brussels, 1 December 2022, <https://www.consilium.europa.eu/en/press/press-releases/2022/12/01/council-adopts-position-on-due-diligence-rules-for-large-companies/> (accessed 10 December 2022).

25 ECCJ, “Map: Corporate Accountability Legislative Progress in Europe” (see note 22).

Metal Supply Chains: Characteristics, Governance, Key Actors

Metal supply chains are complex and structurally diverse. Many of the actors remain out of sight. That, combined with the lack of traceability, makes it hard to enforce due diligence on human rights and environmental concerns. Yet ensuring sustainability is particularly important in metal supply chains, which pose great environmental and human rights risks, above all in mining and processing (see pp. 14ff.).

Material flow and characteristics

Metal supply chains can be broadly divided into *four stages* (see Figure 3, p. 14). The beginning of the process – here the first two stages – is described as *upstream*, the later stages as *downstream*.

After successful geological prospecting and project development the *first stage* is mining (deep or open-cast). In industrial mining this stage is capital- and technology-intensive. The less formal extraction methods employed in artisanal mining lie outside the scope of the present study.²⁶ The next step is to process ore into concentrate. This is normally done in ore-dressing plants close to the mines.

The *second stage* is smelting and refining, to extract the metal itself from the concentrate. Depending on geological and geographical factors, this may occur close to the mine or further away.

The *third stage* is industrial processing, where the refined metal is turned into semi-finished products such as sheet, wire and tube for use in manufactur-

ing. The final products range from simple jewellery to extremely complex machines and electronic devices.

The *fourth stage* is recycling, where scrap metal is reintroduced to the cycle. The recycling stage is not the focus of the present study.

Most metal supply chains follow this scheme, but each has its own specific characteristics. These have as much influence on the supply situation as the sustainability governance. The specific structure is heavily influenced by material factors such as the distribution of geological deposits, the type of metal and its uses.

The *number of processing steps* in the supply chain is a relevant characteristic. Industrial metals, including copper and platinum, end up in an enormous range of products. This creates greater complexity than a case such as gold, for example, which is used principally in jewellery and as a store of value. The more industrial processes and the broader the spectrum of final applications, the more complex the supply chain will be – and the more difficult it will be to track the materials.

The longer and more complex the supply chain, the more difficult it is to track the materials.

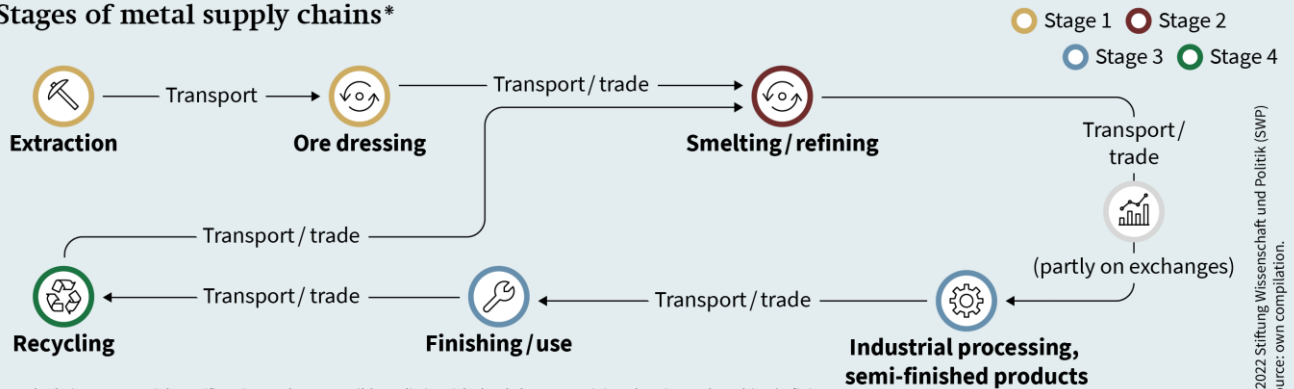
As a result, secondly, supply chains are of different *lengths*. Raw material supply chains almost always span multiple countries, and often several continents. This increases the risk of non-compliance with sustainability standards, and may threaten security of supply.

A third characteristic is the *concentration of production steps* at specific locations. As well as the number of countries involved, the number of companies must

²⁶ Bettina Engels, “Handwerklicher Bergbau”, in *Wörterbuch Land- und Rohstoffkonflikte*, ed. Jan Brunner et al., Global Studies (Bielefeld: transcript, 2019), 135–40, doi: 10.14361/9783839444337-019.

Figure 3

Stages of metal supply chains*

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Source: own compilation.

also be considered.²⁷ The greater the concentration at a particular stage the smaller the possibility for importers to switch to other countries or companies and the greater the dependency. At the same time, a high degree of concentration is conducive to traceability.²⁸

Ultimately, the more complex a supply chain and the dynamics within it, the harder it will be to realise specific sustainability measures. If individual actors choose to block sustainability governance, risks can arise even in shorter and less complex supply chains.

Sustainability risks

The biggest sustainability risks in metal supply chains arise during the *first stage*, in connection with mining.

Environmental degradation can affect both the immediate vicinity of the mine and the broader region.²⁹ Mining activities represent a major intervention in flora, fauna and habitat. Moving large masses of earth and rock (especially in open cast mining) has repercussions for diversity and landscape structure. Further

environmental risks include air pollution through emissions, dust and blasting, and acidic mine drainage.³⁰ Mining also consumes a great deal of water. For example 350 m³ of water is required to mine and dress one tonne of copper.³¹ Mining and dressing are also extremely energy-intensive. The management of overburden and tailings and the (lack of) rehabilitation of abandoned mines represent another sustainability problem, especially when mining wastes are not properly disposed of.³²

Mining in populated areas also has *direct social impacts*, and is associated with risks to observance of human rights (for example the right to health and clean water). Adverse impacts on the livelihoods of local communities is by no means unusual. For example conflicts and violence may arise where resource extraction is permitted on land previously used for settlements or agriculture. Disputes over land use and questions of fair compensation are a

27 DERA, *DERA-Rohstoffliste 2021*, DERA Rohstoff-Informationen 49 (Berlin, 2021), 5, 11ff., https://www.deutsche-rohstoffagentur.de/DE/Gemeinsames/Produkte/Downloads/DERA_Rohstoffinformationen/rohstoffinformationen-49.pdf?__blob=publicationFile (accessed 8 February 2022).

28 Svenja Schöneich et al., "Traceability and Foreign Corporate Accountability in Mineral Supply Chains: Insights from the Copper, Platinum and Gold Supply Chains", *Regulation and Governance* (2023), forthcoming.

29 Sebastian Luckeneder et al., "Surge in Global Metal Mining Threatens Vulnerable Ecosystems", *Global Environmental Change* 69 (2021), doi: 10.1016/j.gloenvcha.2021.102303.

30 Lukas Rüttinger et al., *Impacts of Climate Change on Mining, Related Environmental Risks and Raw Material Supply: Final Report*, Texte 106/2020 (Dessau-Roßlau: Umweltbundesamt, June 2020), <https://www.umweltbundesamt.de/publikationen/impacts-of-climate-change-on-mining-related> (accessed 2 November 2020).

31 Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), *Kupfer: Informationen zur Nachhaltigkeit* (Hannover, 2020), https://www.deutsche-rohstoffagentur.de/DE/Gemeinsames/Produkte/Downloads/Informationen_Nachhaltigkeit/kupfer.pdf (accessed 10 September 2022).

32 Daniel Weiss et al., *Umweltrisiken und -auswirkungen in globalen Lieferketten deutscher Unternehmen: Branchenstudie Automobilindustrie*, Texte 56/2022 (Dessau-Roßlau: Umweltbundesamt, May 2022), <https://www.umweltbundesamt.de/publikationen/umweltrisiken-auswirkungen-in-globalen-lieferketten> (accessed 5 July 2022).

perennial issue in mining regions, for example in South Africa.³³ The lack of local value creation at the local and national levels is another bone of contention. The same applies to the distribution of costs and benefits between mining companies and workers, local communities and the state.

The *lack of effective complaint mechanisms* for communities affected by mining creates further potential for conflict, as does inadequate implementation of corporate “social and labour plans”, for example in connection with provision of local infrastructure and workers’ housing.³⁴ The NGO Global Witness has documented more than 145 conflicts associated with mining and processing since 2012, including the deaths of more than 280 activists; the number of unreported cases is assumed to be even higher.³⁵ Industrial mining (especially underground) poses great challenges for workplace health and safety. Important rights such as freedom of assembly or the right to join a trade union are restricted in certain countries.³⁶ In many, women in the mining sector experience sexualised or sexual violence.³⁷ According to the ILO women account for just 10 percent of mineworkers and gender-specific workplace discrimination is rife.³⁸

33 Interview with South African lawyers and discussions with NGOs, 2 November, 4 November and 12 November 2021.

34 Amnesty International et al., *Unearthing the Truth: How the Mines Failed Communities in the Sekhukhune Region of South Africa* (2022), <https://www.wits.ac.za/media/wits-university/faculties-and-schools/commerce-law-and-management/research-entities/cals/documents/programmes/environment/resources/Unearthing%20the%20truth%20final%20report.pdf> (accessed 10 August 2022).

35 Global Witness, “Which Industries Are Linked to the Killings?” (London, n. d.), <https://www.globalwitness.org/en/campaigns/environmental-activists/numbers-lethal-attacks-against-defenders-2012/> (accessed 29 July 2022).

36 Maximilian Spohr, *Human Rights Risks in Mining: A Baseline Study* (Hannover: BGR and Max-Planck-Foundation for International Peace and the Rule of Law [MPFPR], 2016), https://www.bgr.bund.de/DE/Themen/Zusammenarbeit/TechnZusammenarbeit/Downloads/human_rights_risks_in_mining.pdf (accessed 10 November 2022).

37 Jane Pillinger and Nora Wintour, *Risks of Gender-Based Violence and Harassment: Union Responses in the Mining, Garments and Electronics Sectors* (n.p.: IndustriALL Global Union/Friedrich-Ebert-Stiftung, 15 March 2022), https://www.industriallunion.org/sites/default/files/uploads/documents/2022/GBVH/gbv_h_mining.pdf (accessed 10 December 2022).

38 International Labour Organization (ILO), *Women in Mining: Towards Gender Equality* (Geneva, September 2021),

While the risks associated with extraction are well-researched and the issues receive considerable attention at the political level, the same cannot be said of sustainability risks in the *second stage* (smelting/refining) and in transport. If labour and environmental standards are neglected, workers and surrounding communities will suffer. The metallurgical complex at La Oroya in Peru is alleged to have polluted the ground and water with heavy metals for decades until it was closed in 2009. A case concerning the grave health consequences was filed by the Inter-American Commission on Human Rights (IACHR) in October 2021.³⁹

The industrial processes used to produce metals are energy-intensive, with environmental and climate consequences. The enormous amounts of energy required to smelt and refine platinum and copper, for example, still originate predominantly from fossil fuels.⁴⁰ According to estimates by the United Nations Environment Programme (UNEP), mining and processing of metals accounted for approximately 18 percent of resource-related climate change in 2011.⁴¹

Bulk transport by land and sea, as in the case of copper, is also associated with large CO₂ emissions.⁴² Lack of transparency about working conditions in the transport sector creates additional risks.⁴³

https://www.ilo.org/sector/Resources/publications/WCMS_821061/lang-en/index.htm (accessed 10 November 2022).

39 “CIDH presenta caso sobre responsabilidad de Perú por efectos de la contaminación en la Comunidad de La Oroya” [IACHR files case on Peru’s responsibility for effects of contamination in La Oroya], *Revista Energiminas* (online), 22 October 2021, <https://energiminas.com/cidh-presenta-caso-sobre-responsabilidad-de-peru-por-efectos-de-la-contaminacion-en-la-comunidad-de-la-oroya/> (accessed 16 September 2022).

40 Sikho Luthango, *Extraterritorial Obligations in the Governance Gap: What South Africa’s Mine Closures Can Teach Us about the Utility of Binding International Legal Frameworks*, Policy Paper 1/2022 (Berlin: Rosa-Luxemburg-Stiftung [RLS], April 2022), <https://www.rosalux.de/en/publication/id/46314/extraterritorial-obligations-in-the-governance-gap> (accessed 11 May 2022).

41 United Nations Environment Programme (UNEP), International Resource Panel, *Global Resources Outlook 2019: Natural Resources for the Future We Want* (Paris, 2019), 76, <https://wedocs.unep.org/handle/20.500.11822/27517> (accessed 16 September 2022).

42 Wilhelm Kuckshinrichs et al., “CO₂ Emissions of Global Metal-Industries: The Case of Copper”, *Applied Energy* 84, no. 7–8 (2007): 842–52.

43 ILO, *Sectoral Studies on Decent Work in Global Supply Chains: Comparative Analysis of Good Practices by Multinational Enterprises*

China's role in metal supply chains must be considered from the human rights and sustainability perspective.

If sustainability is to be achieved in metal supply chains, the *central role of China* will need to be considered from the human rights and sustainability perspective. There have been a succession of revelations concerning inadequate human rights and labour standards in Chinese workplaces. A statement by the UN High Commissioner for Human Rights recently laid out grave human rights abuses experienced by the Uighurs for example.⁴⁴ Restrictive legislation and tight constraints on free speech and the press make it impossible for external observers – including academic researchers – to ascertain what is really happening in and around China's mines, how metal-processing firms are operating, and to what extent they are implicated in violations.⁴⁵ Nevertheless, there have been a string of revelations of human rights violations in Chinese production facilities, including those used by European companies.⁴⁶

Vertical and horizontal governance

In the great majority of cases, the participation of European firms in metal supply chains begins with industrial manufacturing (*stage 3*). This begs the question which instruments are available to influence the first two stages. The concept of supply chain governance is understood as the entirety of the co-existing forms of collective regulation, including binding

in *Promoting Decent Work in Global Supply Chains* (Geneva, 2015), 139ff., https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_467295.pdf (accessed 10 November 2022).

⁴⁴ United Nations Office of the High Commissioner for Human Rights (OHCHR), *OHCHR Assessment of Human Rights Concerns in the Xinjiang Uyghur Autonomous Region, People's Republic of China* (Geneva, 31 August 2022), <https://www.ohchr.org/en/documents/country-reports/ohchr-assessment-human-rights-concerns-xinjiang-uyghur-autonomous-region> (accessed 12 September 2022).

⁴⁵ Human Rights Watch, *China: Events of 2020*, <https://www.hrw.org/world-report/2021/country-chapters/china-and-tibet#eaa21f> (accessed 10 November 2022).

⁴⁶ Wasil Schauseil, "Problematische Lieferketten", Deutsche Gesellschaft für die Vereinten Nationen, 22 July 2022, <https://dgvn.de/meldung/problematische-lieferketten> (accessed 12 December 2022).

legislation, voluntary standards, norms, initiatives and institutions.⁴⁷ This understanding of governance extends beyond binding legislation and includes further possibilities at various stages, in both the vertical and horizontal dimensions (see Figure 4).

The *vertical dimension* comprises the transnational flow of materials through the various stages of the supply chain. The analytical focus here is on the actors and standards that connect the various stages. The starting points for sustainability governance on the vertical plane are national instruments that apply throughout the supply chain (in other words with extraterritorial effect). These include the German Act on Corporate Due Diligence Obligations in Supply Chains and the EU Conflict Minerals Regulation, as well as their supporting measures. Private standards may also influence actors' behaviour at multiple stages. The "Copper Mark", for example, is a certification system covering the entire copper supply chain.

The *horizontal dimension* focuses on the individual stages and geographical locations, where power constellations, actors' interests, local governance structures and political factors all play salient roles. Openings for the EU and its member states include foreign policy and development cooperation instruments as well as trade promotion.

There are also instances where horizontal and vertical sustainability governance instruments overlap, for example where the same actors interact on both levels, where the same standards are applied along the entire supply chain, and also through international standards such as the UN Guiding Principles.

Central actors

Various actors and networks influence supply chain sustainability governance, in the sense of developing and implementing standards.⁴⁸ The following *six groups of actors* can be distinguished.

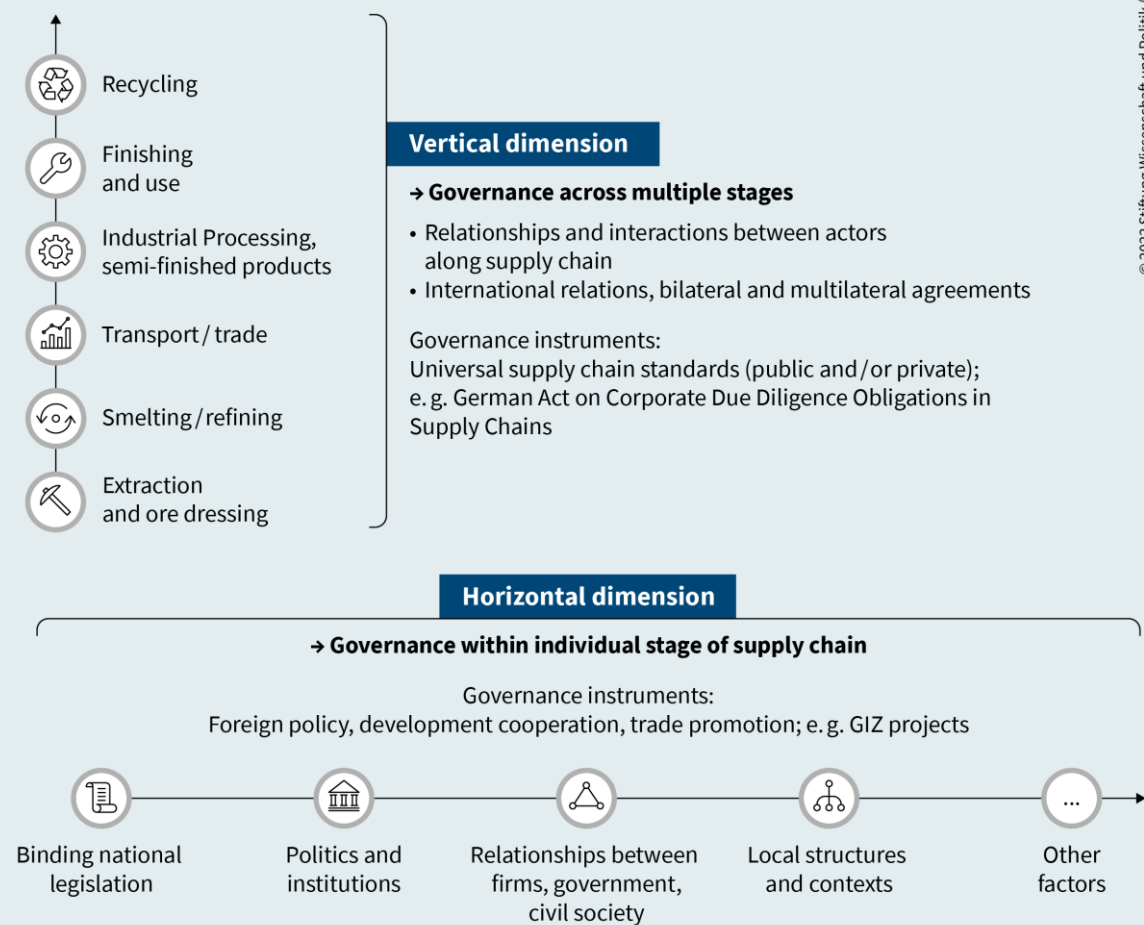
Firstly the United Nations and other international organisations, which are increasingly involved in setting standards for sustainable supply chains; secondly

⁴⁷ Renate Mayntz, "Von der Steuerungstheorie zu Global Governance", in *Governance in einer sich wandelnden Welt*, ed. Gunnar F. Schuppert and Michael Zürn (Wiesbaden: VS Verlag für Sozialwissenschaften, 2008), 43–60 (43ff.), doi: 10.1007/978-3-531-91066-6_2.

⁴⁸ Neil M. Coe and Henry W. Yeung, "Global Production Networks: Mapping Recent Conceptual Developments", *Journal of Economic Geography* 19, no. 4 (2019): 775–801.

Figure 4

Horizontal and vertical sustainability governance



© 2022 Stiftung Wissenschaft und Politik (SWP) Source: own compilation.

states where one or more stages of a supply chain are located. A third group is businesses operating at the national or transnational level, in particular (private-sector or state-owned) mining enterprises, transnational traders and exchanges, and the financial sector. The certifying agencies and initiatives that develop and/or audit standards form the fourth group; workers in or affected by mining and processing, local communities and their civil society representatives the fifth. Sixth and last is the (intermediate and final) consumers. The relative influence of these actors and groups varies considerably.

Businesses and states are without doubt the most important actors in supply chains. The former organise the material flow and exert decisive influence over the organisation. They can also (co-)determine the forms and scope of sustainability management through their own standards and initiatives (for example for

reducing CO₂ emissions). States create the legislative and regulatory framework for mining, processing and trading within their sphere of influence and define concrete terms for companies operating within supply chains. The companies (*lead firms*) and countries that occupy key positions in the supply chain are especially influential. For example, control of very large mining and/or refining capacity for a critical metal implies great potential influence on sustainability governance in the individual stages of the supply chain. The centrality of key actors enables them to promote sustainability along the entire supply chain (see pp. 32ff.). That makes them important partners for European actors seeking to improve sustainability in upstream stages.

Certain central actors function as *chokepoints for transparency* (see info box “Chokepoints”, p. 27) and/or as *links* between different stages and geographical

locations. As such they are decisive for the implementation of sustainability instruments throughout entire supply chains. The first chokepoint is the *smelters and refiners*. They frequently process ores from different mines and can therefore actively promote – or hinder – transparency by revealing their sources and suppliers.⁴⁹ This second stage is generally very opaque, partly because of inadequate standard-setting, but also because the second stage for many critical metals occurs in China. Another chokepoint is the *commodity traders and metal exchanges*, which pass information from the upstream supply chain to downstream actors. Traders and metal exchanges also have possibilities to set their own sustainability standards, but have to date made very little use of these.⁵⁰

Greater attention needs to be paid to the role of *transport* as an important link in supply chains. The movement of raw materials and products within countries and across borders is associated with significant environmental impacts and human rights risks, as well as numerous dangers of disruption. *Financial actors* represent another link. Their role in enabling material flows and projects in capital-intensive raw material supply chains gives them the opportunity to enforce requirements.⁵¹ Here again, much of the potential for implementing sustainability standards remains untapped.

49 Melanie Müller, *Deutsche Kupferimporte: Menschenrechtsverletzungen, Unternehmensverantwortung und Transparenz entlang der Lieferkette*, GLOCON Policy Paper 1 (Berlin: Freie Universität Berlin, 2017).

50 Rita Kesselring et al., *Valueworks: Effects of Financialization along the Copper Value Chain*, Working Paper (Basel: Universität Basel/Geneva: Swiss Network for International Studies [SNIS], 2019), https://snis.ch/wp-content/uploads/2020/01/2016_Kesselring_Working-Paper.pdf (accessed 10 November 2022).

51 Ibid.

Standard-Setting: Regulatory Heterogeneity in the Sustainability Sphere

Sustainability governance in raw material supply chains involves voluntary and mandatory instruments and regulations, established and implemented by private and state actors.⁵²

Private standards and certification systems in metal supply chains

Many of the firms involved in metal supply chains have instituted internal systems to guard against sustainability risks and fulfil their corporate responsibilities, employing external certification systems as well as internal controls. This applies to the major mining and refining companies in the upstream supply chain as well as the buyers of raw metal and semi-finished products in the downstream supply chain. This development is an outcome of growing public pressure, but also reflects tightening legal requirements (see pp. 11f.).

The quality of sustainability reporting often fails to meet stakeholder expectations.

Communicating sustainability goals and strategies to investors and the public is a routine aspect of business today. Downstream actors, such as European automobile manufacturers, originally tended to concentrate their sustainable supply chain management and standards more on social aspects of mining such as human rights violations than on negative environmental externalities.⁵³ In the meantime climate issues, for example quantifying and publishing CO₂ emissions, have become a major topic along mineral supply chains,⁵⁴ partly overshadowing other aspects, which are also more difficult to monitor and quantify.

Many companies in mining and in the upstream supply chain continue to pursue a strongly compliance-driven approach, driven by external requirements.⁵⁵ Much more comprehensive (risk) analyses are needed, covering the gamut of environmental, human rights and governance risks. But corporate strategies should not focus exclusively on risks. Long-term development potentials need to be identified and the necessary cooperation with suppliers and local actors strengthened, in order to initiate permanent, sustainable improvements in metal supply

52 Cf. Marianne Beisheim and Klaus Dingwerth, *Procedural Legitimacy and Private Transnational Governance: Are the Good Ones Doing Better?* SFB-Governance Working Series Paper 14 (Berlin, 2008); Philip Schleifer and Luc Fransen, *Towards a Smart Mix 2.0: Harnessing Regulatory Heterogeneity for Sustainable Global Supply Chains*, Africa and Middle East Research Division Working Paper 4 (Sustainable Global Supply Chains Research Network) (Berlin: Stiftung Wissenschaft und Politik, August 2022), https://www.swp-berlin.org/publications/products/arbeitspapiere/WP04_SmartMix2.0_Schleifer_Fransen.pdf (accessed 17 September 2022).

53 Philip C. Sauer, “The complementing role of sustainability standards in managing international and multi-tiered mineral supply chains.” *Resources, Conservation and Recycling* 174 (2021): 105747.

54 Gudrun Franken and Phillip Schütte, “Current Trends in Addressing Environmental and Social Risks in Mining and Mineral Supply Chains by Regulatory and Voluntary Approaches”, *Mineral Economics* 35 (2022): 653–71.

55 Responsible Mining Index, “RMI Report 2020: Summary” (online) https://2020.responsibleminingindex.org/resources/RMI_Report_2020-Summary_EN.pdf (accessed February 2023); interviews with NGOs in South Africa in October and November 2021.

chains.⁵⁶ The quality of ESG-related reporting in the mining and metals sector generally remains poor, for example by not setting specific performance targets and reporting accumulated rather than mine-level data.⁵⁷

Buyers of raw metals and semi-finished products apply various *internal measures* to enforce standards on partners further up the supply chain. For example many employ contracts requiring their suppliers to observe environmental standards and human rights and to conduct (or arrange for) risk analyses and audits, or use questionnaires to gather sustainability-related information. Large companies in particular often work closely with their suppliers in the scope of corporate social responsibility activities and capacity-building.⁵⁸

Upstream businesses (in the first and second stages) sense the pressure to respond to growing sustainability requirements. In adopting internal measures and communicating these externally, they orientate clearly on the demands of their respective parent companies and customers.⁵⁹ Local and international industry organisations like the International Council on Mining and Metals (ICMM) also exert great influence on standard-setting in mining.

On the other hand, firms along the supply chain are also making increasing use of *external private standard and certification systems* to achieve their own sustainability goals and/or to satisfy external requirements.

56 Melanie Müller et al., *Public-Private Alliances for Sustainable Commodity Supply Chains. Opportunities and Risks in the South African Mining Sector*, SWP Comment 5/2022 (Berlin: Stiftung Wissenschaft und Politik, January 2022), <https://www.swp-berlin.org/publikation/public-private-alliances-for-sustainable-commodity-supply-chains> (accessed 28 November 2022).

57 Hanna Thorsteinsdottir, *Sustainability Reporting in the Mining Sector: Current Status and Future Trends* (UNEP, 2020) <https://europa.eu/capacity4dev/file/107282/download?token=KiAzEyO2> (accesses 20 February 2023).

58 Enrico Partiti, “The Place of Voluntary Standards in Managing Social and Environmental Risks in Global Value Chains”, *European Journal of Risk Regulation* 13, no. 1 (2022): 114–37; Axel Marx et al., “Voluntary Sustainability Standards: State of the Art and Future Research”, *Standards* 2, no. 1 (2022): 14–31; Kenneth W. Abbott and Duncan Snidal, “The Governance Triangle: Regulatory Standards Institutions and the Shadow of the State”, in *The Spectrum of International Institutions: An Interdisciplinary Collaboration on Global Governance*, ed. idem (Abingdon, UK: Routledge, 2021), 52–91.

59 Interviews with South African mining firms, 11 November and 24 November 2021.

A series of *problem-specific and sector-specific* private standards have become established in metal supply chains, with widely differing target groups, levels of obligation, scope and reach. Most of these are voluntary initiatives, with different requirements for corporate reporting, verification (auditing) and traceability.⁶⁰ The diversity of voluntary standards is confusing and makes it difficult for businesses to select and implement the one that suits them best (see pp. 26f.).

The establishment of private-sector standards and certificates is a fundamentally welcome development. *Three aspects* need to be considered, however.

Firstly, many relevant private-sector standards and certificates are heavily shaped by *industry actors* and thus reflect particular interests. As a consequence, these actors often find their legitimacy questioned by local communities and civil society.⁶¹ In that context, *multi-stakeholder initiatives* like the Initiative for Responsible Mining Assurance (IRMA) represent a relevant corrective.

Secondly, most private standards lack *consistent guidelines* concerning implementation and publication. Standards run by industry actors like the ICMM place great weight on agenda-setting and negotiating corporate guidelines and less on enforcement and monitoring.⁶²

Thirdly, few of the available private standards and certificates cover the *entire supply chain*. And where they do they are rarely material-specific. As a result they fail to cover (material-) specific production conditions and contexts and thus lack regulatory depth. Furthermore, very few of the existing standards include industrial processing (stage 3), while insufficient attention is likewise paid to risk-associated activities like transport.⁶³ Certification (or more thorough certification) of the entire supply chain would be a major undertaking. But it would offer a welcome

60 Karoline Kickler et al., *Mapping Sustainability Standards Systems for Mining and Mineral Supply Chains*, Commodity TopNews 59 (Hannover: BGR, June 2018), https://www.bgr.bund.de/DE/Gemeinsames/Produkte/Downloads/Commodity_Top_News/Rohstoffwirtschaft/59_sustainability_standards.html (accessed 16 December 2020); Luc Franssen et al., “The Multiplicity of International Corporate Social Responsibility Standards”, *Multinational Business Review* 27, no. 4 (2019): 397–426, as well as the authors’ analyses.

61 Ibid.

62 Abbott and Snidal, “The Governance Triangle” (see note 58).

63 Kickler et al., *Mapping Sustainability Standards Systems for Mining and Mineral Supply Chains* (see note 60).

opportunity to address the problem of transparency (see pp. 27f.) in transnational supply chains.

Inadequate transparency and standard-setting in the international trading sector

In contrast to mining and processing, regulation efforts tend to pay a great deal less attention to the metal traders and exchanges, which often represent an important chokepoint, and the financial sector. In fact it would be vital to include them if one wishes to improve transparency and realise universal standards, as the EU CSDDD sets out to do.

The structure of the commodity trade is not conducive to introducing systematic sustainability standards.

Implementing sustainability standards in the commodity trading sector is especially challenging. Trading operations tend to be material-specific, the actors dispersed and hard to pin down. Within Europe Switzerland and the United Kingdom (London) are the decisive trading hubs; neither is an EU member. To date both countries lack corresponding legislation and the corporate sustainability initiatives of traders and exchanges are largely voluntary.

Switzerland is one of the world's largest trading centres for metals and home to major transnational commodity traders, such as Trafigura and Glencore. Various trading instruments, including prefinancing of production, enable these enterprises to influence producing countries and shape prices and availability.⁶⁴ In recent years Switzerland has initiated a number of processes to improve transparency and tighten corporate responsibility. It is an active member of international bodies like the OECD and the Extractive Industries Transparency Initiative (EITI), the latter focussing on good governance and transparency in the raw materials sector. Switzerland has also issued guidelines for implementation of the UN Guiding Principles, aimed at trading houses.⁶⁵ Finally,

⁶⁴ Public Eye, *Trade Finance Demystified: The Intricacies of Commodities Trade Finance* (Lausanne and Zürich, 2020), https://www.publiceye.ch/fileadmin/doc/Rohstoffe/20200928_PublicEye_TradeFinanceDemystified_E.pdf (accessed 14 September 2022).

⁶⁵ Institute for Human Rights and Business (IHRB), "Implementing the UN Guiding Principles on Business and Human Rights: Guidance for the Commodity Trading Sector" (East-

the Swiss Code of Obligations was amended in January 2021. It now requires resource-extracting enterprises to disclose all (aggregate) payments of 100,000 Swiss francs (approx. €102,000) or more made to government authorities. But overall the legal obligations placed on businesses remain weak. The referendum for the Responsible Business Initiative, which proposed a Swiss equivalent of the German supply chain legislation, failed at the end of 2020.⁶⁶

The United Kingdom is regarded as Europe's commodity hub on account of the London Metal Exchange (LME), which conducts a significant proportion of the world's metal trade. Not until 2019 did the LME publish sustainability guidance orientated on the OECD Guidelines. It will be obligatory for all market participants from 2023, with failure to comply potentially leading to exclusion from trading activities. The LMEpassport introduced in 2021 allows producers to provide information about the sustainability of their products, albeit on a voluntary basis.⁶⁷ The main criticisms of the LME are that the instruments are not necessarily binding, violations are not consistently followed up, and complaints from supply chain actors are not published.⁶⁸

There are also a number of over-the-counter trading centres, such as the London Platinum and Palladium Market (LPPM). The LPPM introduced obligatory Responsible Sourcing Guidance for all refiners in 2020. Although its scope could be broader, it is nevertheless an important step forward as it is based on verification by independent actors (third-party audits).

bourne, UK, n. d.) <https://commodity-trading.org/> (accessed 17 September 2022).

⁶⁶ Marc Leutenegger, "Konzernverantwortungs-Initiative: gesiegt und doch gescheitert", *swissinfo.ch* (online), 29 November 2020, <https://www.swissinfo.ch/ger/konzernverantwortungsinitiative--es-wird-knapp/46191624> (accessed 17 September 2022).

⁶⁷ London Metal Exchange (LME), "LMEpassport", n. d., <https://www.lme.com/Trading/Initiatives/LMEpassport> (accessed 17 September 2022); BGR, *Kupfer: Informationen zur Nachhaltigkeit* (see note 31).

⁶⁸ Lara Röscheisen, *Können Börsen Sorgfaltspflichten? Der Einfluss von Rohstoffbörsen auf soziale und ökologische Standards am Beispiel der London Metal Exchange* (Berlin: Weed – Weltwirtschaft, Ökologie & Entwicklung e.V., July 2021), https://www2.weed-online.org/uploads/weed_2021_koennen_boersen_sorgfaltspflichten_web.pdf (accessed 18 August 2021).

In spring 2022, for example, LPPM was able to use this mechanism to rapidly exclude Russian refiners.⁶⁹

The *leading producers and traders* are increasingly working to establish ESG standards in their business practices.⁷⁰ This trend is driven both by growing customer expectations and by sometimes massive pressure from NGOs.⁷¹ Nevertheless, the EU's power to regulate transnational supply chains and the associated traders remains indirect in nature. The many smaller traders, which are often based in Switzerland, continue to be completely overlooked. They focus largely on purchasing as cheaply as possible on digital platforms and are currently affected only indirectly by supply chain laws.⁷²

First regulatory initiatives for the financial sector and investments

Legislators are only just starting to turn their attention to the financial sector and supply chain – related investments, despite their enormous influence on sustainability standards. For example half of all mining projects are funded by foreign investors.⁷³ Private-sector – and to an extent also public – banks play a special role via their lending and investment guarantees. Financial actors are thus a vital factor for enabling major mining-related investments and for the activities of transnational traders.⁷⁴

Changes in financing are beginning to be seen, initially in the area of environment and climate. New

initiatives are emerging, such as the Task Force on Climate-Related Financial Disclosures (TCFD).⁷⁵ *Private-sector financial actors* increasingly stipulate ESG terms in their lending and investment contracts, seeing this as a way of minimising the risk to their investments.

Similar developments are also observed in the *public finance sector* and its guarantee schemes. For example, investments by the Global Gateway Fund (GGF), which aims to support the EU's Global Gateway strategy, need to follow the social and environmental standards of the European Investment Bank (EIB).⁷⁶ In Germany the criteria for loans from the state-owned investment and development bank KfW and Untied Loan Guarantees (Ungebundene Finanzkredite, UFG-Garantien) are currently under review. The International Finance Corporation (IFC), the World Bank and other multilateral development banks have also laid out criteria that projects must fulfil if they are to receive funding.

While the mostly ESG-related criteria in these private and public financing schemes are of utmost importance, far-reaching challenges exist in terms of ESG-related data collection, comparability and monitoring as well as in transparency and disclosure.⁷⁷ This is particularly relevant in connection with investments in high-risk sectors, such as the minerals sector. However, we also observe the introduction of stricter standards for the financial sector and other investments, driven by growing investor demand and by *legislation*.⁷⁸ According to the Commission's draft, the EU Corporate Sustainability Due Diligence Direc-

69 London Platinum & Palladium Market (LPPM), "LPPM Good Delivery Platinum and Palladium Update", press release, 8 April 2022, https://www.lppm.com/news/lppm-good-delivery-platinum-and-palladium-update_830.htm (accessed 17 September 2022).

70 ESG stands for environment, social and governance.

71 Interview with a commodity trader, 27 August 2021, and a multinational mining company, 1 September 2021.

72 IHRB, *The Swiss Commodities Trading Industry: A Mapping Study: Informing the Development of Guidance on Implementing the UN Guiding Principles on Business & Human Rights* (Eastbourne, UK, March 2017), https://eiti.org/sites/default/files/attachments/ihrb_the_swiss_commodities_trading_sector_-_a_mapping_study_mar_2017.pdf (accessed 17 September 2022).

73 United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2020: International Production beyond the Pandemic* (New York, 2020), https://unctad.org/system/files/official-document/wir2020_en.pdf (accessed 16 September 2022).

74 Public Eye, *Trade Finance Demystified* (see note 64).

75 Anahita Yousef and Tina Lutz, *Finanzierung der Entwaldung: Der Beitrag des deutschen Finanzsektors zur globalen Waldzerstörung* (Radolfzell and Berlin: Harvest and Deutsche Umwelthilfe, September 2022), https://www.duh.de/fileadmin/user_upload/download/Projektinformation/Naturschutz/Entwaldung/220902_DUH_Harvest_Finanzierung_der_Entwaldung.pdf (accessed 16 September 2022).

76 European Investment Bank, "Global Gateway Fund (GGF)" (online) <https://www.eib.org/de/projects/all/20220752> (accessed 20 February 2023).

77 Riccardo Boffo and Robert Patalano, "ESG Investing: Practices, Progress and Challenges" (Paris: OECD, 2020), <http://www.oecd.org/finance/ESG-Investing-Practices-Progress-and-Challenges.pdf> (accessed 7 February 2023).

78 Anil Walia, *Creating a Path for Sustainable Supply Chains* (Frankfurt: Deutsche Bank, May 2022), <https://flow.db.com/trade-finance/creating-a-path-for-sustainable-supply-chains#3> (accessed 16 September 2022).

tive should also include the financial sector,⁷⁹ although certain member states oppose this and the matter is not settled.⁸⁰

National regulation in the mining and processing sectors

In the horizontal dimension initiatives for binding regulation of due diligence in supply chains – like the German Act on Corporate Due Diligence Obligations in Supply Chains or private standards and certificates – encounter local governance structures. Here it is crucial to have (or establish) a binding legal framework for labour and social rights and environmental standards in mining and processing countries (stages 1 and 2).

Certain countries in which metal ores are mined have established *extensive legislation* to regulate the mining and processing sectors. They often build on international frameworks, such as the ILO norms or the Universal Declaration of Human Rights. While South Africa has set high standards for environmental and social rights (also specifically for the mining sector), regulatory loopholes and legal uncertainties still remain for example in relation to land rights. As an OECD member Chile is already committed to that organisation’s guidelines. But it has gone further, passing numerous laws laying the groundwork for the implementation of sustainability and corporate due diligence. In both countries, however, the central challenge of sustainability governance lies in implementation (see pp. 25ff.).

The participatory rights of mining communities and civil society form a flashpoint in both these countries. In South Africa there has been criticism that participatory rights relating to licencing of mining projects are not adequately anchored in the legislation. Nor is there any provision for state

agencies to deal with complaints or offer mediation.⁸¹ Certain Latin American countries such as Peru, have established state ombudsman’s offices to protect the rights of affected communities and mediate in the event of conflict. Here again the problem lies more in the implementation: the institutions are often regarded as biased or lack of sanctioning mechanisms constrains their effectiveness.⁸²

In countries with weak governance and/or authoritarian structures it is especially hard to enforce sustainability standards.

Countries with *weak governance* and/or *authoritarian structures* present particular challenges for sustainability standard-setting. A business operating in such a setting that wishes to observe international standards must do so on its own initiative, and due diligence may be harder to realise. One good example is Zimbabwe, whose mining legislation is outdated and in great need of reform. There is a particular deficit concerning sustainability standards. Here the legislative processes have been bogged down for years.⁸³ Authoritarian structures that restrict the rights of civil society and trade unions also make it harder to realise a sustainability agenda (see pp. 35f.).⁸⁴

The absence of political strategies for expanding local value creation in mining regions is another controversial issue in many countries. Highly automated industrial mining offers only a very limited number of jobs directly. The lack of employment and training opportunities and the limited involvement of local companies in upstream industries often leads to local conflicts and blockades. This is closely associated with questions of transparency in the raw materials sector and profit distribution. Chile, South Africa and Zim-

⁷⁹ Andreas Heitker and Stefan Reccius, “Lieferkettengesetz in der EU schließt Finanzbranche ein”, *Börsen-Zeitung* (online), 23 February 2022, <https://www.boersen-zeitung.de/lieferkettengesetz-in-der-eu-schliesst-finanzbranche-ein-2ed9f546-94b1-11ec-bc8c-14469fb372ce> (accessed 7 November 2022).

⁸⁰ János Allenbach-Ammann, “EU-Mitgliedsstaaten verwässern Lieferkettengesetz deutlich”, *euractiv* (online), 2 December 2022, <https://www.euractiv.de/section/all/news/eu-ministers-exclude-finance-from-due-diligence-law-in-victory-for-france/> (accessed 10 December 2022).

⁸¹ Interviews with South African lawyers and academics, 12 November and 8 December 2021.

⁸² Interview with a former employee of the Peruvian state ombudsman’s office and of the mining ministry, 27 October 2021.

⁸³ Interviews with a consulting firm, 24 November 2021, and discussions with Zimbabwean NGOs, 25 October and 1 December 2021.

⁸⁴ *Ibid.*; “Zimbabwe: ‘We Need CSOs to Continue Working and Defending People’s Rights’”, *Civicus* (online), 1 June 2022, <https://www.civicus.org/index.php/media-resources/news/interviews/5830-zimbabwe-we-need-civil-society-organisations-to-continue-working-and-defending-people-s-rights> (accessed 17 September 2022).

babwe are not members of EITI. Peru was recently suspended for failure to meet a reporting deadline.⁸⁵

At this juncture it is instructive to consider *China*, which is increasingly setting its own standards for mining and processing, above all in the environmental and climate spheres. The Chinese government introduced environmental regulations more than a decade ago, including strict reporting obligations for enterprises. China is also pursuing specific strategies to promote “green mining” at home. But its labour and social standards – and not least complaint mechanisms – still lag far behind the international field.⁸⁶ Multiple states and parliaments have sharply condemned grave human rights violations in China, up to and including crimes against humanity. In June 2022 the European Parliament reiterated its call for the Chinese authorities to allow independent monitoring and reporting, and appealed for European and UN engagement regarding the human rights situation in Xinjiang.⁸⁷ Shortly thereafter the European Commission presented a legislative proposal on forced labour that would impose import restrictions on products made using forced labour.⁸⁸

85 Extractives Industries Transparency Initiative (EITI), “The EITI Board Has Temporarily Suspended Peru”, press release, 27 April 2022, <https://eiti.org/board-decision/2022-22> (accessed 7 November 2022).

86 Schüler-Zhou et al., *Einblicke in die chinesische Rohstoffwirtschaft* (see note 10).

87 European Parliament, “European Parliament Resolution of 9 June 2022 on the Human Rights Situation in Xinjiang, including the Xinjiang Police Files”, text adopted 9 June 2022, https://www.europarl.europa.eu/doceo/document/TA-9-2022-0237_EN.html (accessed 22 February 2022).

88 Silvia Ellena, “Commission Unveils Law to Prohibit Products Made with Forced Labour”, *EURACTIV*, 15 September 2022, <https://www.euractiv.com/section/economy-jobs/news/commission-unveils-law-to-prohibit-products-made-with-forced-labour/> (accessed 6 February 2023).

Challenge: Implementing and Enforcing Sustainability Standards

Increasing the number of standards does not automatically minimise the social and environmental risks associated with metal supply chains. The reason for this lies principally in the difficulties in implementation and enforcement. Firstly, certain producing countries have not set standards, or fail to implement those they do have. Secondly, not all businesses in the supply chain demand that their trading partners observe particular standards or hold particular certifications. Thirdly, opacity in the supply chain leaves certain businesses unable to identify their suppliers; this is the case for many EU buyers. Fourthly, actors in the downstream supply chain face the challenge of working concretely to implement and enforce sustainability standards in upstream stages, and in particular of verifying whether this has occurred.

Difficulties in the individual stages of the supply chain (horizontal dimension)

Governance deficits at individual production stages and thus at the national level affect the enforcement of sustainability standards. From the downstream perspective (where EU actors are often located) these gaps are difficult to identify and comprehend, because they result from complex political, social and economic circumstances.

Such deficits are found above all in regions with *weak statehood*,⁸⁹ where the risk of negative environmental and social repercussions is especially high. The problem affects many mining areas, but transport

and processing are by no means excepted (see pp. 14ff.).

Governance deficits hinder implementation of sustainability standards.

In the mining regions investigated for this study it is often a *lack of monitoring and enforcement of statutory requirements* that prevents effective sustainability governance, even where high standards are set. Scarcity of funding, personnel and know-how is a problem within the national ministries – and even more so at the regional and local level. There is often a shortage of qualified administrators. Training opportunities are limited and qualified staff are often attracted away by better pay and conditions in the private sector. Deficits in digitalisation and organisational administration only exacerbate the problems.⁹⁰ One effect is that fines are seldom enforced and prosecutions are rare.

Inadequate implementation capacity is frequently an issue in the sphere of environmental standards. In Peru for example a lack of control instances makes it hard for the authorities to police environmental standards in remote Andean mining regions, or to verify whether hazardous wastes are properly disposed of.⁹¹ In South Africa, too, state mine inspections can be unreliable, and the same applies to the monitoring of private-sector rehabilitation of aban-

⁸⁹ Tanja A. Börzel and Thomas Risse, eds., *Effective Governance under Anarchy* (Cambridge: Cambridge University Press, 2021), doi: 10.1017/9781316872079.

⁹⁰ Interviews with a Peruvian NGO, 27 October 2021, a South African NGO, 20 October 2021, and a South African parliamentarian, 1 December 2021.

⁹¹ Interview (see note 82).

doned mines. Both of these issues create local problems on the ground.⁹²

There may also be *conflicts of interest and competence*. In South Africa for example the relationships between the national departments involved in regulating the mining sector are characterised by power imbalances and lack of cooperation.⁹³ *Questions of representation* also affect implementation. To cite the South African example again: The role of traditional authorities is codified in law at the national level, but is interpreted inconsistently in practice and contested by parts of the local population. Conflicts between the *national and local levels* are also found in many mining regions. In Peru regional and local mining regulations sometimes contradict national rules or hinder their enforcement. Finally, *corruption*, whether in state institutions, affected communities or involved businesses, also impairs the state's ability to enforce standards.

Widespread difficulties in enforcing legal and private sustainability standards are also observed among *businesses* in the respective stages of production. In some cases the guidelines of the often transnational mining and processing firms are implemented poorly or not at all at the local level. The reasons for this include inadequate communication, monitoring and training in the area of sustainability, as well as diverging goals between the levels of vertically integrated firms.⁹⁴

Conflicts of competence also arise between company divisions and with suppliers. Examples are found in the relationships between large mining firms and their outsourced units, as well as with their local suppliers, such as transport firms and energy providers. In South Africa working conditions at sub-contractors are often a good deal worse than for those employed directly by the mining firms.⁹⁵ In Peru mining companies only accept partial responsibility for their service providers.⁹⁶ The question of responsibility can lead to prolonged legal conflicts. Some operators with

low human rights and sustainability standards exploit legal uncertainty as a deliberate strategy to avoid responsibility.

Problematic conflicts of competence arise when firms take on tasks that are actually the responsibility of the state.

Conflicts of competence are also problematic when firms take on tasks that are actually the *responsibility of the state* but which the latter does not (or cannot) fulfil, such as the provision of infrastructure for basic public services. The voluntary or statutory engagement of the private sector in regional development, sometimes through *public-private partnerships (PPPs)*, is *fundamentally welcome*. However, excessive expectations and *confusion over responsibility* offer potential for conflict especially with the local population. One problem is that if the commitment is voluntary the community lacks leverage to insist on fulfilment. South Africa's statutory social and labour plans, in which companies commit to local development measures, are frequently orientated on local development plans. But their implementation is often inadequate, partly because the state invests too little in basic infrastructure.⁹⁷

Difficulties in transnational supply chains (vertical dimension)

Implementing and enforcing sustainability standards throughout metal supply chains – across multiple stages – is problematic in the current configuration. It is crucial to create transparency throughout transnational supply chains (see info box “Chokepoints”, p. 27). If they are to fulfil their due diligence, buyers need to be able to verify the conditions under which the product has been produced, processed and transported.

Various instruments are available to European buyers wishing to ascertain the conditions under which their supplies were produced. Many employ internal instruments to fulfil their corporate due diligence by communicating directly with their suppliers, or participate in external initiatives (such as sector dialogues on implementing human rights due dili-

92 Interviews with a South African NGO, 20 October 2021 and the South African Human Rights Commission (SAHRC), 15 November 2021; Luthango, *Extraterritorial Obligations in the Governance Gap* (see note 40).

93 Melanie Müller et al., “Public-Private Alliances for Sustainable Commodity Supply Chains. Opportunities and Risks in the South African Mining Sector” (see note 56).

94 Interview with a South African NGO, 4 November 2021.

95 Interviews with South African trade unions, 27 October and 9 November 2021.

96 Interview with an NGO employee, formerly employed in the Peruvian mining ministry, 5 November 2021.

97 Ibid.; Amnesty International et al., *Unearthing the Truth* (see note 34).

Chokepoints hinder transparency and traceability

European companies are generally located in the downstream stage of metal supply chains (industrial manufacturing). If their supply chains are insufficiently transparent they will have difficulty ascertaining where the ores originate from, where the materials flow, what conditions are associated with the earlier stages of the process, and whether standards are observed. This poses great difficulties for sustainability management in the vertical dimension.

Two characteristic chokepoints in metal supply chains restrict the traceability of the material and the identification of suppliers. The first is the *smelters and refiners*. If the companies involved fail to disclose the origin of the primary material and the conditions of its production, it is impossible for downstream actors to trace material back to specific mines (see pp. 29).

The second chokepoint is the *international commodity trade*, which is largely decentralised and typically opaque. Long-term supply contracts between mining companies and smelters/refiners are common (and sometimes the same company operates in both stages). There are also – rather less frequently – direct supply contracts between firms operating in the second and third stages of a supply chain. On the other hand, most of the global trading of refined metals is conducted through specialised trading houses and metal exchanges. Here again, transparency concerning suppliers and provenance remains inadequate (see pp. 21f.). Information on refiners (especially those that are certified) is sometimes available through traders. But trading firms frequently supply no information on provenance. That is a problem, given that conditions vary from mine to mine within a country.

gence). Or they can require their producers and suppliers to apply private standards and certificates, or recognise those the former are already using. These possibilities allow businesses to demand certain standards and monitor their observance (see pp. 19f.).

If this is to succeed, industrial buyers in the EU must consciously strategise longer-term communication and cooperation with suppliers involved in mining and processing, where this is possible and viable. This challenging task demands determination and capacity.

On the other hand, companies along the entire supply chain need to address multiple challenges associated with the implementation of sustainability standards. The first difficulty lies in the *heterogeneity of standards*. Buyers have to choose a standard or certifi-

cate on the basis of what they can plausibly demand of their suppliers. It gets even trickier where buyers diversify their sources, because the selected standard has to be viable in different regional contexts. Firms in the upstream supply chain, for their part, find themselves dealing with multiple international customers each preferring different private standards and certificates (and often imposing stricter requirements than the local legislation).⁹⁸

We are already seeing a decline in the number of private standards, however, with particular standards becoming more widely established.⁹⁹ Developers of standards and certificates also confirm that harmonisation efforts are under way in certain areas. Companies all along the supply chains regard harmonisation and mutual recognition processes as central to enhancing clarity and transparency.

Cost is another problem. Companies in the downstream supply chain have to continuously monitor the scope and quality of the information provided to them by their suppliers – either directly or by third parties in the case of external audits. That is generally manageable for large, well-resourced companies, but not always for small and medium-sized enterprises (SMEs).

Additional cost and effort is also an important consideration in the upstream supply chain, where producers are required to report to their buyers and sometimes to pay large sums for certificates and audits. In the case of industrial metals like platinum and copper there is currently no price premium for certified material. This makes it difficult for producers of raw materials and precursors to pass costs on to their customers and reduces the incentives to seek certification, especially for small-scale mining companies.¹⁰⁰ The latter therefore wish for more support from their buyers.

⁹⁸ Martin Erdmann and Gudrun Franken, *Sustainability Standard Systems for Mineral Resources: A Comparative Overview* (Hannover: BGR, June 2022), https://www.bgr.bund.de/DE/Themen/Min_rohstoffe/Downloads/studie_sustainability_standard_systems_2022.html (accessed 6 July 2022).

⁹⁹ Ibid.

¹⁰⁰ Tobias Wuttke, “Global Value Chains and Local Inter-Industry Linkages: South Africa’s Participation in the Automotive GVC”, *Journal of Development Studies* (2022), doi: 10.1080/00220388.2022.2110491.

Unreliable audits the risk of greenwashing.

The third major difficulty concerns verification in production facilities in the upstream supply chain, irrespective of whether such *audits* are integral to transparency initiatives or requested by individual customers. In the latter case they are frequently conducted by third parties such as freelance auditors or established consulting firms. The dangers here include unfamiliarity with the local context, insufficient transparency concerning auditors' activities, and lack of thoroughness. Superficial audits may be misused for *greenwashing*, and the certificate has no real value.¹⁰¹

The example of China demonstrates the importance of the quality of auditing. Inadequate reporting and disclosure by Chinese refiners participating in international certification systems has been documented.¹⁰² As a result their business practices remain opaque and information about the origins of their raw materials is unavailable. This is a problem because there are no alternative means of verification.

101 See Rebecca Heinz et al., *Industriestandards im Rohstoffsektor auf dem Prüfstand: Welchen Beitrag leisten sie zur Umsetzung menschenrechtlicher Sorgfaltpflichten und wie stellen sie Wirkung vor Ort sicher?* (Bonn and Berlin: Germanwatch, 7 March 2022), <https://www.germanwatch.org/de/85063> (accessed 12 September 2022).

102 Global Witness, *Digging for Disclosure: A Review of Publicly-Available Supply Chain Due Diligence Information by Chinese Metals Processing Companies* (London, March 2021), <https://www.globalwitness.org/en/campaigns/natural-resource-governance/digging-disclosure/> (accessed 24 September 2021).

Comparing Metal Supply Chains: Platinum and Copper

Alongside the general challenges of implementing and enforcing sustainability standards in metal supply chains, certain metal-specific factors are central to sustainability governance. The specific structure of a raw material supply chain shapes the (possibilities of) participation and influence of states and other actors. If we are to identify the potentials for and obstacles to sustainability initiatives, we need to adopt a material-specific perspective. The following investigation of the examples of platinum and copper is based on our analysis of interviews conducted in 2021–22, supplemented by secondary sources.

Structural differences

The *supply chain for platinum from southern Africa to the EU* is shorter than the copper supply chain and exhibits greater geographical and firm concentration, especially in the first two stages. This makes it easier to identify material flows and participants than in the lengthier and more diversified copper supply chain.

In 2022, Europe had the world's third-largest demand for platinum, after China and North America. Within the EU, Germany is the biggest importer (see Table 1, p. 30).¹⁰³ Platinum is used in catalytic converters and thus an important input for the European car industry. Other industrial uses are found in the chemicals, electronics and medical sectors. Platinum is also used in jewellery, and increasingly also as a store of value.

103 On the basis of United Nations Commodity Trade Data Base (UN Comtrade), "International Trade Statistics" (n. d.), <https://comtrade.un.org/data> (accessed 14 September 2022), year 2021, HS Code 7110, sorted by trade value; Johnson Matthey, *PGM Market Report: May 2022*, no. 3605 (May 2022), <https://matthey.com/pgm-market-report-2022> (accessed 9 February 2023).

Global demand for platinum is currently moderate.¹⁰⁴ In the medium term the transition from petrol and diesel to electric vehicles will considerably reduce demand. It remains to be seen whether additional demand will arise in connection with new technologies (such as water electrolysis). A study commissioned by DERA suggests that demand for platinum in a future sustainability scenario will remain below today's levels.¹⁰⁵

Although the EU covers part of its current needs through its own recycling sector it still imports primary material, almost all of which comes from the world's biggest exporter South Africa and arrives in a refined state. EU companies focus mainly on secondary production and recycling, with important producers being the German Heraeus Precious Metals and C. Hafner GmbH and the Belgian Unicom.¹⁰⁶

Most of the world's platinum reserves are located in South Africa and Zimbabwe, which together accounted for 76.5 percent of global mining output in 2021.¹⁰⁷ Accordingly, *primary production of platinum* (stage 1 of the supply chain) is concentrated in Southern Africa. Ore mined in Zimbabwe is mostly dressed locally, close to the mines (still stage 1) and sometimes also processed into concentrate. But the refining (stage 2) is done exclusively in South Africa.

104 Johnson Matthey, *PGM Market Report* (see note 103).

105 Frank Marscheider-Weidemann, *Rohstoffe für Zukunftstechnologien 2021: Auftragsstudie*, DERA Rohstoffinformationen 50 (Berlin, 2021), https://www.deutsche-rohstoffagentur.de/DE/Gemeinsames/Produkte/Downloads/DERA_Rohstoffinformationen/rohstoffinformationen-50.pdf (accessed 24 August 2022).

106 Interview with a mining firm in South Africa, 11 November 2021.

107 U.S. Geological Survey, *Mineral Commodity Summaries 2022* (Washington, D.C., 2022), 127, <https://pubs.usgs.gov/periodicals/mcs2022/mcs2022.pdf> (accessed 15 September 2022).

Table 1

Platinum

Consumption by sector (EU), 2021	Car industry (50.3 percent), jewellery (12.2 percent), investment (8.6 percent), chemical industry (8.6 percent), dentistry and biomedicine (4.6 percent), emissions reduction (3.5 percent), glassmaking (1.3 percent), other (10.1 percent)*
Emerging technologies	Water electrolysis, data centres
Main importers (platinum), 2021	United States, United Kingdom, Germany, Japan, China (trade value)
Platinum group metal reserves	South Africa (90 percent), Russia (6.4 percent), Zimbabwe (1.7 percent), United States (1.3 percent), Canada (<0.1 percent), other (n.a.)
Mining	South Africa (67.5 percent), Russia (13.9 percent), Zimbabwe (9 percent), Canada (4.2 percent), United States (2.5 percent)
Recycling	27 percent of global platinum production originates from recycled scrap
Supply chain concentration	Reserves, mining and refining strongly concentrated in South Africa. Downstream supply chain less concentrated

* Data for EU+ (including United Kingdom and Turkey, without Russia).

Sources:

Johnson Matthey, *PGM Market Report. May 2022*, May 2022, <https://matthey.com/pgm-market-report-2022> (accessed 3 August 2022); UN Comtrade, “International Trade Statistics”, n. d., <https://comtrade.un.org/data> (accessed 14 September 2022), year 2021, HS Code 7110, by trade value; U. S. Geological Survey, *Mineral Commodity Summaries 2022* (Reston, VA, 2022), 126, <https://pubs.usgs.gov/periodicals/mcs2022/mcs2022.pdf> (accessed 15 September 2022); Frank Marscheider-Weidemann et al., *Rohstoffe für Zukunftstechnologien 2021: Auftragsstudie*, DERA Rohstoffinformationen 50 (Berlin, 2021), https://www.deutsche-rohstoffagentur.de/DE/Gemeinsames/Produkte/Downloads/DERA_Rohstoffinformationen/rohstoffinformationen-50.pdf (accessed 24 August 2022).

The platinum supply chain also exhibits strong *concentration at firm level*. Just three transnational corporations dominate the first two stages of the supply chain: Sibanye-Stillwater, Anglo American Platinum and Impala Platinum. They control a large proportion of South African mining, and operate the refineries there, which process raw material from across the region. In addition they run the platinum mines in Zimbabwe, sometimes through subsidiaries. They often have long-term purchase contracts with smaller South African mining firms (offtake agreements), because refineries are costly to operate and only profitable above a certain threshold. Even though certain South African refiners have already been externally certified, for example under the LPPM Responsible Sourcing Standard, they still represent a chokepoint with all the associated problems of lack of transparency (see info box “Chokepoints”, p. 27).

The three largest importers of South African platinum are the United States, Japan and the United Kingdom.¹⁰⁸ *Platinum is traded through various channels*, with a significant proportion over-the-counter – through LPPM in London – and via other specialised intermediaries. On the other hand, there are also direct contractual relationships between mining firms and those that conduct intermediate and final processing (some of which are European). But the physical product is often exported directly from the producer to the final customer. Because platinum is used in small amounts and has an extremely high value-to-weight ratio, it is usually transported by air freight.

While China plays no relevant role in platinum mining, it is a significant user of the material. In

108 On the basis of UN Comtrade, “International Trade Statistics” (see note 103), year 2021, HS Code 7110, export South Africa.

Table 2

Copper

Consumption by sector (Germany), 2021	Electrical (57 percent), construction (10 percent), car industry (9 percent), mechanical and plant engineering (8 percent), trade (5 percent), other (6 percent)
Emerging technologies	Many applications in green technologies; increased demand in fields including grid expansion, e-mobility, wind power, batteries
Main importers (ore and concentrates), 2021	China, Japan, South Korea, Germany, Spain (trade value)
Copper reserves	Chile (22.7 percent), Australia (10.6 percent), Peru (8.6 percent), Russia (7.0 percent), Mexico (6.0 percent), United States (5.4 percent), Democratic Republic of the Congo (3.5 percent), other (36.2 percent)
Mining	Chile (27.8 percent), Peru (10.4 percent), China (8.4 percent), Democratic Republic of the Congo (7.8 percent), United States (5.8 percent), Australia (4.3 percent), Zambia (4.1 percent), other (31.4 percent)
Recycling	17 percent of global copper production originates from recycled waste; in the EU approx. 44 percent
Supply chain concentration	Reserves and mining in all continents; main mining region is South America. Refining increasingly concentrated in China (also largest consumer of refined copper)

Sources:

Gesamtverband der deutschen Buntmetallindustrie (GDB), *Recycling: Kupfer im Kreislauf* (Berlin, 2019), https://www.gdb-online.org/wp-content/uploads/2019/12/Factsheet_Kupfer-Recycling.pdf (accessed 12 September 2022); UN Comtrade, “International Trade Statistics”, n. d., <https://comtrade.un.org/data> (accessed 14 September 2022), year 2021, HS Code 2603, by trade value; U. S. Geological Survey, *Mineral Commodity Summaries 2022* (Reston, VA, 2022), 54, <https://pubs.usgs.gov/periodicals/mcs2022/mcs2022.pdf> (accessed 15 September 2022); WVMetalle, *Metallstatistik 2020* (Berlin, 2020), <http://bit.ly/3Zdo5Wc> (accessed 8 February 2023); EuRIC, *Metal Recycling Factsheet* (Brussels, 2020), <https://www.euric-aisbl.eu/position-papers/download/591/335/32> (accessed 8 February 2023).

China – unlike Europa and North America – platinum is used principally for jewellery.¹⁰⁹ Even if global demand for platinum is currently moderate, strong *potential price and supply risks* must be assumed. The reasons for this include strong concentration in mining and processing, as well as existing risks in source countries such as disruption of mining through strikes and protests. DERA accordingly classifies platinum as

a supply risk and the EU also included platinum group metals in its 2020 list of critical raw materials.¹¹⁰

The *supply chain for copper from the Andes* to the EU is longer than that for platinum. Copper mining is more globally diversified, with Chile and Peru the largest producers. On the other hand there is strong concen-

109 Johnson Matthey, *PGM Market Report* (see note 103); Roger Dixon and Robert Schouwstra, “The Role of Forensic Geology in the Illicit Precious Metals Trade”, *Episodes* 40, no. 2 (2017): 132 – 40.

110 DERA, *DERA-Rohstoffliste 2021* (see note 27); European Commission, “Critical Raw Materials Resilience: Charting a Path towards Greater Security and Sustainability”, COM/2020/474 final (Brussels, 2020), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0474>.

tration in smelting/refining and industrial processing, which are centred on China.¹¹¹

Germany has the most significant copper industry in the EU, and is the world's fourth-largest importer of copper ores and concentrates after China, Japan and South Korea (see Table 2, p. 31). Major copper producers such as Aurubis and Wieland are German-based. Copper is a very widely used material, and is crucial in construction, engineering and electronics.¹¹² It is also important for the transition to green energy and for numerous emerging technologies.¹¹³ For this reason demand for copper is forecast to increase massively. IRENA predicts *global demand* of 50 to 70 megatonnes in 2050, compared to 30 megatonnes in 2021.¹¹⁴ In light of the expected growth, recycling cannot be expected to cover demand in the medium term.¹¹⁵ Even if the EU already has significant copper recycling capacity, it remains highly dependent on the primary raw material.

The first stage of the copper supply chain is less concentrated than in the case of platinum, with meaningful reserves on all continents. Nevertheless, Latin American mining and export of primary raw material is crucial for the global market. Chile is one of the world's biggest copper producers and an important supplier of copper ore and concentrates to the EU.¹¹⁶ Peru also exports significant quantities. The market share of small and medium-sized mining firms in the Andean copper sector is larger than for platinum in Southern Africa, but the market is ultimately still dominated by a handful of very large operators: Chile's state-owned CODELCO and multinationals (MNCs) like Glencore and BHP.

111 International Copper Study Group (ICSG), *The World Copper Factbook 2022* (Lisbon, 2022), <https://icsg.org/download/factbook2022-pdf?wpdmdl=7096> (accessed 20 February 2023).

112 BGR, *Kupfer: Informationen zur Nachhaltigkeit* (see note 31).

113 Liesbet Gregoir and Karel van Acker, *Metals for Clean Energy: Pathways to Solving Europe's Raw Materials Challenge* (KU Leuven, April 2022), <https://eurometaux.eu/media/jmxf2qm0/metals-for-clean-energy.pdf> (accessed 4 May 2022).

114 Dolf Gielen and Martina Lyons, *Critical Materials for the Energy Transition: Rare Earths Elements*, Technical Paper 2/2022 (Abu Dhabi, 2022), 15, https://irena.org/-/media/Files/IRENA/Agency/Technical-Papers/IRENA_Rare_Earth_Elements_2022.pdf (accessed 6 July 2022).

115 Gregoir and van Acker, *Metals for Clean Energy* (see note 113).

116 European Commission, *3rd Raw Materials Scoreboard* (see note 2).

The copper supply chain is bound up with a complex transnational transport infrastructure. While Chile possesses the world's second-largest copper refining capacity, Peru's is marginal.¹¹⁷ Both export most of their copper concentrate to China. Copper concentrate is a bulk product requiring complex logistics and transnational shipping.

Concentration in refining (stage 2) has increased over the past two decades, with additional capacity appearing principally in China. In 2019 China was the world's biggest producer of refined copper, accounting for around 41 percent. China has also developed a large industrial processing sector (stage 3), both for its own consumption and as a global exporter of precursors and semi-finished products. Today China accounts for more than 50 percent of global demand.¹¹⁸

Material flows in the copper supply chain are especially difficult to trace, because diversification on the mining side is greater and the transnational transport routes are opaque. The chokepoint of Chinese smelting/refining presents a real challenge (see info box "China's dominance", p. 9). And the copper trade – another chokepoint – is considerably less centralised than the platinum trade. As a base metal, copper is traded in large volumes through transnational brokers and metal exchanges across the world, including the LME in London. The decentralised nature of the trade is a function of the very large volumes consumed by industry, where copper is used in countless different products.

On account of the moderate geographical concentration and country risks, DERA rates copper mining as uncritical; nor is it included in the EU's list of critical minerals. On the other hand the degree of concentration in industrial processing in China warrants close observation.¹¹⁹

Lead firms and state cooperation

Their position towards the end of the supply chain offers European actors little direct influence over sustainability governance in mining and processing. If political decision-makers or businesses wish to take action to influence sustainability, they are dependent

117 ICSG, *The World Copper Factbook 2022* (see note 111).

118 Ibid.; BGR, *Kupfer: Informationen zur Nachhaltigkeit* (see note 31).

119 DERA, *DERA-Rohstoffliste 2021* (see note 27).

on cooperation with other actors. These differ from supply chain to supply chain and therefore need to be identified on a case by case basis.

European actors should collaborate with lead firms to manage sustainability in metal supply chains.

While research indicates that so-called *lead firms* are central to establishing standards in many transnational supply chains,¹²⁰ our analysis of the copper and platinum supply chains reveals that no enterprise in either possesses sufficient market power to ensure the implementation and observance of particular standards on its own. There are, however, a number of companies whose position enables them to positively influence sustainability governance.

These are well-organised companies, mostly MNCs, operating in the first two stages of the supply chain. They play a leading role, often in connection with strong concentration at firm level, and are (theoretically) able to ensure that their suppliers introduce standards and have them regularly verified. They are also able to directly influence others, from smaller market participants to state institutions. The more vertically integrated these companies are, the better they are able to achieve this.¹²¹ This applies not only to mining firms but also to smelters/refiners and traders, and in particular to firms involved in several stages in the supply chain. Examples of the latter include Anglo American, which operates mines, smelters and refineries, and Glencore, a Swiss commodity trading and mining company. Such companies are in a particularly good position to make material flows transparent, and can supply urgently needed information (see info box “Chokepoints”, p. 27).

The most important actors in Southern Africa are the three market leaders, which control a large share of the platinum mining, smelting and refining: Sibanye-Stillwater, Anglo Platinum and Impala Platinum.¹²² They hold great sway over platinum extrac-

tion, smelting and refining in Southern Africa. And they influence South African mining ministry and other relevant actors in the area of standard-setting, in particular through the Minerals Council South Africa (MCSA).¹²³ They are also able to influence working and production conditions in their facilities in Zimbabwe. The example of platinum also underlines the advantages of direct long-term supply contracts between producers and industrial users. They can improve cooperation and above all improve transparency in the supply chain. International trading centres like LPPM in London can achieve similar advances when they introduce standards (see pp. 21f.). Firms in Europe are therefore often relatively well-informed about the origins of their imported platinum.

When it comes to sustainability governance in the more diversified copper supply chain from the Andes to the EU, the Chilean state-owned CODELCO and a handful of MNCs are the decisive actors.¹²⁴ Fundamentally, vertically integrated companies that are involved in multiple stages of the supply chain wield great influence. That certainly applies to CODELCO, whose state-owned status and dominance of mining and processing lend it a dual role in implementing and enforcing standards. Commodity traders like Glencore and metal exchanges like the LME also possess great sway over sustainability governance in the copper supply chain. They are only beginning to introduce standards for sustainability and transparency, so scope and enforcement still leave room for improvement (see pp. 21ff.). This is also relevant with respect to China, where traders often represent the link to the European market and are in a position to pass on sustainability and transparency requirements.

Most of the influential MNCs that dominate the two first stages of the supply chains analysed in this study are organised in the International Council on Mining and Metals (ICMM). Its guidance is influential, also on other MNCs and SMEs in the mining sector. SMEs tend to have fewer resources at their disposal for influencing their business partners to introduce and implement standards. Given sufficient demand,

120 Gary Gereffi et al., “The Governance of Global Value Chains”, *Review of International Political Economy* 12, no. 1 (2005): 78 – 104.

121 Ibid.

122 Calculated by the authors on the basis of company annual reports and South African export volumes; after Michael Schmidt, *Rohstoffrisikobewertung – Platingruppenmetalle: Platin, Palladium, Rhodium*, DERA Rohstoffinformationen 26 (Berlin, 2015), <https://www.deutsche-rohstoffagentur.de/>

DERA/DE/Downloads/studie_Platin_2015.pdf?__blob=publicationFile&v=2 (accessed 4 November 2020).

123 Interviews with various stakeholders in South Africa in October and November 2021, and interview with MCSA, 28 October 2021.

124 Analysis of copper mining industry in Chile and Peru, based on ICSG Online Statistical Database and ICSG Directory of Copper Mines and Plants (2021).

smaller, uncertified mines will also be able to find local or international customers, even if their standards are looser.¹²⁵ Larger enterprises and industry associations tend to intervene more strongly. They are able to generate (public) pressure, and offer guidance and concrete support for implementation.

The industry-backed Copper Mark is becoming increasingly established as a resource-specific standard in the copper supply chain; the production facilities of certain European companies, including German-based Aurubis, have gained Copper Mark certification. It has also been awarded to a number of mines in important copper-producing countries like Chile.¹²⁶ In the platinum sector, the multi-stakeholder initiative IRMA is increasingly important, not least on account of pressure from industrial users (in particular the European car industry).¹²⁷

(Large) European companies exert influence largely through their direct relationships with producers in mining countries. But smaller buyers may find it difficult to trace their supply chains or to establish effective instruments with which to influence upstream sustainability. Remedying this requires state support measures, such as national helpdesks on business and human rights, the UN Human Rights Toolkit or the ILO Helpdesk for Business on International Labour Standards. Exchange between actors within a sector is also useful, for example through the Automobile Industry Sector Dialogue in Germany.

As our analysis of the copper and platinum supply chains demonstrates, states have different types of influence on sustainability governance. Given its limited legislative influence on the upstream supply chains, the EU and its member states should collaborate (more) strategically with states where mining and processing occur, as well as those that possess particular influence over trading centres

The great geographical dispersion of copper reserves and mining makes it easier for European businesses to diversify their sources. At the same time, however, this makes it more difficult to influence standard-setting in the supply chain, because the selected instruments have to cope with different

regional contexts and priorities. Here cooperation with important copper exporters like Chile is a central factor. At company level, German copper refiner Aurubis has recently signed a memorandum of understanding with state-owned copper producer CODELCO aiming to enhance sustainability in the copper value chain. The agreement supports the German-Chilean Raw Materials Partnership, which was re-established at political level in January 2023.¹²⁸ Chilean efforts to establish binding sustainability standards and actively promote sustainability initiatives in the industry¹²⁹ can also influence other mining countries and have positive effects at other stages of the supply chain.

In the more concentrated platinum supply chain South Africa plays a decisive role as the main exporter. Close bilateral cooperation is essential for making progress on sustainability (governance) in the mining sector and standard-setting for businesses. Positive developments in South Africa would also have knock-on effects in other countries where South African mining firms operate, such as Zimbabwe.

Certain mining and processing countries hold powerful negotiating positions.

Growing demand for metals, especially for green technologies, can be expected to strengthen the negotiating position of particular mining and processing countries. Like vertically integrated firms, states that control multiple stages of a supply chain wield greater power in the markets. Chile and South Africa each find themselves in an advantageous position, because they not only operate as the principal exporter (of copper and platinum respectively), but also possess parts of the refining industry. The role of demands for technology transfers and local value creation will play a larger role in future bilateral trade and cooperation agreements.

China, as the example of copper demonstrates, plays a key role in metal supply chains. This poses problems for supply chain transparency because the transport and processing steps remain largely opaque to Euro-

¹²⁵ Interviews (see note 122) and review of company reports in the respective countries of study.

¹²⁶ Copper Mark, “Recipients of the Copper Mark”, n. d., <https://coppermark.org/participants-home/participants/> (accessed 17 September 2022).

¹²⁷ Discussion with a South African mining firm, 24 November 2021, and examination of company reports; interview with a German automotive OEM, 2 February 2022.

¹²⁸ Aurubis, “Aurubis and Codelco Sign an Agreement to Cooperate on a More Sustainable and Responsible Copper Value Chain”, press release, <https://www.aurubis.com/en/media/press-releases/press-releases-2023/aurubis-and-codelco-sign-an-agreement-to-cooperate-on-a-more-sustainable-and-responsible-copper-value-chain> (accessed 9 February 2023).

¹²⁹ Discussion with representatives of the Chilean mining ministry, 1 December 2021.

pean buyers, while risks are rife, in particular in the field of human rights. Furthermore, the willingness of Chinese refiners to participate in sustainability and transparency initiatives remains inadequate and implementation poor.¹³⁰

On the trading side too, the possibilities open to the EU and its member states are limited. The European Union simply possesses no significant trading centre that it could regulate directly (since Brexit took London out of the EU).

Important counterweights: Civil society and trade unions

If sustainability within supply chains is to be addressed more effectively, civil society and trade unions will need to be more closely involved. Both have a contribution to make in improving and verifying sustainability standards in mining and processing countries. *Democratic structures are an important precondition* for the proper function of trade unions and civil society; financial resources, personnel and local organisational structures are also vital. Formal civil society organisations with secure funding enjoy advantages over the voluntary and often less formal organisations frequently encountered in mining communities.

The influence of civil society actors and trade unions in the horizontal dimension of supply chains relies on existing local governance structures, which are geographically uneven (see pp. 23f.). They tend to command fewer resources and less access to information than political and business actors. Such *power asymmetries* are especially salient in the mining sector.

Chile, Peru and South Africa are democratic states where civil society actors and trade unions have greater potential influence than in authoritarian regimes like Zimbabwe. South Africa's corporatist structures include trade unions in national dialogue processes and grant extensive labour rights. Chile has a heterogeneous landscape of NGOs and other organisations, which work to promote sustainability and defend the rights of communities affected by mining.

¹³⁰ Nora Sausmikat, *Auf dem Weg zur Regulierung von Lieferkettenverantwortung: Richtlinien in der Volksrepublik China* (Berlin: PowerShift and Urgewald, November 2021), <https://power-shift.de/wp-content/uploads/2021/12/Auf-dem-Weg-zur-Regulierung-von-Lieferkettenverantwortung-China-web-112021.pdf> (accessed 21 February 2022).

Even here *governance gaps* exist, especially when it comes to participatory rights of mining communities and civil society. South Africa lacks legislation covering participatory rights in the areas of licencing and monitoring in the mining sector, nor does it provide complaints or mediation mechanisms. Affected individuals and communities generally turn to local NGOs or the South African Human Rights Commission (SAHRC) – which lack formal powers and tend to have to use often slow and cumbersome legal options, even in the case of acute conflict.¹³¹ Many Latin America countries, such as Peru, have state ombudsman's offices to protect the rights of affected communities and mediate in the event of conflicts where occur. Despite various initiatives, Chile does not currently have a comparable body.¹³² Such institutions are most effective where they are independently appointed and entitled to impose sanctions.¹³³

Civil society actors face multiple challenges and need support.

Many civil society actors lack the resources to fund legal representation. Further challenges include legal and practical confusion over participatory rights; corruption, threats and violence also hamper the work of activists (see pp. 14ff.).¹³⁴

Such difficulties are greatest in *authoritarian states* like Zimbabwe, where trade unions and civil society are tightly restricted. They are able, to a certain extent, to draw attention to their concerns through political opposition parties, but are largely excluded from decision-making processes and public criticism

¹³¹ Interviews in South Africa with NGOs and representatives of mining communities, October and November 2021, and discussion with SAHRC, 30 November 2022.

¹³² Natalia Palma, "Pleno de la Convención aprueba creación de la Defensoría del Pueblo" [Plenary of Constitutional Convention approves establishment of ombudsman's office], *diarioUchile* (online), 3 May 2022, <https://radio.uchile.cl/2022/05/03/pleno-de-la-convencion-aprueba-creacion-de-la-defensoria-del-pueblo/> (accessed 17 September 2022).

¹³³ Interview (see note 82).

¹³⁴ Bettina Engels and Kristina Dietz, eds., *Contested Extractivism, Society and the State. Struggles over Mining and Land, Development, Justice and Citizenship* (London: Palgrave Macmillan, 2017), doi: 10.1057/978-1-137-58811-1; Global Witness, *Enemies of the State? How Governments and Business Silence Land and Environmental Defenders* (London, 2019), <https://www.globalwitness.org/en/campaigns/environmental-activists/enemies-state/> (accessed 5 October 2020).

is dangerous.¹³⁵ The situation is similar in China, where there are massive restrictions on civil rights, in particular freedom of expression and assembly.¹³⁶

It is even harder for civil society actors and workers to gain any influence over other stages of metal supply chains (still less the entire chain). As discussed in the section on implementing and enforcing sustainability standards (see pp. 25ff.), the *opacity* of the supply chain often prevents actors from addressing risks and violations — alongside *lack of funding and personnel*. One obvious alternative is to leverage public pressure through international media campaigns and protests, as seen in the textile and agriculture sectors.¹³⁷

135 Itai Kabonga and Kwashirai Zvokuomba, “State – Civil Society Relations in Zimbabwe’s ‘Second Republic’”, *International Journal of African Renaissance Studies – Multi-, Inter- and Transdisciplinarity* 16, no. 1 (2021): 177 – 201; and interviews with a Zimbabwean NGO, 25 October 2022, and a trade union, 8 December 2021.

136 Freedom House, “Freedom in the World 2022. China” (Washington, D.C., 2022), <https://freedomhouse.org/country/china/freedom-world/2022> (accessed 10 November 2022).

137 Florence Palpacuer, “Contestation and Activism in Global Value Chains”, in *Handbook on Global Value Chains*, ed. Stefano Ponte et al. (Northampton: Edward Elgar, 2019), 199 – 213, doi: 10.4337/9781788113779.00018.

Seeking a Sustainable Raw Materials Diplomacy

Despite the manifold geopolitical and structural challenges, the current situation offers European firms opportunities to actively reconfigure their metal supplies. Strategic approaches are called for, with political management connecting the three target dimensions: resilience, sustainability and efficiency.¹³⁸

Diversifying supply chains

Businesses need to diversify their supply chains wherever possible, especially where vulnerabilities are particularly salient due to dependence on risky partners (especially China) and to establish stable supply relationships. Their procurement policies to date have been driven principally by short-term profitability. If they are to live up to their twin responsibilities of security of supply and sustainability, they need to pay greater heed to longer-term perspectives and potential risks. Political decision-makers at national, EU and international level can support such approaches and promote incentives for diversifying supply chains.

In particular, greater attention needs to be devoted to expanding European and international cooperation. For all the discussion about bringing metal supply chains closer to home (onshoring or nearshoring), such strategies are often unviable. As the example of platinum illustrates, the question of geographical availability is non-negotiable.

Another relevant aspect is (lack of) acceptance for domestic resource extraction in European states, where new exploration projects take a great deal of time to develop. Neither of these observations mean that there is no question of extracting resources in

¹³⁸ Jan Grumiller et al., *Resilience in Sustainable Global Supply Chains: Evidence and Policy Recommendations*, Study for the Research Network Sustainable Global Supply Chains (Vienna: Österreichische Forschungsstiftung für Internationale Entwicklung [ÖFSE], February 2022).

Europe (again) in future (reshoring) – especially where projects can be realised quickly and under strict sustainability standards. But it will not be possible for the EU to achieve strategic autonomy in metals through European mining alone.

In order to reduce dependency it certainly makes sense to employ specific metals more efficiently, to increase recycling quotas, and – not least – to consume less. But, as the example of copper demonstrates, demand may exceed the amount of scrap that is currently available.¹³⁹ The same applies to certain other metals. Given that demand for many metals is expected to continue increasing, developing the circular economy can only be part of the solution, at least in the short and medium term. European and international cooperation in the raw materials sector must therefore be intensified as a central pillar of a sustainable raw materials diplomacy (see p. 38ff.). And cooperation must be backed up with high sustainability standards and concrete support for implementation.

Reducing dependency on China

One of the greatest challenges facing European businesses – and national and EU policy makers – is China's key position in metal supply chains.

Businesses must pay heed to geopolitical risks and sustainability issues.

Geopolitical turbulence and supply chain disruptions and dependencies are already requiring businesses to think ahead and operate more strategically. It is up to companies to improve their understanding of their supplier relationships, integrate geopolitical

¹³⁹ European Commission, *3rd Raw Materials Scoreboard* (see note 2).

risks and sustainability criteria into their procurement, and where necessary anticipate concrete crisis scenarios and seek diversification.

In Germany, companies can already draw on various forms of support. Thanks to the work of DERA, they already have access to comprehensive information about dependencies and risks in specific metal supply chains. Moreover, the German government's Helpdesk on Business and Human Rights (Helpdesk Wirtschaft und Menschenrechte) and services offered by the Federal Office for Economic Affairs and Export Control (Bundesamt für Wirtschaft und Ausfuhrkontrolle, BAFA), on which SMEs can also draw for information about human rights and sustainability risks. At EU level, the European Commission has issued a series of studies on critical raw materials and in 2020 created the European Raw Materials Alliance to promote dialogue on critical raw materials and to identify investment cases along raw material value chains.

It would be advisable, as part of the Critical Raw Materials Act, to pool experience and enhance the information flows on critical dependencies and risk in mineral supply chains, also at the European level. Establishing a permanent European Mineral Resources Agency would be one option to increase awareness and improve information for businesses, as well as to directly inform EU actions and legislation.

The efforts to promote diversification need political backing and support. It would be good to see the challenges concerning metals spelled out clearly in both the European Foreign Policy and the national political strategies of EU member states (such as Germany's upcoming China strategy). Apart from mining itself, political decision-makers need to pay particular attention to smelting and refining, where China has entrenched its status as the dominant producer globally. The same applies to metal recycling (see info box "China's dominance", p. 9). When the EU and its member states develop a new strategy for dealing with China, they could follow the example of the Japan Organisation for Metals and Energy Security (JOGMEC) and provide funding for construction of smelters and refineries outside China in order to reduce dependency, shorten supply chains and guarantee high sustainability standards.

Achieving that will require a material-specific approach, given that China's role varies from supply chain to supply chain (see p. 9). Priority should be placed on the metals where dependency on China is greatest, for example by promoting modernisation

and expansion of smelters and refineries in significant producer countries like Chile (copper). It would also make sense to identify corresponding possibilities for other strategically relevant metals.

The idea of complete decoupling from China for metals and mineral raw materials will remain unrealistic for the foreseeable future, because diversification strategies take time to implement and dependencies cannot be completely dissolved; moreover, the supply relationships in this sector are closely interconnected and precipitous decoupling would have massive economic repercussions. European political actors must nevertheless – in conjunction with like-minded international partners – demand that sustainability and human rights standards be implemented in China.

It is also important to create a level playing field within the EU, by enacting and applying the European CSDDD and the planned Regulation on Prohibiting Products made with Forced Labour on the Union Market. Widening the circle of customers subject to due diligence would step up the pressure on Chinese businesses to reveal their production conditions. If Chinese firms refuse to remedy violations and abuses, or if there is evidence of systematic human rights violations, the last resort for European businesses would be to terminate the business relationship. The European legislation must supply the requisite framework.

Finally the EU can work to require metal exchanges and traders to adopt stronger binding measures. The object would be to improve transparency about sourcing and to promote certification both in mining projects and in processing in China. However that would mean getting countries with important trading centres on board, specifically the United Kingdom and Switzerland.

Building and expanding strategic raw material alliances

The EU and its member states should work to establish additional strategic partnerships on raw materials and to deepen existing relationships. Their interest should be directed not only towards established partners such as the United States and Canada; they should also enhance cooperation with countries in the Global South that respect democracy and human rights.

Increased political engagement at national and EU level is already visible. In November 2022 the EU and

Namibia established a strategic partnership on sustainable raw materials and renewable hydrogen. Chile and South Africa – which already cooperate closely with Europe and Germany – adhere to high standards and themselves wish to intensify cooperation in the minerals sector. OECD member Chile for example is currently working to expand local value creation, with a strong focus on environmentally sustainable mining. German Chancellor Olaf Scholz visited the country in January 2023 to strengthen the existing bilateral raw material cooperation and offered support for local processing of lithium and for enhancing sustainability in Chile’s mining sector.¹⁴⁰

Like Chile, South Africa is interested in strengthening local value creation from minerals. In December 2022 German Economy Minister Robert Habeck visited Southern Africa to identify opportunities for collaboration on energy (particularly hydrogen) and minerals.

Efforts to establish raw material partnerships by the EU and by individual member states should be consistent and complementary. The Critical Raw Materials Act should therefore also pave the way for more cooperation within the EU. A successful strategy for reconfiguring partnerships demands close and inter-ministerial cooperation at the national level and with the European Union. Within the EU, coordination is needed most importantly between the Commission directorates general responsible for internal market and industry (GROW), trade (DGT) and international partnerships (INTPA), and in the interest of a coherent foreign policy also with the European Council and the European External Action Service (EEAS).

The EU and its member states should offer attractive proposals to potential partners.

Enhancing bilateral cooperation with resource-rich countries that subscribe to comparable norms and values in the areas of sustainability and democracy (friendshoring) must take account of the partners’ needs.¹⁴¹ The growing demand for metals puts many

140 “Scholz bietet Chile Hilfe bei der Verarbeitung von Lithium an”, *Spiegel Wirtschaft* (online), 30 January 2023, <https://www.spiegel.de/wirtschaft/olaf-scholz-bietet-auf-suedamerikareise-chile-hilfe-bei-der-verarbeitung-von-lithium-an-a-604e6ebc-b399-47e2-90b7-5b56739262c2> (accessed 6 February 2023).

141 Günther Maihold, *A New Geopolitics of Supply Chains: The Rise of Friend-Shoring*, SWP Comment 45/2022 (Berlin: Stiftung

mining countries in a position to choose their partners. The EU and its member states therefore need to make attractive offers that should include cooperation on developing local industries (value creation) and research, as well as support through development projects. For many states high dependency on resource exports has turned out to be a hindrance to development and economic diversification.

Rising global demand for critical minerals worldwide comes with great challenges, but also opens a *window of opportunity*, if backed by policy learning and effective national and regional industrial strategies as well as supported by international partnerships.¹⁴² That potential is increasingly recognised by many states, especially in Latin America and Africa. The EU should therefore tailor partnership offers embedding the promotion of local value creation. Depending on the partner country, measures to enhance the local value created from mining could include investment in smelting and refining capacity, infrastructure (for example for transport and energy) or to promote the involvement of partner countries in green tech value chains. This could be achieved by developing the beneficiation of local minerals for battery production.

A number of African countries have recently embarked on this path. In April 2022 for instance Zambia and DR Congo signed a cooperation agreement on developing a local electric vehicle battery value chain.¹⁴³ As most countries are not endowed with all the minerals needed for the production of green technologies, facilitating regional cooperation in this area (rather than national competition) is of strategic importance for resource rich countries to create synergies and to seize the opportunities created by increased geopolitical competition.

Nearshoring strategies in the Global North that aim to enhance processing of minerals and manufacturing of green technologies (like the US IRA requirements and the European Green Deal Industrial Plan) must

Wissenschaft und Politik, August 2022), <https://www.swp-berlin.org/publikation/a-new-geopolitics-of-supply-chains> (accessed 28 November 2022).

142 Nem Singh Jewellord, “The New Geographies of an Energy Transition: A Challenge or Developmental Opportunity?” in *From Extractivism to Sustainability: Scenarios and Lessons from Latin America*, ed. Henry Veltmeyer and Arturo Ezquerro-Cañete (London: Routledge, 2023).

143 ECA, “Zambia and DRC Sign Cooperation Agreement to Manufacture Electric Batteries”, <https://www.uneca.org/stories/zambia-and-drc-sign-cooperation-agreement-to-manufacture-electric-batteries> (accessed 10 February 2023).

therefore be balanced against the interests and development strategies of partner countries seeking to promote local value creation. The MSP could be a promising initiative for increasing investment at all stages of supply chains, including processing of minerals and the development of local value chains in the battery and clean energy sectors, also in regions outside the G7.

Within the *Team Europe Approach* – supported by European companies – the EU’ partnership offers should align with partners’ development agendas and include greater support to businesses in partner countries, especially smaller mining and processing enterprises with limited resources. Conceivable forms of support could include research cooperation in areas such as “climate-smart mining” and training programmes in the mining sector, as well as supporting implementation of due diligence standards.

Alongside bilateral and EU-coordinated initiatives with partner countries in the raw material sector, the EU should maintain a dialogue with China, as it does with other states that fail to demonstrate adequate efforts to implement sustainability standards. At the same time, the EU should consistently and openly address the lack of transparency and human rights violations in China, and explore possible leverage for making progress on these issues. Furthermore, as China is active in the mining sector in many countries worldwide and is also open to complying with regulations in third countries, EU efforts for international standard-setting and cooperation with partners to strengthen local governance structures are of key importance.

States that demonstrate openness and a willingness to improve their sustainability governance should be supported. In order to uphold the credibility of such approaches, however, the EU and its member states should not pursue strategic partnerships with states that demonstrate no effort at all to realise human rights and sustainability (such as Zimbabwe at the current stage). The quality seal of a “strategic partnership” should only be awarded to countries that show a strong commitment to sustainable governance of the minerals sector.

Political actors in the EU must ensure that they are not rushed into strategic partnerships simply on the basis of their partners’ promises on reducing emissions in the minerals sector. They must also pay attention to social and political rights, where the biggest implementation deficits frequently lie. Businesses too must define their red lines more clearly and communicate that there will be consequences if they are transgressed.

Intensifying European and international cooperation

Political pressure should be increased on the laggards, whether companies or states, to ensure sustainability standards along mineral supply chains. A strong European CSDDD can create a level playing field for European companies, offering them a solid foundation for realising their sustainability concepts and improving cooperation between EU partners.

Multilateral cooperation among states within and without the EU in the context of the Minerals Security Partnership (MSP) has the potential to spur progress on sustainability standards. In its most recently published Principles for Responsible Mineral Supply Chains, the MSP acknowledges the need for standards to develop with the industry, and recognises the importance of strong ESG credentials, transparency, and stakeholder engagement in creating successful projects. However, it remains unclear to what extent these principles are used for investment decisions and whether monitoring is planned.

Greater use should also be made of existing international dialogue formats to promote exchange and signalise openness, especially against the backdrop of current geopolitical dynamics and shifts. For instance the dialogues initiated in the G20 framework could be expanded into platforms for subsequent negotiations. The UN’s Binding Treaty process offers an opportunity to cooperate with resource-rich countries on these issues. That would also serve the objective of systematising standards and securing their international recognition. But the EU can only operate effectively if it invests more in intra-Union coordination and receives a negotiating mandate.

Europe has to date neglected to use the Global Gateway process to expand cooperation with metal-producing countries. However, this need has now been recognised by the European Commission. Under the Global Gateway Strategy partner countries receive financial support for creating infrastructure aligned with the Agenda 2030 and the Paris Climate Agreement. These funds should be specifically channelled into developing local value-creating structures, for example for metal processing or to subsidise smelters and refineries. These investments should be made conditional on strict environmental and human rights standards, in order to promote effective sustainability governance.

Creating transparency

If cooperation among European and international partners is to be expanded, it is imperative to ensure (greater) transparency in the complex metal supply chains. Here the focus of political regulation must shift to the actors operating at the chokepoints.

Various instruments potentially come into play; an obligation for commodity traders to report on their procurement channels; guidance for EU companies trading on metal exchanges; mapping tools offered by third parties. But the EU and the governments of its member states have no direct influence over the regulatory instruments applied in trading centres like Switzerland and the United Kingdom, or in many of the countries where smelters and refineries are located. On the other hand, laying out clear rules for purchasers within the EU can generate pressure on their trading partners and suppliers.

At the same time political and economic pressure needs to be stepped up on states that profit in some way from the prevailing opacity (like China, or Switzerland and the United Kingdom as important trading centres). A strong European Corporate Sustainability Due Diligence Directive would send a message to non-European states involved in metal supply chains and could persuade suppliers outside the EU to provide relevant information to EU buyers. Initiatives like the European Partnership for Responsible Minerals (EPRM) could promote cooperation between European firms within raw material supply chains. That would be another way to ensure greater transparency, including by creating cross-sectoral complaint mechanisms.

International initiatives working to improve transparency include the Extractive Industries Transparency Initiative (EITI). Companies in participating states are required to provide information about the entire value chain in the form of a report. This also includes openness about ownership, finance, tendering, and taxes. Even if certain aspects of initiatives like the EITI are in need of reform,¹⁴⁴ participation can significantly improve transparency.

144 Ibeth López-Cazar et al., “The Extractive Industries Transparency Initiative (EITI) and Corruption in Latin America. Evidence from Colombia, Guatemala, Honduras, Peru, and Trinidad and Tobago”, *Resources Policy* 70 (2021): 101907.

Promoting multi-stakeholder processes

The power imbalance between the actors involved in the supply chain mean that the communities and workers who are most affected by human rights violations and environmental harm generally have the smallest (access to) influence on sustainability governance. That in particular makes complaint mechanisms – for example as required for a series of businesses from 2023 under the German Act on Corporate Due Diligence Obligations in Supply Chains – a relevant instrument. Accessible complaint mechanisms, offered in the languages of the metal exporting countries give affected groups a possibility to report problems. Businesses should see this as an opportunity rather than a burden, as it draws their attention to potential human rights and environmental risks at an early stage, thus enabling them to optimise their sustainability management.

Bilateral cooperation, for example through political foundations working on the ground, should support local NGOs and activists in taking their political concerns and concrete complaints to the responsible actors (state or corporate, potentially both). It would be desirable for local groups to be provided with resources and thus enabled to better network with civil society organisations and businesses within transnational metal supply chains. To date such local groups and workers generally lack the resources to participate in initiatives (frequently as volunteers), while the staff of companies and public institutions do so in the scope of their employment.¹⁴⁵ Better networking could ensure an exchange of information about risks, as well as the ideas and concerns of local groups about making supply chains sustainable. More national and EU-level resource dialogues on individual raw materials would be helpful and should include civil society, for example on the model of the German Automobile Industry Sector Dialogue (Branchendialog Automobilindustrie).¹⁴⁶

If effective instruments for sustainability governance are to be developed, there is no alternative to bringing together different actors with often diverg-

145 Interview with NGO members who participated in various dialogues, 10 November 2021.

146 Bundesministerium für Arbeit und Soziales (BMAS), “Branchendialog Automobilindustrie”, n. d., <https://www.csr-in-deutschland.de/DE/Wirtschaft-Menschenrechte/Umsetzungshilfen/Branchendialoge/Automobilindustrie/automobilindustrie.html> (accessed 21 September 2022).

ing interests, and especially actively integrating critical civil society actors. It would be recommendable to strengthen multi-stakeholder approaches, both within individual stages and along the entire supply chain. Multi-stakeholder formats differ in their institutional and functional structures:¹⁴⁷ They can be employed for example in negotiations and decisions about mining projects, in the introduction of certificates and sustainability labels (for example IRMA), in sector dialogues or at round tables at the international level.

Currently such initiatives are the exception in the raw material sector and its supply chains. The field is dominated by industry-led initiatives and standards that prioritise public relations and tend to take their lead from statutory requirements. Their depth varies enormously, and they risk being (mis)used for greenwashing, especially when critical voices are excluded. This exacerbates informational and negotiating asymmetries. Multi-stakeholder formats are a viable option for counteracting such developments.

“Smart mix” rather than regulatory heterogeneity

There is a myriad of voluntary and private initiatives, standards and instruments in the area of sustainability. Some apply specifically to the mining sector, others encompass all or part of the supply chain. In addition to these standards, various EU member states have introduced or are introducing mandatory corporate due diligence requirements (for example Germany and France). Political decision-makers have set themselves the objective of integrating voluntary and private standards with statutory requirements. The proposed “smart mix” of instruments would unfold maximum effect.

A “smart mix” approach offers various advantages. In some cases private standards are more ambitious than public regulation and offer more flexible and problem- and/or sector-specific guidelines and instruments that can complement horizontal due diligence legislation such as the EU CSDDD. Established multi-stakeholder initiatives in particular may inform legislative processes at national and EU level and can

promote the uptake of standards by smaller businesses that are not yet affected by binding legislation or have not yet concerned themselves in detail with sustainability instruments for other reasons. If companies have already committed to voluntary standards they can also use the associated internal instruments to fulfil their statutory obligations. On the other hand, public regulations can also improve the design, uptake and compliance with specific private standards.¹⁴⁸

The “smart mix” is not always easy to realise in practice, however. The heterogeneity of the – partly competing – initiatives, instruments and standards that have emerged over recent years is often too complex for many companies. This applies in particular to SMEs, which find themselves faced with a multitude of potential certifiers and guidelines with varying scope and coverage, from which they are supposed to choose the ideal one for their legal requirements.¹⁴⁹ That kind of competition between standards is not conducive for an efficient “smart mix”; it would be better if they complemented each other. Moreover, with any private standard and certification there is a risk of “greenwashing”, where certifiers and auditors may prioritise customer satisfaction through rapid implementation or a simple lack of skills or context-sensitivity, to the detriment of actual due diligence.

Another problem is that most private standards were developed by actors from the Global North and most companies that audit social and environmental issues at mine sites are also based in the Global North. Although the transnational character of supply chains demands an integrative and context-sensitive approach, actors and perspectives originating outside the Global North are rarely included on an equal footing in the area of standard-setting and the due diligence management practices of European companies. Existing standards, concepts and verification instruments need to pay greater attention to perspectives and proposals from the Global South.¹⁵⁰ The same holds true for European due diligence laws. While these laws are supposed to make an impact in resource-rich countries in the Global South, regional actors were not included in the process of policy formulation. Actors from the Global South need to be included more

147 Christian Helbig et al., “Multi-Stakeholder Dialogues as Instrument for Design and Qualitative Research in Educational Organisations”, in *Digital Transformation of Learning Organization*, ed. Dirk Ifenthaler et al. (Cham: Springer Open, 2021), 23–40, doi: 10.1007/978-3-030-55878-9_2.

148 Schleifer and Fransen, *Towards a Smart Mix 2.0* (see note 52).

149 Interview with German entrepreneurs, March 2022.

150 Schleifer and Fransen, *Towards a Smart Mix 2.0* (see note 52).

closely when developing, implementing and monitoring private standards and mandatory due diligence regulations, rather than presenting partner countries with a *fait accompli* – and risking guidelines being incompatible with local realities.

Compliance with private standards should not reduce or eliminate corporate legal liability.

European policy-makers should aim for an effective smart mix for sustainability governance in mineral supply chains that avoids perpetuating existing imbalances and challenges related to regulatory heterogeneity. Whether the integration of private certification schemes into mandatory due diligence laws will ultimately enhance sustainability in supply chains remains unclear at this point. Given the aforementioned limitations of private standards, their use (safe harbour) should not reduce or eliminate corporate liability for violations of human or environmental rights. Instead of introducing a “safe harbour” against liability (as currently under discussion for the European CSDDD) the EU and its member states could provide more information and advice on private standards, for example by publishing studies that compare different sustainability schemes at sector level and by informing sector dialogues. If the EU or the governments of its member states do decide to introduce “safe harbour” provisions, they should pay close attention to the challenges and lessons from other regulations that have followed this path, such as the EU Renewable Energy Directive and the EU Timber Regulation.¹⁵¹

151 Christine Moser and Sina Leipold, “Toward ‘Hardened’ Accountability? Analyzing the European Union’s Hybrid Transnational Governance in Timber and Biofuel Supply Chains”, *Regulation and Governance* 15, no. 1 (2021): 115–32.

Conclusion

The requirements for sustainability in transnational supply chains have expanded steadily over the past decade. Regulatory milestones like the UN Guiding Principles on Business and Human Rights (2011) and the OECD Guidelines for Multinational Enterprises have played a decisive role. More broadly too, corporate and public awareness of the responsibility borne by businesses in transnational supply chains has grown.

At the same time geopolitical dynamics have put the question of security of supply firmly back on the agenda of European policy-makers and businesses. Given the growing demand for various metals associated with the European transition to green industries, including renewable energy, e-mobility, digitalisation and other emerging technologies, this aspect can be expected to loom ever larger in the coming years. There is also great uncertainty concerning relations with China, as a central actor in the supply chains of many economically important metals. Structural insecurity in the supply of important metals is therefore likely to be the rule rather than the exception.

Faced with such risks, one could conclude that security of supply should take priority over human rights and sustainability goals. In political contexts — for example in the negotiating processes around the European CSDDD — an (ultimately untenable) contradiction between sustainability and security is sometimes asserted. The present investigation of sustainability governance in the supply chains for copper and platinum underlines that implementing and enforcing human rights and sustainability standards is in fact a core element of security of supply. Helping to identify — and remedy — supply chain risks at an early stage can also contribute to increasing transparency and ensuring that importers are aware of the origin of their supplies.

In order to promote sustainable and effective governance in metal supply chains, the EU and its member states must concentrate on expanding recycling and the circular economy, on encouraging businesses to diversify their supply chains, and on closer inter-

national cooperation. In the short term complete decoupling from China is neither possible nor politically expedient. Nevertheless, the grave and highly risky dependencies that exist in certain metal supply chains urgently need to be reduced.

As well as closer European cooperation, that requires an expansion of resource cooperation with strategic partner countries (friendshoring). Here again, it is essential to verify human rights, environmental and sustainability standards given the high risks associated with the mining sector. Partners' needs should be included more strongly than hitherto, and support offered to expand local value creation. Individual EU member states will not succeed by pursuing this strategy alone. Coherent European strategies and coordination will be key.

Abbreviations

BAFA	Bundesamt für Wirtschaft und Ausfuhrkontrolle (Federal Office for Economic Affairs and Export Control)	STRADE	Strategic Dialogue on Sustainable Raw Materials for Europe
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe	TCFD	Task Force on Climate-Related Financial Disclosures
BMAS	Bundesministerium für Arbeit und Soziales (Federal Ministry of Labour and Social Affairs)	UBA	Umweltbundesamt (German Environment Agency)
BMWi	Bundesministerium für Wirtschaft und Energie (Federal Ministry for Economic Affairs and Energy)	UFK	Ungebundene Finanzkredite (Untied Loans)
BMWK	Bundesministerium für Wirtschaft und Klimaschutz (Federal Ministry for Economic Affairs and Climate Action)	UNCTAD	United Nations Conference on Trade and Development
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (Federal Ministry for Economic Cooperation and Development)	UNEP	United Nations Environment Programme
CSDDD	Corporate Sustainability Due Diligence Directive		
CSIS	Center for Strategic and International Studies		
DERA	Deutsche Rohstoffagentur (German Mineral Resources Agency)		
ECCJ	European Coalition for Corporate Justice		
EITI	Extractive Industries Transparency Initiative		
EPRM	European Partnership for Responsible Minerals		
ESG	Environmental, social and governance		
EU	European Union		
GIZ	Gesellschaft für Internationale Zusammenarbeit		
IACHR	Inter-American Commission on Human Rights		
ICMM	International Council on Mining and Metals		
ICSG	International Copper Study Group		
IEA	International Energy Agency		
IFC	International Finance Corporation		
IHRB	Institute for Human Rights and Business (Eastbourne, East Sussex)		
ILO	International Labour Organisation		
IRENA	International Renewable Energy Agency		
IRMA	International Responsible Minerals Assurance		
ISO	International Organisation for Standardisation		
JOGMEC	Japan Organisation for Metals and Energy Security		
KfW	Kreditanstalt für Wiederaufbau		
LME	London Metal Exchange		
LPPM	London Platinum and Palladium Market		
MCSA	Minerals Council South Africa		
MNC	Multinational corporation		
MPFPR	Max-Planck-Foundation for International Peace and the Rule of Law		
MSP	Minerals Security Partnership		
OECD	Organisation for Economic Cooperation and Development		
OEM	Original equipment manufacturer		
OHCHR	United Nations Office of the High Commissioner for Human Rights		
PPP	Public-private partnership		
RLS	Rosa-Luxemburg-Stiftung		
SAHRC	South African Human Rights Commission		
SDGs	Sustainable Development Goals		
SMEs	Small and medium-sized enterprises		
SNIS	Swiss Network for International Studies		

