

# **Tracing Austrian Corporate Footprints in the Global South: Data-Driven Due Diligence in Extractive Supply Chains**

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**Joseph Baines**

King's College London

**Julian Germann**

University of Sussex

**Steven Rolf**

University of Sussex

**Sean Kenji Starrs**

King's College London

**Martin Wirth**

University of Applied Sciences BFI Vienna

## **Abstract**

This research paper analyzes Austrian companies' supply chain connections to extractive activities and/in the Global South within the context of the EU Corporate Sustainability Due Diligence Directive (CSDDD). The EU CSDDD requires businesses to identify and address environmental and human rights risks throughout their global operations, but faces political attempts to weaken its implementation. Chief among what is termed the Omnibus simplification package is the proposal to limit due diligence obligations to first-tier suppliers only, effectively allowing companies to ignore potential environmental and human rights violations occurring deeper in their supply chains – precisely where the most severe risks often exist. Our contribution demonstrates that comprehensive supply chain mapping beyond first-tier suppliers is both necessary and feasible using existing commercial datasets. Our illustrative case studies of Austrian companies provide regulators, advocacy groups and social movements with theoretically guided insights into the possibilities and challenges of driving meaningful upgrading of environmental and labor standards throughout global production networks. Building on existing GVC and GPN analysis, we argue that our approach can offer useful pointers on where initiatives such as the CSDDD can be most impactful, and how public governance can strengthen private and social governance so that due diligence becomes a robust, globally just and context-sensitive instrument for sustainability transformation.

## **1. Introduction**

Spanning vast distances, global value chains (GVCs) are complex sequences of interrelated production activities which transform raw materials into finished goods. These value chains deliver huge benefits for firms and consumers, but they also generate significant harms for both communities and the environment. The Austrian economy, like most advanced economies, is deeply embedded in GVCs. There have been several major regional initiatives advanced at the EU level that have promised to address and mitigate these harms. Foremost among these is the EU Corporate Sustainability Due Diligence Directive (CSDDD), which came into force last year and which member states including Austria must transpose into national law before 26 July 2026.

The CSDDD represents a landmark development following extensive negotiations between EU institutions, member states, corporate lobbies, and civil society representatives. It mandates that businesses operating within the EU assume environmental and social responsibility for their global production networks. Companies subject to the directive must implement thorough due diligence measures covering their own operations, subsidiaries, and their entire upstream and downstream supply chains. These measures must address risks including forced labor, unsafe working conditions, deforestation, biodiversity loss, pollution, and greenhouse gas emissions. Businesses must publish annual compliance reports, with non-compliance potentially resulting in financial penalties, legal accountability, and exclusion from public procurement. In these ways, the Directive represents a significant milestone in efforts to hold companies accountable for their global environmental and human rights impacts.

However, under the banner of restoring competitiveness and reducing bureaucracy, the European Commission proposed an Omnibus simplification package in February 2025 that would delay and substantially modify the CSDDD's implementation. If adopted, the Omnibus package would significantly weaken the CSDDD's effectiveness in several critical ways. It would raise eligibility thresholds, effectively exempting the vast majority of European businesses from any due diligence obligations (Gros and Fernyhough 2025). Furthermore, it would eliminate the requirement for companies to disengage from non-compliant partners when mitigation efforts fail, essentially permitting continued sourcing from problematic suppliers without liability. The proposal also makes civil liability provisions optional rather than mandatory for EU member states, and allows them to determine maximum penalties at their discretion, replacing the previously established rate of 5% of turnover.

Most significantly, the package would limit companies' due diligence requirements to their direct business partners only, unless specific evidence of abuses exist. Applauded by the Industriellenvereinigung (Federation of Austrian Industries) as fulfilling "[a] long-standing core demand" (IV 2025), this proposal has been severely criticized by numerous environmental, human rights and labor advocacy groups. The European Coalition for Corporate Justice calls it "nothing short than a gutting of the [CSDDD]", "allowing companies to ignore problems at deeper supply chain tiers such as raw material extraction or subcontractor operations where the highest risks are concentrated" (European Coalition for Corporate Justice 2025).

This working paper contributes to the debate over the CSDDD's scope and implementation in three key ways. First, we demonstrate that limiting due diligence to first-tier suppliers would be severely detrimental to social upgrading. Our analysis reveals that close to a quarter of Austrian firms subject to the CSDDD are tied to primary material extraction carrying a high risk of adverse impacts on human rights and the environment. Some 15% of all in-scope companies across various sectors of the Austrian economy source directly from low- or medium-income countries where labor and environmental protections are often less comprehensive, and suppliers likely fall below the reporting threshold established by the CSDDD. Narrowing the CSDDD's scope to direct business partners would therefore leave potentially problematic lower-tier connections inadequately examined and effectively unregulated.

Second, our detailed firm-level case studies challenge industry claims about the excessive costs of due diligence by demonstrating that comprehensive supply chain mapping is feasible using existing commercial datasets, even without access to companies' internal information. Finally, we advance suggestions for more effective regulatory design. By applying global value chain (GVC) and global production network (GPN) frameworks, we offer pointers on how the CSDDD can strengthen both private and social governance so that it becomes a robust, globally just and context-sensitive instrument for sustainability transformation.

The remainder of this working paper is structured as follows. We begin by grounding our analysis in the academic GVC/GPN literature, deriving key conceptual insights that inform our approach. We then detail

our data sources and methodology for profiling the Austrian companies subject to the CSDDD and analyzing the network linkages to extractivist activities and Global South suppliers. The final section presents three case studies that demonstrate the feasibility of sub-tier supply chain analysis while highlighting different configurations of inter-firm power relations, each offering distinct opportunities for civil society mobilization and regulatory interventions.

## **2. Existing Literature: The Topology of Supply Chains**

The proposed changes to the CSDDD necessitate a rethink in progressive strategies for promoting corporate sustainability within and beyond the rubric of the CSDDD. In this work package, we argue that progressives should strive to regain the initiative by tackling commonly accepted claims propagated by industry lobbies and pro-business research institutes that comprehensive supply chain mapping is impossible due to a lack of information or impracticable given the intricacies of globalized production networks. Regaining the initiative in this context rests on two key pillars. The first pillar is to contribute to the ongoing agenda of *mapping supply chains from below* by building on longstanding collaborations and connections forged between workers, social movements, activists and other stakeholders throughout supply chains, who have experienced, borne witness to, and documented corporate misconduct.<sup>1</sup> Such alternative, granular and action-oriented data-gathering practices serve as a counter to the polished corporate sustainability statements published on company websites (Ullah et al. 2021). The second pillar, which we devote the most space to in this paper, entails drawing on the wide range of business analytics and data providers that are available to map supply chains. These data analytics are chiefly used by both corporations and investors in monitoring supply chains, with governments also increasingly interested in this data. However, they are virtually untapped by progressive movements oriented towards achieving a sustainable and just transition. They offer a powerful weapon for traceability and transparency, piercing the veil of allegedly impenetrable global production networks that corporations have long hidden behind. What critics of the CSDDD claim is ‘too complex to regulate’ is often simply ‘too inconvenient to disclose’. In our reckoning, mapping supply chains from below with these data analytics must be oriented around charting the *topology of production networks* so that we can better understand where both corporate and non-corporate actors are best positioned to drive transformations towards sustainability.

Fortunately, instructive scholarship has emerged in recent decades that lays much of the conceptual groundwork for undertaking this endeavor. In the 1990s, the global commodity chains (GCC) approach evolved from the world systems analysis of uneven patterns of profit and power across the global economy (Hopkins and Wallerstein 1986, Gerrefi 1994). However, whereas world systems theory viewed unequal exchange as an integral feature of global capitalism, scholars working within the GCC framework viewed

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<sup>1</sup> E.g. Global Atlas of Environmental Justice, Global Heat Map of Alleged Corporate Abuses, Violation Tracker Global.

unevenness of profits and power as a contingent characteristic of how particular supply chains are governed (Bair 2009). Governance, from this perspective, pertained to the 'authority and power relationships that determine how financial, material, and human resources are allocated and flow within a chain' (Gereffi 1994: 96-7). With this conceptualization of governance, two types of commodity chains were identified. The first is producer-driven commodity chains in which manufacturing corporations harnessed their primacy in research and development and tangible production capabilities over capital-intensive supply chains. The second was buyer-driven commodity chains, in which large retailers and merchandisers leverage their core competencies in design and marketing to exert control over largely labor-intensive supply chains.

Although this twofold typology has been challenged by more fine-grained conceptualizations of GVCs and GPNs in recent years, it still remains influential. In relation to the literature on corporate sustainability, scholars have found that consumer-facing lead firms that govern buyer-driven value chains are more likely to exert pressure on suppliers to raise environmental standards than the lead firms' producer-driven value chains (Poulsen et al. 2016; Ponte 2022). It has also been established that intermediary companies, such as trading firms, operating at several degrees of separation from end-consumers, are also in certain circumstances less likely to adopt a proactive approach to environmental governance given their lower exposure to reputational risk than consumer-facing firms (Heron et al. 2018). Finally, scholars have found that unipolar GVCs, in which lead firms are clustered in one functional position in the chain, are more likely to drive through environmental governance initiatives than multipolar GVCs in which power and authority are distributed across a wide range of supply chain segments (Ponte 2019; Ponte 2022).

Beyond the delineation of buyer-driven versus producer-driven commodity chains, and the distinction between unipolar and multipolar value chain structures, GVC and GPN scholarship has developed fine-grained conceptualizations of the nature of inter-firm relations at individual supply chain linkages. These conceptualizations have important implications for our understanding of how well environmental and social sustainability initiatives may translate throughout the value chain. Moving beyond the initial buyer-driven versus producer-driven typology developed in GCC research in the 1990s, Gereffi et al. (2005) developed a more granular framework which identified five governance types on the basis of three criteria: complexity, codifiability and supplier competence. In between the two poles of market (arms-length trading of commoditized goods) and hierarchy (vertical integration of complex processes) first systematically theorized by transaction cost economics, three intermediary governance types were identified: modular value chains based on the management of complex processes through codification and the development of rules; relational value chains that are oriented around mitigating the problems of complexity through the development of reciprocity and trust between buyer and supplier; and captive value chains that are characterized by less competent suppliers operating as subordinates to lead firms.

This GVC and GPN scholarship on governance and firm-level strategy has implications for our understanding of the efficacy of sustainability initiatives. Specifically, by identifying *what* kind of

governance type and firm-level strategies predominate in global supply chains, we can more precisely hypothesize *where* in these supply chains efforts to promote sustainability should be targeted, and *how* these sustainability initiatives should be organized. In those supply chains in which hierarchy (i.e. intra-firm coordination) or captive (inter-firm control) value chain linkages predominate, the lead firm is clearly the main locus of power and authority, and therefore should be the main (and direct) target for non-firm actors, including governments and campaigners, who wish to promote sustainability in supply chains through improvements in private governance. In contrast, in those supply chains in which relational governance (inter-firm partnership) is central, power and authority is relatively equally shared between lead firms and highly competent suppliers, and so both buyer and supplier should be targeted by those seeking to drive improvements in private governance. Finally, in those supply chains where market or modular relations predominate, power and authority are more dispersed across a wide range of actors, making these kinds of value chain linkages potentially more amenable to standards-setting interventions from public governance bodies. In both the latter cases, international trade agreements would be an effective vehicle by which to enforce such standards.

To our knowledge, the amenability of different value chain linkages to different kinds of interventions by actors wishing to promote sustainability has rarely been systematically theorized within the global value chains scholarship (but see Lund-Thomsen and Lindgreen 2018). The importance of such a task is underlined by calls for a “synergistic” approach to governance, where the private, firm-led modes of governance most discussed in the GVC literature are variously complemented and enhanced by both ‘public governance’ authored by nation-states and supranational governance institutions, such as the EU, as well as ‘social governance’ advanced by progressive actors including trade unions, NGOs and other civil society organizations (Lee and Gereffi 2015; Alford et al. 2023). While our model suggests that there is an elective affinity between private governance and hierarchical and captive value chain linkages, and between public governance and market and modular linkages, the synergistic approach is key in highlighting that no single mode of governance will suffice in guaranteeing improved environmental and social outcomes throughout supply chains.

Existing research on environmental and social upgrading provides ample support for such a synergistic perspective. For example, it has been demonstrated in several buyer-driven value chains that lead firms’ environmental governance initiatives often result in limited forms of environmental upgrading, focused on narrow cost-based efficiencies, as well as economic *downgrading* for suppliers in the form of squeezed profit margins for suppliers and social *downgrading* for workers in the form of reduced wages (Khan et al. 2020). Similarly, it has been shown that the bargaining power of first-tier suppliers with wide-ranging capabilities can often only redound positively for employees if it is accompanied by worker militancy as well as forms of public governance which accommodate such labor agency (Selwyn 2013, Kumar 2020, Marslev et al. 2022).

Table 1 sets out our model for theorizing the intersection of synergistic governance with different value chain linkages. Crucially, it is intended as a heuristic, rather than an all-encompassing framework that can capture all the nuances and complexities of supply chains. Indeed, even the categories that we employ in our model are far from clear-cut as, for example, certain forms of public governance overlap with private and social governance, and certain modular value chain linkages, for example, phase into relational value chain forms. Nonetheless, we contend that the model may provide a useful analytical abstraction to navigate the multivalent and hugely complex forms of governance and inter-firm linkages within global value chains. More precisely, we suggest that the model does not just help explain governance – it can strategically guide it. This is because it helps show where public governance initiatives such as the CSDDD can be most impactful, and how these initiatives can strengthen both private and social governance so that the CSDDD becomes a robust, globally just and context-sensitive instrument for sustainability transformation. With this in mind, the next section examines the corporate profiles of Austrian companies subject to the CSDDD to understand their sectoral distribution and operational characteristics, and set the context for examining their supplier relationships.

	<b>Governance form</b>		
	<b>Private</b> (driven by firms) e.g. codes of conduct, CSR, buyer standards.	<b>Public</b> (driven by states and supranational organizations) e.g., legislation, trade agreements, regulations.	<b>Social</b> (driven by civil society) e.g., NGO campaigns, unions, multi-stakeholder initiatives.
<b>Market</b>	<b>Supportive but secondary:</b> Individual firms have limited power to enforce sustainability due to arm's-length ties; rely primarily on broadly agreed industry standards.	<b>Primary role:</b> State or supranational bodies set baseline standards to ensure level playing field in markets. Prevents 'low-road' competition.	<b>Complementary and watchdog role:</b> Civil society actors pressure dispersed firms toward sustainability, exposing abuses and alerting regulators to infractions.
<b>Modular</b>	<b>Moderate influence:</b> High levels of codification often only reach the first tier of the chain.	<b>Central role:</b> State-led or industry regulatory bodies can address gaps left by private codes, enforcing standards throughout the value chain.	<b>Important monitoring and activist roles:</b> NGOs monitor adherence and expose infractions, while workers use leverage to improve conditions.

<b>Relational</b>	<b>Strong, collaborative influence:</b> Co-produced standards and sustainability strategies between buyer and supplier based on mutual capability.	<b>Supportive role:</b> Institutionalized standards jointly agreed by competent firms and their suppliers, ensuring verification and adherence, and correcting non-compliance.	<b>Supportive and activist roles:</b> Civil society facilitates dialogue and accountability between buyer and supplier firms; workers use leverage to improve conditions.
<b>Captive</b>	<b>Very strong, buyer-driven control:</b> Lead firms set and enforce standards directly, through risk/cost shifting onto suppliers. Can entail shallow or deep engagement.	<b>Strong complementary role:</b> Public regulations prevent lead firms from burdening suppliers with costs of environmental compliance. Safeguarding suppliers and workers where bargaining power is limited.	<b>Crucial accountability role:</b> Essential watchdog function – civil society needed to challenge power imbalances and prevent suppliers from bearing all the costs of environmental or social upgrading.
<b>Hierarchy</b>	<b>Maximum internal control:</b> Internal practices apply firm-wide; easier to set unified goals. No external suppliers to negotiate with, so firms can directly address sustainability problems.	<b>Important regulatory role:</b> Public oversight needed to ensure adherence to broader societal and legal sustainability norms and prevent abuses despite internal control.	<b>Critical accountability role:</b> Essential role to ensure transparent and socially responsible internal operations, guarding against greenwashing or internal abuses.

Table 1. A Heuristic Model of the Intersection of Synergistic Governance and GVC Linkages

**3. Austrian Companies Under the CSDDD and Their First-Tier Suppliers**

To demonstrate that the Omnibus proposal would create significant blind spots in corporate accountability, we began by profiling the specific Austrian companies that fall within the CSDDD’s regulatory scope. The SOMO CSDDD Datahub lists 91 Austrian corporate entities that meet the size thresholds. From this initial list, we excluded financial institutions (banks and insurance companies) whose investments and services are exempt from due diligence requirements. However, holding companies remained in our analysis as they are responsible for the activities of the subsidiaries within their investment portfolios, except where a

specific portfolio company has formally assumed group-wide obligations on the holding company's behalf.<sup>2</sup>

Following these refinements in our case selection, our analysis encompassed 83 Austrian companies subject to CSDDD requirements. We collected comprehensive business descriptions from S&P Capital IQ and systematically categorized each in-scope firm according to the Sustainable Industry Classification System (SICS), mapping their activities to both broad sectoral categories and specific industry designations. The advantage of SICS over conventional industry classifications used for financial analysis or statistical purposes is that it groups companies based on shared sustainability challenges, including resource dependencies and environmental impact, even if their products or services differ.

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<sup>2</sup> AMAG Austria Metall AG and its ultimate parent company B&C Industrieholding have distinct suppliers and are both included in the network analysis. SPAR Holding AG is included in place of its ultimate parent company Holdag Beteiligungsgesellschaft, for which no supplier information is available.

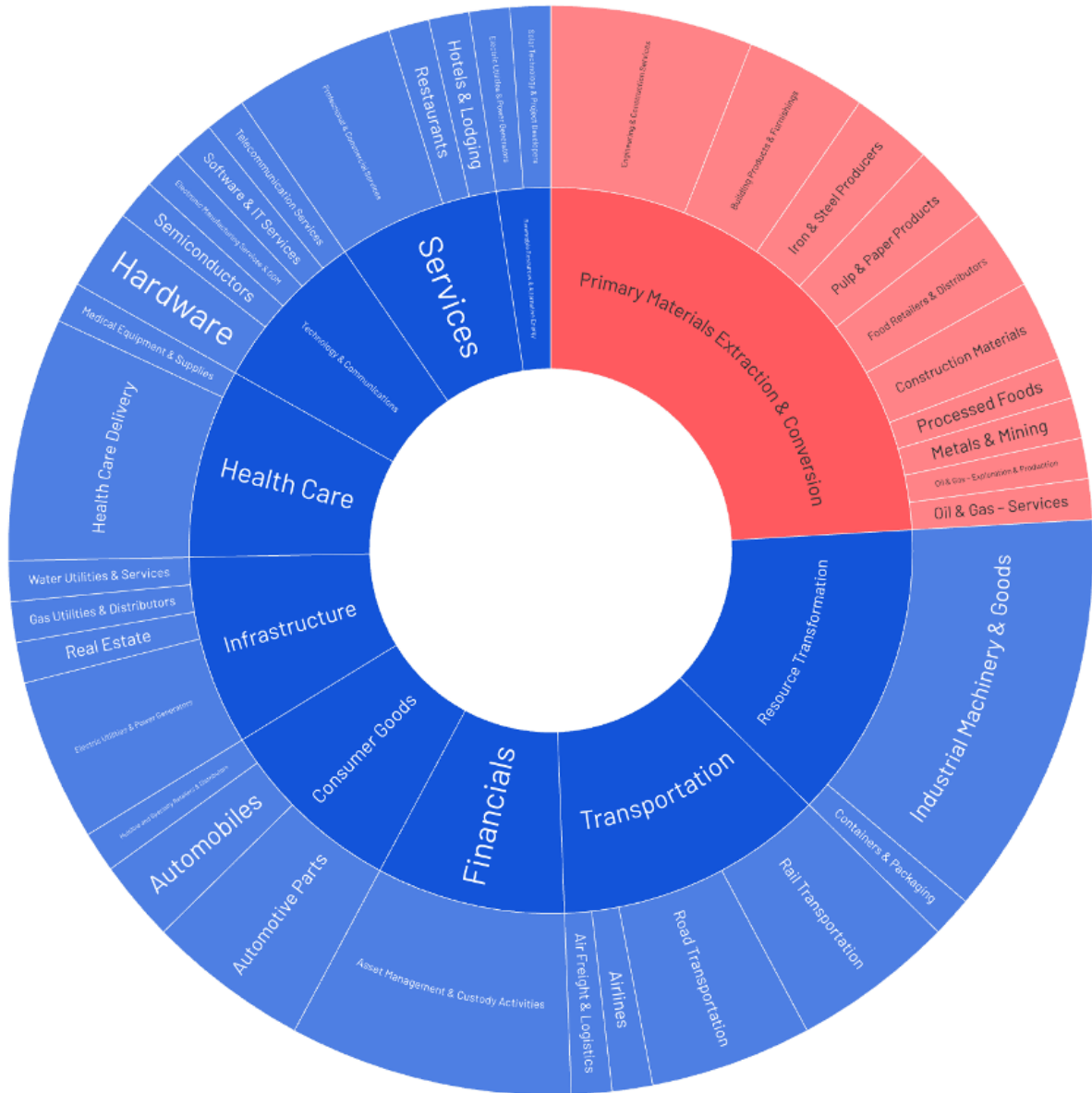


Figure 1: Austrian In-Scope Companies' Sectoral Classification

Source: Authors' own elaboration of data from S&P Capital IQ, Sustainable Industry Classification System (SICS). Data elaborated through flourish.studio

Our analysis reveals that a significant proportion of the Austrian companies subject to the CSDDD participate in what we term the "primary material complex" – a system of enterprises involved in the extraction of non-renewable as well as increasingly constrained natural resources, and their immediate industrial consumption. This includes fossil fuels extracted by companies like OMV, Austria's largest oil and gas company, and Schoeller-Bleckmann, a supplier of tools and equipment for oil and gas drilling. The metals and mining sector is represented by Voestalpine, a major steel producer, along with AMAG Austria

Metall AG, a significant aluminum producer, and Benteler International, which manufactures steel tubes and components.

Construction materials form another crucial segment, with RHI Magnesita, a producer of refractories, and Wienerberger, the world's largest brick manufacturer. This also encompasses building products manufacturers like Blum (hardware and fittings), Doka (scaffolding and formwork systems), and Egger (wood-based building materials including particleboard and laminate flooring), which either process primary materials (timber, zinc) themselves or supply the wider construction industry. The construction sector, represented by major Austrian companies Granit, PORR, Strabag and Swietelsky, consumes approximately half of all materials extracted globally each year (Ellen MacArthur Foundation 2022) – a reality that justifies its inclusion as a central component of the primary material complex.<sup>3</sup>

In addition to construction-related industries, two other sectors merit inclusion in the primary material complex due to their resource-intensive practices. First, the pulp and paper sector, represented by Austrian companies Heinzl and Mayr-Melnhof Karton, processes timber into paper products and cartonboard. While wood is technically renewable, this industry has been implicated in illegal deforestation operations, with several European and Austrian companies found to source from unsustainable logging in biodiversity-rich regions like Romania and Russia (Der Standard 2021). Similarly, the agribusiness sector, which supplies food retailers like MPREIS and Spar, frequently depletes resources like soil and water faster than they can regenerate through intensive monocropping, excessive irrigation, and overuse of fertilizers or pesticides. Both industries demonstrate that the boundary between renewable and extractive resources is blurred.

Overall, the primary material complex – encompassing both direct extractors and immediate consumers of primary materials – represents nearly one quarter of all in-scope Austrian companies subject to CSDDD requirements. This broadened definition corresponds closely to the “sectors with high risk of adverse impacts” originally defined in Article 2.1(b) of the February 2022 European Commission CSDDD proposal, which identified extractives, construction, textiles and agriculture as high-risk industries for environmental harm and human rights violations (DIHR 2024: 9).<sup>4</sup> Despite the subsequent deletion of this classification

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<sup>3</sup> Construction material firms tend to “operate their own quarries, mining crushed stone or sand and gravel”. They “purchase raw materials from the mining and petroleum industries”. And they supply the construction industry with “cement and aggregates, plastic materials, bricks and roofing material”. <https://sasb.ifrs.org/find-your-industry/>

<sup>4</sup> As set out in Art. 2.1(b) of the “Proposal for a directive of the European Parliament and of the Council on corporate sustainability due diligence and amending Directive (EU) 2019/1937”. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52022PC0071> (EPRS 2023). For corresponding NACE Rev. 2 codes, see Annex II of Council of the European Union (30 November 2022), “Proposal for a directive of the European Parliament and of the Council on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937 – General Approach”, <https://data.consilium.europa.eu/doc/document/ST-15024-2022-REV-1/en/pdf>

from the final version of the CSDDD, the significant concentration of Austrian firms dependent on primary material extraction warrants deeper scrutiny.

To fully understand the implications of limiting due diligence to the first tier, we now turn to mapping the immediate supply network of these Austrian in-scope companies. We selected S&P Capital IQ from several commercial data providers because it readily provides two crucial data points for each supplier: geographical location and primary industry classification. This information enables us to systematically identify suppliers that operate in high-impact sectors and/or are located in the Global South – a critical distinction given the robust empirical evidence that Global North companies frequently offshore environmental and human rights risks. Studies show that lead firms based in developed economies commit the majority of human rights violations in developing or emerging countries (Ullah et al. 2021) and strategically relocate pollution-intensive activities to lower-income regions with less stringent environmental regulations (Ben-David et al. 2020; Presberger and Bernauer 2023).

Before presenting our findings, it is important to address the methodological context of this analysis. The S&P Capital IQ supply-chain dataset is not comprehensive. It lacks supplier information for 26 of the 83 in-scope companies, and even for documented firms, the lists of their suppliers and customers are incomplete. S&P subdivides a firm’s suppliers and customers into “recently disclosed” and “prior and not recently disclosed”, based on the start date of the relationship. In the overwhelming majority of cases, no end date is provided. This suggests that the relationship is ongoing, but this is impossible to verify. And lastly, S&P’s proprietary methodology prevents us from definitively confirming whether all captured connections involve a commercial agreement and thus meet the CSDDD’s definition of the *direct* as opposed to *indirect* business partners the Omnibus proposes to exclude. Other supply-chain data sources like Bloomberg SPLC sometimes include suppliers that are two or more degrees removed from a firm, but are deemed to be materially involved in that firm’s operations. However, we know that such lower-tier relationships are probably rare in practice.

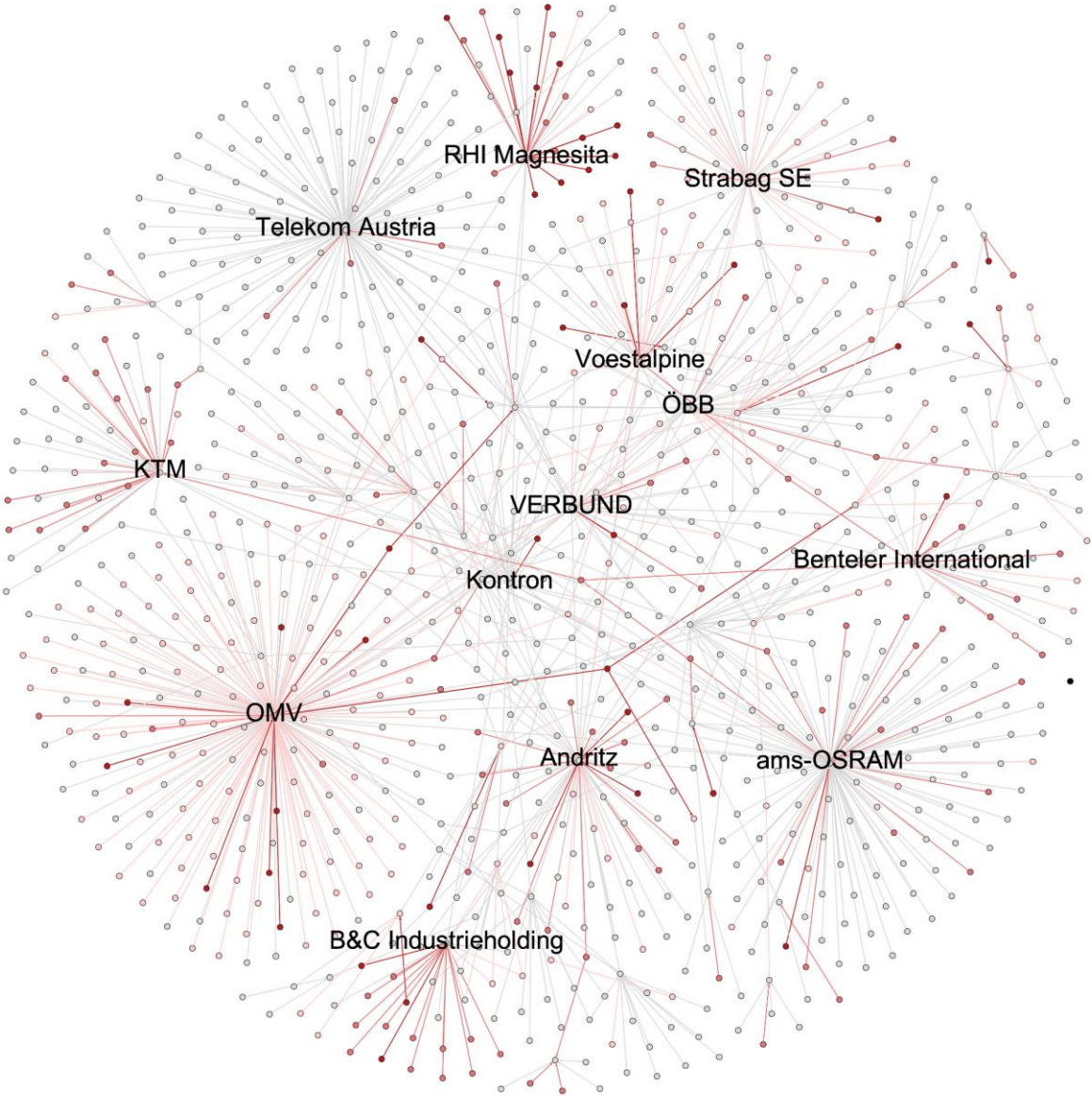
These constraints are significant but do not detract from the purpose of the analysis: Our mapping exercise is not intended to exhaustively document every supply chain relationship, but rather to demonstrate that even limited, commercially available data points to potentially problematic linkages that companies should be expected to know about and investigate.

To operationalize our network analysis, we constructed a straightforward two-by-two risk assessment matrix that combines the Commission’s originally proposed “high-impact” sectoral classification<sup>5</sup> with the OECD Development Assistance Committee’s “high-income” country designation. The resulting framework categorizes firms into four distinct risk levels. Where a firm is both active in a high-impact sector and domiciled in a low- or middle-income country, it is considered to face the highest risk level. Conversely,

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<sup>5</sup> We extend the Commission’s definition to encompass the construction sector given its prominence among Austrian CSDDD firms and its position as the largest global consumer of extracted materials.

firms in low-risk sectors and based in high-income countries are assigned to the lowest risk level. Two intermediate categories capture mixed profiles: Companies in high-impact sectors but located in high-income countries are classified as medium-low risk, while those in low-impact sectors but domiciled in low- or middle-income countries are treated as medium-high risk.



**Risk Level**

- Low
- Medium-Low
- Medium-High
- High

## Figure 2. Risks in First-Tier Supplier Networks of Austrian In-Scope Companies

Source: Authors' own elaboration of data from S&P Capital IQ. Data elaborated through Gephi

Note: Risk levels reflect combinations of sector and country exposure. Firms are colored on the basis of whether they (a) operate in high-impact sectors (Art. 2.1[b], EC CSDDD proposal, February 2022), and/or (b) are domiciled in low-/middle-income countries (OECD DAC classification). Firms are labelled when they have 25 or more in-degree connections in the network.

Figure 2 presents our findings as a network visualization that maps the interconnections between Austrian firms subject to the CSDDD and their known first-tier suppliers. Both the supplier nodes and their connecting pathways are color-coded according to their respective risk levels. Our analysis shows that the vast majority (85%) of supply chain linkages among the 57 in-scope Austrian companies visible through S&P Capital IQ are concentrated in high-income economies. This suggests a favorable risk profile, as high-income economies are generally associated with stronger regulatory frameworks that typically reduce human rights and environmental violations while ensuring more accessible legal remedies when adverse impacts occur. However, we should not automatically assume suppliers in high-income countries operate safely just because of their location. Corporations have also faced fines for environmental violations, labor abuses, and other misconduct in well-regulated economies. Recent political developments further undermine this assumption, as the Trump administration is dismantling the regulatory apparatus of the United States, climate commitments have been scaled back globally following electoral swings to the far right, and intensifying economic competition is threatening a deregulatory race embodied by the Omnibus package. This regulatory uncertainty becomes even more concerning when we consider that just over half (52%) of all first-tier suppliers operate outside the EU's regulatory jurisdiction, with few generating enough EU turnover to trigger direct CSDDD obligations. The EU therefore cannot rely on consistent enforcement of social and environmental standards even in traditionally stable jurisdictions, as some have proposed (Felbermayer et al. 2024: 32-33).

Our network analysis yields a further, pivotal finding: supply chain risks extend beyond the Austrian firms engaged in primary material extraction, permeating diverse industrial sectors with no obvious connection to high-risk activities. Companies in semiconductors (ams OSRAM) and electrical components (Zumtobel), industrial machinery (Andritz), automotive parts (KTM), and even IT services (Kontron) maintain first-tier relationships with suppliers operating in high-risk sectors and regions. Already visible at the first tier, these unexpected and potentially problematic linkages suggest that limiting oversight to immediate suppliers would miss critical environmental and human rights risks. The – already significant – 15% of first-tier suppliers currently operating under conditions that place them in the medium-high or high-risk categories likely represents merely the tip of the iceberg, with substantially greater exposure lurking deeper in the supply network. However, since Global South suppliers generally have no direct reporting obligations under

the CSDDD, the Omnibus simplification would effectively leave these lower-tier supply chain connections unmonitored and unregulated.

The remainder of this working paper extends our mapping exercise across further tiers of the supply chain in pursuit of three objectives. First, we follow up on the suspected elevated risks present deeper in global production networks, based on estimates that there are “no more than three degrees of separation between each European company and potential non-EU HR violators” (Hurt et al. 2023: 15). Second, we counter claims of unmanageable complexity by demonstrating that in-depth analysis of individual companies is perfectly feasible even when using only commercially available rather than privately held and undisclosed data. And third, our selection of company case studies illustrates the key theoretical claim of our working paper, i.e. that successfully pushing lead firms to drive through sustainability transformation in value chains depends on understanding the distinct configuration of inter-firm power within the supply chain.

Global production networks are significantly more complex than a first-tier analysis can reveal. And as we will see below, they also vary in organizational and governance forms. Paradoxically, however, the very argument that supply chains are “too complex to keep track of” is used to justify restricting due diligence to first-tier suppliers only – resulting in self-imposed regulatory blindness that reinforces the underlying issue. Rather than being invoked to justify abdicating regulatory oversight, acknowledging the complexity of supply chains underlines the necessity of careful and sustained research.

#### **4. Company Case Studies**

While awaiting approval from the European Parliament and Council, the Omnibus proposal has sparked renewed political debate. Austrian industry representatives are among the most vocal opponents, demanding that the CSDDD “must either be significantly simplified or dismissed altogether” (Hodgson 2025). The main argument that business leaders have made is that global production networks are so complex that oversight is impossible. “Supply chains alone”, a grouping of virtually all major European business associations jointly proclaimed, “can comprise multiple tiers with hundreds or thousands of locations, product lines and entities” (Joint Business Statement on Due Diligence Proposal [CS3D]), which is why “companies cannot be expected to focus on every single element of their value chains” (Joint Business Statement on the Corporate Sustainability Due Diligence Directive [CS3D]). Some economic research institutes, including in Austria, similarly caution against the administrative burden of sub-tier due diligence, arguing that “many firms do not have a complete picture of their supply chain” (Hurt et al. 2023: 5) and that “[s]upply chain data at the firm level...is not available” (Felbermeyer et al. 2024: 31).

The final section exposes this supposed data limitation as often representing a deliberate strategy to avoid accountability rather than an actual informational barrier. While oversight is not perfect, large companies typically possess better supply chain maps than they publicly acknowledge – precisely because effectively governing value chains is core to their business operations. Their reluctance to share these insights with competitors, regulators, or the public does not negate the existence of this information. Moreover, our

multi-tier case studies demonstrate that even without such insider information, firms can readily track their suppliers' suppliers (and conversely, their customers' customers) through subscription-based yet publicly available data sources.

Specialized data providers like Bloomberg, S&P Capital IQ Pro, and FactSet have expanded existing databases and launched targeted services to meet this growing demand for supply chain transparency. While industry groups might object that these tools are prohibitively expensive, researchers at SOMO have demonstrated that only a small number of European companies – 3,400 corporate groups – would be subject to the CSDDD and that the costs of compliance would amount to no more than 0.13% of the average €478 million paid out to shareholders in 2023 (Teefelen and de Leth 2025).

The three case studies presented below illustrate the varying organizational and governance structures of supply chains, and reflect on how these shape the effectiveness of supply chain governance initiatives to drive extraterritorial improvements in environmental standards in lower-tier supplier firms.

#### **4.1. ams OSRAM**

ams OSRAM is a leading producer of light-emitting diodes (LEDs), sensors, lasers, lamps and related microchip technologies. According to company briefings, it holds a very strong position within the automotive sector as the largest producer of automotive LEDs, lasers and lamps. Beyond this, it is the number-one producer of CT medical imaging technologies, and of horticultural lighting for hydroponic, aeroponic and other advanced forms of agriculture such as vertical farming. Finally, the company claims to be the second-largest producer of light sensors used in consumer goods, and the 16th-largest automotive semiconductor firm. Overall, it boasts a 34% market share in both automotive emitters and light sensors, a 13% market share in the LED industry, and a 1.5% share in the production of automotive chips (ams OSRAM 2024b).

In recent years, ams OSRAM has been very dependent on East Asian supply chains, not least through its relationship with TSMC as indicated in the supply chain map in Figure 3. According to Bloomberg SPLC (2025) data, ams OSRAM is among TSMC's top 20 customers across the world, accounting for 0.6% of the Taiwanese chip manufacturing giant's revenues, a not inconsiderable share given the sheer scale of TSMC's operations. Beyond TSMC, ams OSRAM has direct supply chain ties to other major East Asian firms such as the Chinese assembly, packaging and testing firm, and United Microelectronics, the second-largest semiconductor manufacturing company in Taiwan after TSMC. Through such first-tier suppliers, Figure 3 traces the supply chain linkages to the large array of chemical firms that produce the chemicals for wafer production, photolithography, etching, cleaning, planarizing and other key stages of semiconductor manufacturing and assembly. Additionally, through these companies, Figure 3 traces linkages to major mining firms, which not only operate in the high-risk sector of minerals extraction and processing, but also in lower-income countries, where environmental risks and potential problems regarding human rights violations may be most severe.

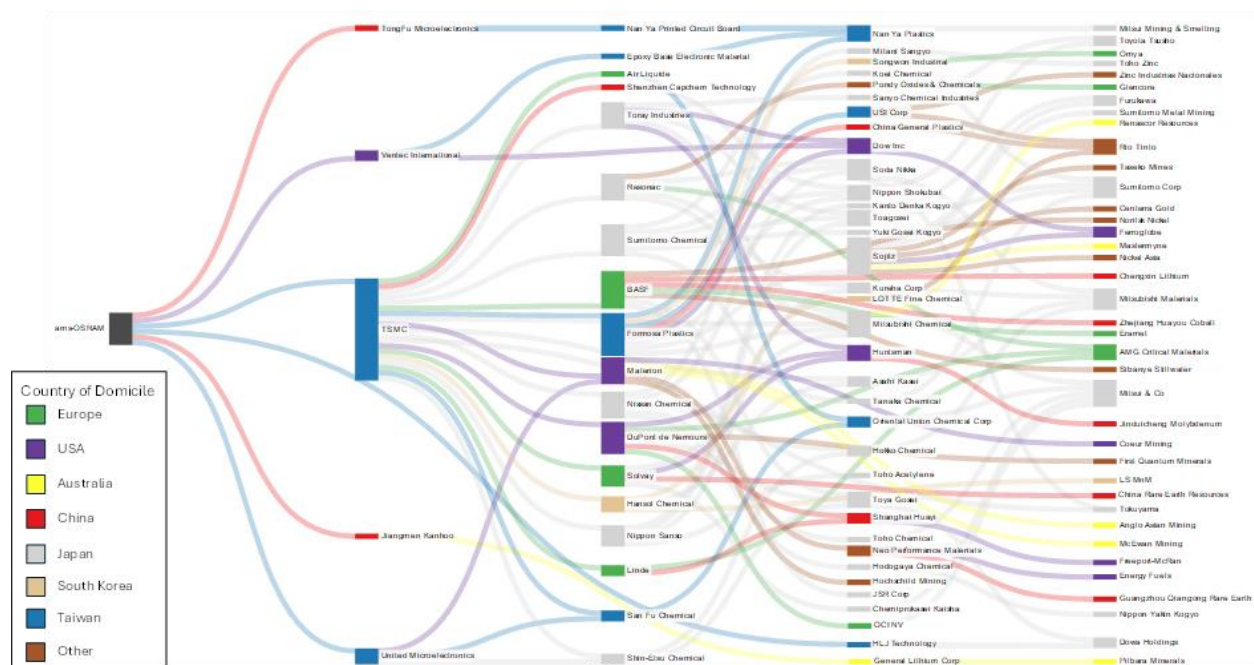


Figure 3. ams OSRAM’s Supply Linkages to Chemical and Mining Firms [figure to be presented in landscape mode]

Source: Authors’ own elaboration of data from Bloomberg SPLC (2025). Data elaborated through sankeymatic.com

The linkages presented in Figure 3 therefore underscore a key claim that we advance in this working paper: contrary to many detractors of the more stringent version of the CSDDD that was originally proposed, supply chains are not too complex to map beyond the first tier. Even those working outside of major firms’ procurement and supply chain teams have both the capacity and data to map out linkages to suppliers several stages removed from lead firms within the supply chain. If this mapping exercise is not enough to convince the reader of our view that the main limit on mapping supply chains is not data availability, nor research capacity, but rather political will, it is worthwhile considering the evolution of ams OSRAM’s own supply chain disclosures. The company’s disclosures regarding the minerals sectors reached a peak in 2019 when, as part of the Responsible Minerals Initiative, ams OSRAM submitted an exhaustive list of 563 smelters and mineral refiners, based in a total of 37 countries, that process minerals used in ams OSRAM’s supply chain (ams OSRAM 2019). Since this high point in transparency, ams OSRAM has regrettably published much less granular data on the origins of minerals in its supply chain, largely replacing in-depth information with glossier and, in many respects, vaguer assurances of corporate social responsibility. Such disclosures leave us with much less information on how and where key materials are processed and sourced.

The mapping exercise for ams OSRAM not only shows that firms' supply chain linkages can be effectively traced; it also offers pointers to what kinds of public governance initiatives would be most effective in driving environmental and social upgrading. While ams OSRAM is clearly a very important firm in its own right, compared to its first-tier supplier, TSMC, it lacks the clout and buyer power to drive through changes in a predominantly East Asian semiconductor value chain. Indeed, while it is true that the value chain linkage between ams OSRAM and TSMC represents a relational pattern – where large amounts of information have to be exchanged between each firm – TSMC holds the greater sway in this relationship. More broadly, the semiconductor value chain as a whole is multipolar in structure, making private governance initiatives of any one company, including ams OSRAM, inadequate to the task of raising sustainability standards. This indicates that public governance, including embedding social and environmental clauses in trade agreements between European and Asian nations, may be a more effective lever for raising sustainability and labor standards in ams OSRAM's supply chain. By supporting such initiatives, as well as the social governance capabilities and collective power of workers and communities at the sharp end of extractivist processes within ams OSRAM's supply chain, the myriad environmental and social problems associated with extractivism in the semiconductor value chain can be mitigated and reversed.

While our mapping exercise highlights ams OSRAM's deep linkages to predominantly East Asian chip manufacturing and chemical firms, and the linkages from these firms to extractivist projects across the world, in recent months there has been a regional turn in ams OSRAM's production network strategy. This is typified by the construction of a wafer manufacturing plant in the south-western exurbs of Graz for chips used in the automotive, industrial, consumer and medical sectors. Significantly, the €567 million investment required to establish this facility will be defrayed by €227 million in state aid from the Austrian government. The aid package was approved by the European Commission in February 2025, on the basis that it will “strengthen Europe's security of supply, resilience and technological autonomy in semiconductor technologies” in line with the EU's embrace of the digital sovereignty agenda since the European Chips Act was first announced in September 2021 (European Commission 2025). As industrial and competition policy in Europe becomes increasingly driven by geoeconomic priorities, progressive actors within Europe and beyond will have the task of ensuring that sustainability concerns are not sidelined.

#### **4.2. Agrana**

Agrana is Austria's largest food products company by revenue, and among the top 50 largest food products companies headquartered in Europe (S&P Capital IQ 2025). It operates three segments: a fruit segment which produces fruit preparations and concentrates for the food and beverage industry; a starch segment which processes raw agricultural commodities such as corn, wheat and potatoes into starch products for the food industry as well as industrial products, such as ethanol, for the energy sector; and finally, its sugar segment processes sugar beets and raw cane sugar into products for confectioners and food resellers as well as by-products for the fertilizer and feedstuff industry.

How do we characterize inter-firm and extra-firm relations within Agrana's value chain, and what implications do these relations have for questions regarding environmental and social governance? In our analysis of ams OSRAM's global value chain, we remarked on the relational value chain connection that links the company, albeit asymmetrically, to TSMC. However, beyond that crucial value chain linkage, other types of inter-firm relationship can be found in ams OSRAM's value chain. The same applies to Agrana as different relationship types can be found depending on the part of Agrana's GVC. Within some production channels, it is fair to say that Agrana exhibits high levels of vertical integration (MarketLine 2024). These include, for example, the fruit, starch and sugar processing and preparation facilities located in 27 countries across the world as presented in the map in Figure 4. Such vertically integrated operations provide Agrana with direct control over product specifications, production standards, labor practices and environmental management.



Figure 4. Agrana's Production Sites by Segment

Source: Authors' own elaboration of data from company website. Data elaborated through data.wrapper.de

Beyond its own integrated processing operations, distinct relationship types can be found between Agrana and its suppliers. These range from: market-type linkages, where, for instance, Agrana may buy raw sugar, corn or wheat and other fungible agricultural products through spot markets based on price and relatively simple quality specifications via large agricultural commodity traders; modular linkages, where Agrana provides detailed technical standards based on factors such as quality, hygiene and traceability to suppliers involved in the primary processing of fruits; relational linkages in which Agrana and farmer cooperatives

co-develop plans for regenerative agriculture through reducing synthetic pesticides and fertilizers and promoting agroecological practices (Agrana 2022); and captive relationships whereby, for example, contract farmers and fruit processors in the Global South depend on Agrana's business and invest in specific equipment and quality controls to meet the company's standards.

Given that Agrana's sales are overwhelmingly business-to-business (B2B), with business-to-consumer (B2C) activities playing a role solely within its sugar segment, it is not direct consumer pressure that is driving the firm's environmental and social governance strategy. Instead, it is based on an effort to occupy higher-value niches within the agri-food supply chain which feature consumer-facing food giants such as Nestle, Unilever and Danone, among many others, as buyers (S&P Capital IQ 2025). One outcome of this is that since 2014 Agrana has been part of the Sustainable Agriculture Initiative platform, which was first established by the three food giants mentioned above in 2002 (Agrana 2025: 7). This platform includes tools to record and evaluate the degree of sustainability of practices throughout the value chain, including the Farm Sustainability Assessment (FSA), which assigns grades of 'gold', 'silver' or 'bronze' to farms on the basis of a range of sustainability criteria.

Notwithstanding these efforts, there are longstanding issues with the scope of the FSA, as it currently only covers 18.5% of the fruit processed by the company worldwide (Agrana 2024: 76). Moreover, in spite of the relatively proactive approach that Agrana takes to sustainability issues, the company remains deeply embedded in broad structures of ecologically uneven exchange. This means that even if Agrana may not be the main culprit in environmentally or socially harmful practices, it can profit from the wider context in which such practices flourish. One example of this is strawberry farming in Morocco, which has been the focus of widespread concern given the huge volumes of water that is required in a country for which water is already scarce (El Masaiti 2024). This directly relates to Agrana as strawberries are – by its own admission – the most important fruit by volume in its fruit preparations business (Agrana 2024: 76), and a large share of this fruit is processed in, and imported from, Morocco. In fact, as Table 2 shows, according to data from Panjiva, the third most important trading linkage by trade value within Agrana's production network between January 2021 and December 2024 was shipments from Morocco by Frigodar SA – a major fruit preparations company – to Agrana Fruit Services. Similarly, the tenth most important trade link by value also pertains to exports from Morocco, but in this case what we see are intra-company flows, as the shipper here – Dirafrost Maroc – is a subsidiary company of Agrana. By importing large volumes of fruit from Morocco and other water-constrained countries like Egypt, Agrana is effectively appropriating huge quantities of water that could otherwise be used for essential local needs.

<b>Exporting country</b>	<b>Shipper</b>	<b>Consignee</b>	<b>Share of total trading value</b>
Vietnam	Hung Phat Fruits Production Co	Agrana Fruit Services GmbH	18.8%
Egypt	Global Food Investment	Agrana Fruit Services Inc.	6.3%
Morocco	Frigodar Sa	Agrana Fruit Services Inc.	3.3%
Greece	Intercomm Foods S.A.	Agrana Fruit Services Inc.	2.6%
Mexico	Agrana Fruit Mexico S.A.	Agrana Fruit Services GmbH	2.4%
Mexico	Mx&Solutions123 Sa De Cv	Agrana Fruit Services GmbH	2.2%
China	Yantai Haixing Food Co., Ltd.	Agrana Fruit Mexico S.A.	1.5%
Mexico	Agrana Fruit Mexico S.A.	Agrana Fruit Services Inc.	1.5%
US	Agrana Fruit Mexico S.A.	Revela Foods Llc	1.4%
Morocco	Dirafrost Maroc Sarl	Agrana Fruit Services Inc.	1.4%

Table 2. Highest Value Intra-Firm and Inter-Firm Trading Links in Agrana’s Production Network, 2021-2024  
Source: Authors’ own elaboration of data from Panjiva through S&P Capital IQ

Beyond the export of ‘virtual water’ from water-constrained countries, other environmental and social problems abound within the broader business context in which Agrana operates. This includes heavy pesticide and fertilizer use in horticultural operations, which poses significant health risks not only to consumers, but – more pressingly – to workers involved in these farming activities; deforestation and community displacement in Southeast Asia as a result of the expansion of sugarcane plantations in the context of high market demand for cane sugar from big international buyers such as Agrana; and highly exploitative labor practices including the use of child or forced labor in farming activities extending from fruit production in Central and South America to sugarcane production in Southeast Asia. In its defense, Agrana is not the direct perpetrator of such labor abuses. In fact, it was one of only two major companies to answer a survey on human rights due diligence in Mexican berry production (Business & Human Rights Resource Centre 2023). Moreover, as a participant of the UN Global Compact, the company has developed its own code of conduct that should in principle protect workers involved in its supply chain (Agrana 2025). But given the complexity and global scale of its operations, and the wide variety of linkages found in its value chain, progressive actors must remain vigilant and continue pushing for enhanced private, public and social governance wherever needed.

**4.3. Voestalpine**

The iron and steel industry currently accounts for 7-10% of global CO<sub>2</sub> emissions. Further upstream, the mining industry accounts for 2-3% of emissions (Grüning et al. 2025: 56). The huge emissions from the iron

and steel industry and related sectors make Voestalpine’s industrial activities and supply chain practices of considerable interest, as it is Austria’s biggest steel company, and the third largest in Europe by revenue. Figure 5 presents the total revenues of the world’s major steel companies, including Voestalpine, as well as the percentage of their revenues that can be classified as ‘green’ in accordance with the EU taxonomy on sustainable activities, which was implemented in 2022 in the context of the European Green Deal. As of 2024, Voestalpine generated 15.6% of its revenues from green activities – below the simple average for the steel sector (22.8%) as well as the average weighted by revenue (16.9%) (LSEG 2025). The bulk of these revenues are generated from the introduction of electric arc furnace technologies, which supplement the company’s coal-based blast furnace technologies (Voestalpine 2024).

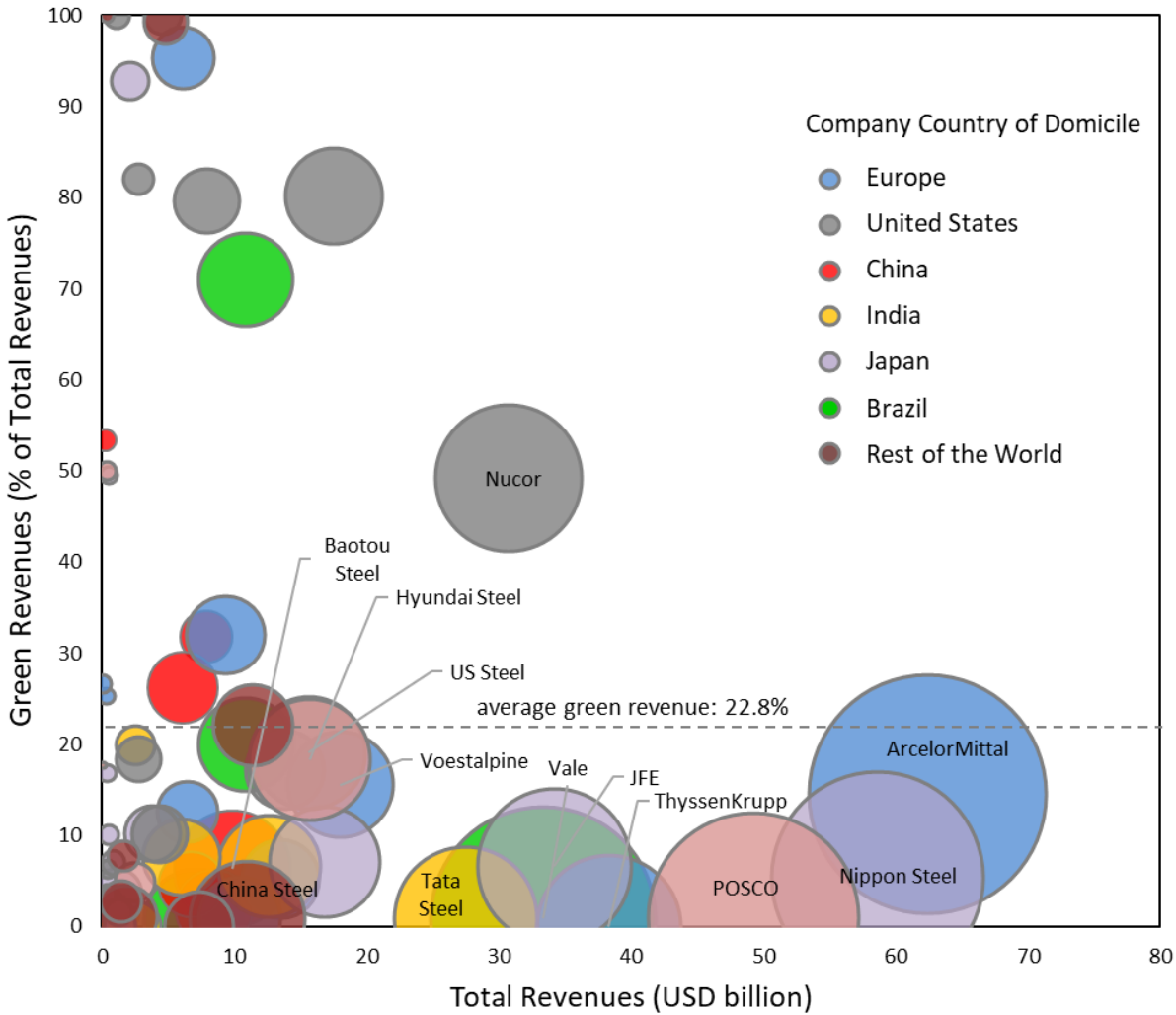


Figure 5. The Green Revenues and Total Revenues of Steel Companies, 2023  
 Source: LSEG (2025).

Note: Node size is proportional to companies' total assets. Alongside Voestalpine, those companies with total assets above \$10 billion are labelled.

To understand Voestalpine's role in global value chains, it makes sense to examine the end uses of its steel products by analyzing its segment data. As Figure 6 shows, the core segment of Voestalpine is its steel division, which accounts for 33.4% of company-wide sales. The main source of revenue for the steel division is the automotive industry, which accounts for 40.8% of this segment's sales and 32.5% of company-wide sales. The automotive industry also accounts for 55.3% of the sales of its metal form division, a segment which produces ready-to-install components such as door frames, roof structures, and other chassis parts. The hydrocarbon and renewable energy sectors are a major source of revenues – accounting for 16.9% of company-wide sales – for items such as pipes, casings, wires and turbines. The energy sector also accounts for 21.5% of the sales of the high performance metals division and 24.7% of the sales of the metal engineering division. However, the main revenue driver of the metal engineering division is railway systems, with 49.1% of segment sales coming from the supply of tracks and other key rail infrastructure technologies. Other major sources of the sector's demand are the mechanical engineering, construction and aerospace industries, as well as manufacturers of consumer goods such as washing machines, dishwashers, refrigerators and other white goods (Voestalpine 2024).

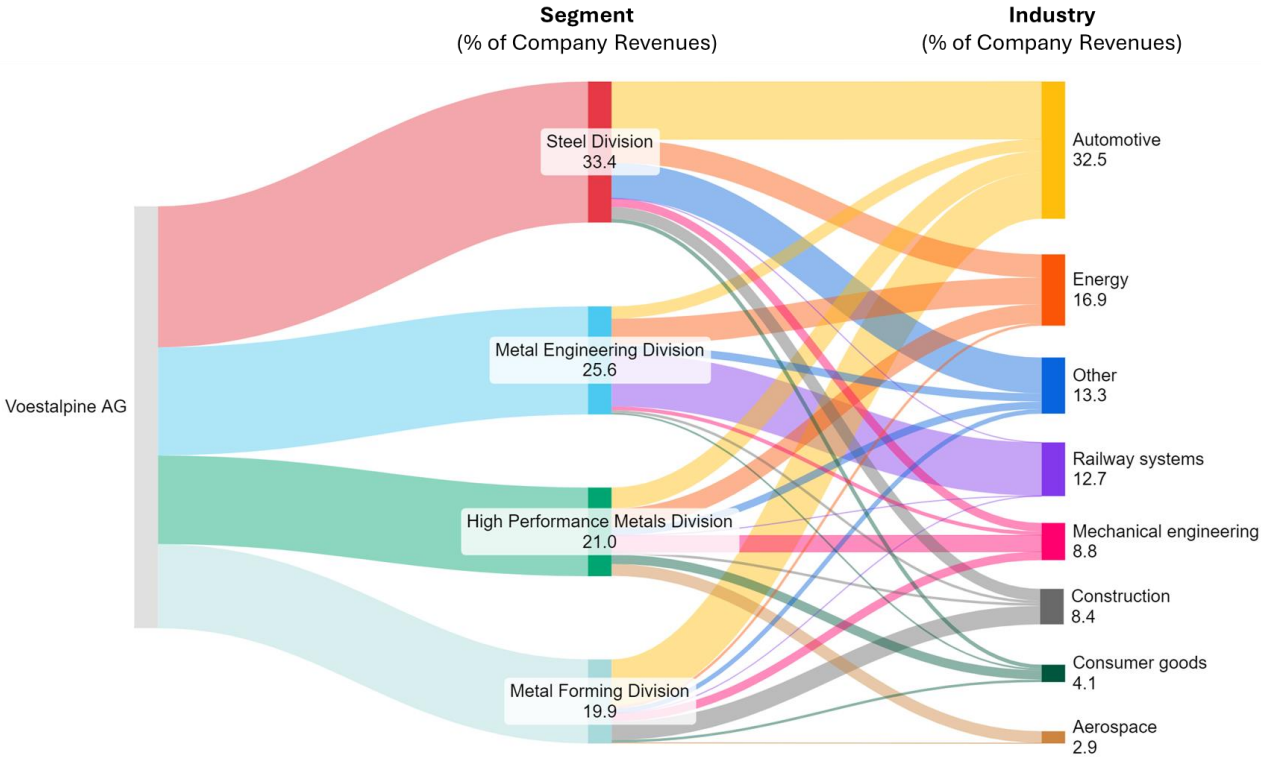


Figure 6. Voestalpine AG's Revenues by Segment and Industry, 2023-24

Source: Voestalpine (2024: 152-3). Data elaborated through Sankey Matic

Given the main demand drivers for Voestalpine’s products, it is no surprise that some of the world’s largest companies in the automotive, aerospace, heavy industry and energy sectors are among its customers. These major customers are presented in the treemap in Figure 7. With no B2C activities, Voestalpine can be considered largely as a midstream industrial actor which often operates at several degrees of separation from individual consumers. The procurement practices of its major corporate customers are therefore central to its sustainability performance. Unfortunately, however, as a recent study of a German steel company reveals, there is often “no willingness on the part of most end consumers or car manufacturers to pay a price premium to compensate for the additional costs of low-carbon production and/or corresponding external verification” (Grüning et al, 2025: 59). The reluctance of steel companies’ major corporate customers to absorb the costs of decarbonization may impose significant constraints on the sustainability performance of firms such as Voestalpine. This underlines the importance of developing a comprehensive and robust system of accountability from the CSDDD architecture and related regulatory structures to promote improved environmental governance within the steel sector and beyond.

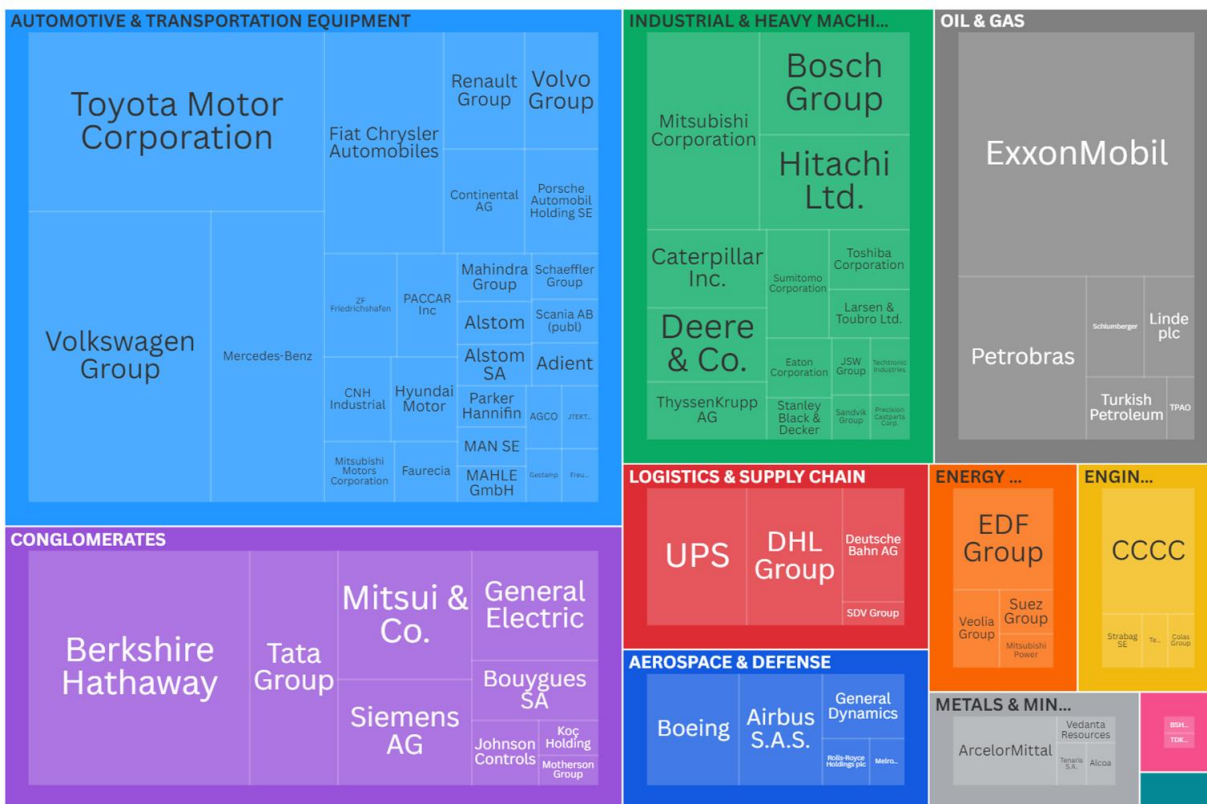


Figure 7. Voestalpine’s Largest Customers by Revenue

Note: Only firms with annual revenues in excess of \$10 million included in the visualization. Rectangle size reflects level of revenue.

Source: Authors' own elaboration of data from Bloomberg SPLC (2025) and S&P Capital IQ (2025). Data elaborated through flourish.studio

For Voestalpine, emissions derived directly from its own production operations (Scope 1) account for 51% of all emissions in its supply chain, emissions originating from power and heat purchased for these operations (Scope 2) account for 3% of emissions, and emissions originating from its suppliers (Scope 3) account for 46% of the total (Voestalpine 2024: 99). These figures contrast sharply with the two other firms studied in this report, for which Scope 3 emissions constitute a significantly larger share of total emissions. The emissions breakdown for ams OSRAM is 5% (Scope 1), 20% (Scope 2) and 75% (Scope 3) (ams OSRAM 2024a: 105); for Agrana it is 15% (Scope 1 and 2) and 85% (Scope 3) (Agrana 2025: 47). Nonetheless, according to company data, the sheer volume of Voestalpine's Scope 3 emissions dwarfs those of ams OSRAM and Agrana by a factor of 10 and 3 respectively, and therefore its relationship to its suppliers is of particular importance from an environmental governance perspective. With this in mind, Figure 8 draws on data from Bloomberg Professional to present Voestalpine's major suppliers and their commodity exposures as recorded in company disclosures.

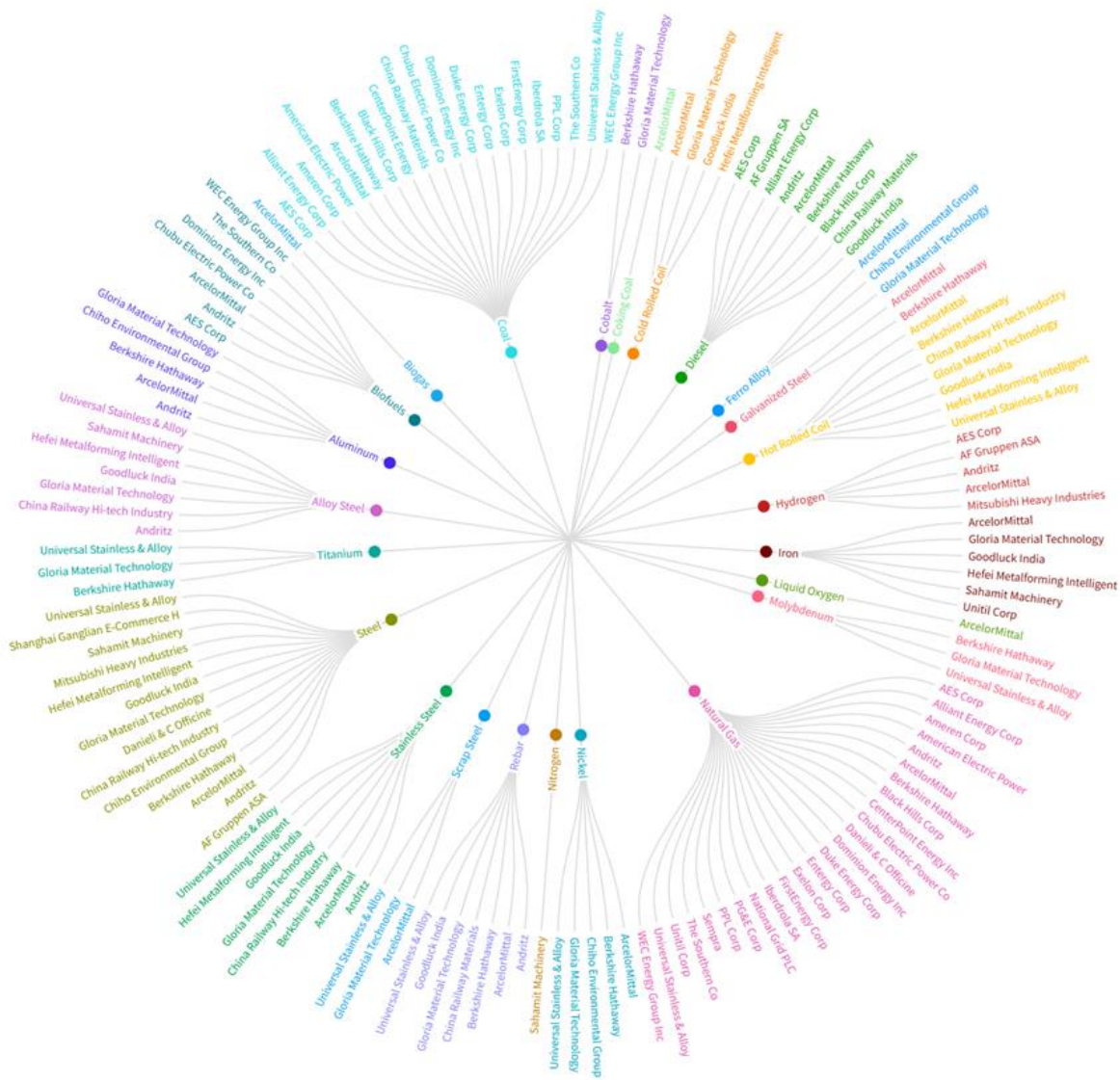


Figure 8. Voestalpine’s Supplier Exposures, 2025

Source: Authors’ own elaboration of data from Bloomberg SPLC (2025). Data elaborated through flourish.studio

As with the two other cases explored in this study, Voestalpine is embedded in a multipolar value chain. Unlike the two others, however, Voestalpine is truly a midstream industrial actor. As Figures 7 and 8 show, its customers and suppliers include some of the largest manufacturing and heavy industry firms in the world, including Volkswagen and Toyota on the one hand, and Tata Steel and ArcelorMittal on the other.

Panjiva data also reveals that Voestalpine receives shipments from major mining firms, with Rio Tinto, Glencore and Vale accounting for 22.8%, 21.9% and 16.0% respectively of the tonnage of known trade within Voestalpine's supply chain between 2021 and 2024 (S&P Capital IQ 2025). These data suggest that even in markets of highly fungible and commoditized goods, such as the metals and minerals used in Voestalpine's steel plants, data are available to trace crucial linkages within value chains between end-users and sites of potential environmental degradation and human rights violations.

ArcelorMittal is a particularly notable supplier as it is a firm with which Voestalpine has relational ties via plant co-ownership and a long-term offtake agreement (ArcelorMittal 2022). Between 2012 and 2023, 314 workers died at ArcelorMittal sites worldwide: 113 in its mines and 201 in steel plants (IndustriALL Global Union 2024). In one single case, 45 miners died in a 2023 fire in an ArcelorMittal-owned coal mine in Kazakhstan. This disaster followed a series of earlier mine fatalities and prompted the Kazakh government to nationalize ArcelorMittal's local subsidiary on the basis of the company's poor safety record (Agence France-Presse 2023). In another instance of apparent mismanagement, the notorious blast-furnace steelworks plant in Taranto, Italy, has been a persistent source of pollution that has devastated the local area, even after ArcelorMittal became the majority owner in 2018. Communities in the surrounding area continue to suffer from higher-than-average rates of cancer along with respiratory, kidney and cardiovascular illnesses. Following a lengthy dispute between ArcelorMittal and the Italian government, including over legal liability for environmental pollution, the steelworks has been put under special administration (Kazmin 2024).

In addition to labor and environmental risks, political risks relating to ArcelorMittal abound. Not least, this is due to ArcelorMittal's persisting commercial links with Russia in the aftermath of the invasion of Ukraine in February 2022. In one investigation of customs data led by Global Witness and ARIA Research, it was found that at the end of 2023, \$23 million of coal was bought from Russian entities by an Indian-based joint venture between ArcelorMittal and Nippon Steel, despite announcements by ArcelorMittal the year before that it had eliminated Russian commodities from its supply chain (Global Witness 2024). According to our own analysis of Panjiva shipment data, these commercial links between ArcelorMittal and Russia continue, with no less than \$83 million of goods imported from Russia to India by its joint venture company between October 2024 and March 2025 alone (S&P Capital IQ 2025).

Relations with indigenous peoples are also a concern within Voestalpine's supplier base. For example, another Voestalpine supplier – Sempra – has been embroiled in controversy due to a project awarded in 2015 to build and operate a natural gas pipeline through the territory of the Yaqui indigenous community in Sonora, Mexico. The Yaqui community has protested against this pipeline on the basis of concerns surrounding the violation of indigenous sovereignty, inadequate consultation, and water pollution. These

protests have culminated in violent confrontations with the police, the detention of an activist leader, and the disappearances of many other leaders – potentially as a result of territorial disputes with organized crime networks (Garcia Sanchez 2020, Matute and Jenss 2025).

Beyond fossil fuel infrastructures, the impacts of green extractivism on indigenous communities is potentially also a significant concern. This is underscored, for example, by the case of AES – another supplier of Voestalpine. In April 2025, AES signed an agreement to develop wind farms in the territory of the Wayuu community, the largest indigenous group in Columbia (Bnamericas 2025). The project is being implemented against the backdrop of ongoing resistance to industrial wind farm projects from Wayuu groups, the proliferation of threats against indigenous land defenders, and longstanding concerns about deforestation and the desecration of ancestral burial grounds that many fear will result from the expansion of wind power in the region (Curvelo and Schwartz 2023). As with the other examples offered here, the case of AES’s wind farm developments in Colombia underlines the need to have a robust regulatory system in place to monitor the ongoing supply chain risks of Voestalpine and other major companies within Europe and beyond.

## **5. Concluding Discussion**

The prospective weakening of the CSDDD as a result of the February 2025 Omnibus simplification package has created new challenges for policymakers, activists, NGOs and other stakeholders who have sought to leverage the Directive to promote sustainable corporate practices within Europe and beyond. Limiting the depth of due diligence to direct business partners is justified by industry lobbies with reference to otherwise onerous obligations that exceed what companies can realistically document and control (Joint Business Statement on Due Diligence Proposal [CS3D]). Central to this claim is the purported gap between the complexity of global production networks and the availability of relevant data, which supposedly makes it impossible to enforce the CSDDD in its current form.

This working paper has challenged this narrative by demonstrating that progressive movements can wield new data analytics to dismantle the edifice of strategic ignorance that corporations have constructed around their supply chains. Comprehensive mapping beyond the first tier, we have argued, is both necessary and possible. Our analysis of Austrian businesses has established that approximately one quarter of all in-scope companies are linked to the extraction and conversion of primary materials – encompassing non-renewable resources like fossil fuels, minerals, and construction materials derived from geological formations, as well as ostensibly renewable resources like wood-based products and agricultural commodities often grown, harvested and processed unsustainably. This primary materials complex carries a high risk of adverse impacts on human rights and the environment which deserve to be more closely examined. Moreover, our mapping of first-tier suppliers shows that potentially risky links to the Global South extend to other sectors of the Austrian economy. Widespread yet still sporadic at the first

tier, these supply linkages require precisely the kind of deeper investigation that the Omnibus proposal would eliminate.

Building on this sectoral analysis, our company case studies have showcased some of the tools that can be used for due diligence purposes, even without access to companies' internal information. They also aim to support effective regulatory implementation by applying insights from global value chain (GVC) and global production network (GPN) approaches to identify how far and under what conditions corporate customers can leverage inter-firm bargaining power to establish and enforce environmental and labor standards throughout their production networks. As we have argued, private governance is most viable in the context of hierarchical or captive value chains and where unipolar structures predominate. However, in these contexts they can fall short in promoting environmental restoration and safeguarding labor if short-term profit motives and superficial branding drive firms' decision-making.

If designed and implemented effectively, the CSDDD can be a crucial means for advancing synergistic governance on three counts. First, ensuring broad coverage in the CSDDD is crucial, given not only the multipolar organization of many global value chains – including those surveyed in our three case studies – but also the clear and well documented limits of many private sustainability initiatives in unipolar chain structures. Second, by establishing a system of grievance mechanisms and channels for civic liability, the CSDDD can strengthen social governance in ways that empower stakeholders, including workers and local communities, to identify harms and ensure accountability throughout supply chains (Müller-Hoff 2023). Third, by promoting a risk-based approach to social and environmental harms to replace the prevailing compliance-based model, the CSDDD can help ratchet up private governance efforts by influencing lead firms' decision-making models in ways that make sustainability governance core to their day-to-day operations.

Nonetheless, in the context of the latest Omnibus package, there is a clear risk that the CSDDD will be restricted to first-tier suppliers only and that the general scope and promise of due diligence will be severely circumscribed. Such a curtailment of the CSDDD would, we argue, not only sidestep legitimate concerns over corporate misconduct in global supply chains, but also ignore crucial scholarly insights from GVC/GPN literature and disregard the readily available data tools that already make due diligence entirely feasible.

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## Appendix

Company	Bloomberg S PLC	S&P Capital IQ Current	S&P Capital IQ Prior
"Ring" International Holding AG	0	0	34
ACP Group AG	0	0	0
Agrana Beteiligungs-Aktiengesellschaft	0	0	5
AMAG	3	1	19
Ams-Osram AG	7	5	156
Andritz AG	4	6	56
Apollon SE	0	0	0
At&S Austria Technologie & Systemtechnik AG	2	1	5
AVL List GmbH	0	1	10
B&C Industrieholding GmbH	0	4	38
Benteler International Aktiengesellschaft	2	3	30
Beteiligungsverwaltung Knapp GmbH	0	0	5
Blum Group Holding GmbH	0	0	3
Datax Handelsgmbh	0	4	28
Do & Co AG	1	0	1
Doka GmbH	0	0	3
Doppelmayr Holding SE	0	1	2
Egger Holzwerkstoffe GmbH	0	4	2
Energie AG Oberoesterreich	0	2	16
EVN AG	0	5	18
Flughafen Wien AG	1	5	16
Frauenthal Holding AG	1	0	3
Gartner Transport Holding GmbH	0	0	0
Gebrüder Weiss Holding AG	0	0	5
Gemeinnuetzige Salzburger Landeskliniken Betriebsgesellschaft Mbh	0	0	0
Granit Holding GmbH	0	0	0
Greiner AG	0	0	5
Heinzel Holding GmbH	0	1	20
Herz Industries GmbH	0	0	0
Holdag Beteiligungsgesellschaft M.b.h.	0	2	9
IGO Industries GmbH	0	0	1
Kaerntner Energieholding Beteiligungs GmbH	0	0	0
Keba Group AG	0	1	3
Kepler Universitaetsklinikum GmbH	0	0	0
Klinikum Wels-Grieskirchen GmbH	0	0	2
Kontron AG	10	37	112
KTM AG	0	14	39

LKW WALTER Internationale Transportorganisation AG	0	0	2
Ludwig Engel GmbH & Co Kg	0	0	0
Management Trust Holding Aktiengesellschaft	0	0	0
Mayr-Melnhof Karton AG	1	1	13
Med-El Elektromedizinische Geraete Gesellschaft M.b.h.	0	0	0
Mitterbauer Beteiligungs GmbH	0	2	4
Mpreis Warenvertriebs GmbH	0	0	3
Ms Management GmbH	0	0	0
MTB Beteiligungen AG	0	0	0
Netz Niederoesterreich GmbH	0	0	0
ÖBB-Holding AG	0	6	41
Oberoesterreichische Gesundheitsholding GmbH	0	0	2
Oesterreichische Bundesbahnen-Holding Aktiengesellschaft	0	9	41
Oesterreichische Post AG	2	2	14
Oesterreichische Postbus Aktiengesellschaft	0	0	0
Oesterreichisches Verkehrsbuero Aktiengesellschaft	0	0	0
OMV Aktiengesellschaft	18	59	197
Ordensklinikum Linz GmbH	0	0	0
Palfinger AG	2	2	7
Pankl Racing Immobilien AG	0	0	0
Pierer Industrie AG	14	1	8
Plasser & Theurer Beteiligungs- Und Verwaltungsgesellschaft M.b.h.	0	0	0
Polytec Holding AG	1	1	3
Porr AG	0	3	13
Pöttinger Landtechnik GmbH	0	0	2
Rail Cargo Austria Aktiengesellschaft	0	0	0
RHI Magnesita NV	1	13	52
Rosenbauer Beteiligungsverwaltung GmbH	3	0	0
Schachermayer GmbH	0	0	1
Schoeller-Bleckmann Oilfield Equipment AG	0	0	2
Steiermaerkische Krankenanstaltengesellschaft M.b.h.	0	0	0
Strabag SE	3	1	54
Swietelsky AG	0	1	0
Telekom Austria AG	9	10	115
TGW Logistics Group GmbH	0	0	2
VA Intertrading Aktiengesellschaft	0	0	7
Varta AG	0	1	4
Verbund AG	3	4	40
Verbund Hydro Power GmbH	0	0	1
Voestalpine AG	5	4	37
Wien Energie GmbH	0	1	8

Wiener Linien GmbH & Co Kg	0	0	5
Wiener Netze GmbH	0	1	5
Wienerberger AG	0	2	9
Xxxlutz Kg	0	1	8
Zumtobel Group AG	0	0	23

**Table A.1:** Supper data points per company

	<b>Bloomberg SPLC</b>	<b>S&amp;P Capital IQ Current</b>	<b>S&amp;P Capital IQ Prior</b>
Number of companies with data	21	39	60
Proportion of companies with data	25.3%	47.0%	72.3%
Median of number of data points	3	2	8
Standard deviation of number of data points	4.7	10.8	37.3

**Table A.2:** Descriptive statistics on supplier data

<b>Country</b>	<b>Number of suppliers</b>
Albania	1
Argentina	1
Australia	19
Austria	278
Belarus	0
Belgium	9
Bermuda	1
Brazil	26
Bulgaria	7
Canada	29
Chile	2
China	36
Croatia	9
Cyprus	1
Czechia	23
Denmark	3
Finland	45
France	54
Germany	174
Greece	11
Hong Kong	8
Hungary	6
India	90
Indonesia	1
Ireland	3

Israel	13
Italy	26
Japan	28
Kazakhstan	4
Luxembourg	10
Malaysia	17
Mexico	1
Moldova	1
Morocco	1
Netherlands	28
New Zealand	13
Norway	18
Oman	1
Pakistan	2
Philippines	1
Poland	37
Portugal	3
Qatar	1
Romania	90
Russia	11
Saudi Arabia	1
Serbia	2
Singapore	9
Slovakia	1
Slovenia	40
South Korea	14
Spain	6
Sri Lanka	2
Sweden	45
Switzerland	41
Taiwan	27
Thailand	12
Türkiye	14
USA	266
United Arab Emirates	7
United Kingdom	52
Vietnam	2

**Table A.3:** Country of origin of supplier companies

<b>Continent</b>	<b>Total suppliers</b>
Europe	1034
North America	297
Asia	291
Oceania	32
South America	29
Africa	1

**Table A.4:** Continent of origin of supplier companies