

STUDY

Requested by the INTA committee



Global value chains:

Potential synergies between external trade policy and internal economic initiatives to address the strategic dependencies of the EU



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ABSTRACT

Global value chains enable two-thirds of international trade, notably for the EU. The EU wants to preserve its commercial links with third countries and organisations to make up for trade disruptions. This study examines sustainable supply of raw materials, commodities, and critical goods using the EU's Open Strategic Autonomy concept. It examines which raw material are crucial for sustainable supply and necessary for the green transition. The paper examines EU internal legislation and international cooperation instruments to determine the EU's disruption risk. It evaluates the economic impact of EU preferential trade agreements on raw material availability. The study illustrates the political and economic relevance of raw material partnerships and plurilateral and bilateral trade agreements. It analyses the EU's toolbox for safeguarding its interests and making independent trade choices to counteract other actors' unfair practices and intervention. Finally, the paper examines regulatory frameworks, international alliances, and activities to find ways to strengthen global value chains in critical EU industries.

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1 Executive summary

1.1 Context and political relevance

A global value chain (GVC) involves cross-border manufacturing and distribution of commodities. It integrates various processes, from acquiring raw materials to delivering completed products to customers. A worldwide value chain involves product idea, design, marketing, and after-sales services. Global supply networks impact how we make things. Most modern final goods comprise foreign and domestic materials added at different stages of manufacture and distributed through worldwide supply networks. These linkages constitute complex, diversified, fragmented, dynamic, and developing organizational systems. The globalized economy is coined by the internationalization of supply networks. Dismantling trade barriers, expanding technology breakthroughs, liberalizing investment, and Asia's development as a global industrial centre, especially after China's WTO entrance in 2001, made it feasible. While driven by Multi-National Enterprises (MNEs), global supply chains also increasingly incorporate Small and Medium Sized Enterprises (SMEs). According to the World Bank, supply chain growth occurred mainly in machinery, electronics, and transportation in Europe, North America, and East Asia. While most countries in these regions participate in complex global value chains, engaging in advanced manufacturing and innovative activities, many countries in Africa, Latin America, and central Asia still supply commodities and intermediate goods for further processing. Overall, North America, Europe, and Asia dominate global supply networks.

The OECD verified in February 2020 that **the integration of GVCs is strong but has decreased**. The **financial crisis** had hurt trade financing and consolidated global supply networks. This has **slowed international trade** growth **due to restrictive regulations** and **limited cross-border investment**. Many **structural causes suggest the decline will continue**. China, the USA, and other rising economies increase local (and interregional) supply networks and domestic production.

With a greater focus on R&D and innovation, global value and supply chains are becoming more knowledge-intensive, signalling a shift from labour-intensive to capital-intensive manufacturing processes. This change benefits countries with strong innovation ecosystems and trained labour.

More than **two-thirds of international trade is facilitated by global supply chains**, and this is especially true for the EU. Despite a global downturn in economic integration, the Euro area is deeply linked in global industrial chains, more so than the USA and China. Against this background, **the EU has the utmost interest in supporting its trade relations with third countries and organizations in such a sustainable way that interruptions in trade routes can be compensated**. Compensatory, defensive trade policy mechanisms and instruments must always be assessed for their compatibility with WTO law and the corresponding secondary legislation of the EU.

While these very days the EU, the G-20 and G7, the WTO, or the IMF are warning about the **risks of geo-economic fragmentation and geo-politicization of trade**, policymakers and business leaders are to discuss ways to re-evaluate global supply chains, including how far they should and could go to regulate authorities and governments in trying to regulate cross-border production in favour of resilience. Yet, both theoretical frameworks and empirical assessment of supply-chain vulnerabilities are still underdeveloped.

The idea of **European strategic autonomy** has its origins in the fields of security and defence but gone beyond these areas extending to foreign and trade policies, after the EU tabled its new trade strategy in 2022. The COVID-19 pandemic and more recently the Russian invasion in Ukraine, have

made clear **the vulnerability of GVCs and the need to maintain functioning and resilient supply chains and trade flows** during such crises.

1.2 Aims and structure of the study

Adopting the EU's understanding of "Open Strategic Autonomy", this study **aims at exploring the foundations and fabric of a contemporary European supply of raw materials, energy, and critical goods**. It addresses the following questions: Which raw materials are particularly important for the EU – especially against the background of the green transformation – and at the same time critical in terms of supply? Where are these currently obtained from, what alternative sources are there? What (economic) importance could raw material partnerships in the EU have? How can the EU, whenever possible, work strategically with trade partners (at multilateral, plurilateral and bilateral level) and, when necessary, defend its interests and take autonomous trade decisions offsetting other countries' unfair practices and undue interferences? ? And how can the needs of European economies in terms of maintaining global supply chains be reconciled with the EU's climate, sustainability, human rights and labour rights policy goals and standards?

The study pays specific attention on **how international trade and investment can help address the EU's vulnerabilities relating to energy, raw materials, and critical goods and on the importance of GVCs for the strategic sectors** concerned. It analyses how international agreements as well as EU-internal, legislative, and other tools so far address these items and the question of raw materials dependency of the EU.

1.3 Findings

The **EU's strategic autonomy effort is interconnected**. Other major economies have adopted "strategic autonomy" discourses, strategies, and policy instruments with different aspects. The COVID-19 crisis has accelerated a long-term decline in globalization, but major countries' inward-looking responses might worsen it as a self-fulfilling prophecy or prisoner's dilemma. Such strategies also **risk producing a "security dilemma", in which one power's defensive measures are seen as aggressive by others, causing friction and disintegration of the international system**.

Addressing the EU's strategic reliance on other states requires a continuous and comprehensive, examination of product and partner criticalities. The European Commission's main criteria for assessing supply risks, such as the potential of material shortages in the EU, is supply concentration. Critical Raw Materials (CRMs) make up just 0.7 % of EU imports, whereas other raw materials make up 5 %. **CRMs are heavily concentrated at the national level and typically found in poor-governance nations, even if their collective impact in total additional EU imports is minor**.

Thus, the **concentration of suppliers and the nature of their countries make raw material supply problematic, and there are often no obvious substitutes**. Baryte, borate, and antimony are imported from nations with low economic freedom and democratic ratings. After processing, the EU's import partners for borate, coking coal, cobalt, titanium, vanadium, and tantalum have low economic freedom and democracy scores. CRMs are essential to many businesses and goods. These include the aircraft, military, battery, medical, chemical, semiconductor, and automobile sectors (vanadium, titanium).

Investment agreements from EU member states (BITs) or EU-wide trade agreements **cover 55 % of CRM imports on average**.

EU Raw Materials Diplomacy aims to build bilateral, regional, and global cooperation frameworks to include specialized chapters and provisions in prospective and current free trade agreements. To date, the EU Raw Materials Diplomacy seeks to source CRM from "trusted" partners.

To improve supply chain resilience, the EU's external policies require more attention. This should be done while understanding that EU and worldwide demand for raw materials has and will continue to rise as global material usage will more than double in 2060 compared to 2011, with metal use growing by 250 %. The EU usually gets its raw materials from the same countries that supply the globe. Thus, raw material competition will rise globally.

If one examines the EU's import dependence on non-FTA trade partners, the PRC is its most significant partner. The EU's direct import dependent on China ignores China's importance as a trade partner of other EU suppliers. **This suggests that China can "command" more global exports.**

This study's second section examined the EU's main policy instruments on GVCs to see whether they address identified deficiencies. Direct vs. indirect and considerable vs. small synergies are analysed. We examine whether these devices address short-term or long-term vulnerabilities. Our screening showed: 23 instruments connect internal and external policy goals. Most instruments emphasize supply chain security: 22 instruments prioritize preserving supply, while seven prioritize broadening international sources. Most instruments seek long-term sustainability: 23 tools prioritize capacity development at home or abroad. Only the EU's FDI screening framework and the InvestEU concentrate on onshore supply networks. Our analysis suggests a gap in instrument deployment and enforcement: 12 instruments are binding, 28 are excellent attempts. 22 EU and signatory agreements need partner cooperation. **The screening demonstrates that the EU has addressed deficiencies in each category, linking short-term responses to the COVID-19 pandemic and economic recovery with long-term diversification and sustainability goals. Trade and investment mechanisms dominate due to the EU's particular expertise and negotiating power.**

The 2020 nomination of the Chief Trade Enforcement Officer (CTEO) underscored the need to improve EU global, regional, and bilateral trade agreements and partner compliance. The Anti-Coercion Instrument and further trade defence instruments were introduced with the CTEO.

Recent EU trade instruments have focused on improving trade implementation and enforcement. **New or amended measures could target foreign activities, increase EU CRM access, and address trade and investment imbalances.** Some of the tools discussed here affect supply chain diversification and resilience but are not directly related. Climate change risks have spurred initiatives to minimize its effects, meet EU climate commitments and objectives, and improve EU and foreign partner capability to innovate and meet sustainability standards. **Synergy-based climate change policy may impact supply chains.**

Finally, the risks highlighted above need geopolitical action to foster regional cooperation and external partnerships and protect EU strategic interests. In this regard, **the EU-US framework is vital, but balancing internal and external aims is difficult.** EU-US cooperation on standard-, product-, or sector-specific challenges may produce multilateral synergy. Since most countries trade and invest with the EU or US, the transatlantic connection affects the global economy.

The proposed **Corporate Sustainability Due Diligence legislation** has **immediate, massive, and long-term benefits.** The Directive's supply chain sustainability makes it a model. It will apply to value chains of additional minerals related to human rights, climate, and environmental problems. It will add value chain due diligence for raw materials not covered by the Batteries Regulation without certification for EU market placement.

EU climate change goals have a large indirect impact on the CBAM strategy. CBAM targets climate leaks to rewrite supply networks. Its **extraterritoriality might influence EU and global supply networks.**

The study's empirical data show that **closing markets does not help the EU diversify its trade and control important technological industries.** Moreover, the study's findings suggest that **trade diversification benefits the environment and sustainable development by spreading EU trade laws and practices.** However, a sustainable trade diversification strategy and trade policy based on it requires a better understanding of those EU goods and sectors that should be diversified and expanded.

Given the current state of the global trading system, **the EU should expect further economic coercion, whether through sanctions against EU member states, arbitrary tariffs or export bans on raw materials.** To prepare for a more competitive, aggressive and antagonistic international trading system, the EU needs to lead on security of supply while remaining open for trade. **Material stockpiling, recycling, replacement, and EU innovation should coexist with lowering potentially harmful dependences.**

EU trade agreements enable diversification. The EU might use FTAs to offset risks including political instability, economic coercion, and climate vulnerability. **Since a green and digital economy requires more minerals and commodities, trade diversification is needed to secure supply.**

The **EU should build enforceable bilateral and plurilateral resource and cooperative industry partnerships to alleviate raw material shocks.** In the sake of balanced, fair competition based on a rules-based system inside the WTO, **the EU should not see other countries as raw material suppliers alone! Thus, we recommend not just include full commodities chapters in future trade agreements. These chapters should also include sustainable cooperative industrialization and shared value generating tools.**

To minimize imports and respective dependency, the **EU should invest in research and development and encourage local industry growth.** To diversify its global value chains and minimize its dependence on a few important trading partners, the **EU should develop its "region-to-region" plurilateral trade partnerships with Africa, Asia, and Latin America.** The EU should continue to give **financial and technical assistance to SME's to enable them penetrate new markets and diversify global value chains.** It should encourage firms to adopt sustainable and ethical practices to decrease the environmental and social implications of global value chains and make them more resilient. Moreover, the EU should assist companies develop partnerships to reach new markets and diversify their global value chains.

2 Introduction

In recent years, **supply-chain security has clearly emerged as a novel problem**, to the extent that deep geo-economic fragmentation of production processes has linked together private actors who belong to different areas of geo-political influence and therefore might become sources of severe disruptions. Indeed, persistent disruptions from various sources hit countries, societies, and companies over the last few years, pushing them to find innovative ways to address urgent global issues such as fixing shortages of commodities, raw material, food, energy and other essential products.

Interrupted global value chains (GVC) are not a new phenomenon (Craighead, C. W., Blackhurst, J., Rungtusanatham, M. J., Handfield, R.B. 2007; Shepherd, B. 2013-05-14; Dür, A., Jappe, E., Poletti, A. 2020; Kano, L., Tsang, E. W. K., Yeung, H. Wc. 2020; Poletti, A., Sicurelli, D., Yildirim, A. 2021; De Marchi, V., Alford, M. 2022). Unforeseen or unplanned events can interrupt the usual flow of goods, services, and materials in a supply chain. Changing suppliers to meet demand is the simpler case; storage capacities can also be expanded with manageable effort. However, plant closures and extensive damage compensation proceedings can massively endanger the economic existence of many companies.

There has been a dramatic shift in manufacturing due to the development of global value chains. Most manufactured commodities in today's global economy are a product of cross-border, international supply chains that utilize both domestic and imported components. Corporations, governments, and inter- or supranational organizations have taken the GVC revolution as an opportunity to explore unilateral and multilateral measures to manage the associated risks. The EU as well as transnational trade policy organisations such as the WTO or the OECD investigate how trade policy institutions might be adjusted to reflect this new reality. This policy priority derives from the underlying assumption that GVC linkages alter the traditional calculus of trade defence by changing the outcomes of tariffs and other border barriers, and thus the goals of inter-, supra-, or purely national governance. Even though practitioners of industry and management pay special attention to GVCs, they are rarely included in empirical studies of trade policy. One explanation for this is because GVCs are still relatively new phenomena, and as a result, data sources and methods to assess GVC links are still in their infancy. In addition, GVCs can take many different shapes and sizes, depending on factors such as whether they are sequential or non-sequential in nature, whether they are organized within firms or between firms, whether prices are negotiated between partners or are left to the market, whether they involve only two countries or many, and so on. Due to their widespread distribution and extreme fragmentation, current supply chains and networks are vulnerable to interruption. Strong supply chain disruptions occur due to the unstable global economy, rapid technology advancements, unforeseeable catastrophes, and other factors (Calvo et al., 2020, pp. 38–39).

GVCs are coined by connections and hence interdependencies:

An action within one chain element can have an impact on the efficiency and cost of other activities. As a result, a supply chain is a complex structure that is vulnerable to disruption due to interruption of one or more chain elements. This interdependence also requires anticipatory collaboration and effective management. For example, the greater the emphasis on on-time delivery, the better a supply chain must function.

A competitive advantage may be developed by maximizing the coordination of connections along the supply chain, both inside a company and to its suppliers on the outside (Porter & Millar, 1985, p. 3). To acquire a competitive edge over rivals, companies that specialize in a particular stage of production and export the finished product (Porter & Millar, 1985, p. 3; Sindi & Roe, 2017, p. 48) are becoming a more important organizational aspect in global production. Therefore, multinational

corporations have a stronger preference for more open trade, indicating a propensity for global supply networks (Meckling & Hughes, 2017, p. 225). **Global supply chains function in an atmosphere and under circumstances that are very unpredictable and variable.** History shows that they are vulnerable to disruptions that can be triggered by unforeseen contingencies such as natural disasters, pandemics, or wars. (Wagner & Bode, 2006, pp. 304–305). Due to the uniqueness of each GVC, it is impossible to draw broad conclusions or make broad predictions about policy based on the available data.

It appears that supply networks have gotten increasingly fragile over the past few years (Sneader/Lund 2020; Shih 2022), despite these very important facts. Several explanations have been offered for this: Intensifying rivalry, rapid globalization, and the enormous push to streamline operations and reduce the material and labour costs of manufacturing by shifting operations to low-wage nations. As a result, supply chain resilience is highly valued, making the issue of risk management strategy in supply chains an important one for managers to discuss (Christopher & Lee, 2004, p. 388). PwC conducted a survey in 2013, which found that businesses that use their supply chain as a strategic asset get an average performance boost of 70 %. The results of the poll emphasize the significance of seeing the supply chain as a key strategic component (Geissbauer et al., 2013, pp. 8–9).

Box 1. GVC in a nutshell

The term global supply chains (GSC) describes production processes that cross-national or political system boundaries, extend across continents and thus link manufacturing processes and labour relations in different regions of the world. To characterize these phenomena, several analytical frameworks have arisen in geography, economics, political science, social science, and history. The terms global commodities chains and global production networks were frequently utilized in these analytical contributions. Global value chains (GVC) are frequently mentioned by international institutions and civil society organizations, particularly in the context of international trade policy and development cooperation. In the 1980s, Terence Hopkins and Immanuel Wallerstein's work included an investigation of historical supply networks. It therefore follows on from critiques of dependence theory in Latin America, which dealt with global economic inequities but examined them through the lens of state relations. Hopkins and Wallerstein describe global commodity chains as a network of labour and industrial activities that culminate in a final commodity Hopkins and Wallerstein (1986: 159). They concentrate their research on the cross-border manufacture of ships and wheat flour from the 16th to the 18th centuries. They argue that the (power) connections between individual production units in various states that comprise a supply chain, as well as the relationship between capital and labour, decide which actors may take how much of the surplus value of production. Following Hopkins and Wallerstein, research concentrated on current globalisation processes, which are characterized above all by the reduction of trade barriers. In this context, in 1994, a concretisation of Wallerstein and Hopkins' definition emerged, defining global commodity chains as inter-organizational networks that exist around a commodity or product and connect households, businesses, and the state within the global economy (Gereffi/Korzeniewicz/Korzeniewicz 1994: 2). The concept's empirical foundation is the revolution in global commerce that occurred between the 1960s and 1970s. Large multinational corporations are increasingly outsourcing manufacturing stages to countries in the Global South to take advantage of wage differentials to cut production costs (Yeung/Coe 2014: 30). Since the beginning of the twenty-first century, large, transnationally operating companies have played an important role in the global expansion and intensification of industrial mining, as well as the large-scale appropriation of land for the cultivation of energy crops to produce agrofuels and animal feed, as well as commercial food production. Transnationally active trade enterprises frequently occupy crucial positions in the supply chain, allowing them to exercise monopolistic or oligopoly power (Fuchs/Glaab 2011: 731). Smaller agricultural producers rely on these trading firms for exports. As a result, control over output has replaced ownership of land and means of production as the key power component in agricultural production (Pimbert et al. 2001: 11). Following the concept's introduction, a great number of empirical studies arose, the majority of which focused on the role of so-called lead businesses in global supply chains and therefore examined the power position of huge transnationally functioning companies. They classify global supply chains according to the dominance of lead businesses and the way they wield influence (Gereffi/Humphrey/Sturgeon 2005). Initially, the scholarly literature on these phenomena referred to power dynamics inside the supply chain. Other scholars (for example, Henderson et al. 2002) suggested that the social framework in which production is situated should also be considered. This encompasses the roles of civil society players such as trade unions and non-governmental organizations (NGOs), as well as state actors (Henderson et al. 2002). Furthermore, several studies look at strategies to grow so-called emerging and developing nations by integrating them into global supply networks (Morrison/Pietrobelli/Rabellotti 2008. Cattaneo/Gereffi/Staritz 2010. Bamber/Fernandez-Starki/Gereffi/Guinnii 2014), What

makes the GVC idea useful is its ability to extend one's perspective. It examines not just the interaction between nations, but also the structure of production and the behaviour of the players participating in the global economy. This highlights not just global inequities between nations, but also those that exist within global labour relations. GVC has the capacity to capture both the macro-level of global economic systems and the micro-level of firms. As a result, it integrates many levels of research and emphasizes the interconnection of the global, national, and local economies. The concept provides a valuable analytical framework for dealing with land and commodity conflicts. It may be utilized to situate the power relations that define specific conflict situations in a global framework and conceptually and analytically connect them to the examination of global power relations. Transnationally engaged corporations are frequently conflict players, such as investors, and their influence is dependent on their size and geographical reach. In this context, the more recent discussion on corporate social responsibility throughout supply chains demonstrates an increased awareness of the problem among state players and can be used as a political tool by political and civil society actors to enforce human rights and environmental norms.

2.1 GVC disruptions

The COVID-19 pandemic put GVCs to a test. A public health emergency of this magnitude and severity has never occurred in the contemporary era. Businesses throughout the world experienced supply chain disruptions due to the pandemic. The reaction to the tremendous scope of the disruption has been mostly disorganized. The **COVID-19 pandemic** unfolded as a **combination of supply and demand shocks** that moved through the global economy in overlapping waves. COVID-19 hit key GVC nodes one after the other, spreading contagion through the supply chain across different networks and in reverse. The first impact of the pandemic was a production shutdown in China, followed by a collapse in domestic demand. As the virus spread, the same shocks hit other Asian countries, causing global supply shortages of inputs from Asia. As Chinese companies began to resume production, other parts of the world also experienced production stoppages, particularly in Europe, the United States, and the Middle East. As in Asia, the initial supply shock was followed by a demand shock, triggered by local quarantine measures, and rising unemployment. The supply-side shock, initially from China, later reverberated through China's dependence on inputs from other countries. Tensions intensified in 2021 because of the flare-up of COVID-19 in the East Asia and Pacific region, leading to new factory and port closures, as well as shocks related to weather disruptions and container shortages. GVC instability has become painfully evident in the pandemic. It threatens security of supply as much as cyber-attacks and geopolitical uncertainties along supply chains. The EU is particularly dependent on stable GVC and secure trade conditions. In this respect, security of supply is a central condition for the EU's ability to survive as an industrial location, but it is also crucial for a secure supply of a wide range of consumer goods. The COVID-19 pandemic had an unprecedented effect on the EU's economy: Nearly all of Europe's main automobile producers had to halt all operations (Chambers, 2020; Choi et al., 2020; Jones et al., 2020; Knowledge/Wharton, 2020; Reuters, 2020).

Besides COVID-19, **shocks that affect global production are growing more frequent and more severe**. These range from natural and man-made disasters to geopolitical uncertainties, inter-state and inter-regional conflict, and cyber-attacks on firms' and service-providers' digital infrastructures, and the financial toll associated with the most extreme events has been climbing. In fact, even before COVID-19 certain sectors started to revise the international organization of production in favour of higher shares of domestic input. The OECD cites structural shifts like the digitalization of economies, servicification of manufacturing, and consumer preferences for more sustainable production processes as reasons why firms are producing closer to consumers and relying less on offshoring while becoming more productive and offering better products and services.¹ Other sectors, meanwhile,

¹ OECD (2020). COVID-19 and global value chains: Policy options to build more resilient production networks. <https://www.oecd.org/coronavirus/policy-responses/covid-19-and-global-value-chains-policy-options-to-build-more-resilient-production-networks-04934ef4/>.

have not significantly modified their supply linkages despite the ongoing trends towards reshaping the geographic scope of suppliers for security reasons.

The accumulation of constraints observed over the last few years in many areas of the global economy is driving the debate on GVC security. Resource scarcity and a lack of resource diversification is the central concept in analysing production problems and supply shortages that affect not only semiconductors, but also raw materials and basic production materials. Open and integrated markets are prerequisites for the effective functioning of GVCs. However, their mechanisms are coming under increasing pressure from external events, market intervention and manipulation, and short-term disruptions in the flow of goods and services. The fact that suppliers abroad are no longer able or willing to meet their delivery obligations due to production hindrances (lockdowns, lack of transportation means such as ships or containers) is just as much a part of this reality as the shortage of products and supplier parts due to growing demand in the wake of the economic upturn.

Beyond COVID-19, evidence is starting to emerge that **UK's Exit of the European Union** has resulted in the reorganization of supply chains by decreasing UK integration with the EU relative to integration with the rest of the world. Sectors such as agriculture, fisheries products, and the automotive industry, possibly anticipating high barriers to trade in imported inputs, re-organised supply chains away from the EU before the EU–UK Trade and Cooperation Agreement was signed (Bakker et al, 2022). It is likely that firms initially chose to source their inputs from the EU as the most efficient option for them and thus a reallocation is likely to represent a fall in efficiency. The UK example illustrates that different patterns are developing in specific sectors and even product categories, since each sector has a different structure of imported inputs used in its production, and each of these imported inputs has a different trend. It also highlights the need to consider short- and long-term dynamics in the process of scenario-building.

Supply chain disruptions, notably caused by the COVID-19 pandemic, Chinese lockdowns in 2022, the Russian war against Ukraine, piracy in the Horn of Africa and the Strait of Malacca **reveal areas of fragility,² risks to supply chains and the adverse effect of their segmentation and non-diversification and have highlighted the vulnerability caused by the EU's dependence on complex import and export chains, as well as the dependence of many non-EU countries on basic supplies.** The two recent crises also highlight the importance of ensuring the EU's autonomy in terms of its capacity to maintain sustainable supplies of resources, goods, and services even when relevant supply chains are disrupted at short notice and by unexpected events.

2.2 Structure of the study

This study aims to map and assess cross-border supply chains vulnerabilities. The objective of chapter 3 is to detect the EU's and individual countries' different positions and roles in production networks and their evolution over time, to be able to assess the overall network structure and to identify nodal points of individual countries that are key providers to their networks. To answer the question, which raw materials are particularly important for the EU, where these are currently obtained from, and which alternative sourcing options for the EU are there, we survey and synthesize the existing

² WTO Press release. 12 April 2022: Russia-Ukraine conflict puts fragile global trade recovery at risk. PRESS/902. https://www.wto.org/english/news_e/pres22_e/pr902_e.htm. Cello Square. 3 May 2022. Geopolitical Risks and Logistical Impact of the Shanghai City Lockdown. <https://www.cello-square.com/go-en/blog/view-156.do>. Prins, B./Gold, A./Phayal, A./Daxecker, U. 19 October 2022. Maritime Piracy and Foreign Policy. Oxford Research Encyclopedia <https://doi.org/10.1093/acrefore/9780190228637.013.522>. Fox, A. (2010). Piracy in the Horn of Africa and its effects on the global supply chain. *Journal of Transportation Security*. 3:231. 243DOI 10.1007/s12198-010-0049-9.

sources that assess the importance of raw materials and commodities for the EU economy. In assessing the EU's exposure to the disruptions in the supply of raw materials, we then analyse several means of international cooperation aimed to alleviate these deficiencies. Moreover, **we assess the economic importance** of the established EU **preferential trade agreements** in improving the EU's access to raw materials. This analysis is supplemented by statistical assessment of trade flows. We show to what extent the trade and investment policy of the EU is geared towards uninterrupted supply of raw materials.

Chapter 4 aims to assess the **efficiency of EU legislation and measures in terms of their ability to successfully address the Union's raw material vulnerabilities** with a focus on identifying synergistic alignment between internal economic initiatives and external trade policy, the analysis will include three steps. We first cast a wide net and map existing internal as well as external EU policies and tools, which address supply chain vulnerabilities. We then **scope existing instruments with relevance for the Union's raw material vulnerabilities**. We narrow down the initial screening and assess the possible synergies, in view of an elaborated set of dimensions. The **detailed assessment of synergies between internal and external policies** focuses on how internal and external policies and measures fit together to efficiently address the vulnerabilities. We focus on critical disconnects and explore the potential for promoting mutual support. Building on historical neo-institutionalist and neo-functional concepts for understanding EU integration, **we define efficient synergies** as a well-fitting interlocking of the institutional-procedural, functional, and budgetary dimensions of the interrelated, externally, and internally oriented policy instruments across all phases and levels of the policy cycle standardised by treaty or secondary law. The detailed assessment is then analysed vis-à-vis the development in multilateral agreements and multilateral fora for pursuing key interests.

Chapter 5 finally **addresses shortcomings of the abovementioned existing legal frameworks and international agreements, engagements, partnerships, and initiatives**. We point to where these existing frameworks fail (or when, i.e., under which internally and externally induced framework conditions they may risk to fail) to cover strategic dependencies of the EU as mentioned in the first section. **We explore potential instruments for the EU's internal and external economic and trade policies to ensure more resilient global value chains in strategic sectors of the EU.**

3 GVCs and the importance of CRMs for the EU economy

3.1 Introduction

Supply chains can be vulnerable to various types and sources of disruptions, depending on their specific structures (hierarchical, more or less centred on 'core' countries and those structures typically change over time following the specific supply chain evolving relationships. Those participating in supply chains can be vulnerable to disruption within the same chain depending on their specific roles, and roles can also change over time. The more central a partner is to the network, the more disruptive to production may be any event that might occur to that partner or between the country involved and other partners (as in the case of economic sanctions or other trade frictions). Production networks can be hierarchical, that is they may show a cohesive core tied to hangers-on in the periphery. Supplier networks can be concentrated or diversified, and this implies diverse degrees of supply chain vulnerabilities. Overall, supply chain diverse types of vulnerabilities may also change over time. For each sector, the resilience of supply chains depends on the presence of vulnerabilities to potential supply shocks, which can arise from different sources:

- Geo-political vulnerability (e.g., energy, metals and mineral imports from countries that are politically unstable or unfriendly are more prone to supply restrictions than are imports from countries that are politically stable or more reliable as partners.);
- Price vulnerability (which depends on the volatility of primary resources, also a result of the structure on the international production and trading network of those resources.);
- Structural vulnerabilities (e.g., due to highly uncompetitive market structures in some parts of supply chain, which can cascade through to the whole production chain).

Recent challenges to supply chains have highlighted that EU external trade policy remains a key tool for dealing with supply chain vulnerabilities. The EU's Trade Policy Review 2021 "An Open, Sustainable and Assertive Trade Policy" highlights the centrality of trade policy in dealing with supply chain vulnerabilities as well as the resilience that supply chains have shown during the COVID-19 pandemic. Trade policy is meant to contribute to the resilience of supply chains via four channels:

1. Stable, predictable, and transparent trading rules – The EU's trade policy strategy and specific policy instruments should contribute to the stability, predictability, and transparency of rules for businesses.
2. Opening new markets to diversify sources of supply – The EU's industrial policy measures, bi- and plurilateral agreements and its unilateral trade defence aim at diversifying sources of supply.
3. Developing cooperative frameworks for fair and equitable access to critical supplies – The EU should work with trade partners and other organisations, including G-20, WTO, OECD, to monitor critical supply chains, and ensuring fair and equitable access.
4. Making supply chains more sustainable – Assuming that more sustainable supply chains are more resilient to disruption, ongoing reforms to promote sustainability within the EU's trade policy frameworks should be pursued and implemented in a consistent, convincing (i.e. visibly rewarding), and democratic way.

With a transition to a climate-neutral economy through a turn to renewable energy and e-mobility solutions, the global economy is moving towards replacing reliance on fossil fuels with reliance on raw materials. For example, under a 2°C temperature increase scenario requiring, the demand for raw materials used in electric storage batteries (aluminium, cobalt, iron, lead, lithium, manganese, nickel) is expected to see a tenfold increase by 2050, compared to a “business as usual” scenario (European Commission, 2020b). Moreover, according to the OECD (2019), the overall global material use will more than double in 2060, compared to 2011, with the use of metals in particular (for which the EU relies heavily³ on imports) increasing by 250 %.⁴ This higher dependence on raw materials could lead to its own set of problems, such as heavy metal pollution, habitat destruction and resource depletion (due to higher mining intensity). Thus, the global demand and competition for raw materials has and will continue to grow⁵ (European Commission, 2020a), because of not only this shift but also population growth, industrialisation and growth of new industrial sectors and the rising consumption in developing countries. Many countries, such as China and the United States, are already actively working towards securing future supplies.⁶ To this end, in 2008 the European Commission launched the European Raw Materials Initiative, a strategy, which involves targeted measures towards securing and improving EU raw material access.⁷ As part of this strategy, the European Commission made a commitment to publishing a list of Critical Raw Materials (CRM) and updating it at least every three years, with the first list appearing in 2011 (European Commission, 2018).

Furthermore, on 1 February 2023, the EU presented The Green Deal Industrial Plan, which set out to increase the competitiveness of the EU net-zero industry and a smooth transition to climate neutrality. One of its pillars, simplifying the regulatory framework to boost strategic projects, is to be achieved through two regulations proposed by the Commission: the Net-Zero Industry Act⁸ and the Critical Raw Materials Act.⁹ Combined, these legislative acts will set the EU CRM strategy and course for the years to come. The first of the two, the Regulation on establishing a framework of measures for strengthening Europe’s net-zero technology products manufacturing ecosystem (Net Zero Industry Act), will outline a set of concrete goals for European cleantech, zeroing in specifically on investment in strategic projects along the entire supply chain. The Regulation’s goals are converted into a quantifiable overall headline benchmark aiming at guaranteeing that by 2030, the Union’s production capacity of strategic net-zero technologies approaches or exceeds 40 % of the Union’s annual deployment demands. This benchmark expresses an overarching political goal of establish-

³ Depending on the metal, between 75 and 100% of the EU supply comes from imports.

⁴ <http://veram2050.eu/wp-content/uploads/2018/10/D4.1-Report-on-economic-outlook-and-raw-material-needs-for-2050.pdf>

⁵ However, it is important to note that demand increase does not automatically lead to supply bottlenecks, as the supply of raw materials is influenced by many other factors – such as the technical possibilities for upscaling extraction and refining capacities. In addition, demand increase and the resulting higher prices can also become drivers for investment in future capacity (European Commission, 2020a).

⁶ For the United States see <https://www.whitehouse.gov/briefing-room/statements-releases/2021/06/08/fact-sheet-biden-harris-administration-announces-supply-chain-disruptions-task-force-to-address-short-term-supply-chain-discontinuities/>. For China see <https://www.orfonline.org/expert-speak/forging-china-resistant-supplier-compacts/>

⁷ In the period of 2018-2020, over EUR 250 million was invested into actions on raw materials (European Commission, 2018).

⁸ Proposal for a regulation of the European Parliament and of the Council on establishing a framework of measures for strengthening Europe’s net-zero technology products manufacturing ecosystem (Net Zero Industry Act, COM(2023) 161).

⁹ Proposal for a regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/1724 and (EU) 2019/102 (COM(2023) 160).

ing high resilience across strategic net-zero technologies and the whole energy system, while keeping in mind the necessity to approach that goal in a flexible and diverse manner. The proposal clearly seeks to enhance the EU's production capacity of net-zero energy solutions to reduce the risk of raw material supply shortages and dependencies. The Regulation will simplify and speed up the process of obtaining permits for production sites and develop uniform European standards. It will also include the possibility of cooperation with like-minded partner countries, to strengthen and diversify supply chains.

Complimentary to this will be the Regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials (Critical Raw Materials Act – CRM Act), which the Commission announced on 14 September 2022 and finally adopted on 16 March 2023. The CRM Act is built around four main goals: defining priorities and objectives for EU actions; improving its monitoring, risk management, and governance in the field of CRM; strengthening the EU CRM value chain in a global context; and ensuring a sustainable level playing field across the Single Market. The Regulation establishes definite standards for domestic capacity throughout the chain of strategic raw material supply, with the goal of diversifying EU supply by the year 2030:

- At least ten percent of the yearly usage in the EU for extraction purposes;
- At least forty percent of the yearly usage for processing in the European Union;
- At least 15 percent of the annual consumption of the EU for recycling;
- Not more than 65 percent of the annual consumption of the Union for any strategic raw material at any relevant stage of processing coming from a single third country.

Preliminary information on the proposed actions and instruments under each pillar is presented below, in Table 1.¹⁰

Table 1. Envisaged actions under each of the four pillars of the Critical Raw Materials Act

Pillar	Actions and instruments
Defining priorities and objectives for EU actions	Determine strategic CRMs based on pre-set criteria
	Set EU objectives for increasing capacity at different value chain stages
Improving the EU's monitoring, risk management and governance in the field of CRM	Create a dedicated operational network for sharing information in a timely manner, including relevant Member State agencies
	Use the network to e.g. develop early warning mechanisms, conduct stress tests on critical supply chains and map strategic mineral resources
Strengthening the EU's CRM value chain (mining, refining, processing, recycling) in a global context	Identify strategic projects in the EU that have the potential to help secure the EU's diversified access to CRMs and have strong environmental and social performance, and ensure they have better access to funding and streamlined and predictable permitting
	Develop investment capacities to enable the development of the value chain

¹⁰ Based on the call for evidence for an impact assessment, European Commission 2022; and the Commission's proposal of 2023.

	Identify strategic projects outside of the EU which could benefit from better access to funding, based on e.g. their environmental and social performance
Ensuring a sustainable level playing field across the Single Market	Strengthen the waste and circularity framework
	Enhance transparency, availability, and coordination of strategic reserves of relevant CRMs
	Ensure the availability of sufficient European and international technical standards, to support innovation, high environmental, social and governance standards while ensuring a level playing field on the Single Market and internationally
	Ensure a level playing field for CRM-based products and components crucial to the green transition, e.g. by setting recycling obligations or an information requirement on the carbon footprint of their production process, inside and outside of the EU.
Linked objectives	
Strengthening the EU external actions: the Commission also issued a communication presenting the intra and extra EU actions to be implemented in order to secure the supply of CRMs, including the EU's vast network of targeted strategic partnerships with third countries, trade agreements, its bilateral/regional trade negotiations, Sustainable Investment Facilitation Agreements, sectoral agreements, as well as development cooperation, and multilateral initiatives such as a "Critical Raw Materials Club" bringing together consuming and resource-rich countries to promote the secure and sustainable supply of CRMs. ¹¹	
Accelerating research and innovation, notably on efficiency, recycling and substitution of CRMs.	
Enabling the development of skills needed for the critical raw materials value chain, for instance by up- and re-skilling.	

Source: own elaboration based on the "Call for evidence for an impact assessment" (European Commission, 2022)

The most recent updated list – announced in the 'Action Plan for Critical Raw Materials' drafted by the European Commission on 3rd September 2020 – screened 83 materials in terms of their criticality at the stages of both extraction and processing, finding 30 of them to be critical (the first version contained only 14). In addition to metals such as cobalt and tungsten and so-called 'rare earth' elements¹², bauxite and lithium were listed for the first time. The latter is a key component for batteries in electronic devices and electric vehicles. Many of these are defined as "critical raw materials" because they play a key role in the economy and industrial production, a role that is destined to grow even more in the wake of the ecological transition and the move away from fossil fuels. Furthermore, their supply chain is subject to strategic risks, due mainly to the fact that they are mostly extracted in non-European countries, some of which are authoritarian and/or countries with low quality of market institutions (see later a more detailed analysis of this issue), often in problematic social conditions (e.g., exploitation of workers, underage labour) and using methods with a high environmental impact (European Commission, 2020a).

¹¹ Communication from the Commission: A secure and sustainable supply of critical raw materials in support of the twin transition, Brussels, 16 March 2023, COM(2023) 165 final.

¹² <https://www.renewablematter.eu/articoli/article/terre-rare-le-vitamine-dellindustria-moderna>

3.2 Economic importance of Critical Raw Materials and supply risk

Critical Raw Materials are essential in the modern-day economy. Minerals such as lithium, cobalt, and copper are essential for digitalization, for renewable energy technologies, and for the further deployment of electric vehicles. The main parameters used to determine the criticality of the material for the EU are two¹³: economic importance and supply risk.

- **Economic importance** i.e., the importance of a material for the EU economy in terms of end-use applications and the value added (VA) of corresponding EU manufacturing sectors at the NACE rev.2 (2-digit level).

According to the study “Critical materials for strategic technologies and sectors in the EU – a foresight study” (European Commission, 2020a), the economic importance of individual raw materials is determined by how they are allocated to end-uses, based on industrial applications. As a part of the EU raw materials criticality assessment in 2020, dependence on critical raw materials has been analysed for nine strategic technologies and three sectors.

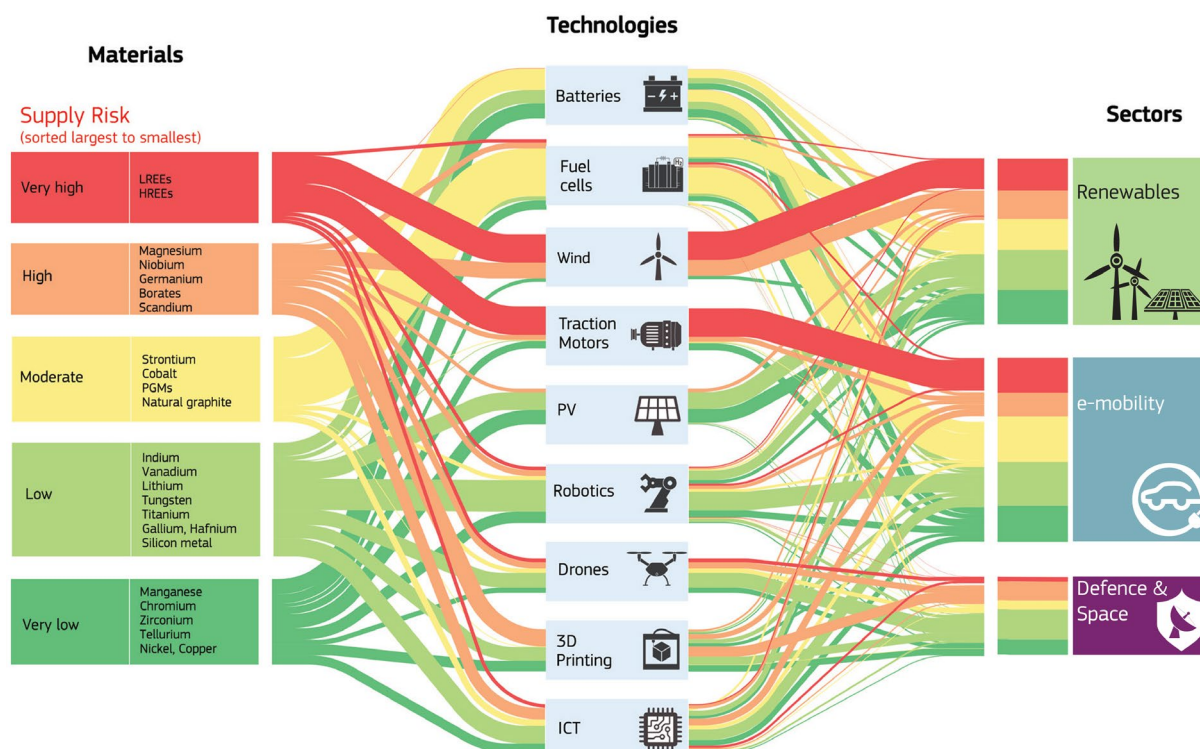
The nine technologies that make use of CRMs are batteries, fuel cells, wind energy, traction motors, PV, robotics, drones, 3D printing and ICT. All those technologies are strategic in so far, they are central to sectors such as renewables, e-mobility, defence, and space. Those technologies use intensively an array of raw materials that face varying degree of supply risk. Therefore, they are subject to potential disruptions due to possible lack or shortage of input supplies. Moreover, many of those technologies compete for the same raw materials.¹⁴

The following figure shows a complete picture of competition of technologies and sectors for the same materials.

¹³ https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en

¹⁴ For example, wind energy and traction motors compete both for various rare earths, as well as for borates; robotics and drones also use motors; fuel cells and digital technologies require a large amount of platinum group metals (PGMs).

Figure 1. Semi-quantitative representation of flows of raw materials and their current supply risks to the nine selected technologies and three sectors (based on 25 selected raw materials)



Source: EU Commission (2020a), p. 10.

- **Supply risk (SR)** reflects the risk of a disruption in the EU supply of the material. It is based on the concentration of primary supply from raw materials producing countries, considering their governance performance and trade aspects. Depending on the EU import reliance (IR), proportionally the two sets of the producing countries are considered — the global suppliers and the countries from which the EU is sourcing the raw materials. SR is measured at the ‘bottleneck’ stage of the material (extraction or processing), which presents the highest supply risk for the EU. Substitution and recycling are considered risk-reducing measures (see footnote 14 on recycling in the EU).

According to the European Commission, supply risk considers the degree of diversification of primary and secondary supply sources at the country level, the quality of governance in supplier countries, applicable trade restrictions, the degree to which the EU relies on imports of a given material, the impact its extraction and processing have on the environment and recycling or substitution potential (European Commission, 2020b).

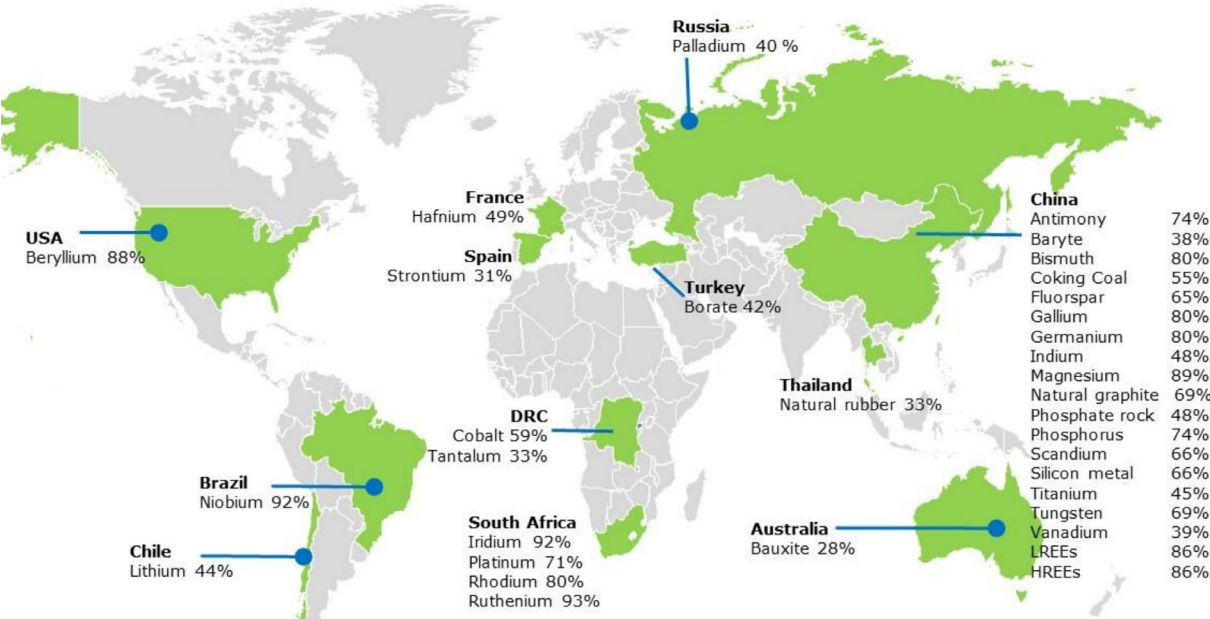
Based on the criteria above, the Commission’s 2023 list of CRMs is the following:¹⁵

- | | | |
|-------------|-------------------------------------|------------------|
| - Antimony | - Light Rare Earth Elements (LREEs) | - Tantalum |
| - Baryte | - Indium | - Titanium metal |
| - Beryllium | - Magnesium | - Tungsten |
| - Bismuth | | - Vanadium |

¹⁵ See Annex II of the Proposal for a regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/1724 and (EU) 2019/102 (COM(2023) 160): Critical raw materials – Section 1 – List of Critical Raw Materials.

- Borate
- Boron
- Cobalt
- Coking Coal
- Copper
- Fluorspar
- Gallium
- Germanium
- Hafnium
- Helium
- Heavy Rare Earth Elements (HREEs)
- Manganese
- Natural Graphite
- Natural Rubber
- Nickel – battery-grade
- Niobium
- Platinum Group Metals (PGM)
- Phosphate rock
- Phosphorus
- Scandium
- Silicon metal
- Bauxite
- Lithium
- Titanium
- Strontium

Figure 2. Largest supplier countries of CRMs to the EU



Source: European Commission (2020c)

Table 2. Importance of CRM and raw material inputs in total extra EU imports (2021)

	CRM	Raw materials (SITC 2&4)	Remaining trade	Total trade
Total value of imports (million EUR)	13 800	106 700	2 003 000	2 118 520
Percentage of total	0.7	5.0	94.5	100.0

Source: own elaboration of the Eurostat Comext Data

While the numbers reflecting the importance of CRMs in aggregate extra EU imports (Table 2) do not suggest large economic importance of those products (i.e., less than 1 % of total imports), many of the CRMs listed above are highly concentrated at the country level (see Figure 2). For instance, China holds 98 % of Rare Earth Elements (REE), for which demand is projected to see a tenfold increase by 2050 due to permanent magnet production alone (permanent magnets are used electric vehicles, digital technologies, and wind generators). What is even more concerning, some CRMs are concentrated in countries and regions characterised by low standards of governance (e.g., the Democratic Republic of Congo, the Russian Federation). Reliance on those countries for CRMs carries many risks,

such as volatile supply security, risks of armed conflicts and a rise in environmental and social problems (e.g., human and labour rights violations). Moreover, given the aforementioned shift towards alternative power sources, energy and the increasing reliance on semiconductors, the demand for CRMs will likely increase substantially.

3.3 Main EU suppliers of CRMs and their characteristics

To obtain the latest information on the sourcing of the CRMs above, we have analysed European Union's detailed import data for 2021 (latest available annual data). While it is not always possible to identify all products belonging to a given CRM and in some cases, the source of imports is not disclosed due to confidentiality reasons.

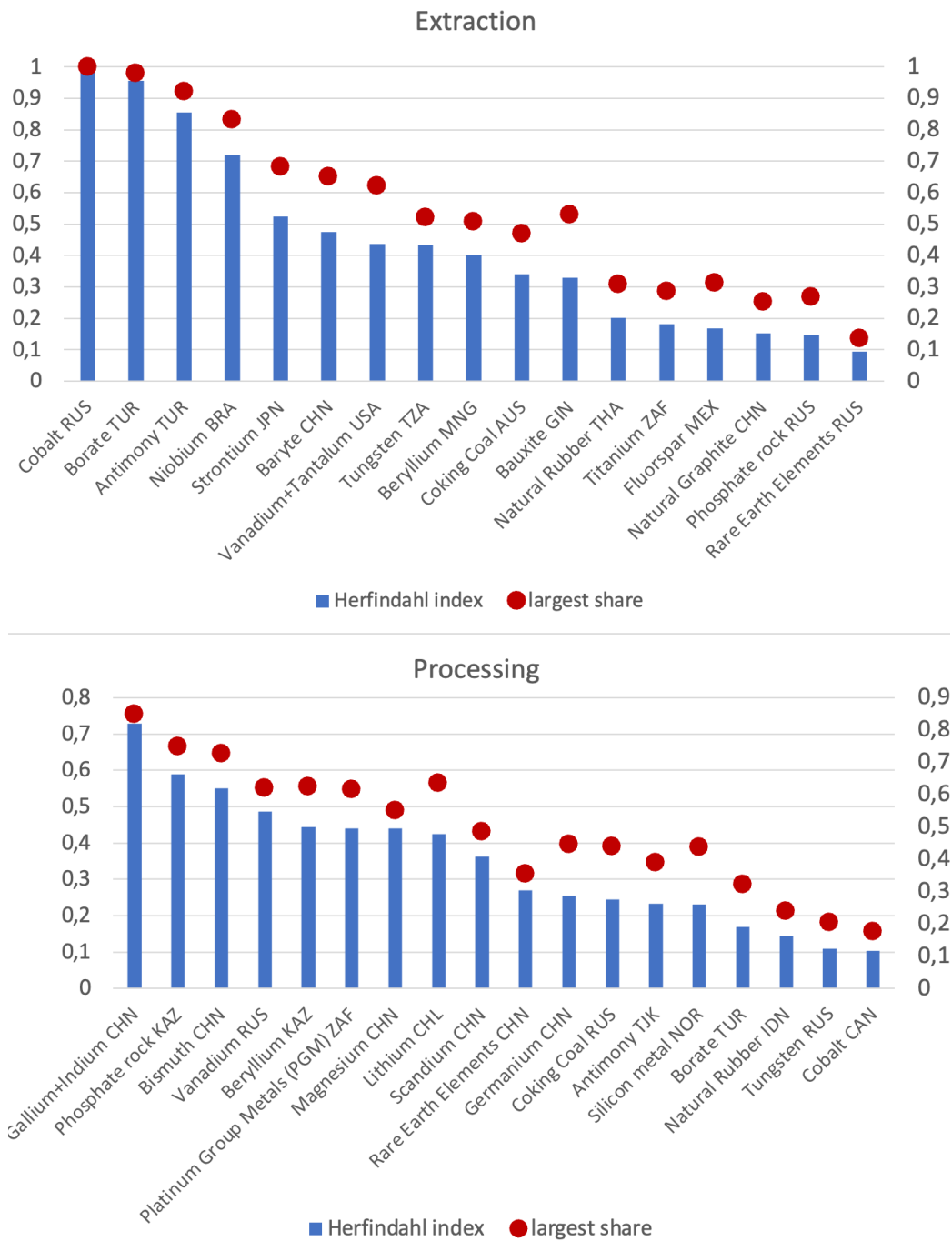
Figure 3 shows the largest suppliers of a given CRM and the Herfindahl index of concentration¹⁶. This figure shows that in many cases where imports of a given material are heavily concentrated, the main suppliers are often countries of relatively weak democratic and market institutions (e.g., Russia, China, Turkey, Kazakhstan).

Figure 4 analyses this issue in more detail by looking at the measures of democracy based on the Polity index ranging from -10 (monarchy), through 0 (autocracy), to 10 (democracy) and the Heritage Economic Freedom Index (ranging from 0 to 100, higher equals more freedom.) associated with the EU external import structure of the listed CRMs. When we consider imports of raw materials from the extraction phase, baryte, borate and antimony are sourced mostly from countries of low economic freedom and relatively low democracy scores. When processing is considered, both low economic freedom and democracy scores apply to import partners from which the EU sources borate, coking coal, cobalt, titanium, vanadium, and tantalum. Several essential products and industries are dependent on the supply of those CRMs including defence industry (antimony, titanium, vanadium), batteries (antimony, cobalt, coking coal), medical and chemical industry (baryte, titanium), semiconductors (gallium, borate) and automotive industry (vanadium, titanium)¹⁷.

¹⁶ It takes values between 0 and 1, where 0 is very many suppliers and 1 is one supplier.

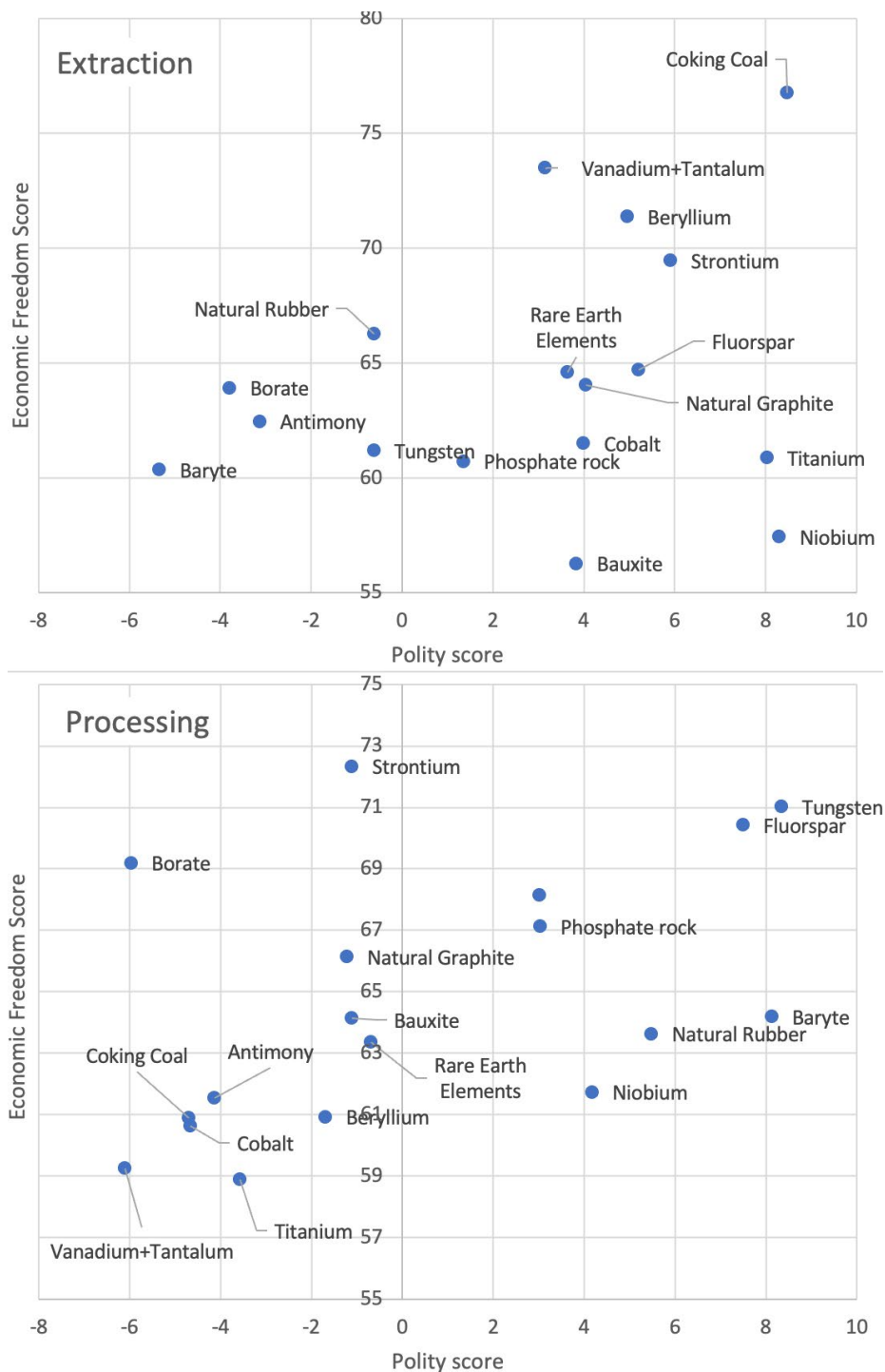
¹⁷ For reference, we have provided in the appendix the average democracy and economic freedom scores for all main categories of extra EU imports. One can observe that for in the case of many categories, the main trading partners are on average democratic countries and countries of significant economic freedom. However, categories that are mainly dominated by increasing imports from China: e.g., assorted manufactured products, as well as machinery and transport equipment, as well as fuels – are primarily imported from countries with both low democracy scores and low economic freedom scores.

Figure 3. Concentration of extra-EU CRM imports and main exporter to the EU (2021)



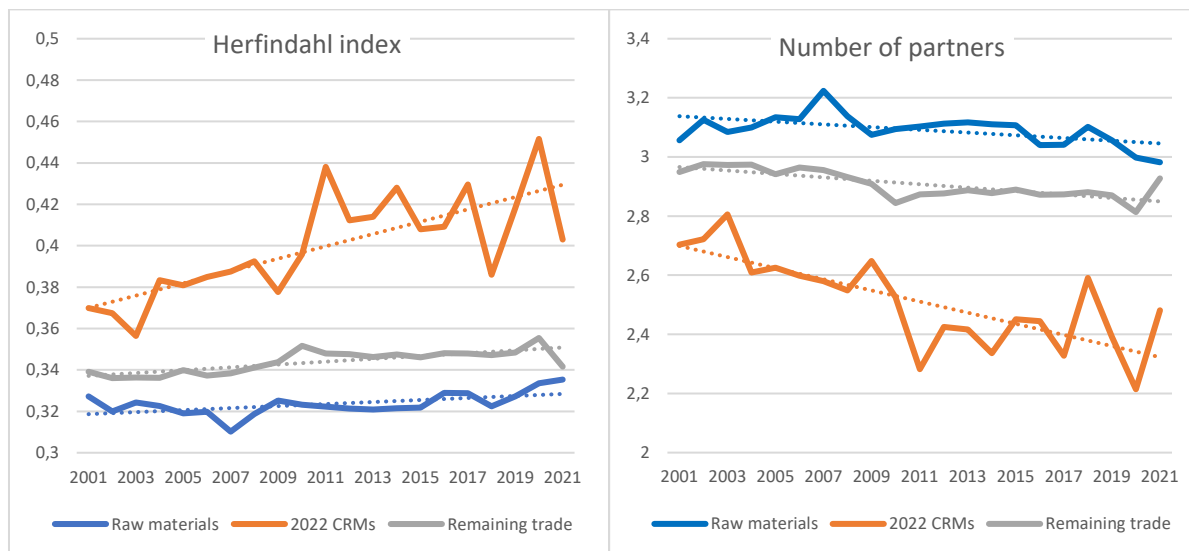
Source: own calculation based on Eurostat Comext Data. Country 3 letter ISO codes in labels correspond to largest extra EU suppliers. Herfindahl index is the sum of squared shares of trading partners in imports: 1 stands for monopoly, values close to zero: many small trading partners. Largest share describes the share of the most important extra-EU partner. Note that it is not always possible to identify CRMs in the trade data because of statistical confidentiality and the fact that some CRMs are extracted as by-products of other mining activities (for example, cobalt is extracted together with nickel and therefore the number for cobalt may be exaggerated as Russia is the main exporter of raw nickel).

Figure 4. Average economic freedom score of EU external trade partners, by CRM product category (2021)



Source: Own elaboration of the Eurostat COMEXT Data, Polity scores, and Heritage Foundation's Economic Freedom score. Economic Freedom score takes values of 0 to 100. However, in the 2021 edition the minimum score is 5 (North Korea) and maximum is Singapore (90). Polity score takes values of -10 (hereditary monarchy) through 0 (autocracy) to +10 (consolidated democracy).

However, in most cases (European Commission 2020b), the current largest supplier to the EU is also the largest global supplier and reserves are heavily concentrated. Moreover, as Figure 5 suggests, while the degree of concentration of aggregate imports has not heavily changed over the last two decades, the concentration of suppliers of CRMs has been in a clear upward trend.

Figure 5. Concentration of extra-EU imports, hypothetical number of symmetric trading partners

Source: own calculation based on Eurostat Comext Data. Herfindahl index is the sum of squared shares of trading partners in imports: 1 stands for monopoly, values close to zero: many small trading partners. The inverse of Herfindahl index is the number of hypothetical symmetric partners (i.e., $H=0.1$ means 10 partners, $H=1$ means 1 partner). Largest share describes the share of the most important extra-EU partner. Herfindahl index is computed at every 8 digit Combined Nomenclature category and averaged for every year. Note: the number of countries is the 2022 composition of the EU, so it includes non-members of the EU before the relevant accessions that occurred within the analysed period and does not include the UK. Dotted lines reflect the linear trends.

Nevertheless, one of the major steps¹⁸ to addressing and mitigating these supply risks is diversifying primary and secondary supply sources via responsible and sustainable sourcing from non-EU countries, combined with removing international trade distortions and strengthening rules-based open trade (European Commission, 2020b). This will be a crucial part of EU strategy, given that for many of the raw materials on the CRM list the EU will continue to be dependent on imports even in the medium and long run. This is because, firstly, the extractive industry (mining and carriers) plays a smaller role compared to the manufacturing and refining industries, causing an imbalance between upstream (extraction and harvesting) and downstream (manufacturing and use) steps. Secondly, some CRMs are entirely absent from European territories (or their exploration and extraction is negatively impacted by socioeconomic factors). Finally, at present secondary sources¹⁹ alone are unable to meet the growing demand (European Commission, 2018). This is reflected in the low recycling input rate²⁰ (the share of secondary sources in raw material supply²¹) for most CRMs and further exacerbated by a lack of necessary technologies (or their high cost) and a large fraction of CRMs being

¹⁸ Other steps include improving material efficiency; reducing, reusing, and recycling materials (scaling up circular economy); improving the sustainability and innovating products; strengthening sustainable and responsible sourcing and processing of raw materials within the EU.

¹⁹ Secondary materials replacing primary CRMs. The former usually consume less resources relative to primary CRMs, generate less waste and have a smaller impact on the biosphere (European Commission, 2018).

²⁰ High for Vanadium, Tungsten, Cobalt, and Antimony; for some the recycling rate is good but cannot meet demand (e.g., PGMs).

²¹ When presenting the Action Plan for Critical Materials, Vice-President of the European Commission for Interinstitutional Relations Maroš Šefčovič stated that the Commission will “map the potential supply of secondary critical raw materials from EU stocks and wastes by 2022 – a precondition for future policy development and concrete recovery and recycling projects”. In fact, 9 million tons of waste electrical and electronic equipment is generated in the EU every year, but only around 30 % is collected and recycled. The recovery of the critical raw materials from this e-

locked in assets with a long lifetime. To fulfil this diversification goal, the EU needs to ensure undistorted access to a wider range of global markets for raw materials, utilize trade policy tools (such as Free Trade Agreements with key source countries), enhance enforcement by swiftly addressing third countries not meeting international obligations and collaborate with international organisations to prevent distortions in trade and ensure that investments in raw materials support its commercial interests.

3.4 International agreements and economic diplomacy: improving the EU's access to CRMs

The European Union has been building an extensive network of preferential trade agreements. Existing FTAs and other partnership agreements cover about 36.1 % of overall extra-EU imports with the currently negotiated agreements intended to cover another 25.7 %.²² As the trade pattern in CRMs is different than the overall EU trade pattern, it is important to understand to what extent the current EU FTAs cover the major suppliers of CRMs. Another important issue (given resource scarcity within the EU), is outward European foreign direct investment (FDI) in resource rich countries through the Bilateral Investment Treaties (BITs) of the EU member states establishing the terms and conditions for private investment abroad. BITs ensure that foreign investments will be legally protected under international law and help avoid double taxation of foreign entities and therefore can reduce barriers to FDI.²³ The importance of BITs to facilitate FDI is all the more important when considering that at a global level, great resource imbalances are piling up, to the extent that in many of the strategic technologies mentioned above, midstream FDI (i.e., those aimed at producing intermediate high-tech input, such as batteries for electric vehicles) have been on the rise since at least 2016, while upstream FDI in metals and mineral extraction have declined since 2018. According to FDI Intelligence, capital expenditure on new mining projects is largely lagging the huge increase in EV and battery manufacturing investment.²⁴

A massive imbalance is emerging across the electric vehicle (EV) supply chain. As Europe overtook China as the world's biggest EV market in 2020, according to data from EV-volumes.com, with roughly 1.4 million EV cars compared to 1.3 million EV cars sold in China, European carmakers will increasingly face supply risk in input supplies, as increasing global demand puts pressure on already tight markets for minerals. Notwithstanding a surge in manufacturing activities with a flood of gigafactory announcements coming from incumbents and newcomers to the market over the last couple of years, the EU is most likely not to reach the target to host around 35 gigafactories by 2035 as predicted. Investments upstream need to keep pace matching increasing demand. The EU expects that battery production will match demand by 2025.²⁵ The immediate challenge to create a competitive and sustainable battery manufacturing industry is immense, and the EU must move fast in this global race. According to some forecasts, from 2025 onwards the EU could capture a batteries market of up to EUR 250 billion a year, served by at least 10 to 20 gigafactories (battery cells mass production

waste stands below 1 %. "Exploiting urban mines – that is, recovering raw materials from urban waste through recycling – could eventually satisfy a large share of the EU's demand for critical raw materials".

²² That includes the investment agreement with China, currently on hold. Source: own analysis of Eurostat's COMEXT trade data together with the list of agreements compiled using the CEPPII gravity dataset and the European Commission website.

²³ See, e.g., Sauvart and Sachs, 2009, for a literature review and more details on the effects of BITs on FDI.

²⁴ <https://www.fdiintelligence.com/content/feature/europes-gigafactory-economy-80118>

²⁵ https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/european-battery-alliance_en

facilities) to cover EU demand.²⁶ The EU is on the track to having 27 gigafactories from 18 producers by 2030 and a capacity of 789.2 GWh (compared to 9 gigafactories and a capacity of 105.8 GWh in 2022).²⁷ So far, 111 industrial battery projects are being developed across EU Member States, with some 20 battery cells gigafactories. The EU is set to meet 69 % and 89 % of its increasing demand for batteries by 2025 and 2030 respectively and should be capable of producing batteries for up to 11 million cars per year. The total level of investment along the battery value chain amounted to EUR 127 billion by 2021. Additional investment of some EUR 382 billion is expected to create a self-sufficient battery industry by 2030. With this pace of investment, the annual added value created by the battery industry would be an estimated EUR 625 billion by 2030.²⁸

Table 3 shows the relevance of EU's international agreements for different categories of EU trade. The bilateral investment agreements, either established by an EU member state on an individual basis or an EU-wide treaties with investment provisions cover roughly 55 % of all CRM imports. While coverage of current free trade agreements and economic partnership agreements is significantly lower (around 27 % of extra-EU CRM imports in 2021), the FTAs and EPAs that are either already completed but waiting to be ratified and those which are currently under negotiations may allow to more than double the coverage of CRMs. However, these numbers include the EU-China Comprehensive Agreement on Investment, which is currently on hold and there have been some doubts about its future following the recent trade tensions.²⁹

Table 3. Coverage of EU external trade by FTAs, EPAs, and BITs (2021)

Percentage subject to	CRM	Raw materials (SITC 2 & 4)	Remaining trade	Total trade
BIT	54.9	37.0	58.5	58.3
FTA or EPA	27.4	45.3	40.2	40.4
BIT & FTA/EPA	66.3	77.9	79.7	79.5
FTA/EPA in progress	9.0	16.2	2.4	3.1
FTA/EPA under negotiations	26.1	10.9	24.6	24.0
FTA/EPA on hold	7.3	5.7	7.0	6.9

Source: Own elaboration of Eurostat Comext Data, EU FTA data based on the CEPII gravity database (www.cepii.fr) as well as European Commission FTA site (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/negotiations-and-agreements_en), BIT data based on UNCTADs International Investment Agreements Navigator (<https://investmentpolicy.unctad.org/international-investment-agreements>). Note that some of the CRM and raw materials FTA and BIT coverage may be inaccurate due to confidential trade flows.

Turning to a more detailed analysis shown in Figure 6, we contrast the current (2021) FTA and EPA coverage with the prospective coverage of CRM imports for each CRM category. One can observe that in most cases of CRMs where the current FTA coverage is low, the prospective coverage is significantly higher, i.e., improving the resilience of current sources. However, wherever China is an important supplier – e.g., for baryte and natural graphite (extraction) as well as gallium/indium, magnesium, and scandium (processing) – as mentioned before, the significant increase in the coverage by the EU agreements is conditional on the uncertain fate of the EU-China Comprehensive Agreement on Investment (CAI). Full details of coverage of specific EU trade agreements are given in the

²⁶ European Commission (2018).

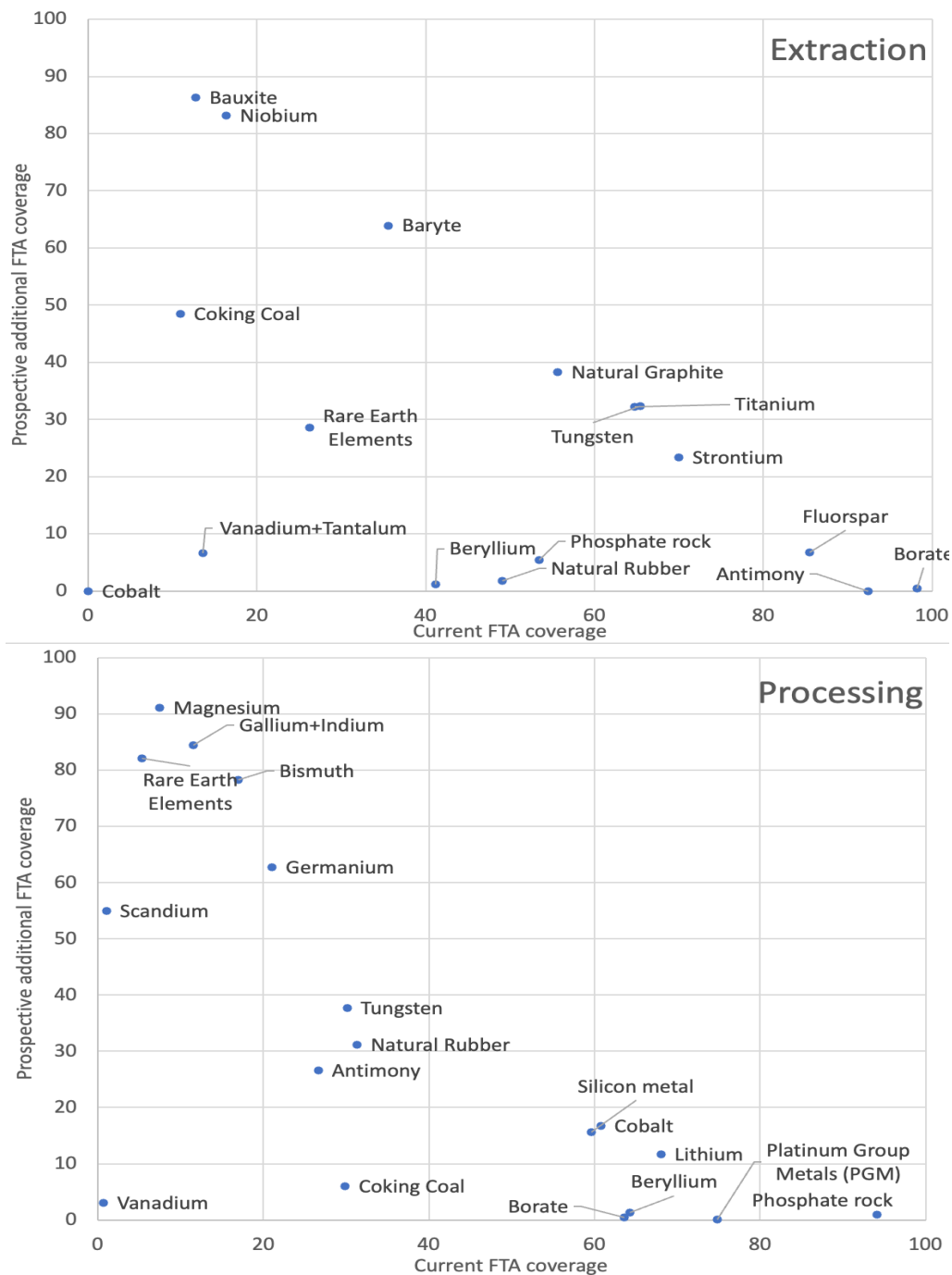
²⁷ <https://www.greencarcongress.com/2022/03/20220312-benchmark.html>

²⁸ https://ec.europa.eu/commission/presscorner/detail/en/QANDA_22_1257

²⁹ This issue has been discussed in some press articles such that <https://www.politico.eu/article/china-throws-eu-trade-deal-to-the-wolf-warriors-sanctions-investment-pact/> and <https://www.reuters.com/article/us-eu-china-trade-idUSKBN2BF276>

Appendix. Moreover, there are several CRMs where both current and prospective FTA coverage is low – these include vanadium and primary cobalt).

Figure 6. Current and prospective FTA coverage of CRM categories (2021)



Source: Own elaboration of Eurostat Comext Data, EU FTA data based on the CEPII gravity database (www.cepii.fr) as well as European Commission FTA site (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/negotiations-and-agreements_en). Note: tables show the percentage of CRM imports covered by EU FTAs. Prospective FTA coverage is the sum of coverage of FTAs that are work in progress (e.g., signed and waiting to be ratified) and those that are under negotiations.

Participation in trade agreements with resource rich countries facilitates access to sources of raw materials. FTAs in general remove import tariffs but also can alleviate export restrictions such as ex-

port taxes or export quotas. For example, both EU-Korea FTA and EU-Singapore FTA include the prohibition of duties, taxes, or measures of an equivalent effect on exportation. In fact, some EU FTAs specifically refer to trade in raw materials as well as provide scope for bilateral dialogue on supply of raw materials. In that respect, the CETA agreement envisages “effective cooperation on raw materials” between Canada and the EU that aims to contribute to market access for raw materials goods by providing a forum of exchange of information on raw materials, discuss best practices and encourage corporate social responsibility as well as to coordinate positions when discussing raw materials in international fora. The currently negotiated agreement with Australia (as per EU offer) also contains similar parts on the dialogue on raw materials as well as instruments increasing transparency of access to raw materials. Similar clauses on the dialogue and raw-material-related authorisations are found in the EU offer for the trade agreement with India, together with a clause forbidding price discrimination as well forbidding export monopolies. Chapters of similar form are also found in the EU offer for EU-Indonesia FTA as well as the negotiated version of the EU-New Zealand FTA. All of the aforementioned texts include also a chapter on the necessity of the environmental impact related to the use of raw materials.

Resource rich countries are highly varied in terms of level of development and include, among others, Australia, Canada, the Democratic Republic of Congo (DRC), Norway, South Africa and Western Balkan countries. The European Commission (2020b) highlights the establishment of FTAs with Western Balkan countries (e.g., +/- Serbia – borates, Albania – platinum) as of particular importance. These partnerships are to go hand in hand with measures to ensure the security and sustainability of sourcing, through fostering improved local governance and disseminating responsible mining practices (which would simultaneously boost economic and social development in the source countries).

Raw Materials Diplomacy is the first pillar of the EU Raw Materials Strategy³⁰. The goal is establishing dialogues with the EU’s strategic partners in raw materials through establishing bilateral, regional, and multilateral frameworks of cooperation (based on signed Letters of Intent or other agreed political frameworks). This is done by reaching out to non-EU countries through strategic partnerships and policy dialogues (which touch on raw material production, trade, recycling, and criticality – of rare earths in particular). The goal is not only to establish dialogues with resource-rich countries, but also to coordinate with other CRM-buying countries and resolve any problems that may arise.

Besides the FTAs and EPAs, the European Commission has signed several letters of intent in the framework of the so-called Missions for Growth, which “involve political and business meetings, and discussions in areas of mutual interest in the fields of enterprise and industrial policy” (Tajani, 2014). These discussions involve access to raw materials for supply to downstream industries as well as limiting risk to human health and environment in extraction and processing of those raw materials. More recently, as part of the Critical Raw Material’s Action Plan, the strategic partnership on raw materials has been signed with Ukraine³¹ and Canada³². Moreover, there are other bilateral policy dialogues on the access to raw materials outside the framework of Missions for Growth. The existing relations in those frameworks are listed below.

³⁰ See European Commission’s Raw Materials Diplomacy website: https://single-market-economy.ec.europa.eu/sec-tors/raw-materials/areas-specific-interest/raw-materials-diplomacy_en

³¹ https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3633

³² https://single-market-economy.ec.europa.eu/news/eu-and-canada-set-strategic-partnership-raw-materials-2021-06-21_en

Table 4. Existing EU Raw Materials Diplomacy bilateral relations

Existing EU relations	
Letters of intent, Missions for Growth, strategic partnerships ³³	Policy dialogue
Argentina, Chile, Colombia, Greenland, Mexico, Namibia, Peru, Uruguay, the EuroMed countries (Morocco, Tunisia, Egypt), Canada, Ukraine.	Australia, China, Japan, the United States, countries of the African Union.

Source: own elaboration based on the European Commission website

While strategic economic partnerships with resource rich countries sharing values similar to the EU is the first-best solution to securing access to raw materials, it can only cover those which are abundant in those countries. For example, Ukraine supplied only 0.2 % of the total value of extra-EU imported CRMs in 2021, with the most important CRMs imported being titanium (6 % of total extra-EU imports), gallium+indium (2 %), coking coal, beryllium, and graphite (all three around 1 % of imports). Canada supplied 4 % of extra-EU imports of CRMs, in particular cobalt (18 %), fluorspar (11 %), niobium (16 %), titanium (8 %) and tungsten (2 %). To secure access to all the CRMs (and to satisfy the projected growth in demand), sole choice of like-minded countries for partnerships may not necessarily be an option. For example, according to the Eurostat trade data, 16 % of extra-EU imports of CRM came from Russia and around 7 % from China, with very high shares of bismuth (processing, China, 80 %), gallium+indium (processing, China, 85 %), rare earth metals (processing, China, 85 %).

Moreover, the European Commission is also active in multilateral fora, to raise awareness of the continued access to critical raw materials and their sustainable use. These international fora include the

³³ The term "strategic partnership" is not defined in primary or secondary law within the EU's hierarchy of norms. The category of "strategic partnership" has different meanings that often depend on the legal basis on which the partnership is built. From the international legal perspective, it is based on non-contractual or contractual relationships between individual national states, groups of countries or groups of countries with individual countries or international organizations. The European Union first used the term "partnership", or more precisely "comprehensive partnership" in its Joint Statement "Building a Comprehensive Partnership with China" in March 1998, detailing that: "this Communication seeks to meet that challenge by building ... comprehensive EU-China partnership" (European Commission, 1998: 4). In the same year, the European Council conclusions of December 1998 used the term "strategic partnership" regarding the financial crisis in Russia, stating "that they [the European Council] considered Russia to be a strategic partner and were therefore willing to help and support the country to overcome its problems, including through food aid". See Framework Agreement on Comprehensive Partnership and Cooperation between the European Union and its Member States, of the one part, and the Kingdom of Thailand, of the other part, ST/11910/2022/INIT, OJ L 330, 23.12.2022, p. 72–108, Strategic Partnership Agreement between the European Union and its Member States, of the one part, and Japan, of the other part, ST/8463/2018/INIT, OJ L 216, 24.8.2018, p. 4–22, Strategic Partnership Agreement between the European Union and its Member States, of the one part, and Canada, of the other part, OJ L 329, 3.12.2016, p. 45–65, Comprehensive and enhanced Partnership Agreement between the European Union and the European Atomic Energy Community and their Member States, of the one part, and the Republic of Armenia, of the other part, OJ L 23, 26.1.2018, p. 4–466, Framework Agreement between the European Union and its Member States, of the one part, and Australia, of the other part, OJ L 237, 15.9.2017, p. 7–35, Enhanced Partnership and Cooperation Agreement between the European Union and its Member States, of the one part, and the Republic of Kazakhstan, of the other part, OJ L 29, 4.2.2016, p. 3–150, Political Dialogue and Cooperation agreement between the European Community and its Member States, of the one part, and the Republics of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama, of the other part, OJ L 111, 15.4.2014, p. 6–28, Partnership and Cooperation Agreement between the European Union and its Member States, of the one part, and the Republic of Iraq, of the other part, OJ L 204, 31.7.2012, p. 20–130, Cooperation Agreement between the European Community and the People's Republic of Bangladesh on partnership and development, OJ L 118, 27.4.2001, p. 48–56. See also Cihelková, E./Nguyen, H. P./Fabuš, M. (2020). The EU concept of the "Strategic Partnership": Identifying the "unifying" criteria for the differentiation of Strategic Partners. *Entrepreneurship and Sustainability Issues*, 7(3), 1723-1739. [https://doi.org/10.9770/jesi.2020.7.3\(19\)](https://doi.org/10.9770/jesi.2020.7.3(19))

OECD, focussing on the topics of conflict minerals, guidance on raw materials, and responsible sourcing, and the United Nations with discussions on the global outlook, environmental pressures, resource management, and mineral governance. The European Commission is taking part in the Commodity Study Groups dealing with market trends, exploration, extraction, production, and trade developments (with separate study groups for lead and zinc³⁴, copper,³⁵ nickel³⁶). Another important forum is the G20 Resource Efficiency Dialogue, which aims to include the subject of efficiency and sustainability of raw materials in the G20 talks. The World Trade Organization provides the framework to ensure the market access, lower technical barriers to trade and alleviate export restrictions. Its dispute settlement mechanism is being used to resolve conflicts related to access to raw materials (e.g., removing the export quotas of China in 2014, ongoing dispute between the EU and Indonesia).³⁷

A major economic diplomacy initiative aimed at cooperating for increasing supply resilience of critical materials is the Trilateral EU-US-Japan Conference on Critical Materials commenced in 2011 in response to such circumstances as soaring prices of some critical materials, especially rare earth elements, from 2010. The conference has been held annually to discuss about supply risks, trade barriers, innovation and international standards, and exchange information on policies for critical materials, R&D, and other efforts under the framework of trilateral cooperation between Japan, the U.S. and the EU. The 12th Annual Critical Material Mineral Meeting was held online on December 6 and 8 2021. Japan was the chair. At the conference, representatives from government ministries and agencies, universities and research institutes in Japan, the US, the EU, Australia, and Canada exchanged information on their policies for critical materials, research, and development (R&D), future challenges and other issues. They also confirmed that the five countries will continue to advance collaborative efforts for securing a stable supply of critical materials.

Regarding the development of technologies related to critical materials, the participants exchanged information on the following: 1) batteries, power generation, and motor technologies to support an electrified society; and 2) recycling and environmental technologies for a circular economy. As a result, the participants reaffirmed the importance of making the supply chains for critical materials more resilient and confirmed that they will continue to promote collaborative efforts between Japan, the US, the EU, Australia, and Canada. The next conference will be held in the EU next year (2022).

In a recent visit to Kazakhstan European Council President Charles Michel met President Tokayev on October 27, 2022. Given the current geopolitical situation, President Tokayev and President Michel noted the importance of expanding existing and developing new international transport corridors between Europe and Central Asia to facilitate global production and supply chains. They also discussed the opportunities offered by the Trans-Caspian International Transport Route and options for its development and the role of other transport connections in the region. The meeting also touched upon cooperation in critical raw materials, including rare earth metals. The sides confirmed their will-

³⁴ <https://www.ilzsg.org/static/home.aspx?from=1>

³⁵ <https://icsg.org/>

³⁶ <https://insg.org/>

³⁷ See the WTO dispute settlements regarding raw materials and rare earths: EU/China-Raw Materials – DS394, 395, 398; EU/China-Duties and other Measures concerning the Exportation of Certain Raw Materials – DS509; EU/Indonesia- Measures Relating to Raw Materials – DS592; EU/China-Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum – DS432.

ingness to develop a strategic partnership in this field. They welcomed the signing of the memorandum of understanding between Kazakhstan and the EU on a strategic partnership on sustainable raw materials, batteries, and renewable hydrogen value chains.

3.5 A supply chain perspective for assessing EU's security of supply and resilience

While there has been systematic attention to the importance of CRMs to the EU economy since well before the pandemic, it is only with the COVID-19 pandemic and even more so with the Russian invasion of Ukraine that the fragility of several critical product supply-chains became evident, beyond those of CRMs. The European Council invited in 2021 the Commission to “identify strategic dependencies, particularly in the most sensitive industrial ecosystems such as for health, and to propose measures to reduce these dependencies, including by diversifying production and supply chains, ensuring strategic stockpiling, as well as fostering production and investment in Europe”.

Therefore, the issue of security of supply and resilience in strategic sectors – beyond CRMs – gained increasing policy attention. On invitation by US President Biden, heads of state and government launched a new forum for cooperation at the Leader's Summit on Global Supply Chain Resilience in Rome on October 31, 2021. A second meeting took place during the Ministerial Forum on Global Supply Chain Resilience on 19 and 20 July 2022. In their final statement of July 20, 2022 the Commission alongside the US and 16 other global partners (Australia, Brazil, Canada, the Democratic Republic of the Congo, France, Germany, India, Italy, Japan, the Republic of Korea, Mexico, the Netherlands, Singapore, Spain, and the United Kingdom) commit to jointly work on global supply chain issues.³⁸ The above joint statement highlights four global supply chain principles to guide the work on supply chain issues globally:

- improving transparency and information sharing among partners to better anticipate supply chain bottlenecks;
- diversifying and increasing global capacities for materials and inputs;
- addressing vulnerabilities and better managing security risks to supply chains;
- fostering fair and sustainable practices along supply chains.

All of the above rest on the capacity to analyse EU supply chains, to be able to identify, among those more vital to the EU economy, those with major fragilities. This requires first clarifying the concept of fragility. Following a recent Report on Vulnerable Supply Chain³⁹ published by the Australian Government's Productivity Commission, it is worth distinguishing among three different degrees of 'vulnerability'

- a basic degree of fragility is related to those products that are vulnerable to supply chain disruptions;
- a further degree of fragility is related to those, from among vulnerable products, that are used in essential industries;
- the higher degree of fragility is related to those, from among the vulnerable products used in essential industries, that are critical (goods and services that cannot be substituted easily, or the production process cannot be adjusted in the short term to avoid their use).

In the EU, a systematic and cross-sector monitoring of the EU's possible strategic dependencies started with a study on Strategic Dependencies and Capacities, and a Commission Staff Working

³⁸ <https://www.state.gov/supply-chain-ministerial-joint-statement/>

³⁹ <https://www.pc.gov.au/inquiries/completed/supply-chains/report>

Document accompanying the Communication from the Commission – Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery.⁴⁰ The above Commission's document includes a bottom-up (quantitative) mapping using external trade flows for more than 5 000 products as its starting point. The results show the following:

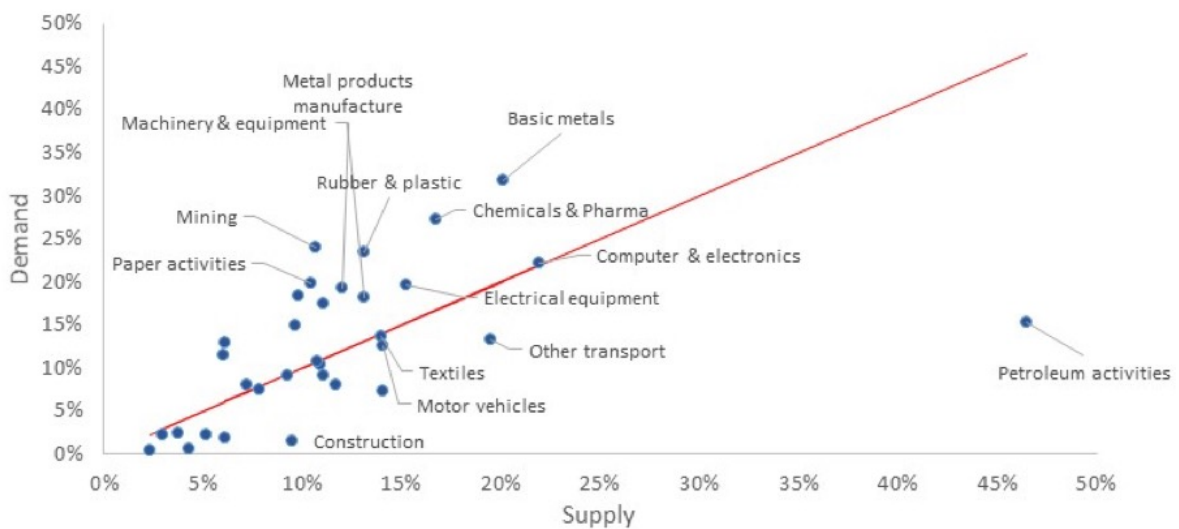
- 137 products are identified where the EU can be considered highly dependent on imports from third countries (representing about 6 % of the extra-EU import value of goods);
- three countries are the main foreign sources of EU import value for these dependent products, namely China (representing about half of import value), Vietnam and Brazil;
- the identified products are situated mainly in the energy intensive industries, the health sector (including pharmaceutical ingredients) and products that are relevant to support the green and digital transformation;
- out of the 137 products identified as dependencies in the most sensitive ecosystems, 34 (representing 0.6 % of extra-EU import value of goods) could be considered as potentially more vulnerable given their possibly low potential for further diversification as well as substitution with EU production.⁴¹
- as regards strategic dependencies in key technologies, a specific assessment of the EU's performance illustrates⁴² the generation and uptake of certain key technologies. It shows that the EU faces particular challenges in comparison with its global competitors for technologies in the digital ecosystem such as cloud and micro-electronics;
- regarding the renewable's sector, the EU has a strong competitive position in several technologies that are key to achieve its climate ambitions (e.g., in the area of hydrogen). Still, there are indications of risks concerning possible (future) dependencies in this area.

Overall, the report shows that EU industries are exposed to non-EU markets not only in terms of supply, as they import a significant share of critical intermediates that are then used in the production process of final sectors, but also in terms of demand, i.e., they export a significant share of final production to extra-EU markets. In the following chart, sectors above the 45-degree line rely more on extra EU demand than on the supply from extra EU countries. Apart from Petroleum activities (which is the mostly exposed in terms of supply), the sectors with the highest upstream and downstream foreign links are Computer & electronics, Chemicals and Pharmaceuticals, Basic Metals and Electrical equipment.

⁴⁰ <https://ec.europa.eu/info/sites/default/files/strategic-dependencies-capacities.pdf>

⁴¹ The analysis also provides examples of products where the US is highly dependent on the EU ("reverse dependencies") and vice-versa. Furthermore, "common dependencies" that the EU and the US share vis-à-vis China and the world can also be identified.

⁴² As the Industry Strategy of March 2020 highlighted that the EU should build competitiveness for technologies that are strategically important for Europe's industrial future.

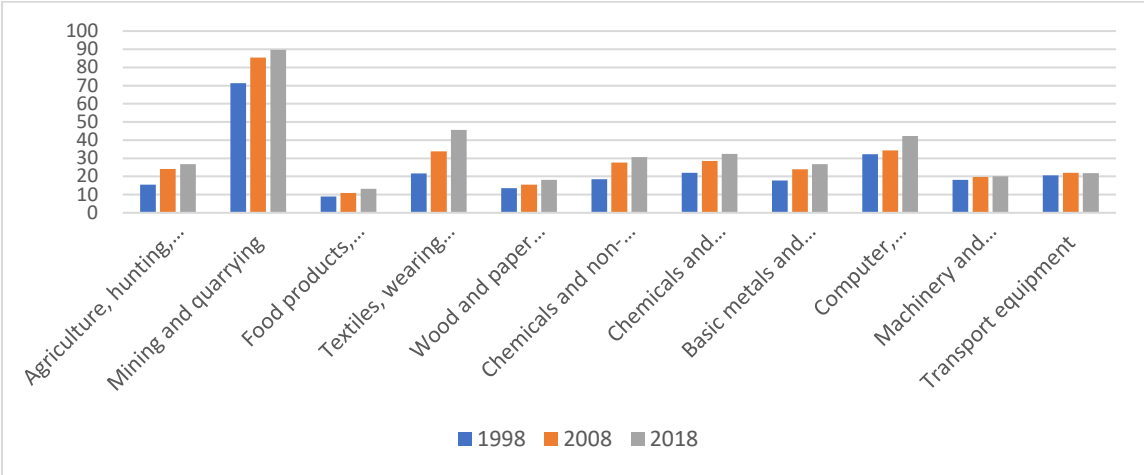
Figure 7. Downstream and upstream exposure to extra-EU markets

Source: Commission elaboration based on OECD 2016-AMNE data. Note: on the horizontal axis, the indicator measures for each EU sector the share of value added that depends on intermediate inputs generated by extra EU supply chains; on the vertical axis the indicator measures for each EU sector the share of final demand absorbed by exports to extra EU countries. These figures are based on the most recent available data (2016). As the share of value added has stayed rather stable over time, more recent figures are not expected to substantially depart from this illustration. EU Commission (2021a)

The analysis above only looks at trade dependencies at one point in time and cannot capture changing or emerging trends. In Figure 8 we compare upstream (or supply) exposure over time across sectors, and what emerges is an upward trend in foreign exposure across sectors. Mining and quarrying stand notably out as the most exposed sector, but all other sectors have increased their foreign value added since 1998.⁴³ This suggests that the historical EU openness that has led to a surge in free trade agreements over time has systematically pursued a widespread specialization – mainly vertical – but at the same time has invariably overlooked the need for the EU to become more resilient at the same time as more open.

⁴³ The growth in mining and quarrying FVA demand in the EU is primarily attributable to two factors: firstly, the transition to a low carbon and low emissions objective, which has gradually decreased the proportion of mining and quarrying operations inside the EU and increased import dependency. The second factor is Brexit, since the UK contributed over 40% of the value added created inside the EU in this industry in 2006.

Figure 8. Trends in upstream exposure of EU demand to extra-EU markets: share of foreign value added in EU demand, % by sector

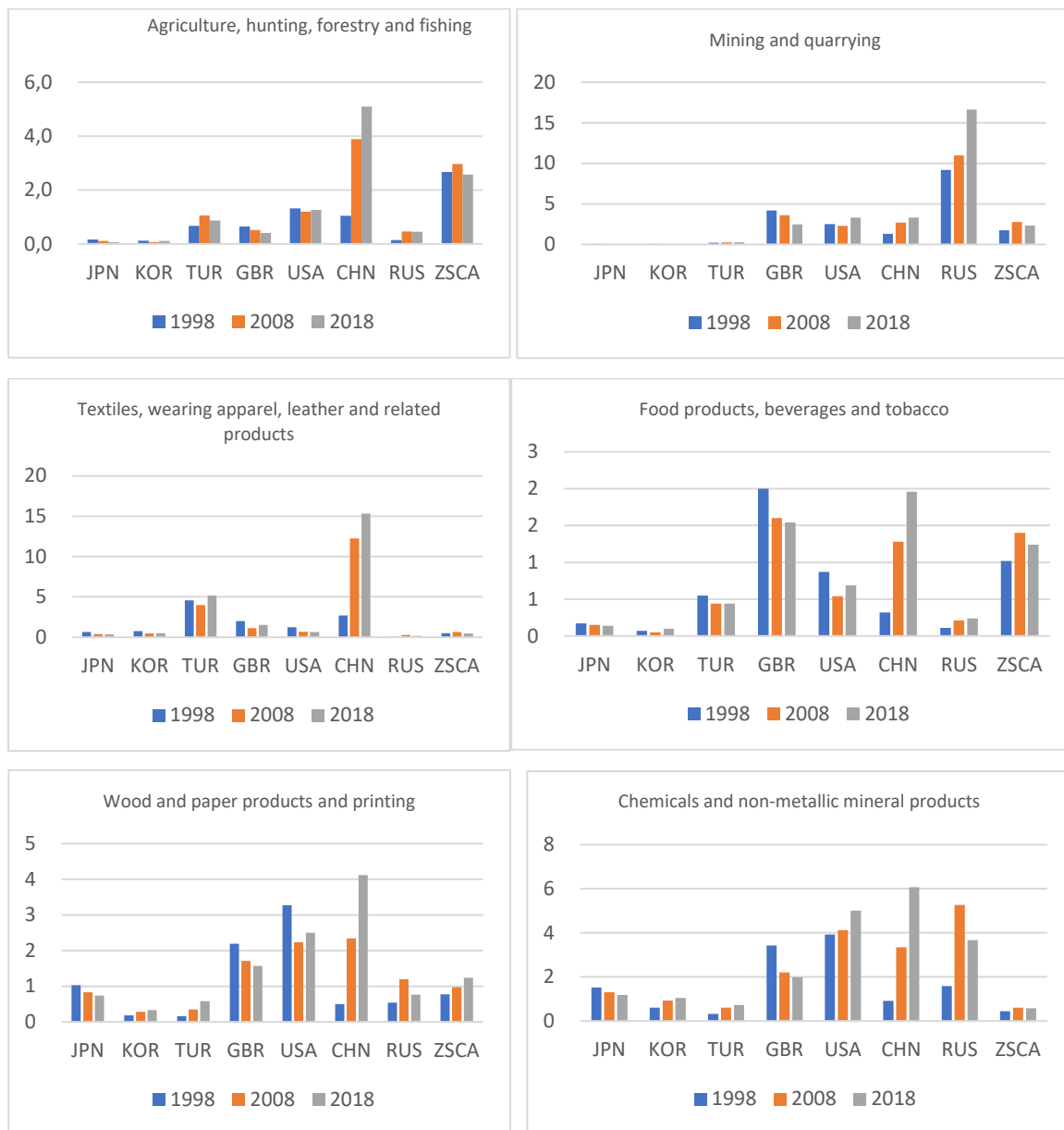


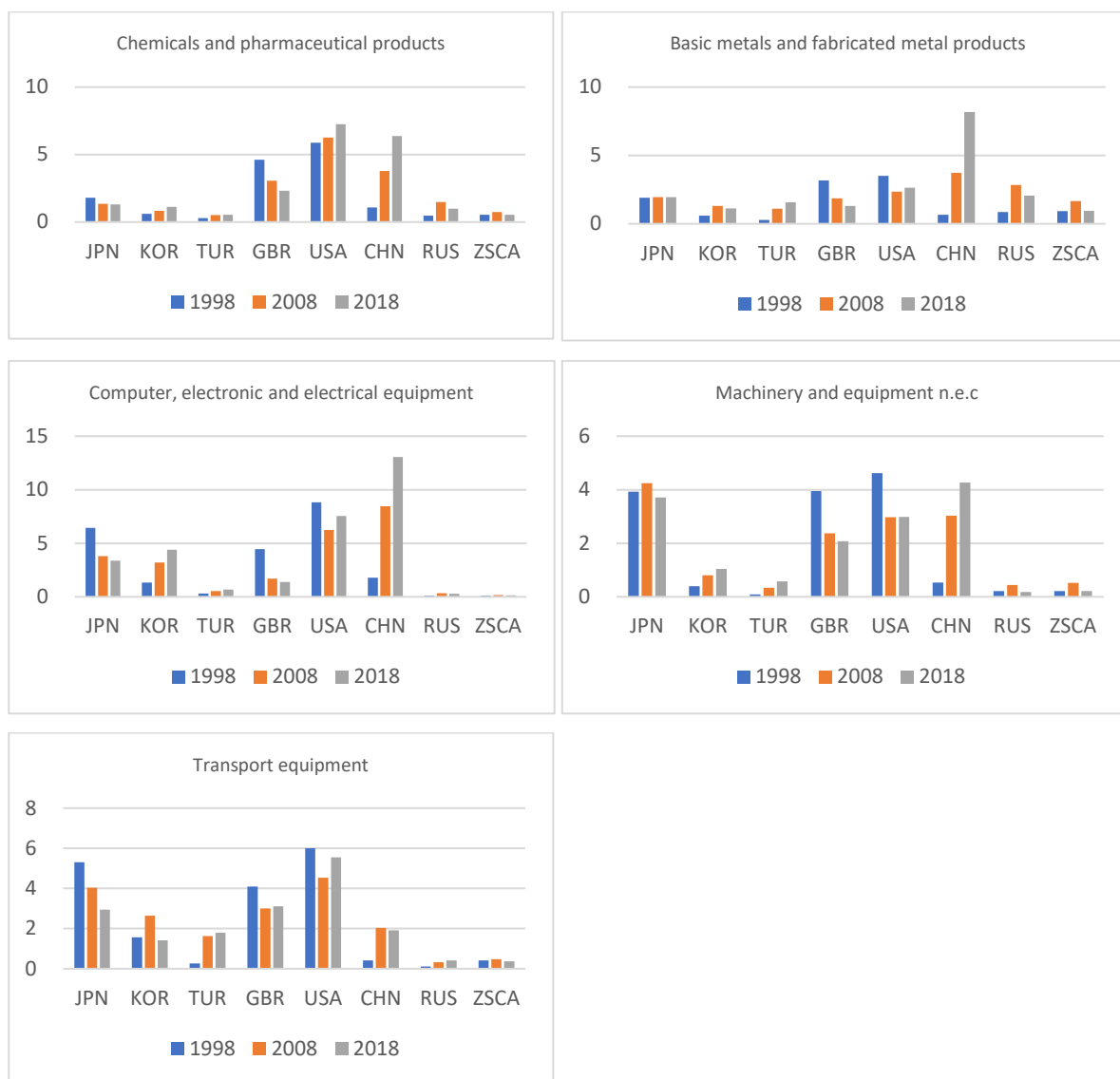
Source: own calculations based on OECD Tiva data, accessed October 2022

Among the sectors in which EU production depends on foreign supply, raw materials and electronics particularly rely on non- EU countries, but also textiles, financial activities, as well as chemicals and active pharmaceutical ingredients (Table 9). Consequently, this highlights on the one hand, the need for the EU to continue being integrated in the global economy, and on the other hand, the concomitant need to ensure that international integration serves the aim to become more resilient to external disruptions.

It is worth noticing the increasing EU dependence on external non-FTA partners – most often China and Russia – in sectors that are important for the overall food security of the EU, such as agriculture, hunting, forestry, and fishing, food products, beverages and tobacco, as well as wood and paper, chemicals and pharmaceutical products, metals and minerals (Figure 9).

Figure 9. Trends in upstream exposure of EU demand to extra-EU markets: share of foreign value added from selected major partners, in %





Source: own calculations based on OECD Tiva data, accessed October 2022

The EU import dependence on non-EU countries – measured as percentage of imports from outside of the EU on total imports – is quite significant across sectors, most notably in mining and quarrying (89.6 %), textiles, wearing apparel, leather and related products (45.6 %), computers, electronics and electrical equipment (42.3 %), chemicals and pharmaceuticals (32.4 %), chemicals and non-metallic mineral products (30.7 %), basic metals and fabricated metal products (26.8 %), agriculture, hunting, forestry and fishing (26.8 %), and transport equipment (21.8 %). If one only considers EU import dependence from non-FTA partners, then the PRC stands out as the single largest non-FTA import partner for the EU. On this regard, it is worth noticing that the direct import dependence on China’s supplies is quite low (in percentage, as it is highest in textiles, wearing apparel, leather, and related products (15.3 %), followed by Computers, electronics, and electrical equipment (13.1 %)). However, EU direct import dependence on China does not consider the importance of China’s centrality as trade partner of other EU suppliers, which means that China can ‘command’ a larger share of world export flows. Such network centrality of EU direct import partners can lead to a much larger overall EU dependence on individual partners.

An example of such broader import dependence through third countries has been recently made with reference to South Korea within the Indo-Pacific Economic Framework for Prosperity (IPEF). IPEF was launched by President Biden in May 2022 to deepen US economic engagement in the region. Thirteen countries have joined: Australia, Brunei, Fiji, India, Indonesia, Japan, Malaysia, New Zealand, the Philippines,

Singapore, South Korea, Thailand, and Vietnam. IPEF framework promises to coordinate the response to perceived threats emerging from international trade and investment flows, especially threats resulting from supply shortages, overreliance on individual suppliers, and unwanted transfers of technology. Such aim to maintain sovereign control over supply chains imply challenging requests on partner countries to tighten policies on export controls and technology transfer, particularly toward China.⁴⁴

South Korea is a very interesting case in point: “as China is Korea’s largest trading partner, US policy discouraging Chinese participation in supply chains has immediate detrimental implications for Korean manufacturers”⁴⁵, which they may not be prepared or willing to accept (because of the likely retaliation measures they would have to face). This type of network effects is so far largely neglected in the policy design towards resilience of supply chains. We argue that these effects may pose the largest unexpected and unintended strains on EU supply chains, even more so to the extent that diversification is expected and projected to occur out of largest potentially unreliable/critical suppliers towards more reliable FTA partners. However, even FTA partners may not be able to allow securing supplies, unless specific and stringent provisions are included in the agreements. Unconditional reliance on FTA partners as more reliable suppliers may force the EU to relinquish the ability to maintain sovereign control over supply chains.

For the reasons above, the approach followed by the European Commission to identify 137 products as dependencies in the sensitive ecosystems needs to be complemented by an analysis of network effects. Among those, a lower number was considered as possibly more vulnerable given their low potential for diversification.⁴⁶ Among those 137, 14 products were identified as foreign dependent, some of which have been of high relevance during the COVID-19 crisis (e.g. part of protective garments).⁴⁷ Moreover, the EU has a high level of foreign dependency with respect to 17 products related to renewable energy production, green mobility and digital/electronics (e.g. permanent magnets, electric accumulators, electric motors, radio broadcast receivers, laptops, mobile phones). The reason for strategic dependencies rests not in the specific EU trade pattern in those products, but in the extremely concentrated production in those sectors worldwide, which every major importing country faces like the EU.

3.6 A network analysis in selected products

In this section we apply network methodologies to assess the overall EU import dependence in selected sectors. The latter are widely applied in international trade analysis to detect the structure of world trade flows emerging from data records at bilateral level. Compared to traditional bilateral trade analysis, network methods allow contextualizing the different positions of countries within the overall web of bilateral trade relationships, called trade network. A package added to the statistical software Stata (<https://nwcommands.wordpress.com/>) was adopted to run the following analyses.

We give a collection of indicators on selected trade networks, picked among those that are the most dependent on imports at the EU level. Evaluating a country's reliance on imported goods requires familiarity with the degree to which a certain product dominates the market for that overall supply: Goods that are mostly reliant on imports are supplied from a small number of established suppliers; thus, there is little room for supplier diversification.

⁴⁴ Goodman and Arasasingham (2022).

⁴⁵ Lovely and Dahlman (2022), <https://www.piie.com/sites/default/files/documents/pb22-8.pdf>

⁴⁶ To evaluate the diversification potential, a standard measure for concentration of world exports was used, namely the Herfindahl Hirschman Index (HHI) index computed at the world level for each product (based on the total export flows of each third country) to capture the concentration of production in the world outside the EU. The HHI index is computed as: $CDI = \sum_{i=1}^n s_i^2$ where s_i is the market share of the extra EU supplying country i in EU’s imports, and n is the total number of extra EU supplying countries. A high level of concentration of world exports of a given product could indicate that the EU has limited potential for further diversification of imports (e.g., in case of an unexpected trade disruption).

⁴⁷ Others include chemical substances known as APIs (i.e., antibiotics, vitamins, hormones, heterocyclic compounds), which are particularly important in the manufacturing of medicines.

Most importantly, a crucial application of network analysis is identifying the important node in a network. Measuring Network Centrality (also called degree centrality) refers to the task of identifying the most influential exporter/supplier of a given product/service. Degree is a simple centrality measure that counts how many trade partners a country has. Two different aspects of centralization have been assessed: out-degree centrality (i.e. number of countries an exporter is supplying) and in-degree centrality (i.e. the number of importers a country is sourcing from).

The above methods allow to better assess the overall structure of interdependencies. Compared to standard statistics for assessing overall import dependence, network methods allow to also consider the potential third country effects, i.e., the possibility that in the event of major trade disruptions from some supplying countries, supplies might also be jeopardized from other suppliers, which were not considered a source of potential disruption beforehand (e.g., because they are FTA partners of the EU). Moreover, it is important to consider that the EU can also be a source of dependency vis-à-vis important trading partners. In presence of such so-called “reverse dependencies”, reliance on international trade is not necessarily a full-fledged vulnerability but rather may help sustaining diversified supply and demand.

We analyse trade data from 2021, to offer the most recent point in time. Usually, one would average trade flows over a couple of recent years, but here we face two issues: first, trade since 2018 and especially during the pandemic was much lower than potential; second, what we want to see is the current level of trade flows, so 2021 is the choice (as 2022 may not be yet available for all countries and products).

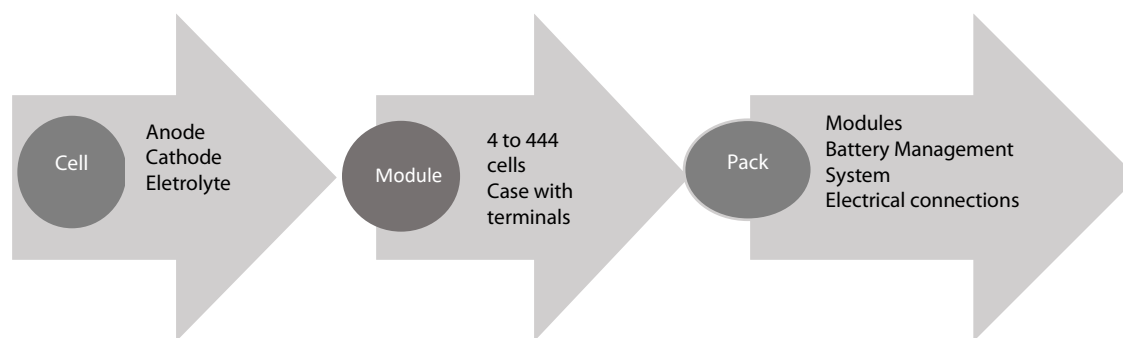
3.6.1 Electronic Vehicle Batteries

Among the above list of products identified by the Commission as highly critical – i.e. those whose EU imports are highly concentrated on a few exporters – we have selected critical products within the batteries supply chain for Electric vehicles (EVs)⁴⁸. EVs are becoming an increasingly important part of the automotive sector. With an increasing interest in EVs, EV battery market is now a USD 27 billion a year business. Batteries are the key differentiator between the various EV manufacturers. The amount of energy stored in the battery determines the range of the EV, thought to be a major limitation on EV sales.

EV batteries, like many high-technology goods, have a complex supply chain in which production can be separated into stages, and those stages are often completed in different locations. The battery manufacturing supply chain has three main parts (Figure 10): cell manufacturing, module manufacturing, and pack assembly. The smallest, but most important, component of the lithium-ion batteries that power EVs is the electrochemical cell, which consists of three major parts: a cathode and an anode separated physically but connected electrically by an electrolyte. Multiple cells in a case with terminals attached form a module. The number of cells per module varies by manufacturer and cell type. Modules feature less value added than cells or pack assembly⁴⁹. EV battery packs are the final stage of EV battery production. Battery packs consist of battery modules, electrical connections, and cooling equipment. As battery packs are larger and heavier than cells or modules, pack assembly tends to occur near the vehicle assembly location because of the cost of transporting.

⁴⁸ As was done, albeit with more traditional trade indicators, and only for the United States with data until 2017, by Coffin, David and Jeff Horowitz (2018)

⁴⁹ According to Coffin and Horowitz (2018), “about 11 percent of the total cost of a finished lithium-ion battery pack comes from the module stage of production”.

Figure 10. A stylised value chain for EV batteries

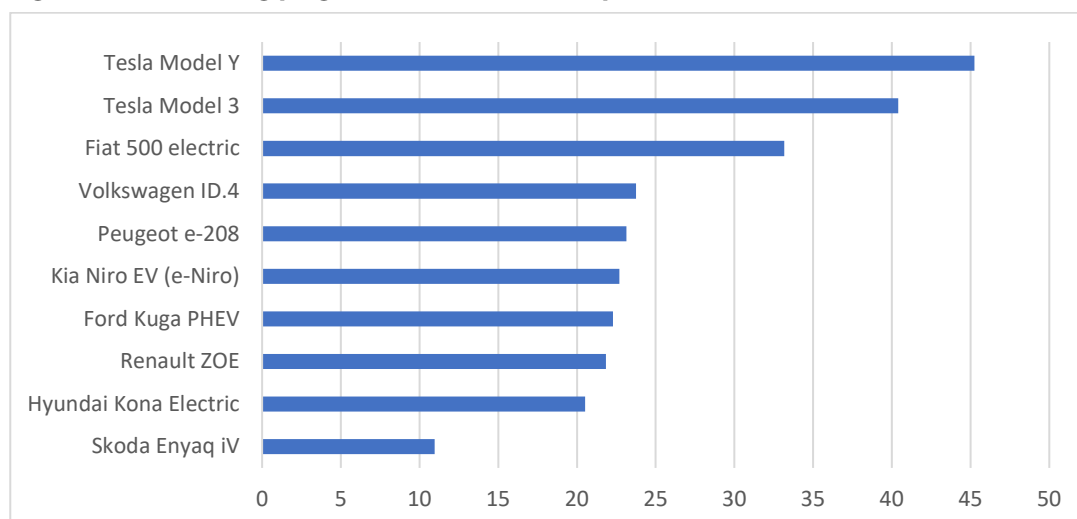
Source: adaptation from Coffin and Horowitz (2018)

The EV supply chain is similar to the Internal combustion engine (ICE) passenger vehicle supply chain. However, instead of competing based on the engine and transmission, EVs compete based on their batteries. Most plug-in hybrids and all-electric vehicles use lithium-ion batteries. Hybrid electric vehicles (HEVs) widely use nickel-metal hydride batteries, also used routinely in computer and medical equipment. Lithium-ion batteries power all EVs and have many different material compositions. For example, lithium-nickel-manganese-cobalt oxide (Li(NiMnCo)O₂ or NMC) is the most common composition used in EVs, but lithium-nickel-cobalt-aluminium oxide (Li(NiCoAl)O₂ or NCA) is used in the best-selling EVs in the United States (Tesla Models S, X, and 3) (Figure 11) and in Europe (Figure 12).

Figure 11. Best-selling plug-in EVs in the United States as of 2017

Manufacturer	Model	Range (miles)	Assembly location	Battery size (kWh)	Battery manufacturer	Battery pack assembly location	Battery cell production location
Tesla	Model S	259-335	United States	75 or 100	Panasonic/Tesla	United States	Japan
Tesla	Model X	295	United States	75 or 100	Panasonic/Tesla	United States	Japan
Tesla	Model 3	220-310	United States	50-74	Panasonic/Tesla	United States	United States
Chevrolet	Bolt EV	238	United States	60	LG Chem	United States	South Korea
Nissan	Leaf	151	United States	30	Automotive Energy Supply Corp.	United States	United States
Fiat	550e	84	Mexico	24	SB LiMotive	United States	United States
VW	e-Golf	126	Germany	35.8	Samsung SDI	Hungary	South Korea
Ford	Focus Electric	118	United States	33.5	LG Chem	United States	United States
BMW	i3	114	Germany	22-33	Samsung SDI	Hungary	South Korea
Kia	Soul EV	111	South Korea	27	SK Innovation	South Korea	South Korea

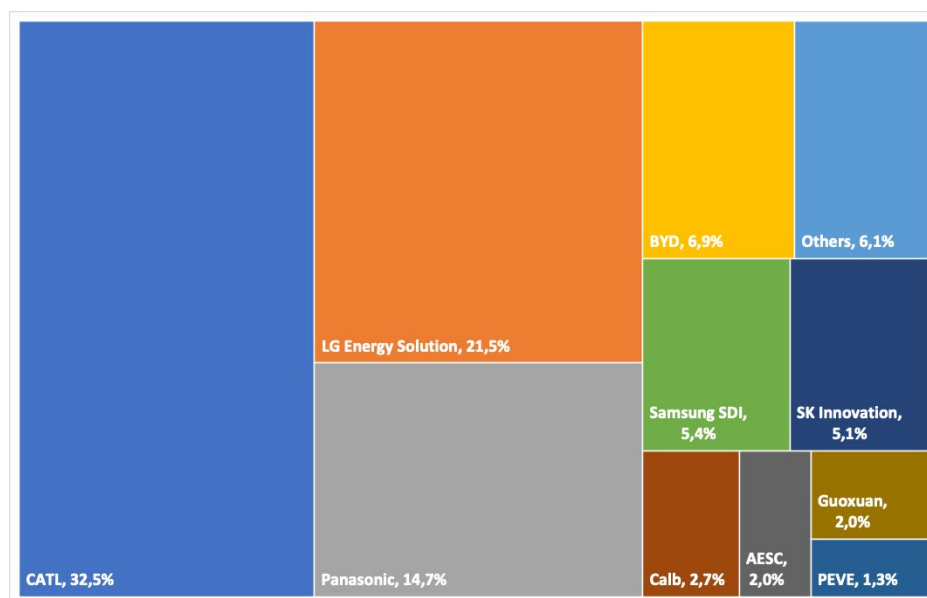
Source: Coffin and Horowitz (2018)

Figure 12. Best-selling plug-in models sold in Europe, Jan-Jun 2022 ('00 units)

Source: data from Statista 2022

All top 10 EV Battery Manufacturers are headquartered in Asia, mostly in China, Japan, and South Korea. The top-3 companies – CATL, LG Energy Solution and Panasonic – make up almost 70 % of the EV battery market (Table 4). Thus far, the EV-battery situation in Europe has been something of a paradox: while European carmakers have struggled to secure sufficient battery supply, investments in battery manufacturing have been mostly concentrated in Asia. Of the 70 announced gigafactories globally, 46 are based in China. Major EV batteries producers in Europe are all non-European, although EU carmakers are also working on their own in-house battery factory projects to ensure a healthy supply of cells. Tesla announcement of a USD 2 billion gigafactory just outside Berlin, is a notable example; the factory will produce the Model 3 and Model Y EVs, and the batteries that power them, expanding eventually to an annual capacity of 500 000 cars.

Table 5. Top 10 EV Battery Manufacturers, 2021



Source: VENDITTI B., Ranked: The Top 10 EV Battery Manufacturers, <https://elements.visualcapitalist.com/ranked-top-10-ev-battery-makers/>

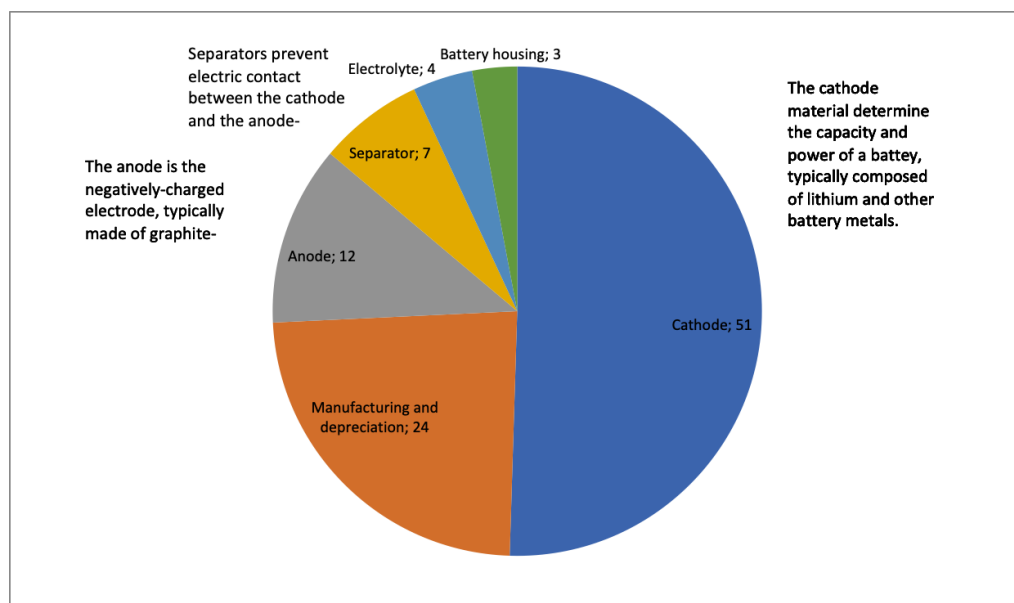
Table 5 (b) Top 5 EV batteries manufacturers in Europe supplying EV car producers

Battery manufacturer	Location	Brands supplied	Production capacity
Samsung SDI KO	Göd, Hungary	BMW, VW, Volvo Trucks	18 million cells per month
SK Innovation	Komárom, Hungary	Hyundai, BAIC, Daimler, VW	Cells to power 500 000 cars per year
LG Chem KO	Wrocław, Poland	Daimler, Volvo, Audi, Renault, Jaguar	Initially cells to power 80 000 EV per year but expanding
Northvolt Ett	Skellefteå, Sweden	BMW, VW	Operating from 2024
CATL CN	Erfurt, Germany	BMW, VW, Daimler, Volvo, Bosch	NA

Source: adapted from Automotive-iq.com (<https://www.automotive-iq.com/electrics-electronics/articles/top-five-ev-battery-factories-in-europe>)

Batteries are by far the most important component of an EV, to the extent that they account for about one third of the total price. Although the average cost of lithium-ion batteries has declined by 89 % since 2010, the average cell cost is still USD 101/kWh (Figure 13), and hundreds of cells are needed to make up an individual module, many of which are assembled into one battery.

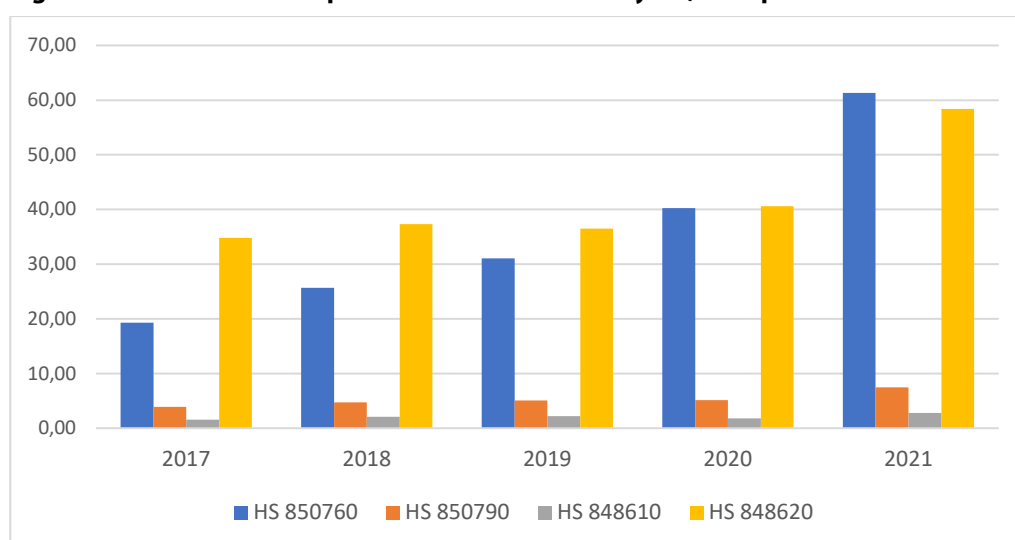
Figure 13. Cost composition of an EV battery cell



Source: GOVIND BHUTADA, *Breaking Down the Cost of an EV Battery Cell*, <https://www.visualcapitalist.com/breaking-down-the-cost-of-an-ev-battery-cell/>

Because of the lithium-ion battery's complex supply chain, international trade data are not straightforward to detect. Battery packs, unlike cells and modules, are classified in the international Harmonized Commodity Description and Coding System (HS) under tariff-classification subheading 8507.60, along with all other lithium-ion batteries for all uses. Together with Plates, separators, and other parts of electric accumulators (HS 850790), they are increasingly dependent on imports, unlike Machines and apparatus for the manufacture of boules or wafers (HS 848610) and Machines and apparatus for semiconductors or electronic integrated circuits (HS 848620)) (Figure 14).

Figure 14. Selected critical products for network analysis (EU import value in billion EUR)



Source: own elaborations on data from

Legend: Lithium-ion accumulators (HS 850760)

Plates, separators, and other parts of electric accumulators (HS 850790)

Machines and apparatus for the manufacture of boules or wafers (HS 848610)

Machines and apparatus for semiconductors or electronic integrated circuits (HS 848620)

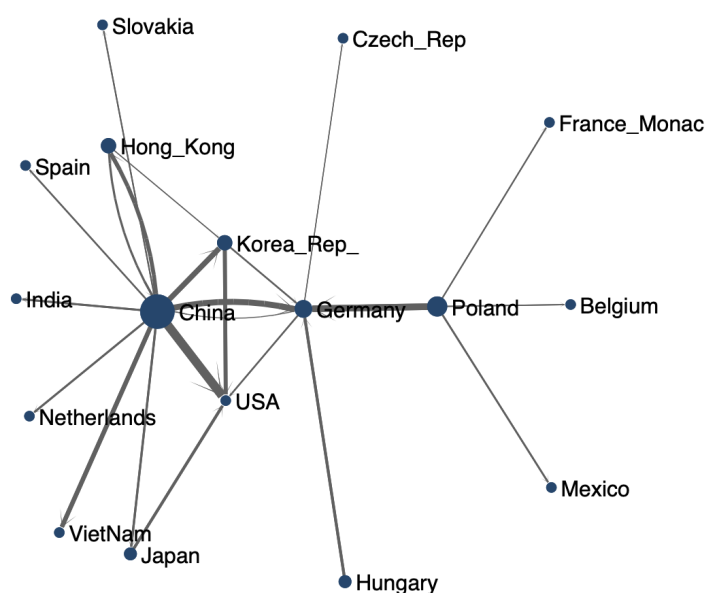
Lithium-ion accumulators’ (HS 850760) trade is a very concentrated and asymmetric network; out of 630 pairs of potential trading partners, 547 are null (no trade), 78 are asymmetric (one-way trade), while only five are mutual (two-way trade). Therefore, reciprocity is very low (0.06). Moreover, the asymmetry shows a few net exporters supplying to a variety of countries (high out-degree centralization (0.897) with low in-degree centralization (0.104)). China is the world largest supplier by far, exporting to 33 countries. Among extra EU suppliers, the Republic of Korea is second with 9, followed by Japan (7) and by the United States (5) (Table 5).

Table 6. Major exporters of Lithium-ion accumulators (2021)

Exporter	No. of importers
China	33
Germany	14
Hungary	10
Japan	7
Korea, Rep.	9
Poland	10
United States	5

Source: own calculations on data from www.intracen.org

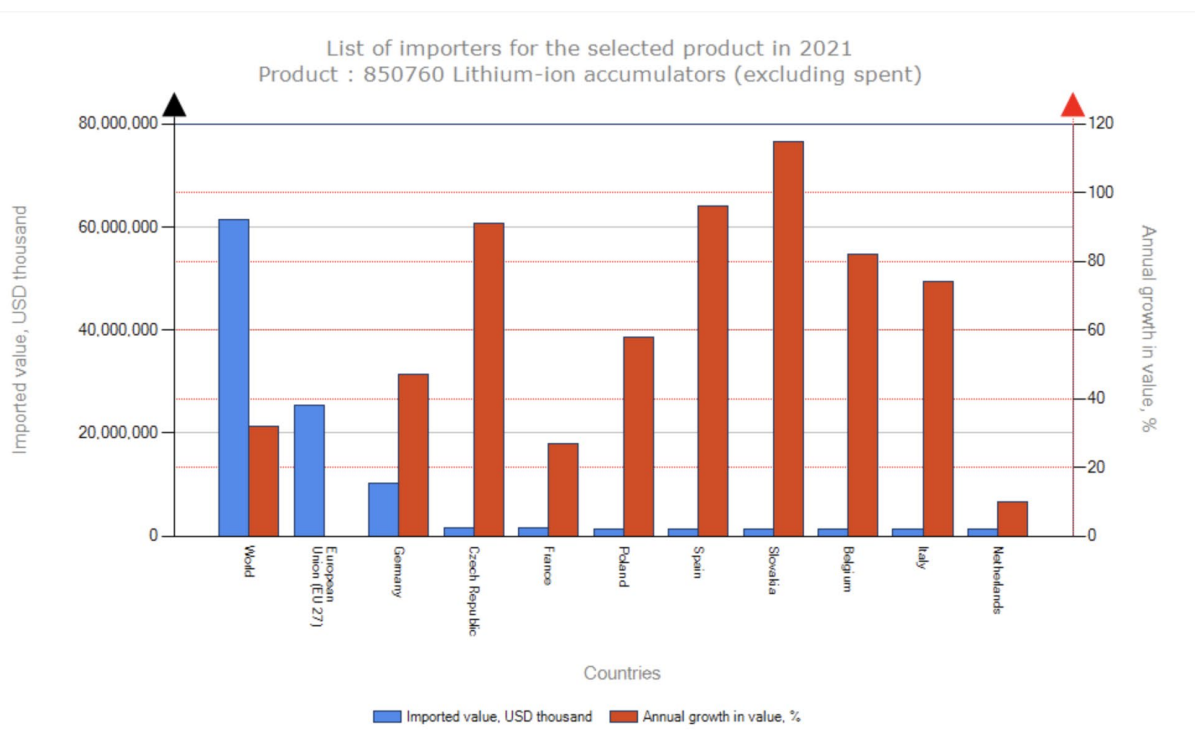
Figure 15. International trade network for Lithium-ion accumulators



Max exported value from China to United States 5 billion USD

Source: own elaboration on data from www.intracen.org

EU imports of Lithium batteries registered a gigantic increase in 2021 (Figure 16) compared to the previous year and more than tripled in value over the years 2017-2021, from 19.321 billion EUR to 61.327 billion EUR. China and Republic of Korea are the two largest extra-EU suppliers to the EU (with respectively 31 % and 9 % of EU’s import value), but there is also a significant intra-EU production in Poland, Germany, and Hungary.

Figure 16. Imports of lithium-ion batteries from the EU in 2021 (value and annual % growth)

Source: own elaboration on data from www.intracen.org

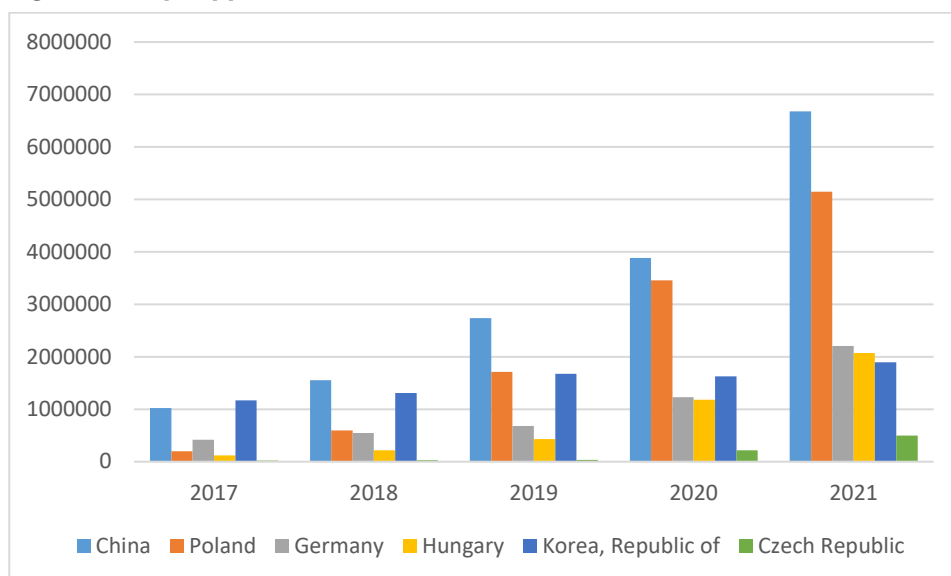
Table 7. Major suppliers of Lithium batteries to the EU in 2021 (billion EUR)

Exporters	Import value, 2021	%	cum %
China	6 675 387	31.21	31.21
Poland	5 146 526	24.06	55.27
Germany	2 205 196	10.31	65.58
Hungary	2 069 861	9.68	75.26
Korea, Rep.	1 896 402	8.87	84.12
Czech Republic	500 797	2.34	86.46
Japan	437 044	2.04	88.51
United States	317 709	1.49	89.99

Source: own elaboration on data from www.intracen.org

The top supplier of Lithium batteries to the EU since 2017 is China (currently more than 31 % share), although most supplies (more than 46 %) come from within the EU, if one combines supplies from Poland, Germany, Hungary, and Czech Republic.

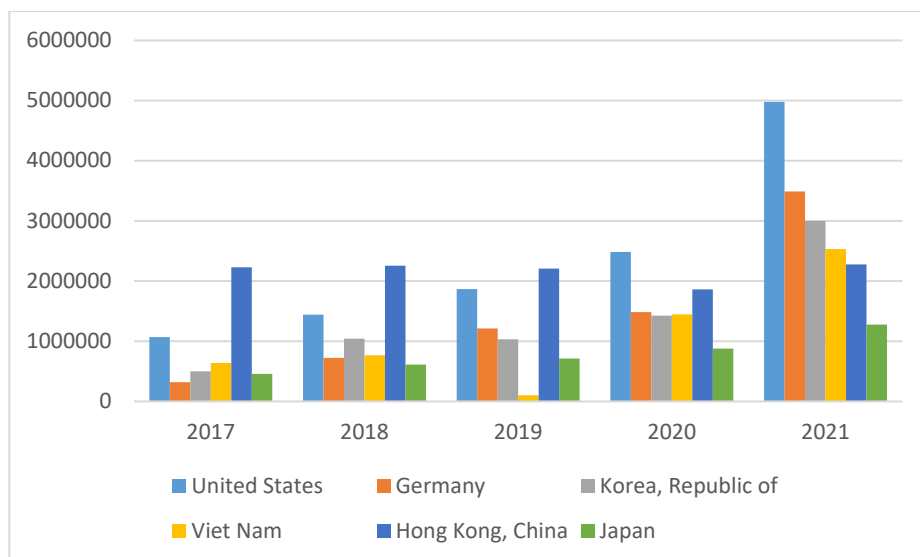
Figure 17. Top suppliers of Lithium batteries to the EU since 2017



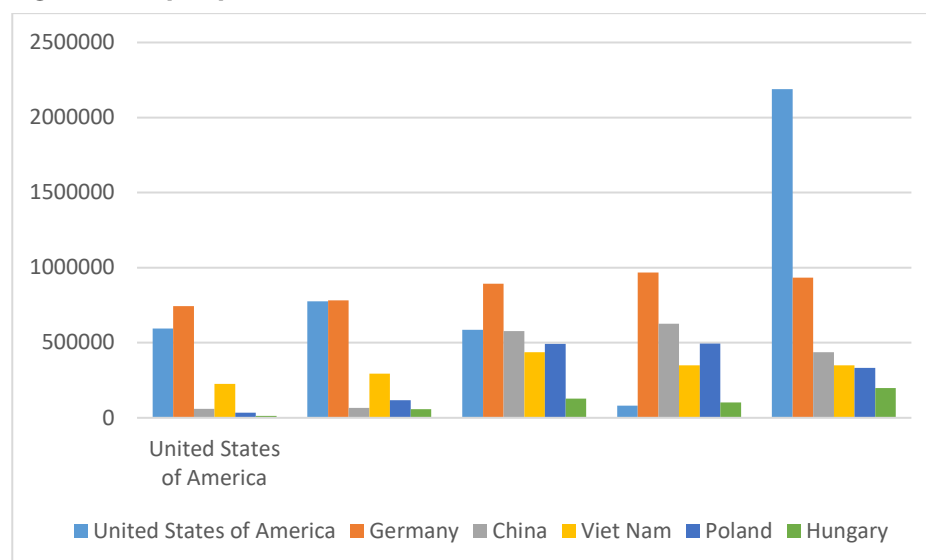
Source: own elaboration on data from www.intracen.org

The specific network structure of trade flows allows to answer to the question ‘who is competing with the EU for supplies’, i.e., how many and which other specific countries are importers from the EU’s major suppliers of that product. The following two graphs show top importers of lithium-ion accumulators from the two largest extra-EU suppliers, namely China and the Republic of Korea, since 2017. China increased exports to the United States from less than 1 trillion EUR in 2017 to over 4 trillion EUR in 2021. The same is true for the second largest extra-EU supplier to the EU – South Korea – which has dramatically increased exports to the US since 2020 (as an effect of the bilateral FTA with the United States). In this regard, it is worth mentioning that there is some consensus that the EU does not really need to aim at semiconductor self-reliance (and probably it will not be achievable all together in any case), as it should be able to trust other sources of chip design and chip production, including the US, South Korea, Japan and Taiwan (Garcia Herrero and Weil, 2022). In the case of South Korea, this suggests that the EUOK FTA may serve as an instrument or platform for potential increases in supplies to the EU, which overlooks the competition between the EU and other major importers from South Korea (most notably the United States).

Figure 18. Top importers of Lithium batteries from China since 2017



Source: own elaboration on data from www.intracen.org

Figure 19. Top importers of Lithium batteries from South Korea since 2017

Source: own elaboration on data from www.intracen.org

3.6.2 Plates, separators, and other parts of electric accumulators (HS 850790)

The international trade network for cells is also a highly concentrated and asymmetric one. Out of 2850 pairs of potential trading partners, 2697 are null (no trade), 144 are asymmetric (one-way trade), while only 9 are mutual (two-way trade). Therefore, reciprocity is very low (0.059). Moreover, the asymmetry shows a few net exporters supplying to a variety of countries (high out-degree centralization (0.795) with low in-degree centralization (0.038)). China is the world largest supplier by far, exporting to 61 countries. As regards international trade in cells, and their components, only three countries – Japan, China, and South Korea – account for around 57 % of the total export value. Together with the next two largest exporting countries (United States of America and Germany) they cover almost 71 % of the world exported value. Similar concentration regards imports where the top five importing countries, led by the United States of America and followed by Poland and Germany, account for about 70 % of the total imported value (Table 8).

Table 8. Major importers of cells (EUR billion)

Importers	2017	2018	2019	2020	2021	%	cum %
World	3.92	4.72	5.05	5.11	7.45	100	100
United States	1.31	1.39	1.36	1.41	2.77	37.19	37.19
Poland	0.08	0.38	0.59	0.92	0.89	11.91	49.10
Germany	0.22	0.27	0.44	0.39	0.67	9.05	58.15
China	0.32	0.43	0.44	0.40	0.46	6.23	64.38
Singapore	0.24	0.31	0.30	0.29	0.38	5.10	69.47
India	0.17	0.22	0.23	0.20	0.21	2.84	72.32
Vietnam	0.08	0.07	0.06	0.06	0.21	2.76	75.07

Table 9. Major exporters of cells (2021)

Exporter	No. of importers
China	61
Germany	35
United States	35
Korea, Rep.	22
Japan	14

Source: own calculations on data from www.intracen.org

Figure 20. The international trade network for cells in 2021

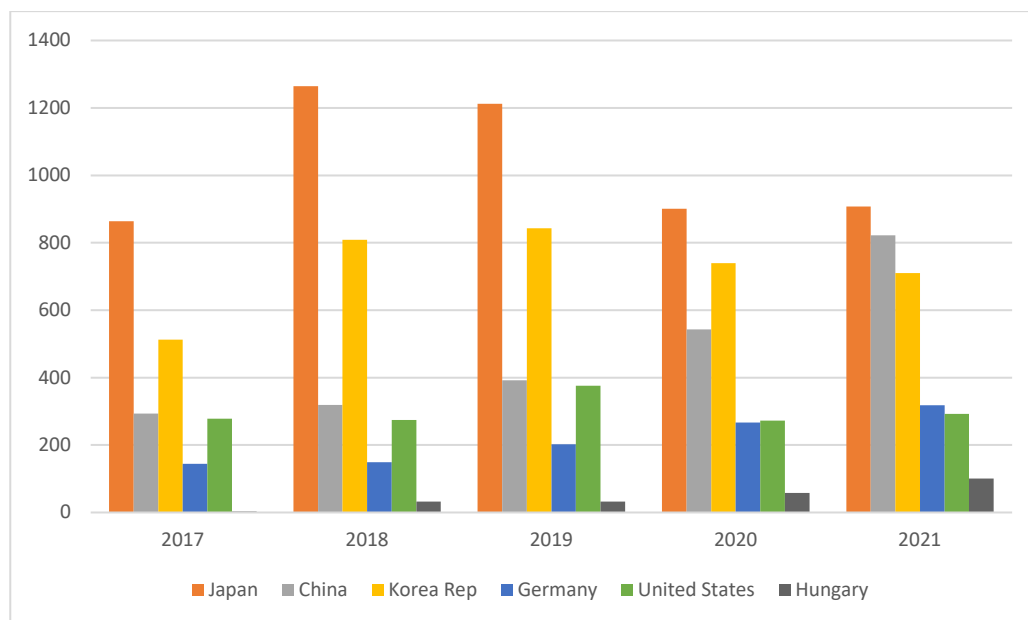


Max exported value from Japan to Singapore 402 billion USD

Source: own calculations on data from www.intracen.org

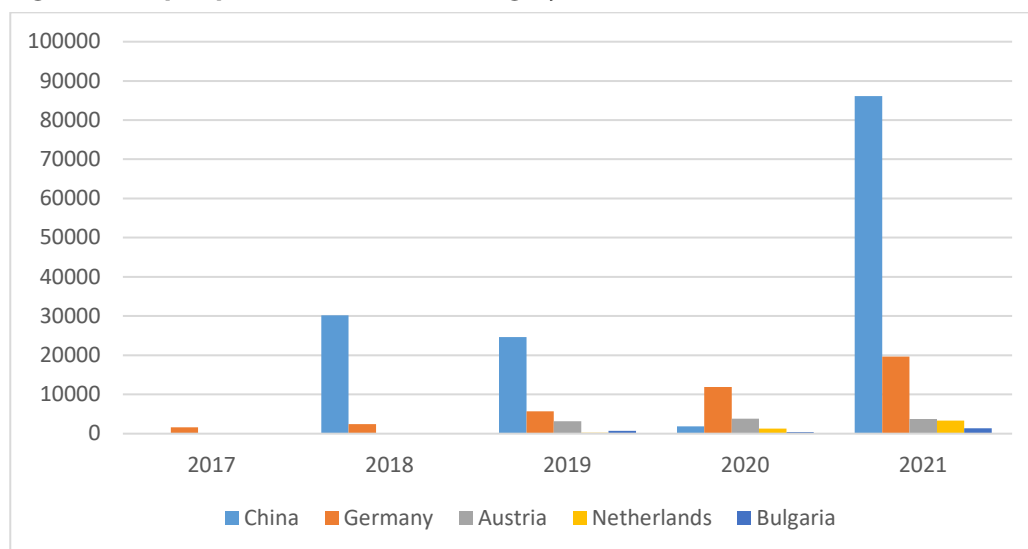
As regards specifically the EU position in the international cell trade, major suppliers are extra EU countries – Japan, China, and South Korea – with a recent trend towards increasing imports from China in contrast with those from South Korea (Figure 16), which exports mainly to China (although progressively less so) and has recently increased exports also to the United States. As regards main competitors for supplies, it is worth noticing that Hungary serves notably as a production base for Chinese battery cell producer CATL for European carmakers (including Mercedes-Benz, BMW, Stellantis and Volkswagen), but also serves increasingly as an export base to China (Figure 17). At the same time, the EU’s largest supplier, Japan, has significantly reduced supplies to China to the benefit of Singapore, United States and United Kingdom (Figure 18).

Figure 21. Major suppliers of cells into the EU since 2017



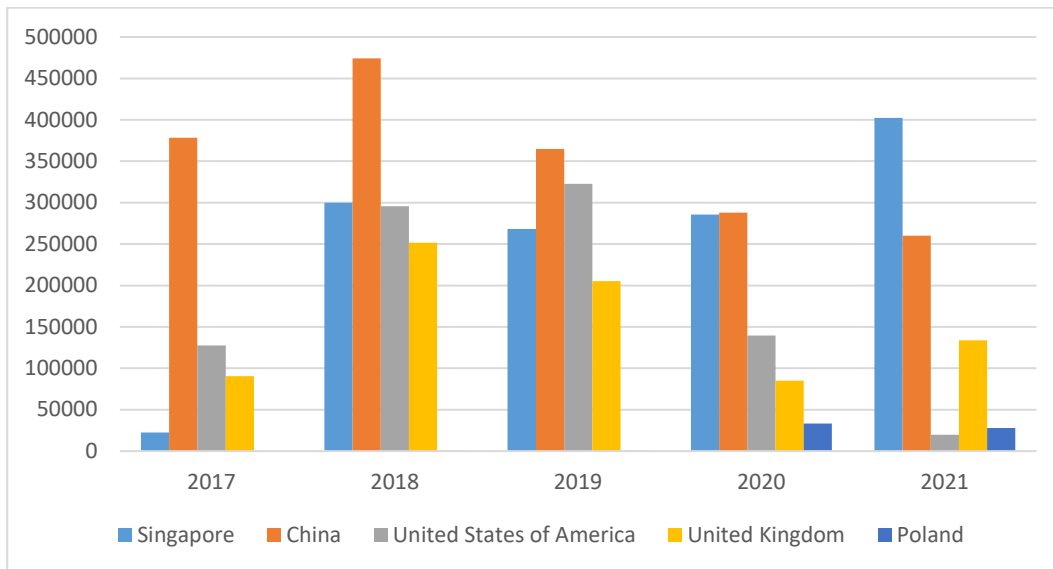
Source: own elaboration on data from www.intracen.org

Figure 22. Top importers of cells from Hungary since 2017



Source: own elaboration on data from www.intracen.org

Figure 23. Top importers of cells from Japan since 2017

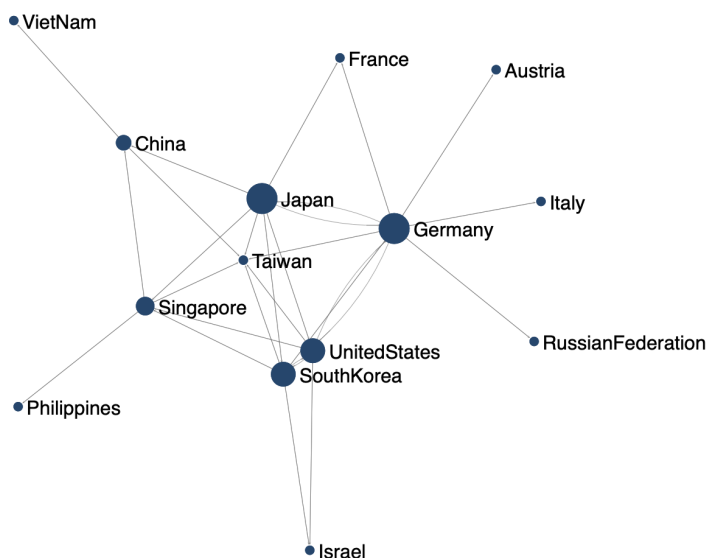


Source: own elaboration on data from www.intracen.org

3.6.3 Machines and apparatus for the manufacture of boules or wafers (HS 848610)

This international trade network is also very asymmetrical and with low reciprocity. Unlike the previous networks, here the direct dependence on Chinese supplies is very low, but the top EU supplier, Japan (more than 36 % in 2021), has recently increased quite significantly its supplies to both China and Taiwan (Figure 26). This is due to China being a net importer in this category, which is quite composite and impossible to disentangle into finer categories with the available trade data. This is a case where the reverse dependency seems to occur, from China on Japan as a supplier. As China and Taiwan have both increased enormously the production of batteries, they have progressively increased imports.

Figure 24. The international trade network of Machines and apparatus for the manufacture of boules or wafers



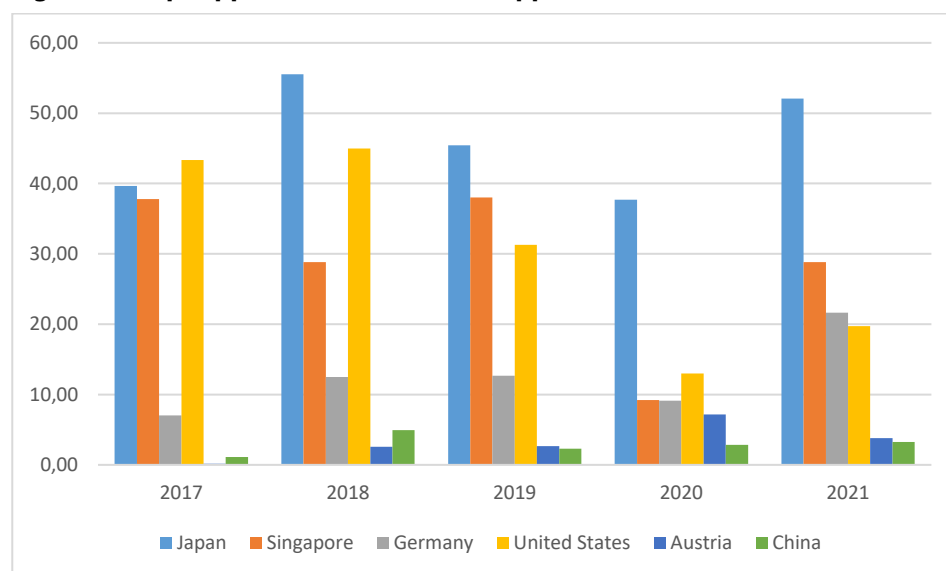
Max value exported from Japan to China billion 476 USD

Source: own elaboration on data from www.wits.org

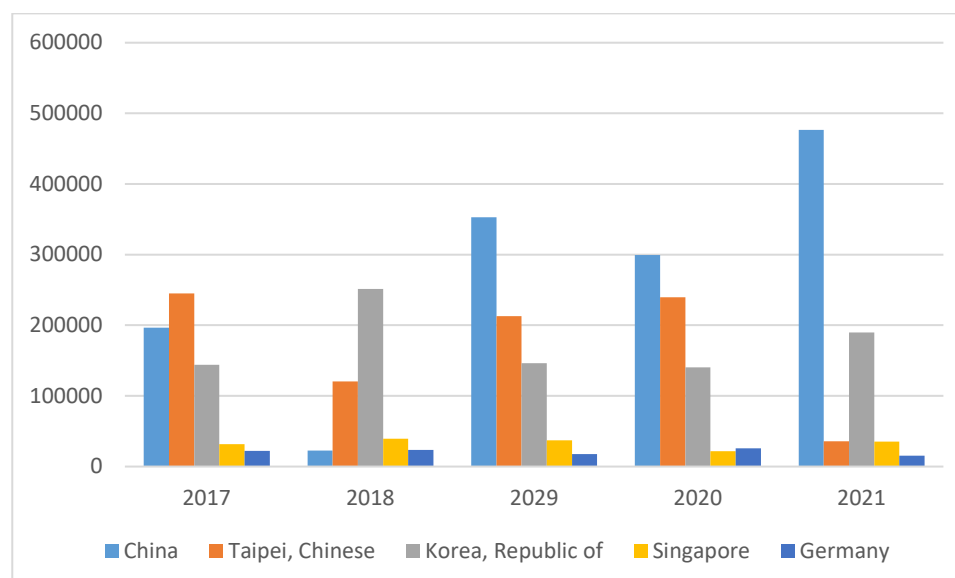
Table 10. Main suppliers of Machines and apparatus for the manufacture of boules or wafers to the EU in 2021 (billion EUR)

Exporters	Import value, 2021	%	cum %
Japan	52071	36.65	36.65
Singapore	28823	20.29	56.94
Germany	21623	15.22	72.16
United States	19734	13.89	86.05
Austria	3778	2.66	88.71
China	3270	2.30	91.01

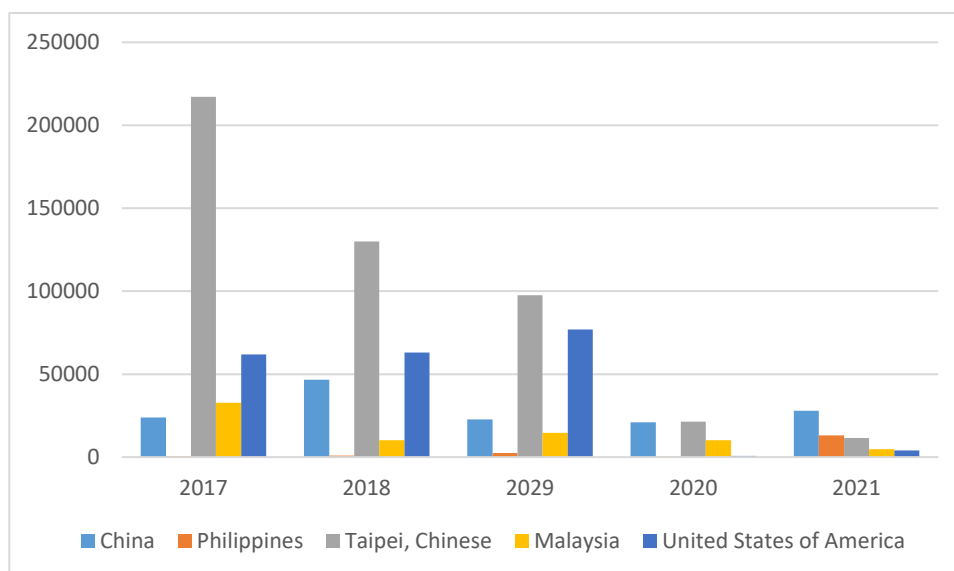
Source: own elaboration on data from www.intracen.org

Figure 25. Top suppliers of Machines and apparatus for boules or wafers to the EU since 2017 (million EUR)

Source: own elaboration on data from www.intracen.org. Data show the top supplying countries from where EU as a whole gets these products. We cannot know from these data whether after importing, some Member States re-export.

Figure 26. Top importers of Machines and apparatus for boules or wafers from Japan since 2017 (million EUR)

Source: own elaboration on data from www.intracen.org

Figure 27. Top importers of Machines and apparatus for boules or wafers from Singapore since 2017 (million EUR)

Source: own elaboration on data from www.intracen.org

3.7 Anticipating potential dependencies in agri-food trade

The agri-food sector does not include ‘critical dependencies’ according to the criteria adopted by the European Commission, i.e., economic importance in EU production activities and supply risk (see section 3.2 for details). Not even cereals, notwithstanding the concerns in the early months of 2022 due the war in Ukraine, are a source of concern, considering EU exports of cereals in July 2022 continued to dominate the EU total export values, accounting for EUR 2.3 billion. Among cereals, wheat exports reached 3 million tons, a 74 % increase compared to July 2021. Compared to June, wheat exports increased by 21 % in volume terms and the unit value dropped by 4 % (EU Commission, 2022g).

However, recent trade developments in some agri-food categories show increasing EU import dependence, i.e., deteriorating trade deficits and increasing shares in total agri-food imports (in value and in quantity). They are also the top imported product categories in agri-food sectors in the first half of 2022 (Jan-Jul 22) (see Table 11). Although these categories may not be included in the group of ‘critical supply’ to strategic EU industries, they are in fact central in the agri-food sector, both in terms of production and consumption.

Table 11. Main agri-food items with negative trade balance (Jan-Jul 22)

Product	Trade deficit (million EUR)	Import increase since 2021	Share of total agri-food imports
Oil seeds and protein crops	-13733	45 %	14 %
Fruits and nuts	-9680	8 %	15 %
Coffee, tea, cocoa, and spices	-8569	32 %	13 %
Vegetable oils (oil seeds and palm)	-3946	70 %	6 %
Non-edible for technical use	-3638	48 %	6 %

Source: EU Commission (2022)

As an example, on how to detect potentially critical dependencies, we analyse the top agri-food products imported by the EU in 2021, i.e., oil seeds and protein crops. The group of suppliers to the EU is rather concentrated, as the top four suppliers account for almost 66 % of imports. Top exporters to the EU are

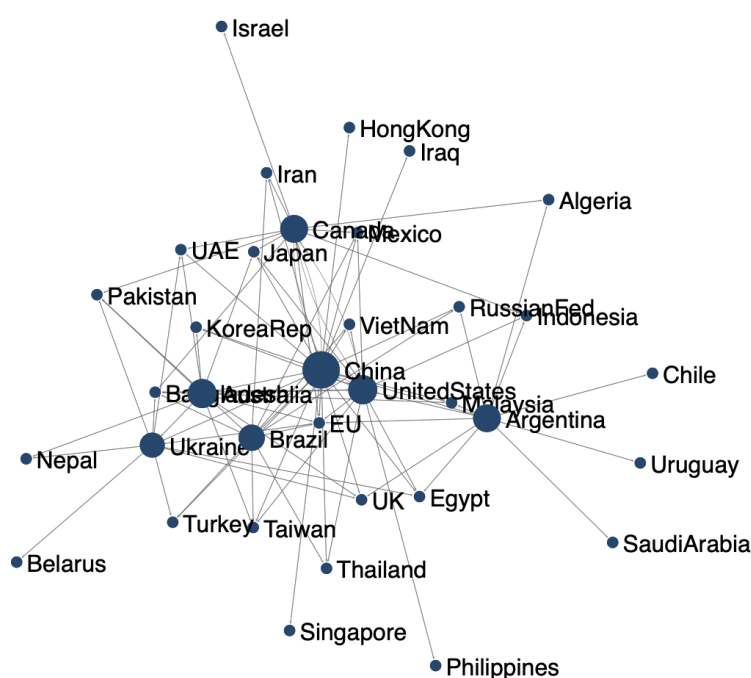
Brazil (28 % of total imported value in 2021), the United States (17 %), Ukraine (11 %), Australia (10 %), Canada (8 %) and Argentina (4 %) (Table 12). When analysing the trade network of major suppliers to the EU, a rather concentrated network stands out, with low in-degree centralization (0.13) and high out-degree centralization (0.50). Moreover, China is the top importer for all major suppliers to the EU, except for Australia and Ukraine. China accounts for 70 % of Brazil's exports, 51 % of Argentina's exports, 46 % of United States' exports, 22 % of Canada's exports.

Table 12. Major suppliers of Oil seeds and protein crops into the EU (2021)

Exporters	Import value (million EUR)	Share of total imports
Brazil	4 218	28.0
United States	2 531	16.8
Ukraine	1 601	10.6
Australia	1 570	10.4
Canada	1 248	8.3
Argentina	666	4.4
China	509	3.4
Russian Federation	273	1.8
India	213	1.4
Turkey	198	1.3
Kazakhstan	197	1.3
Morocco	184	1.2
Total imports	15 082	88.9

Source: own calculations on data from WITS and ITC

Figure 28. Trade network for Oil seeds and protein crops (2021)



Max exported value from Brazil to China 23 billion USD.

Source: own elaboration on data from WITS and ITC

3.8 Interim conclusions

A **major starting point to address the EU strategic dependencies on third countries is a comprehensive and deep assessment of criticalities on both products and partners**. So far, most of the political attention in the EU has been directed to natural resources, as the EU relies heavily on imports of such materials. **The chief criterion** followed by the EU Commission to detect supply risk, e.g., the risk of a disruption in the EU supply of the materials, has been the **concentration of supplies**.

While the aggregate importance of CRMs in total extra EU imports (see table 1 above) is rather low (all raw materials account for only 5 % of total EU imports; CRM account for a modest 0.7 % of total EU imports), many **CRMs are highly concentrated at the country level**, and on top of that, often in countries and regions **characterised by low standards of governance**.

Therefore, the **criticality of raw materials supplies comes from both the concentration of suppliers and the nature of supplying countries** and in many cases, **without obvious possibilities of substitution**. More specifically, imports of raw materials from the extraction phase (such as baryte, borate and antimony) are sourced mostly from countries of low economic freedom and relatively low democracy scores. When processing is considered, both low economic freedom and democracy scores apply to import partners from which the EU sources borate, coking coal, cobalt, titanium, vanadium, and tantalum. Several essential products and industries are dependent on the supply of those CRMs including aviation and defence industry (antimony, titanium, vanadium), batteries (antimony, cobalt, coking coal), medical and chemical industry (baryte, titanium), semiconductors (gallium, borate) and automotive industry (vanadium, titanium).

Currently, the bilateral **investment agreements**, either established by an EU member state on an individual basis or as EU-wide treaties with investment provisions **cover roughly 55 % of all CRM imports**, on average. This means that individual coverage ranges from as low as 0 % (e.g., for cobalt and vanadium), to as high as 100 % (e.g., for borate and phosphate rock). Increasing sourcing of CRM from ‘reliable’ partners – ‘friendshoring’ – is at the heart of the EU’s Raw Materials Diplomacy – the first pillar of its Raw Materials Strategy – with the goal to **establish bilateral, regional, and multilateral frameworks of cooperation, including dedicated chapters and provisions in future and possibly current FTAs**. Friendshoring in raw materials supply may provide advantages such as cheaper material costs, access to commodities that may be difficult to get via conventional routes, and a more “personal” and flexible connection with the supplier. The disadvantages might include a lack of consistency in the quality of the resources, restricted possibilities for material availability, and dependency on the connection for continuing supply. Furthermore, friendshoring may have legal and ethical consequences, like as concerns with compliance, international trade law, and transparency. There is no doubt that increasing resilience of supplies needs to be achieved through more carefully designed external policies. This should be pursued while also acknowledging that not only EU demand, but also the global demand for raw materials has and will continue to grow as the overall global material use will more than double in 2060, compared to 2011, with the use of metals in particular increasing by 250 %. It is usually the case that the countries from which the EU is sourcing the raw materials are also the global suppliers. Thus, global competition for raw materials will continue to grow. This also underlines the importance of the international dialogue and regulation on access to raw materials.

While there has been systematic attention to the importance of CRMs to the EU economy since well before the pandemic, it is only with the COVID-19 pandemic and even more so with the Russian invasion of Ukraine that the fragility of several critical product supply-chains became evident, beyond CRMs. In fact, all sectors have increased their upstream exposure to extra-EU supplies since 1998 (see figure 8 above). If one only considers **EU import dependence from non-FTA partners, then the PRC stands out as the single largest non-FTA import partner for the EU**. Moreover, EU direct import dependence on China does not

consider the importance of **China's centrality** as trade partner of other EU suppliers, which means that **China can actually 'command' a larger share of world export flows**. Such network centrality of EU direct import partners can lead to a much larger overall EU dependence on individual partners. A case in point is the supply chain for Electric Vehicles batteries; major EU suppliers are extra EU countries – Japan, China and South Korea. Recent trends show increasing imports from China in contrast with those from South Korea, which exports mainly to China and has recently increased exports also to the United States. South Korea has recently voiced the concern it may not be able to reduce exports to China and increase those to the EU (as many in Europe think as best solution to excessive dependence on China), because of the likely retaliation it would face from the PRC.

4 Reducing Strategic Dependencies: Synergies in current EU legislation

After having looked at the existing vulnerabilities at hand, we now turn to EU legislation and other strategic documents with a view to explore options for action by the European Parliament particularly in trade and investment. To do so, this chapter first screens the numerous pieces of legislation in place which address supply chain vulnerabilities or might be relevant in this regard. In a second step, the part assesses these instruments to see their impact in various dimensions in view of the vulnerabilities at hand, identified in Chapter 3, and explore potential synergies between internal and external policies. This detailed assessment focuses on how internal and external policies and measures fit together to efficiently address the vulnerabilities. Building on historical neo-institutionalist and neo-functionalist concepts for understanding EU integration, **we define efficient synergies as a well-fitting interlocking of the institutional-procedural, functional, and budgetary dimensions of the interrelated, externally and internally oriented policy instruments across all phases and levels of the policy cycle standardised by treaty or secondary law.**

4.1 Internal policies

The security of supplies is a long-standing concern of the EU and has been dealt with specifically for individual sectors. Many legislative acts of the EU address supply chain vulnerabilities. For each of the instruments, we take note of the key objectives, sector coverage, the identified risks, the context, as well as the mechanisms through which it is delivered. This screening allows to identify linkages to other legislation.

4.1.1 Energy

4.1.1.1 The EU Energy Union Package

The project of a common energy market considered questions of secure and sufficient supply, which was, however, initially addressed mainly by further improving market mechanisms. In a next step, the Energy Union initiative was launched in 2015 (COM(2015) 80 final). It aims at giving EU consumers – households and businesses – secure, sustainable, competitive, and affordable energy and envisages five dimensions, namely: (a) energy security; (b) internal energy market; (c) energy efficiency; (d) decarbonisation; and (e) research, innovation, and competitiveness. More specifically, the initiative is about:

- 1) A fully integrated internal energy market- enabling the free flow of energy through the EU through adequate infrastructure and without technical or regulatory barriers;
- 2) Improve energy efficiency to reduce dependence on energy imports, lower emissions, and drive jobs and growth;
- 3) Supporting breakthroughs in low-carbon and clean energy technologies by prioritising research and innovation to drive the energy transition and improve competitiveness.

The strategy included several legislative measures, which were carried out in the following years. A legislative package adopted in 2019 consists of eight new acts on energy performance in buildings,⁵⁰ renewable

⁵⁰ Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

energy,⁵¹ energy efficiency,⁵² governance of the energy union,⁵³ electricity regulation,⁵⁴ electricity directive,⁵⁵ risk preparedness,⁵⁶ and the Agency for the Cooperation of Energy Regulators (ACER).⁵⁷

In view of energy security, the Commission referred to a 2014 Communication (COM(2015) 80 final) on the issue and highlighted the dimensions of solidarity and trust. In particular, diversification of supply (energy sources, suppliers and routes), cooperation („Working together on security of supply“), a „Stronger European role in global energy markets“ and „More transparency on gas supply“ were mentioned. In 2018 the Regulation on the governance of the energy union and climate action (EU)2018/1999 was added. The EU Energy Union strategy explicitly addresses dependencies from import and in this regard has a direct impact on supply chain vulnerabilities. Insofar as it is concerned with the internal energy market, infrastructures, energy efficiency and the promotion of renewable energies, it has an indirect effect. The latter elements signify a major long-term effect.

4.1.1.2 Security of Gas Supply (SoGS) Regulation

In addition to general regulations for the entire energy sector, particular regulations for individual energies or energy sources were also created at this time. The Security of Gas Supply Regulation⁵⁸ has been enacted originally as part of the Energy Union in 2017 and in context with the Gas Regulation.⁵⁹ The regulation addresses the high dependence on third countries for natural gas. It establishes provisions aiming to safeguard the security of gas supply in the Union by ensuring the proper and continuous functioning of the internal market in natural gas, by allowing for exceptional measures to be implemented when the market fails to deliver the gas supplies required, including solidarity measure of a last resort, and by providing for the clear definition and attribution of responsibilities among natural gas undertakings, the Member States and the Union regarding both preventive action and the reaction to concrete disruptions of gas supply. Also, it envisages cooperation between EU countries in regional groups to assess common supply risks (Common Risk Assessments) and to develop joint preventive and emergency measures. As the regulation stipulates, gas supply disruptions may result from technical or human failures, natural disasters, cyber-attacks, and other emerging risks, as well as from geopolitical disputes. In 2022 the Regulation was amended by Regulation (EU) 2022/1032 of 29 June 2022 to also cover issues of gas storage.

In context of the revision of the regulation, the long-standing issue of a joint purchase of gas from foreign supplies or at least a monitoring of member states' agreements with foreign states have been discussed

⁵¹ Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources.

⁵² Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency.

⁵³ Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

⁵⁴ Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity.

⁵⁵ Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU.

⁵⁶ Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC.

⁵⁷ Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators.

⁵⁸ Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010.

⁵⁹ Idem.

anew. The European Parliament has called for taking action in this regard since several years (resolution of 15 December 2015 “Towards an European Energy Union” (2015/2113(INI)).

The Security of Gas Supply Regulation⁶⁰ aims at reducing dependencies from import of natural gas. It does so in providing for an improvement of the internal market and by advising several measures and mechanisms in case, that the market fails. It thus has a major, direct, long-term impact on supply chain vulnerabilities.

4.1.1.3 REPowerEU

REPowerEU is the European Commission’s plan to make Europe independent from Russian fossil fuels well before 2030 in light of Russia's invasion of Ukraine while also addressing the climate crisis. It aims at enabling voluntary common purchases of gas, LNG, and hydrogen by pooling demand in context with the newly established EU Energy Platform, optimising infrastructure use and coordinating outreach to suppliers. In addition, the Initiative aims at saving energy and at accelerating the roll-out of renewable energy. To this end, the Commission has proposed amendments to the Recovery and Resilience Facility Regulation (RRFR),⁶¹ the Renewable Energy Directive (RED), the Energy Performance of Buildings Directive (EPBD), and the Energy Efficiency Directive (EED),⁶² all of which are currently undergoing amendment procedures in view of the “fit for 55” package. Overall, the estimated cost of the initiative has been said to amount to 210 billion EUR.

REPowerEU clearly has a direct and major impact on supply chain vulnerabilities and short- as well as long-term impacts.

4.1.1.4 The hydrogen strategy for a climate-neutral Europe and related activities

In line with the objective of decarbonisation and the promotion of renewable energy as reflected in the above initiatives and legislative acts, the Commission has published a hydrogen strategy (COM(2020) 301 final) in 2020. Soon after and on this basis, a European Clean Hydrogen Alliance was founded.⁶³ In July 2022, the Commission approved a Project of Common European Interest ('IPCEI') launched by 15 member states. The IPCEI on Hydrogen Technology „Hy2Tech“ will cover a wide part of the hydrogen technology value chain, including (i) the generation of hydrogen, (ii) fuel cells, (iii) storage, transportation and distribution of hydrogen, and (iv) end-users applications, in particular in the mobility sector.

The project is expected to contribute to the development of important technological breakthroughs, including new highly efficient electrode materials, more performant fuel cells and innovative transport technologies. In this way, the project will address threats to EU's strategic interests and its current dependence on non-renewable energy sources. The initiative counts on 5.4 billion EUR of public funding and is expected to unlock EUR 8.8 billion in private investments.

The hydrogen strategy has a direct, major, and long-term impact on supply chain vulnerabilities.

4.1.2 Raw materials and non-energy supplies

The EU has addressed supplies of raw materials early on. Recently, this became part of a much more general concern about the vulnerability of supply chains as reflected in the 2020 EU Industrial strategy.

⁶⁰ Idem.

⁶¹ Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility.

⁶² Proposal for a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency, COM/2022/222 final.

⁶³ https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/european-clean-hydrogen-alliance_en

4.1.2.1 The 2020 EU Industrial Strategy

In 2020, a „New Industrial Strategy for Europe“ (COM(2020) 102 final) was presented by the Commission and soon later updated to take into account the COVID-19 pandemic (COM(2021) 350 final). The Strategy aims at supporting the twin transition to a green and digital economy, to make EU industry more competitive globally, and to enhance Europe's open strategic autonomy. The strategy has several key pillars, including (a) investing in breakthrough innovations and key technologies such as AI, green hydrogen, and advanced materials, (b) strengthening the single market and removing barriers to trade, (c) supporting the transition to a green and digital economy, (d) enhancing the skills and employability of workers, and (e) fostering a level playing field and fair competition. Altogether, the strategy addresses the following vulnerabilities and risks: Climate change, global economic and geopolitical disruptions, lack of predictability, after-effects of the COVID-19 pandemic.

A cornerstone of the initiative are industrial alliances to improve EU's open strategic autonomy in key areas – raw materials, batteries, active pharmaceutical ingredients, hydrogen, semiconductors, and cloud and edge technologies. As this indicates, the Industrial Strategy goes far beyond addressing shortages in supply of raw materials, but also covers other products. Current alliances include:

Box 2. EU industrial alliances

Alliance for Zero-Emission Aviation,⁶⁴
 European Raw Materials Alliance,⁶⁵
 European Clean Hydrogen Alliance,
 European Battery Alliance,⁶⁶
 Circular Plastics Alliance,⁶⁷
 European Alliance for Industrial Data, Edge and Cloud,⁶⁸
 Industrial Alliance on Processors and Semiconductor Technologies,⁶⁹
 Renewable and Low-Carbon Fuels Value Chain Industrial Alliance.⁷⁰

The strategy also points to the international dimension and possible external measures. By doing so, the Commission refers to the Trade Policy Review, and envisages to „work towards diversifying international supply chains and pursue international partnerships to increase preparedness.“ The strategy goes on in pointing to potential „common dependencies“ shared with the EU's partners and envisages „to pool resources and build stronger and more diverse alternative supply chains with ... closest allies and partners.“ The „transatlantic relationship“ and the proposed EU-US Trade and Technology Council are mentioned in this regard together with „the enlargement and neighbourhood policy“ as well as „Free Trade Agreements with other partners and trade blocs“. Also, the strategy mentions „reverse dependencies“ where other countries depend on the EU.⁷¹ The Industrial Strategy has an indirect impact on supply chain vulnerabilities as seen in Part I. This impact, however, depends on the financial resources. Altogether, the strategy may have more of a long-term impact.

⁶⁴ https://defence-industry-space.ec.europa.eu/eu-aeronautics-industry/alliance-zero-emission-aviation_en

⁶⁵ <https://erma.eu/>

⁶⁶ <https://www.eba250.com/>

⁶⁷ https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/circular-plastics-alliance_en

⁶⁸ <https://digital-strategy.ec.europa.eu/en/policies/cloud-alliance#:~:text=The%20European%20Alliance%20for%20Industrial,States%20representatives%20and%20relevant%20experts.>

⁶⁹ https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/industrial-alliance-processors-and-semiconductor-technologies_en#:~:text=The%20Industrial%20Alliance%20for%20Processors,this%20sector%20in%20the%20EU.

⁷⁰ https://transport.ec.europa.eu/transport-themes/clean-transport-urban-transport/alternative-fuels-sustainable-mobility-europe/renewable-and-low-carbon-fuels-value-chain-industrial-alliance_en

⁷¹ All citations: p. 13, footnotes omitted.

4.1.2.2 Critical Raw Materials: The 2020 Action Plan and proposals for legislation

Soon after the Industrial Strategy, the Commission presented the Action Plan on Critical Raw Materials (COM/2020/474 final). It builds on the earlier 2008 Raw Materials Initiative (COM (2008) 699 final) which already aimed at reducing dependencies for non-energy raw materials for industrial value chains by diversifying sources of primary raw materials from third countries, strengthening domestic sourcing and supporting supply of secondary raw materials through resource efficiency and circularity.

On this basis, the Commission published an Action Plan in 2020, together with an updated List of Critical Raw Materials. The Action Plan aims at reducing Europe's dependency on third countries, diversifying supply from both primary and secondary sources and improving resource efficiency and circularity while promoting responsible sourcing worldwide.

The Action Plan also and explicitly addresses trade and trade policy tools (COM/2020/474 final at 3.4) in stating: „Resilience for critical raw materials supply will also be achieved by reinforcing use of EU trade policy tools (including Free Trade Agreements and enhanced enforcement efforts) and work with international organisations to ensure undistorted trade and investment in raw materials in a manner that supports the EU's commercial interests.“

The Action Plan document further explains that „the Commission cooperates with partners on critical raw materials and sustainability in a range of international fora. These include the annual EU-US-Japan Trilateral on Critical Raw Materials (supply risks, trade barriers, innovation, and international standards), the Organisation for Economic Cooperation and Development (conflict minerals, guidance on raw materials, responsible sourcing), the United Nations (global outlook, environmental pressures, resource management, mineral governance), the WTO (market access, technical barriers, export restrictions) and the G20 (resource efficiency). It also has bilateral raw material dialogues with a range of countries, including China.“ Furthermore, it is stated, that „the EU will need to engage in strategic partnerships with resource-rich third countries, making use of all external policy instruments and respecting its international obligations. There is large untapped potential for building sustainable and responsible strategic partnerships with resource-rich countries.“

The Action Plan has a direct impact on supply chain vulnerabilities as signified in Part I, which, however, depends on the financial resources and will surface in longer terms. Recently the Commission has published its proposal for a Regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials (Critical Raw Materials Act), which aims at creating a network of European agencies, strive for a more resilient supply chain and secure a strong and sustainable level playing field.⁷²

4.1.2.3 The European Raw Material Alliance (ERMA)

In line with the Industrial Strategy, the action plan did call for the establishment of an industry-driven European Raw Materials Alliance (ERMA). ERMA aims to make Europe economically more resilient by diversifying its supply chains, creating jobs, attracting investments to the raw materials value chain, fostering innovation, training young talents, and contributing to the best enabling framework for raw materials and the Circular Economy. ERMA will (1) identify and respond to raw material challenges along industrial ecosystems and within the wider society, (2) provide tailored solutions to industry needs, (3) unlock regulatory

⁷² Proposal for a Regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/1724 and (EU) 2019/1020, COM(2023) 160 final. Commission statement of 14 September 2022, STATEMENT/22/5523, https://ec.europa.eu/commission/presscorner/api/files/document/print/en/statement_22_5523/STATEMENT_22_5523_EN.pdf last visited on 8 February 2023.

bottlenecks, and (4) promote stakeholders' strong engagement and commitment through an open process. It will also engage in channel investments for raw materials projects and install a Raw Materials Investment Platform (RMIP)⁷³ to bring investors and investees together. In July 2021, Ukraine joined ERMA by way of a MoU. ERMA has a direct impact on supply chain vulnerabilities as seen in Part I, which, however, as far as its scale is concerned, depends on the financial resources, and may take a longer term to take effect.

4.1.2.4 Microelectronics and the European Chips Act

In the area of microelectronics, European competencies in the field were already promoted by the 2018 IPCEI on Microelectronics,⁷⁴ which had been launched by four member states. In addition, an Industrial Alliance on Processors and Semiconductors was established in 2021. It is meant to help to secure EU's digital sovereignty, address existing current gaps in the production of microchips and the technology developments and address the threat to critical infrastructure, such as energy and communications and the EU's internal and external security.

These initiatives have been complemented in 2022 by the proposed European Chips Act,⁷⁵ which aims at addressing dependency of the semiconductor value chain on a very limited number of actors in a complex geopolitical context. The proposed regulation intends to boost Europe's semiconductor ecosystem's resilience and market share, and to increase the EU's industry's competitiveness by promoting early chip adoption. The regulation aims at establishing a procedural framework to permit joint financing from member states, the Union budget, and private investment.

Moreover, it is geared to assure supply security by attracting FDI for integrated production facilities and open EU Foundries. Facilities recognized by the Commission as EU integrated manufacturing facilities or EU open foundries shall be assessed as serving the public interest.

Regarding the connection between GVC and trade, the Parliament has introduced amendments in its report (COM(2022)0046 – C9-0039/2022 – 2022/0032(COD), A9-0014/2023, 31 January 2023) to promote stronger and more proactive international collaboration initiatives. The various EU activities and legislation in the field of microelectronics have a direct effect on supply chain vulnerabilities as identified in Part I. In view of its magnitude this impact depends on the financial resources allocated and may take a longer term to take effect.

Box 3. IPCEI and EU State Aid law

With "Important Projects of Common European Interest" (IPCEI), the EU has developed a special regulatory instrument to strengthen strategically important European value chains. The aim is to promote transnational cooperation and to map the value chain from applied research, development, and innovation to first-time industrial implementation as well as crucial infrastructure projects in the fields of environment, energy, transport, health, or digital technologies through state aid. IPCEI are a specific instrument of under state aid law for the targeted strengthening of the research and innovation location, for supporting the fulfilment of EU goals (such as the European Green Deal and the digital transition), as well as for strengthening Europe's competitiveness and strategic autonomy. IPCEI address strategically important projects in which companies or research institutions can participate following nomination by participating Member States of the EU (or countries of the EEA) and approval by the European Commission (or the EFTA Surveillance Authority) under state aid law. As a result, these individual projects are usually supported by the respective Member State with state aid outside the General Block Exemption Regulation (GBER).⁷⁶ Companies or research institutions are thus involved in IPCEI with mostly individual projects within the framework of an integrated European consortium project that contribute significantly to the EU's strategic goals and/or pursue ambitious goals in

⁷³ <https://erma.eu/investment/>

⁷⁴ <https://www.ipcei-me.eu/>

⁷⁵ Proposal for a regulation of the European Parliament and of the Council Establishing a framework of measures for strengthening Europe's semiconductor ecosystem (Chips Act), (COM(2022)0046 – C9-0039/2022 – 2022/0032(COD))

⁷⁶ Consolidated text: Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A02014R0651-20170710>.

terms of research and innovation, clearly going beyond the international state of the art in the relevant sectors. IPCEI must thus include far-reaching so-called spill-over activities to guarantee that the information obtained via the project is made available to the greatest possible circle of addressees – well beyond the collaborating partners, EU member states, and the specific industry. These initiatives should also have a favourable impact on the internal market, particularly on employment and competitiveness.

In general, Article 107 TFEU deems state aid that may distort competition to be incompatible with the internal market. Simultaneously, several exceptions allow for state aid under specific instances. These include financial assistance to support the completion of a significant project of shared European interest or to alleviate a substantial disruption in a Member State's economy. Because of its beneficial spill over effects on the internal market and European society, an IPCEI may make a significant overall contribution to the development, employment, and competitiveness of European industry and the economy. Knowledge, financial resources, and economic operators from throughout the EU are brought together to resolve significant market disruptions or systemic breakdowns, as well as to address social concerns that might otherwise be insurmountable. As IPCEI, the public and private sectors collaborate to develop large-scale initiatives that may and should benefit the Union and its population. In other words, if there is a compelling European interest and the investments required cannot be supported only by the project partners, big and substantial highly innovative initiatives may be funded collaboratively as IPCEIs by multiple EU Member States in accordance with defined European rules. The standards are outlined in the European Commission's IPCEI Communications. In general, two categories of projects are eligible for state financing under IPCEI: (A) RDI & FID projects (Research, Development, and Innovation & First Industrial Development) are treated as one common project type, as such IPCEI projects usually span these two phases. This includes industrial research and experimental development aimed at introducing new or significantly improved products, production processes or services. In addition, RDI & FID projects aim at the creation of prototypes, pilot or demonstration plants and experimental facilities as well as investments in research infrastructure and develop the prerequisites for modern research and development operations including building infrastructure, measurement technology and laboratory infrastructure. It is important that the current state of the art is raised by the project. IPCEIs aim to leapfrog several Technology Readiness Levels (TRLs) in one project, but do not support the mass production or commercial activity phase. (B) Infrastructure projects include the construction of environmental, energy, health, digital and transport infrastructure and must ensure open and non-discriminatory access to this infrastructure as well as non-discriminatory pricing. In addition, such projects must be of major importance or make a significant contribution to the internal market in these specific or other areas.

4.1.2.5 IPCEI European Battery Innovation (EuBatIn)

The IPCEI on EuBatIn aims to develop a sustainable process to extract raw and advanced materials, to produce innovative battery cells and systems and safe methods for processing recyclable materials. It heads for establishing by 2030 in Europe the best-in-the-world innovation ecosystem to boost a competitive, sustainable, and circular European battery value chain and to drive the transformation towards a carbon-neutral society. EuBatIn has a direct effect on supply chain vulnerabilities. Part I has identified the criticality of this sector. In view of its magnitude, it depends on the financial resources allocated and may take a longer term to take effect. By December 2021, a total of 42 businesses from 12 EU countries were taking part in IPCEI EuBatIn. Private companies are putting in nine billion euros. A total of EUR 2.9 billion in subsidies are being doled out by the member states. The project's overarching goal is to set up a battery value chain that is competitive, creative, and sustainable. Projects promote extremely cutting-edge innovations in all stages of the value chain (from the responsible mining of raw materials to the safe assembly of batteries and their integration into systems). The programme also seeks to dramatically decrease the battery industry's CO₂ footprint, which would contribute directly to climate protection and the realization of the European Green Deal.

4.1.2.6 The InvestEU Programme and the corresponding Regulation

The InvestEU Programme provides long-term funding to companies and supports Union policies in sustainable recovery. The Programme consists of InvestEU Fund, InvestEU Advisory Hub and InvestEU Portal. The Programme addresses the deep economic and social crises faced by EU businesses post pandemic. InvestEU also supports activities of strategic importance to the EU, in view of enhanced resilience and of strengthening strategic value chains. The Programme identifies links to the EU Green Deal; Just Transition Scheme; and the EU Recovery Plan. The specific actions target promoting onshoring and developing sustainable capacities (at home and abroad). While some of the other instruments do not have a concrete

financial allocation, the InvestEU Programme is expected to mobilise at least EUR 372 billion of public and private investment through an EU budget guarantee of EUR 26.2 billion in support of investment by implementing partners. The budget guarantee is divided among the 4 policy windows as follows: Sustainable infrastructure: EUR 9.9 billion; Research, innovation, and digitisation: EUR 6.6 billion; SMEs: EUR 6.9 billion; Social investment and skills: EUR 2.8 billion.

The InvestEU Fund also features the option of establishing Member State compartments for each policy area and channelling other types of funding, including Cohesion Policy Funds. The InvestEU Programme supports the focus on resilience and the strengthening of strategic value chains by linking together policies for sustainable recovery with MS policy instruments that may qualify to receive funding from other channels, including the Cohesion Funds. Thus, the Programme addresses potential funding gaps in the pursuit of supply chain instruments by integrating with related areas (e.g., infrastructure, digitalisation, innovation, and skills). Building on these initiatives, President of the Commission von der Leyen has announced to put forward a Net-zero Industry Act at the World Economic Forum in January 2023.

4.1.2.7 The Single Market Emergency Instrument (SMEI)

On 19 September 2022, the Commission revealed its plan for a Single Market Emergency Instrument (SMEI). This crisis governance framework intends to safeguard the free movement of products, services, and persons as well as the availability of vital commodities and services in future catastrophic events. The proposal builds on experiences gained during the COVID-19 pandemic and envisages to establish a governance structure for dealing with crises in the Single Market, and to monitor the supply chains of commodities and services that have been designated as being strategically significant as well as to build up strategic reserves in these sectors. The SMEI develops a crisis management system that is well-balanced to recognize diverse risks to the Single Market and to maintain the smooth running of the Single Market via the following means:

1. Establishing a governance structure for dealing with crises in the Single Market: The Commission proposes a new method to monitor the Single Market, determine the various degrees of danger, and coordinate a suitable reaction. This mechanism will consist of multiple stages: the contingency mode, the vigilance mode, and the emergency mode. In the first place, the framework for contingency planning would make it possible for the Commission and the Member States to establish a network for coordination and communication to improve readiness. After then, if it has been determined that there is a risk to the Single Market, the Commission can go into the vigilance mode. The Council will have the ability to switch into emergency mode in the event of a crisis that has a significant and widespread effect on the Single Market. An advisory body that will include of the Commission and Member States will be constituted to evaluate a specific circumstance and provide suggestions regarding the most appropriate actions to take in response to it. It will be an important part of the process in its entirety all the way through.

2. Putting out fresh ideas for combating potential dangers to the Single Market: In the vigilance mode, the focus of the Member States and the Commission, working together, would be on monitoring the supply chains of commodities and services that have been designated as being strategically significant as well as on building up strategic reserves in these sectors. When the emergency mode is triggered, free movement within the Single Market will be maintained with the help of a blacklist of limitations that are not permitted and, more generally, with the help of heightened and more expedient inspection of restrictions that are unilateral. The Commission may also formulate recommendations to Member States to guarantee the supply of items that are relevant to the crisis by enabling the expansion or repurposing of production lines or speeding the permitting process. In conclusion, it is possible that it will suggest to member states that they target the distribution of the strategic reserves that were built up during the vigilance period. Additionally, new regulations will be implemented to enable the public procurement of pertinent goods and services by the Commission on behalf of the Member States during both the vigilance mode and the emergency mode.

3. Permitting the employment of measures of last resort in the event of an emergency. In exceptional situations, and only after the emergency mode has already been established, the Commission may additionally make use of tools that will require a second activation procedure to be utilized. In this scenario, the Commission has the authority to make targeted information requests to various economic operators, and these requests have the potential to be legally binding. It is also possible that it will request that they take priority rated orders for items that are pertinent to the crisis. In response, companies must either comply with the request or explain the significant reasons that necessitate a denial. In addition, the speedier testing and accreditation of some items, together with the conformity assessment that comes with it, will allow for their earlier placement on the market, which will assure their availability during times of emergency. Separate suggestions for a Regulation and a Directive that would change a variety of product-specific regulatory regimes are included with the SMEI Regulation. These proposals detail the rules that would be followed to allow for such derogations.

4.1.3 External and Trade Policies

4.1.3.1 Trade Strategy

External instruments are guided by the overarching strategy under the EU's Trade Policy Review – An Open, Sustainable and Assertive Trade Policy (European Commission, 2021). The strategy relates trade policy to the sustainable growth model as defined by the European Green Deal and the European Digital Strategy and sets out the need for the trade policy strategy to support both internal and external policy objectives. The trade strategy was devised in aid of COVID-19 recovery and in support of the green and digital transformations of the economy and towards building a more resilient Europe in the world. The strategy points to the acceleration of such shifts and points to the need to understand “the right policy mix in terms of diversification of domestic and external sources of supply and the build-up of strategic production capacities and reserves” (Idem). The priority areas identified in the strategy are in relation to the production of health products in a crisis and the need for cooperation to ensure equitable access for the more vulnerable populations.

The synergies between the internal and external dimensions are highlighted by the fact that strengthening the resilience and sustainability of the EU economy, and its supply chains is a pillar of the European Union’s drive towards open strategic autonomy. Resilience is featured in the Strategic Foresight Report as a unifying feature of all EU policies (European Commission, 2022). As an EPRS Briefing in July 2022 underlines while resilience is the key topic, the Foresight Report makes the link between resilience and autonomy: “geopolitical resilience relates to Europe bolstering its 'open strategic autonomy' and 'global leadership role'” (EPRS, 2022).

The COVID-19 pandemic redefined the need for ‘open strategic autonomy’ in its focus to reduce the dependence on foreign supply chains, but it also confirmed the need for the EU to bridge two gaps: on one hand, between the expectations for the EU to act and its capacity to act and on the other hand, between its internal and external constraints to act.

The external instruments screened reflect the internal-external synergies to a different degree, where the following section assesses the likelihood and extent of the impact. The table below identifies the specific actions outlined in the strategy and the examples of instruments, which align with them.

Table 13. EU trade strategy and specific actions

Specific actions based on study’s framework	Examples
Securing existing supply	<ul style="list-style-type: none"> • identifying strategic dependencies; • promoting sustainable standards across value chains, • promoting greater transparency and traceability in supply chains; • use of autonomous measures like CBAM;

Diversification of foreign supply	<ul style="list-style-type: none"> • effective implementation of the modernised Export Control Regulation on sensitive dual-use goods and technologies to support secured value chains • deeper engagement with African and Asian states; • harness EU's broad network of trade agreements; • closer cooperation with G20 partners; • closer transatlantic partnership on the green and digital transformation; • stronger economic integration with the Western Balkans and the Eastern Partnership countries; • consolidate the EU's partnerships with key growth regions – in the Asia Pacific and Latin America.
Developing sustainable capacities	<ul style="list-style-type: none"> • promoting responsible business conduct; • promoting sustainable human and labour rights; • mandatory due diligence; • closer regulatory cooperation; • supporting EU stakeholder to make the best use of EU agreements and online tools; • deepen analytical and data collection efforts

Source: own elaboration.

4.1.4 Specific Trade Instruments

In this section, we review eight specific trade instruments, majority suggested in the EU's Trade Policy Review, by understanding their scope of application, the risks they address, the specific actions they relate to, as well as their enforceability. These instruments are complemented by brief reflections on trade defence instruments and EU Enforcement Regulation for trade disputes. The table below summarises the key features of the selected instruments.

Table 14. Summary of trade instruments and actions

Instrument	Status	Internal/External Synergies	Specific actions
EU's framework for screening FDIs	In force since 11 October 2020 Regulation (EU) 2019/452	The new Industrial Strategy, Horizon Europe, The EU-US Trade and Technology Council	Securing existing supply chains (Promoting onshoring)
The EU-US Trade and Technology Council (TTC)	Established during the EU-US Summit on 15 June 2021 Third Ministerial Meeting (5 December 2022)	EU Green Deal, Proposal for a new Batteries Regulation, and its proposal for Sustainable Products Initiative, The Anti-Coercion Instrument (ACI), European Digital Strategy	Securing existing supply chains Diversification of foreign sources Developing sustainable capacities
Foreign Subsidy Regulation (FSR)	To be applied from 12 July 2023 Regulation (EU) 2022/2560	Foreign Direct Investment Regulation, International Procurement Instrument, EU Public Procurement framework	Securing existing supply chains Developing sustainable capacities

Directive on Corporate Sustainability Due Diligence (CSDD)	Proposal, 23 February 2022 2022/0051(COD) EP draft reports (7 Nov 2022 – 10 Feb 2023)	EU Green Deal, UN Sustainable Development Goals, Conflict Minerals Regulation, Proposal for a Regulation on deforestation-free supply chains, Proposal for a new Batteries Regulation, and Proposal for Sustainable Products Initiative	Securing existing supply chains Developing sustainable capacities
Regulation concerning the exercise of the Union's rights for the application and enforcement of international trade rules	In force since 13 February 2021	Dispute settlement process, EU Green Deal, UN Sustainable Development Goals	Suspension of concessions and measures in response to breaches of the trade and sustainable development chapters of trade agreements,
Regulation on a Carbon Border Adjustment Mechanism (CBAM)	Proposal, 14 July 2021 (2021/0214(COD)) The trilogue meetings on the file begun on 11 July 2022, and on 13 December 2022 a provisional political agreement was reached.	EU July 2021 Climate Target Package; EU Green Deal	Securing existing supply chains Developing sustainable capacities
The Anti-Coercion Instrument (ACI) Regulation on the protection of the Union and its Member States from economic coercion by third countries	Proposed, 08 December 2021 2021/0406(COD) Trilogue negotiations	EU-US Trade and Technology Council, Blocking Statute ⁷⁷ , trade defence instruments Foreign Direct Investment screening regulation, Enforcement Regulation, Foreign Subsidy Instrument, International Procurement Instrument	Securing existing supply chains
EU's International Procurement Instrument (IPI)⁷⁸	Entered into force on 29 August 2022.	WTO Global Procurement Agreement, EU-UK Trade and Cooperation Agreement, EU-Japan EPA, CETA, Europe 2020 Flagship Initiative on Integrated Industrial Policy for the Globalisation Era	Securing existing supply chains Diversification of foreign sources

4.1.4.1 EU's framework for screening FDI

Regulation (EU) 2019/452 of 19 March 2019 establishes a framework for the screening of foreign direct investments into the Union on the grounds of security or public order and for a mechanism for cooperation between Member States, and between the latter and the Commission, regarding FDI likely to affect security

⁷⁷ Council Regulation (EC) No 2271/96 aims to protect EU operators from the extra-territorial application of third country laws.
⁷⁸ Regulation of the European Parliament and of the Council on the access of third-country goods and services to the Union's internal market in public procurement and procedures supporting negotiations on access of Union goods and services to the public procurement markets of third countries, Regulation (EU) 2022/1031, OJ L 173/1 30.6.2022

or public order (Article 1). The instrument identifies potential risk in the area of investment, namely when a foreign investor seeks to acquire control of European businesses supplying critical technologies, infrastructure, inputs or access sensitive information. The reasoning is that such risk may be exacerbated by the fact that investors are owned or controlled by a foreign state (European Commission, 2019).

The challenge which the EU addresses is that albeit being a small number, the EU-based companies controlled by foreign investors may create “significant economic impact given their larger than average size and their focus on high technology sectors” (Idem). To safeguard EU strategic interests relating to foreign investment, the original March 2019 EU Regulation (1) establishes a cooperation mechanism for member states and the Commission to exchange information and, if necessary, raise concerns regarding specific investments; (2) permits the Commission to issue opinions when an investment poses a threat to the security or public order of more than one member state, or when an investment could undermine a project or programme of interest to the EU as a whole, such as Horizon 2020 or Galileo; (3) establishes certain core requirements for Member States who maintain or adopt a screening mechanism at the national level on the grounds of security or public order; and encourages international cooperation on investment screening, including the sharing of experience, best practices, and information on issues of compatibility.

On 25 March 2020 and 5 April 2022, the Commission issued guidelines to the Member States, inter alia urging all Member States to establish a fully-fledged screening mechanism and ensuring a robust EU-wide approach to foreign investment screening during a period of public health crisis and related economic vulnerability. The Regulation includes factors, which define those areas, which may be considered of high risk (Article 4 of the Regulation): critical infrastructure, critical technologies, the supply of critical inputs, such as energy or raw materials, access to sensitive information or the ability to control information, or the freedom and pluralism of the media. The framework achieves two interrelated objectives: It promotes coordination across member states in establishing transparency in the rules and procedures within the EU and provides a framework for the assessment of high-risk areas. The latter underlines the need to balance between the level of risk and the openness of supply chains.

The Regulation also encourages member states and the Commission to cooperate with the responsible authorities of like-minded third countries on issues relating to the screening of foreign direct investments on grounds of security and public order. This cooperation can take place in relation to issues concerning the screening of FDI. Such administrative collaboration needs to have as its primary objective the strengthening of the efficiency of the framework for screening of investment by Member States as well as the cooperation between Member States and the Commission. The EU undertakes international collaboration either on a bilateral basis or on a more expansive scale. In particular, the EU is lending its assistance to the continuing research being conducted by the OECD on investment policies that are connected to issues of public order and national security. Moreover, Working Group 8 of the EU-US Trade and Technology Council (TTC) has been continuing its work on investment screening from the year 2021.

4.1.4.2 The EU-US Trade and Technology Council (TTC)

The TTC serves as a forum for the United States and European Union to coordinate approaches to key global trade, economic, and technology issues and to deepen transatlantic trade and economic relations based on these shared values. Since the EU and the US have the largest bilateral trade and investment relationship and have a high level of economic integration, the TTC has the potential to impact a large volume of global trade and investment, as well as future proofing EU’s supply chains. The objectives of the TTC address developing sustainable capacities (at home and abroad) through ten working groups (see Box 4).

Box 4. TTC Working groups

1. Technology standards cooperation
2. Climate and clean tech
3. Secure supply chains
4. ICTs security and competitiveness
5. Data governance and technology platform
6. Misuse of technology threatening security & human rights
7. Export controls cooperation
8. Investment screening cooperation
9. Promoting SME access to and use of digital technologies
10. Global trade challenges

On semiconductors – an area for future in-depth coordination – the sub-working group is to come forward with a common understanding on semiconductor shortages. Overall, the partners have agreed to improved monitoring and information exchanges, transparency to anticipate shortages, and avoid subsidy races (European Commission, 2022b). The European Parliament has already shown interest in and supports the work of the TTC, while calling for a more democratic scrutiny over it (EPRS, 2022).

The TTC aims to address a key risk in global supply chains related to processes of decoupling, retaliation, and escalation (EPRS, 2022b, Future Shocks). As the European Parliament’s Foresight Report suggest the processes of decoupling between the US, the EU and China have substantial implications for global supply chains, investment gaps as well as loss of investment (EPRS, 2022, p.47).

The importance of trade and technology for EU’s resilience highlights that partner dialogues are a key component of securing, diversifying, and making supply chains more sustainable.

4.1.4.3 Foreign Subsidy Regulation

The Foreign Subsidies Regulation (FSR) came into force on 12 January 2023 (Regulation (EU) 2022/2560). The rules under the FSR are focused on addressing market distortions caused by foreign subsidies. FSR allows for the EU to continue being open to international trade and investment but also ensure a level playing field for all firms operating in the EU. FSR was designed as regulatory tool to fight unfair competition among both European and non-European companies operating in the EU’s single market.

Currently, the subsidies provided by the EU member states are governed by the State aid rules. While WTO subsidy rules and EU trade defence instruments concern trade in goods, they do not apply when foreign subsidies support investments, mergers and acquisitions, bids in procurement procedures, or when services are concerned. The Foreign Subsidies Regulation aims to directly address the distortions that arise due to the subsidies that are provided by non-EU countries to companies operating within the EU’s single market. FSR puts in place procedural rules to investigate all subsidies including cases of large concentrations and bids in public procurement procedures (Council of the EU, 2022).

The regulation establishes a framework to evaluate any business activity supported by a subsidy provided by a non-EU country to operate in the EU’s market. FSR puts forward three tools to evaluate and investigate financial support to companies by a non-EU public authority. They include two prior authorisation tools targeted towards large mergers and public procurement procedure and a general market investigation tool for all other market situations. The FSR will commence its implementation phase starting 12th July 2023 as of which the Commission will be able to initiate investigations. The obligation for companies to notify the Commission becomes effective as of 12th October 2023.

While the Regulation does not specify sensitive sectors, it sets out the possibility for the Commission to conduct market investigations into specific sectors, types of economic activity or foreign subsidy instruments to identify possible distortions and practices that are specific to a given sector, activity or subsidy

instrument. This may strengthen EU's approach to tackling unfair practices in sensitive sectors and thus contributes to securing the existing supply.

4.1.4.4 Corporate Sustainability Due Diligence (2022/0051(COD) – Proposed)

Building on the European Parliament's legislative initiative resolution of 10 March 2021 with recommendations to the Commission on corporate due diligence and corporate accountability (2020/2129(INL)), the proposal for a Directive on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937 (COM(2022)71 final) aims to foster sustainable and responsible corporate behaviour and to anchor human rights and environmental considerations in companies' operations and corporate governance (European Commission, 2022d). It addresses the adverse impact of private businesses on human rights and the environment. The increasing complexity and global nature of supply chains makes it challenging for companies to get reliable information on suppliers' operations. The fragmentation of national rules on corporate, sustainability-related due diligence obligations further slows down the take-up of good practices.

This Directive establishes a clear corporate due diligence duty. The core elements of this duty are identifying, ending, preventing, mitigating, and accounting for negative human rights and environmental impacts in the company's own operations, their subsidiaries, and their value chains. The Directive also introduces duties for the directors of the EU companies covered. These duties include setting up and overseeing the implementation of the due diligence processes and integrating due diligence into the corporate strategy.

The proposed Directive provides an example of direct synergies with existing and proposed internal instruments such as Conflict Minerals Regulation,⁷⁹ the European Commission's proposal for a Regulation on deforestation-free supply chains (COM(2021) 706 final),⁸⁰ its proposal for a new Batteries Regulation, and its proposal for a Regulation establishing a framework for setting eco-design requirements for sustainable products (Sustainable Products Initiative – SPI, COM(2022) 142 final). These linkages are explicitly noted in the communication of the instrument and its impact assessment. In addition to those, the instrument relates to the EU Green Deal and more broadly, the UN Sustainable Development Goals.

This instrument maps strongly on our assessment of internal and external synergies since it not only addresses risk, pertaining to global supply chains, but aims to align action with sustainability goals. Similarly, to some of the other instruments, the absence of concrete financial proposals to support implementation and enforcement raises questions on the effectiveness of the instrument to achieve these goals.

4.1.4.5 The Carbon Border Adjustment Mechanism (CBAM) (2021/0214(COD) Proposed)

The CBAM aims to equalize the price of carbon between domestic products and imports and ensure that the EU's climate objectives are not undermined by production relocating to countries with less ambitious policies. The main risk to address is carbon leakage as non-EU countries have less stringent environment and climate policies in place. The problem being addressed is the current system, comprising "the free allocation of ETS allowances to sectors at highest risk of carbon leakage and the possibility for Member States to give state aid to electro-intensive undertakings active in a sector exposed to international trade, compensating the higher electricity costs resulting from the ETS" (European Commission, 2021). The impact assessment of the CBAM notes that:

"the combination of competition in global supply chains and the provision of free allowances results in a reduced and uncertain carbon price incentive for climate-neutral production processes

⁷⁹ 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.

⁸⁰ European Commission Proposal for a Regulation on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010.

and for the efficient use and choice of materials in manufacturing and recycling. Furthermore, they result in a situation where carbon emissions embedded in goods placed on the EU market are not priced consistently, but depending on the material and its origin, thus limiting the incentives to reduce emissions.” (Idem).

The instrument aligns with goals set out in EU July 2021 Climate Target Package and has the overarching policy objective to address climate change challenges. At the same time, it aligns with the need to secure existing supply chains and the growing use of autonomous measures in the EU and partner countries. It provides the EU with a tool to rectify the increasing risk of other countries and companies’ manufacturing choices and ensuring that EU companies can continue benefiting from a level-playing field.

On 22 June 2022, the European Parliament adopted by 450 votes to 115, with 55 abstentions, its first reading amendments to the proposal.⁸¹ The dossier was referred to committee stage for inter-institutional negotiations. The main amendments adopted in plenary are as follows: In addition to the Commission's suggested goods, Parliament wants the CBAM to include organic compounds, polymers, hydrogen, and ammonia. Furthermore, CBAM should include indirect emissions, such as emissions from manufacturing energy, heating, or cooling. While the Commission's proposal calls for a decentralized hybrid system with 27 CBAM competent bodies, Parliament argues that a centralized CBAM authority would be more efficient, transparent, and cost effective. This would also aid in combating forum shopping by importers. The EU budget should receive the proceeds from the sale of CBAM certificates, according to Parliament. To achieve the CBAM's goal of reducing global carbon emissions and contributing to the EU's climate objectives and international commitments, including the Paris Agreement, the EU should finance the efforts of the LDCs to decarbonise their manufacturing industries with an amount at least equal to the revenue generated by the sale of CBAM certificates on an annual basis. The Commission shall monitor any changes in trade flows from LDCs caused by the CBAM on a regular basis to evaluate the Regulation's performance, particularly its contribution to avoiding carbon leakage and its impact on trade flows between the EU and LDCs. The CBAM shall be rigorously constructed and monitored by the CBAM authority and EU customs authorities to prevent, detect, and penalize any sort of circumvention activity, including misuse or fraud.

4.1.4.6 EU Enforcement Regulation for trade disputes

On 12 December 2019, the European Commission adopted a proposal to alter Regulation No 654/2014 of 15 May 2014 regulating the exercise of the EU's rights for the implementation and enforcement of international trade regulations (Enforcement Regulation). The Enforcement Regulation allows the EU to suspend or revoke concessions or other commitments under international trade agreements in response to violations of international trade laws by third countries that impair the EU's economic interests. The proposed amendments aimed to give the EU the authority to impose countermeasures when EU trade partners violate international trade rules and to obstruct the agreed dispute settlement procedures included in multi-lateral, regional, and bilateral trade agreements, preventing the EU from obtaining final binding rulings in its favour. The proposal was motivated by the fact that the assumption of a functioning second instance of the WTO Dispute Settlement Body, the Appellate Body, which was valid at the time of the original Enforcement Regulation's adoption, was no longer accurate, and that the EU's proposed temporary contingency solution was only applicable to a small number of WTO members. It also addressed the possibility of comparable obstacles in dispute resolution mechanisms under the EU's bilateral and regional trade agreements. Furthermore, the proposal underlined the EU's commitment to multilateralism and binding independent adjudication, and it attempted to avoid the Appellate Body's current paralysis from operating as an incentive for EU trade partners to undermine the international rules-based trading system.

⁸¹ Amendments adopted by the European Parliament on 22 June 2022 on the proposal for a regulation of the European Parliament and of the Council establishing a carbon border adjustment mechanism (COM(2021)0564 – C9-0328/2021 – 2021/0214(COD)), https://www.europarl.europa.eu/doceo/document/TA-9-2022-0248_EN.html.

The agreed changes to the Enforcement Regulation were in line with the new Commission's vow to place a special priority on properly implementing and executing international trade agreements, notably via the creation of a new post of Chief Trade Enforcement Officer. Trilogue discussions finished on October 28, 2021, with a preliminary agreement, which INTA approved on November 10, 2021. On January 19, 2021, Parliament approved the agreed-upon wording. Following Council approval, the modified Regulation went into effect on February 13, 2021.

The amended articles are 3, 4, and 10 of the Enforcement Regulation. First, the scope of the Enforcement Regulation (Article 3) is expanded to enable EU action in new instances when a trading partner's non-cooperation results in the absence of a binding final judgement in a trade dispute at the WTO or in the framework of regional or bilateral trade agreements. A WTO panel report decision upholding the EU's right of action; that an appeal under Article 17 of the WTO's Dispute Settlement Understanding (DSU) could not be carried out; and that the trading partner had not agreed to an interim arrangement for appeal arbitration under Article 25 DSU. In trade disputes involving bilateral or regional trade agreements, EU enforcement action is required if the trading partner fails to cooperate in the operation of a binding dispute resolution system, including by failing to designate arbitrators. Second, the change to Article 4 states that, in accordance with the EU's international law duties, EU countermeasures must be proportionate to the loss or harm of the EU's trade interests caused by the trading partner's violation of international trade norms. Third, the review provision is extended for another five years by the change to Article 10.

4.1.4.7 The Anti-Coercion Instrument (ACI) (2021/0406(COD) Proposed)

Building on a joint declaration of the Commission, the Council, and the Parliament on an instrument to deter and counteract coercive action by third countries, which was published together with the amended Trade Enforcement Regulation, the Commission tabled a legislative proposal on 8 December 2022 to counter the use of economic coercion by third countries. The proposed Regulation lays down rules and procedures in order to ensure "the effective protection of the interests of the EU and its Member States where a third country seeks, through measures affecting trade or investment, to coerce the Union or a Member State into adopting or refraining from adopting a particular act" (Article 1). In cases of economic coercion, the Commission can undertake the following options: direct negotiations; mediation, conciliation, or good offices to assist the Union and the third country concerned in these efforts; or submitting the matter to international adjudication (European Commission, 2021c).

The specific action required is securing existing supply. The Regulation's impact assessment (IA) takes into consideration concerns around supply chain disruptions and in particular, how the existence, threat and response to coercion may alter supply chains. The IA also points out that the ACI is seen as complementary to structural initiatives aimed at enhancing the resilience of the EU economy against external pressures (European Commission, 2021d). Finally, the IA points out that the Commission has identified a list of 137 possible strategic dependencies (out of 5200 products), where for 34 of these products, risk is higher because it is not possible to produce internally and there are few suppliers at global level. Thus, the instrument provides another tool for EU to take autonomous measure, recognising challenge of securing existing supply chains.

INTA endorsed its tentative amendments to the proposal on 13 October 2022. As a result, Parliament advocates for a wider concept of economic coercion to guarantee genuine deterrence. As a result, the ACI must also encompass the threat of measures by a third country, which counts as economic coercion, as well as any measure interfering with an EU policy decision, regardless of its form. Second, where necessary, EU remedies must be appropriate and fast, with the goal of not only ending coercion but also, if feasible, correcting the harm caused by coercion. Third, the rule of law must be protected by legal clarity and countermeasures that are consistent with international law. Parliament requests a system that balances the necessity for a quick response with the need of establishing timeframes for important procedural actions.

Fourth, the ACI countermeasures must consider the EU's economic and social cohesion and should not have a detrimental impact on it. Fifth, the ACI should be compatible with existing agreements addressing the extraterritorial impacts of non-EU nations' actions, such as the Blocking Statute. Finally, Parliament reminds the Commission that it will be kept informed at all relevant phases, from the examination to the continual review of EU actions, and that it will conduct democratic oversight on the instrument. However, against this backdrop, the issue of why Parliament favours the instrument of implementing acts over those of delegated acts for the Regulation's implementation emerges. After all, the opportunities for parliamentary examination would be more obvious in the case of delegated actions.

4.1.4.8 International Procurement Instrument (IPI)

The initial proposal for an IPI dates back to 21 March 2012 (COM(2012)0124). Parliament adopted its first reading on 15 January 2014 (T7-0027/2014). In the light of lengthy debates in the Council, the Commission forwarded an amended proposal in January 2016 (COM(2016)0034). EP approved the agreement by a large majority during its plenary session on 9 June 2022, and the Council formally adopted it on 17 June 2022. The IPI entered into force on 29 August 2022.

The Regulation establishes measures intended to improve the access of Union economic operators, goods and services to the public procurement and concessions markets of third countries (Article 1) (European Commission, 2016). It lays down procedures for the Commission to undertake investigations into alleged restrictive and discriminatory procurement measures or practices adopted or maintained by third countries against Union economic operators, goods, and services, and to enter into consultations with the third countries concerned. Article 1 also provides for the possibility of applying price adjustment measures to certain tenders for contracts for the execution of works or a work, for the supply of goods and/or the provision of services and for concessions, based on the origin of the economic operators, goods or services concerned. While this instrument has been in the planning for a long time, the timing of its re-introduction coincides with the risks set out in the Open Strategic Autonomy Strategy and the need to ensure that the EU can take action in all dimensions of trade policy (e.g., public procurement, investment, economic coercion, etc.).

The revised IPI implements the Europe 2020 strategy and the Europe 2020 Flagship Initiative on Integrated Industrial Policy for the Globalisation Era (COM(2010)614). It also implements the Single Market Act (COM(2011)206) and the Communication on Trade, Growth and World Affairs (COM(2010)612). It is a strategic initiative in CWP 2011 strategic initiative (COM(2010)623 final).

The revised IPI, like its predecessor, implements the Europe 2020 Flagship Initiative on Integrated Industrial Policy for the Globalisation Era, which takes a fresh approach to industrial policy, including “the whole value and supply chain must be considered, from access to energy and raw materials to after-sale services and the recycling of materials” (European Commission, 2010). These linkages established in the revised communication and the impact assessment highlight the balance between the risks of retaliation and escalation with the need to close off selectively EU's procurement markets. The instrument addresses the external dimension of EU's policies while impact on the internal dimension is indirect. Prior to the instrument's entry into force, anecdotal evidence suggests that it has allowed for the EU to negotiate better access for EU companies (Garnizova, 2019).

4.1.4.9 Trade Defence Policy

Additional external measures, which link to security of supply include trade defence measures (esp. anti-dumping, anti-subsidies, and safeguards). In this relation, Executive Vice-President and Commissioner for Trade Valdis Dombrovskis said:

“Defending European producers and workers against the damage inflicted by those who do not play by trade rules is essential. Ensuring fair trade is more important than ever in today’s challenging global environment and when security of supply is under threat. We cannot allow dumped or subsidised imports to damage EU industry. Therefore, the effective enforcement and implementation of our trade defence measures remains a top priority for the European Commission.” (European Commission (2022e))

Together with the Enforcement Regulation, the proposed Anti-Coercion Instrument and the International Procurement instrument, the EU’s actions on trade defence support the EU’s capacity to act in countering coercive and extra-territorial actions and bridge the capabilities-expectations gap.

4.1.5 Commodity Agreements and the GSA

The EU is a member of international commodity bodies for tropical timber, grains, sugar, olives, coffee, copper, and cocoa. These bodies are tasked to monitor markets, price volatility and providing for market transparency, promoting sustainability, and addressing critical export dependencies. They are closely linked to UNCTAD and its work in the area of commodities.⁸² While, in principle, they could address the vulnerabilities as discussed here, the existing commodity bodies as mentioned before only cover commodities, which are not critical from the point of view of the EU. They thus only have a limited relevance in view of the current supply chain vulnerabilities as discussed here. Their mechanisms and instruments are of limited value in this context. For this reason, it would be futile to suggest establishing new commodity agreements for today’s most critical commodities and raw materials.

Since late 2021, the United States and the European Union have been negotiating a climate-related trade arrangement for the steel and aluminium industries. President von der Leyen and President Biden agreed to begin negotiations on a Global Arrangement on Sustainable Steel and Aluminium (GSA) to accomplish the decarbonisation of the global steel and aluminium sectors. The two Presidents also agreed to put the bilateral WTO disputes over steel and aluminium on hold. Following the declaration by the United States to lift Section 232 tariffs on EU steel and aluminium exports up to previous trade levels, the EU said that it will halt its rebalancing measures against the United States. The Global Arrangement, according to the joint EU-US Statement of October 31, 2021,⁸³ will attempt to maintain the long-term survival of these industries, boost low-carbon intensity steel and aluminium production and trade, and restore market-oriented circumstances. All like-minded partners are welcome to join the arrangement.

Based on this revelation, the Biden administration sent to the EU on December 7, 2022, a proposal for the formation of an international consortium to encourage trade in metals produced with lower carbon emissions, while putting tariffs on steel and aluminium from China and elsewhere. The concept paper published by the US Trade Representative is the first concrete look at a new sort of trade agreement that the Biden administration sees as a cornerstone of its trade policy strategy. The proposed Global Arrangement on

⁸² The EU is a member of several international commodity agreements, which are designed to regulate the trade and production of specific commodities. The EU is a signatory of the International Coffee Agreement, which aims to promote the sustainable production and trade of coffee. The EU is also a signatory of the International Sugar Agreement, which aims to stabilize the sugar market by regulating production and trade. The EU is a signatory of the International Grains Agreement, which aims to promote the stability of the international grains market through cooperation on production and trade. The EU is a signatory of the International Rubber Agreement, which aims to promote the stability of the rubber market through cooperation on production and trade. The EU is a signatory of the International Tin Agreement, which aims to promote stability in the tin market through cooperation on production and trade. The EU is a signatory of the International Wheat Agreement, which aims to promote the stability of the wheat market and to reduce the possibility of severe fluctuations in the world wheat prices. These agreements typically involve cooperation among member countries on issues such as production quotas, tariffs, and price stabilization mechanisms. The EU is also member of other agreements such as the International Cocoa Organization, the International Olive Council, the International Organization for Vine and Wine, or the International Tropical Timber Organization.

⁸³ https://ec.europa.eu/commission/presscorner/detail/en/IP_21_5724.

Sustainable Steel and Aluminium would use the strength of US and EU markets to attempt to boost local industry while simultaneously mitigating climate change. To do this, member countries would agree to apply a series of taxes on metals produced in ecologically hazardous methods. The charges would be directed at the People's Republic of China and those nations that did not join the organization. Participating nations would benefit from more advantageous trade conditions among themselves, particularly for cleaner-produced steel and aluminium. Countries would have to verify that their steel and aluminium sectors satisfied specified emissions requirements to join the agreement. Furthermore, governments would be required to agree to not overproducing steel and aluminium, which has pushed down global metal prices, as well as to curb activities by state-owned firms, which are frequently used to transfer subsidies to foreign metal manufacturers. While China is not mentioned in the concept paper, these conditions appear to preclude it from becoming a member.

The concept paper suggests a tiered tariff structure that would increase with the amount of carbon released during the manufacture of a certain steel or aluminium item. Any product originating outside of the consortium would be subject to additional levies. Tariffs would begin at zero for the cleanest products from member countries. Aside from that, the report does not identify rates, instead referring to them as X, Y, or Z. The standards for tariff rates and consortium participation are intended to rise over time to encourage nations to continue cleaning up their sectors. The agreement aims at incentivizing industry globally to decarbonise as a condition of market access, according to the New York Times. Clearly, the GSA draft wants to utilize the strength of the US and EU markets to accelerate global steel decarbonisation.

So far, no US trade deal has included explicit limits for carbon emissions, and negotiators have had a lot of material to cover in order to reconcile the diverging US and EU economic approaches to climate change mitigation. According to the New York Times (7 December 2022⁸⁴), which had access to the US concept paper, an EU official declined to comment "on the details of an active negotiation but said the two sides were discussing ways to continue and deepen their work on the arrangement." The US trade representative, Katherine Tai, termed the GSA endeavour "one of the most significant things that we're working on between the US and the EU in terms of trade." According to European Trade Commissioner Valdis Dombrovskis, the methodologies developed by the US and the EU to quantify the carbon footprint of steel and aluminium might be applied to other products as part of a new trans-Atlantic effort on sustainable trade that the countries agreed to undertake.

Of course, the proposed GSA may help to promote sustainable production by establishing international standards to reduce the environmental impact of steel and aluminium production, as well as promote labour rights, safety, and standards. It clearly has a potential to facilitate trade as it aims to remove trade-distorting practices and reduce tariffs and non-tariff barriers, which could make it easier for participating countries to trade in steel and aluminium, and to expand markets for steel and aluminium. Moreover, the GSA aims to foster cooperation among participating countries by encouraging dialogue, information exchange, and capacity building. By adopting sustainable and fair practices, the Global Arrangement could also improve the competitiveness of steel and aluminium producers and exporters worldwide, which would potentially benefit the economies and the industry in general. Finally, the GSA has the potential to create a level playing field, based on common standards and rules, which will provide a more predictable and transparent environment for industry stakeholders, including companies, workers and their unions, communities, and investors. If the US and the EU proceed with the US' GSA concept paper, there will almost certainly be a heated debate over where tariffs are placed and how carbon emissions are quantified. The creation of a widely acknowledged technique for calculating the quantity of greenhouse gas emissions in

⁸⁴ Ana Swanson, "U.S. Proposes Green Steel Club That Would Levy Tariffs On Outliers", NYT, 7 December 2022, <https://www.nytimes.com/2022/12/07/business/economy/steel-tariffs-climate-change.html>.

the manufacture of any given product is still in its early stages, and much more data at the level of specific goods and enterprises would be required.

While both the US and the EU have expressed interest in expanding the GSA consortium's membership to any country that can meet its high standards, it is unclear how the arrangement might irritate allies in the short term if countries such as Australia, Canada, Japan, or South Korea are initially excluded. The planned buyers' "demand oligopoly" might possibly provoke retribution from China or be challenged at the World Trade Organization, which mandates its members to treat one another fairly in trade.⁸⁵ Finally, a GSA may result in an oligopsony trying to lower the bargaining power of sellers and/or producers. While such institutions may delight labour unions and environmental advocacy organizations, they are also likely to frustrate free trade proponents on both sides of the Atlantic: Instead of repealing the global steel and aluminium tariffs imposed by the Trump administration in 2018, the GSA proposal would replace them with a new global tariff system based on climate concerns. Because the GSA is still in its early stages, the disadvantages will be determined by the contents of the final agreement. However, without getting into the specifics of the club's size and membership requirements, several potential drawbacks may be identified: Setting and adhering to international standards for sustainable manufacturing may be expensive for steel and aluminium companies, particularly in smaller and less developed nations. Furthermore, the consortium may not be equally binding or accessible to all nations, thereby resulting in unequal participation and an uneven playing field. Second, without the cooperation of key steel and aluminium producing countries, the initiative's influence may be restricted and will not adequately solve the steel and aluminium sector's difficulties. Finally, the GSA might cause a rise in manufacturing costs for steel and aluminium companies, which could contribute to higher final product prices, making them less accessible for consumers. Depending on the final agreement's parameters, the project may also confront implementation, monitoring, and enforcement challenges, and a lack of political will or technical competence in certain nations may limit its efficacy. It is crucial to remember that these are potential drawbacks that will be determined by how the project is developed and executed. The real effect of the effort will be decided by the agreement's contents, as well as nations' desire and capacity to adopt and comply with its requirements.

4.1.6 Free Trade Agreements

Part I reviewed a range of ongoing negotiations and existing FTAs with key trading partners, which may be relevant to critical supply chain materials. Here we look at the proposed texts of the negotiations for modernised and recently signed FTAs to look at how the EU is addressing the vulnerabilities identified.

Table 18 in the Appendix provides a screening of whether each of the FTAs finalised or proposed includes an explicit chapter for trade and cooperation relating to energy and raw materials; a reference to supply chain vulnerabilities in any way, and a reference to any of the major supply chain risks (diversification, sustainability, specific sectors). Based on this screening and the commissioning request by the European Parliament, we focused on nine partners / groups for in-depth review.

⁸⁵ Generally, in a demand oligopoly, a small number of actors (firms or states) dominate the market and have some control over the price of a product or service. Advantages of such a demand oligopoly firstly include high barriers to entry: The high market share and economic power of the club makes it difficult for outsiders to enter the market, which can result in higher profits for existing firms from within the oligopoly. Secondly, larger firms in an oligopoly can often take advantage of economies of scale, which may result in lower costs and higher efficiency. Thirdly, oligopolies have limited competition, which means that firms from within the club do not have to engage in intense price competition, which can result in higher profits. However, one should also bear in mind the disadvantages of a demand oligopoly: Firstly, limited competition within the club also means that there is less incentive for undertakings to innovate and improve their products or services, and they may also not act in the best interest of the consumer. Secondly, oligopolies may be able to charge higher prices for their products or services than would be possible in a more competitive market. Thirdly, given that an oligopoly achieves a market dominance, lack of choice for the consumer may exist. Finally, the concentration of market power in the hands of a few actors can raise concerns about antitrust violations, and governments from outside the club may intervene to regulate or break up oligopolies to promote competition.

In the academic literature, EU FTAs are recognised as an important tool to deliver a range of trade and non-trade policy objectives (Garnizova, 2019). Our screening highlights that beyond tariff elimination and controlling export restrictions, FTAs are a core policy instrument to address supply chain vulnerabilities, particularly due to their institutional features, possible capacity building allocations, as well as implementation and enforcement. We elaborate on these key features in Table 18 of the Appendix.

Table 15. Selected EU FTAs and global value chain vulnerabilities

Partner country/ countries	Key features addressing global value chain vulnerabilities
ACP countries	<p>Vulnerabilities: environmental and climate change-related challenges, economic shocks, conflicts and political crises and epidemics and pandemics; transparency of energy markets</p> <p>The Negotiated Agreement text initialled by the EU and OACPS chief negotiators on 15th April 2021 mentions promoting sustainable energy; energy security, and fair and non-discriminatory access to the sustainable extraction of and trade in minerals and raw materials.</p> <p>„Clean, diverse, cost-effective and sustainable energy technologies, with a focus on renewable and low-emission energy technologies“ and the promotion of Africa-EU partnerships;</p>
Australia	<p>Vulnerabilities: security and reliability of supply of energy and resources is mentioned as a principle in the draft chapter; under environmental impact assessment, the vulnerability of the project to risks of major accidents and/or disasters must be assessed; reduce or eliminate trade and investment distorting measures affecting energy and raw materials.</p> <p>Environmental sustainability is a key objective; focus on developing sustainable capacities.</p> <p>Draft chapter on energy and raw materials, includes: the right to adopt, maintain and enforce measures necessary to securing the supply of energy goods and raw materials; prohibition of dual pricing; access to energy transport infrastructure, including renewable energies.</p> <p>Cooperate to reduce or eliminate trade and investment distorting measures in third countries affecting energy and raw materials; strengthen cooperation on raw materials. Coordinate their positions in international fora, foster exchange of market data.</p>
Chile	<p>EU proposed and parties discussed chapter on Cooperation on Energy and Raw Materials.</p> <p>Insecurity of supply of energy and raw materials identified as a risk.</p> <p>Vulnerabilities: security and reliability of supply of energy and resources is mentioned as a principle in the draft chapter; reduce or eliminate trade and investment distorting measures affecting energy and raw materials.</p> <p>Cooperation on securing existing supply chains and developing sustainable capacities.</p> <p>Environmental sustainability is a key objective. Focus on renewable energy sector.</p> <p>Focus on developing and supporting Chile's National Green Hydrogen Strategy and the EU Green Pact.</p> <p>Safeguard the regulatory space for emerging industries.</p>
Indonesia	<p>Proposed chapter on Cooperation on Energy and Raw Materials</p> <p>Vulnerabilities: challenges related to the international production of and trade in raw materials and energy highlighted; reduce or eliminate trade and investment distorting measures affecting energy and raw materials.</p> <p>Aiming at developing and promoting sustainability.</p> <p>Promote the principle of responsible sourcing and mining globally.</p> <p>Focus on renewable energy sector; promote trade in sustainable energy goods such as renewable energy and energy efficient.</p>
Mercosur	<p>No explicit chapter on energy and raw materials, COM considers some text proposals in trade in goods / service to address the issues.</p>

	<p>No mention of energy and raw materials supply chain and its vulnerabilities.</p> <p>Focus on facilitating access to overall raw material inputs (hides, soya, etc) for the industries in the EU and Mercosur region.</p> <p>Trade and sustainable development provisions exist; under the TSD chapter responsible supply chains are mentioned (focus on environment, climate, labour issues and human rights issues).</p>
New Zealand	<p>Proposed chapter on energy and raw materials.</p> <p>Securing the supply of energy goods and raw materials</p> <p>Vulnerabilities: reference to offshore safety and security of oil and gas operations (high standards of safety and environmental protection); under environmental impact assessment, the vulnerability of the project to risks of major accidents and/or disasters must be assessed; reduce or eliminate trade and investment distorting measures affecting energy and raw materials.</p> <p>Sustainable production of raw materials identified as a key objective.</p> <p>Promote the values of responsible sourcing and mining globally to the fulfilment of the UN Sustainable Development Goals.</p> <p>Focus on energy generation from renewable resources and green technologies.</p>
Turkey	<p>Ankara Association Agreement (1963) and Customs Union Agreement (1995) – No revisions of texts and no chapter on energy and raw materials.</p> <p>In December 2016, the Commission proposed to modernise the Customs Union and to extend bilateral trade relations to areas such as services, public procurement, and sustainable development. However, the Council has not yet adopted the negotiation mandate.</p>
Southern Mediterranean	<p>The European Commission's Joint Staff Working Document focuses on the green transition including the energy sector – flagship 10 focus on energy transition and energy security; no mention of critical raw materials.</p> <p>Considering a dedicated chapter on trade and sustainable development.</p> <p>Focus on open strategic autonomy and the restructuring of global value chains in the wake of the pandemic.</p> <p>Flagship 5 focuses on sustainable value chains and cluster.</p> <p>The EC's Joint Staff Working Document focuses on the green transition including the energy sector – flagship 10 focus on energy transition and energy security.</p> <p>Focus on renewable energy sector</p>
Ukraine	<p>The 2016 Association agreement contains a specific chapter on trade-related energy, energy cooperation including nuclear energy, and mining and metals.</p> <p>Vulnerabilities: the risk of accidental interruption, reduction or stoppage of transit and transport of energy goods; address potential energy crisis situation; discriminatory energy market.</p> <p>Focus on the electricity sector, the hydrocarbons sector, and gas.</p> <p>Focus on the integration of the Ukrainian electricity network into the European electricity network.</p> <p>Facilitate and promote trade and foreign direct investment in environmental goods, services and technologies, sustainable renewable-energy and energy-efficient products and services, and eco-labelled goods.</p>

Source: own elaboration. The table is not conclusive on all aspects of the agreements, rather it outlines key features.

4.2 Synergies between internal and external policies

Given the global context and the trade dimensions of supply chain disruptions and the EU's dependencies, as well as its aim to gain strategic autonomy, internal and external policies have to go hand in hand to unlock their full potential. Such situation goes far beyond a mere absence of conflicts or inconsistencies and requires some measure of mutual support. This in turn can be said to exist, where internal and external measures are in sync.

4.2.1 Matching by objectives

In determining a sync or lack of it, the objectives of the instruments are key. From this point of view, the internal and external instruments may be broken down into three distinct categories, and the following correlations can be formed between the various types of internal and external measures:

Table 16. Mapping of objectives and external and internal instruments

Objectives	Internal Instruments	External Instruments
Strategic autonomy and transition to green economy	The European Council conclusions of 5 April 2022, which extend strategic autonomy to the economic and financial sector The updated 2020 EU Industrial strategy InvestEU Programme Directive on Corporate Sustainability Due Diligence IPCEI Hydrogen Technology "Hy2Tech" Foreign Subsidies Regulation	The EU's Trade Policy Review – the new EU Trade Policy EU's framework for screening FDIs International Procurement Instrument (IPI) CBAM EU-Southern Mediterranean Association Agreements The EU-US Trade and Technology Council EU ACP Negotiating Directives
Energy Autonomy and Resilience; EU Green Deal goals	The EU Energy Union Package REPowerEU Initiative Security of Gas Supply (SoGS) Regulations (EU) 2017/1938 The European Commission's 'fit for 55' package adopted in 2021	The Africa-EU Energy Partnership EU Egypt Israel Memorandum of Understanding The Energy Community Treaty The Anti-Coercion Instrument (ACI)
Resilience in critical raw materials and products	European Chips Act The Industrial Alliance on Processors and Semiconductors IPCEI on Microelectronics IPCEI on EUBATTIN IPCEI on European Partnership for Batteries (BATT4EU)	European Raw Material Alliance (ERMA) International Tropical Timber Agreement International Grains Council International Sugar Agreement International Agreement on Olive Oil and Table Olives International Coffee Agreement International Copper Study Group International Cocoa Agreement

As Table 16 indicates, there is an explicit sync between internal and external policies with the majority of instruments linking the internal / external dimensions.

4.2.2 Findings of detailed assessment of synergies

A more detailed assessment on various dimensions of the instruments and the interplay between internal and external measures has been undertaken instrument by instrument.

We have reviewed the following:

- Total FTAs – 49 FTAs, which are either signed or under negotiation, out of which we selected 14 for in-depth review in Table 15 based on criteria we outlined in the previous section. Full list is in Table 18 in Appendix.

- Total EU policy instruments – 34, based on Parliament’s commissioning request and our screening, out of which we selected seven for in-depth review in Table 14. Full list is in Table 19 in Appendix.
- In sum, we have reviewed 83 instruments. For analytical purposes we discuss these separate.

The most relevant findings can be highlighted as follows:

1. **A wide range of potential addressees:** the bulk of EU policy instruments are directed at both the EU and international actors;
2. **Securing existing supply chains as the overarching objective:** out of the seven instruments in review, all of them have identified securing existing supply as either a primary or a secondary objective. Three of the instruments are focusing on the diversification of foreign sources, and four are concentrating on the development of sustainable capacities.
3. **Sustainability as the long-term aim:** the majority of instruments have highlighted establishing sustainable capacity (at home and/or abroad) as a significant objective;
4. **Not designed to encourage reshoring:** Just two tools, the EU's framework for screening foreign direct investments and the InvestEU Programme, have a clear emphasis on onshore supply chains;
5. The extent to which these instruments can be implemented and enforced: Our evaluation draws attention to a possible weakness in the implementation and enforcement of these instruments. **Just approximately a third of the documents contain legally enforceable provisions, while the other two demand nothing more than best efforts.** In a similar manner, the majority of instruments are to be implemented by the EU and the other signatories to become effective. As a result, the majority of instruments do not depend simply on the activity of the EU, but rather on the collaboration of the partners. The appointment of a Chief Trade Enforcement Officer is a significant step forward for the organization, as we shall see in the next section.

Chapter 3 of the analysis already highlighted three key issues relevant for the internal-external synergies.

- Firstly, there has been growing recognition that one of the major actions to addressing and mitigating supply risks is through diversifying primary and secondary supply sources via responsible and sustainable sourcing from non-EU countries, combined with removing international trade distortions and strengthening rules-based open trade (resilience).
- Secondly, there is a growing awareness and adjustment to the expected demand in line with the EU’s climate and energy ambitions, which pose challenges to sourcing. The reasons are not only the absence of some CRM materials from the EU, but also a concentration of CRM materials in only a limited number of territories, who supply all countries.
- Thirdly, we showed that the current network of signed FTAs, EPAs, and plurilateral agreements do not fully cover the need for access to CRM and expected future needs.

4.2.3 Synergies by risk dimensions: the area of trade and investment

The empirical evidence from our screening suggests that proposed instruments and ongoing negotiations do effectively acknowledge the linkages across internal and external risks by focusing on six risk dimensions:

- **Trade and investment:** Trade barriers and limited market access, especially in the energy sectors; limited diversification of value chains and sourcing; limited enforcement of international sustainable standards;
- **Raw materials and energy:** Shortages of key raw materials and resources (gas and CRM); high external dependence of key sectors; lack of single regulatory space in the energy and critical raw material sectors; threat to EU’s strategic interest;
- **Geopolitics and Geoeconomics:** Rising geopolitical tensions and fragmentation; limited cooperation with important CRM partners; relations between Russia and China and relations with them; high incidence of risk for vulnerable sectors;
- **COVID-19 pandemic and the following economic recovery;**
- **Climate change and natural disasters; including food insecurity;**
- **Technology and Innovation:** technological evolution and cyber-attacks.

Moreover, our screening underlines that the EU has already taken action to address these gaps by working on each of these dimensions, where the response to the COVID-19 pandemic and economic recovery in the short-term are combined with the long-term ambitions for GVC diversification and sustainability. Most actions have been taken in the area of trade and investment, not only due to the EU's exclusive competence but also in the light of EU's extensive bargaining power.

In the inter-institutional space, the appointment of the Chief Trade Enforcement Officer (CTEO) in 2020 acknowledged the need to strengthen the implementation of the EU's multilateral, regional and bilateral trade agreements and ensuring that countries implement commitments as set out in their bilateral trade agreements. The introduction of the CTEO has been paralleled with concrete proposals on implementation and enforcement ranging from the Anti-Coercion Instrument to Trade Defence Instruments.

In addition to identifying direct versus indirect impact, we also assess whether the impact has been major or minor. Trade instruments have focused on:

- strengthening the implementation and enforcement of trade and trade-related commitments;
- introducing new or revised instruments, which target specific foreign activities, which may reduce EU access to CRM and which address trade and investment distortions;
- negotiating new FTAs and modernisation of existing FTAs in line with the need to remove import tariffs, reduce export restrictions such as export taxes or export quotas, as well as reduce regulatory barriers to trade;
- working with partners and with international organisations to prevent distortions; and
- addressing challenges in investment policy, which preclude investment on raw materials and developing commercial interests.

There are also specific actions taken in investment in terms of streamlining investments in renewable energy and sustainable methods of production of critical materials.

4.2.4 Synergies by risk dimensions: raw materials and energy risks

In addition to the actions in trade and investment, a second group of instruments pertain to mitigating specific raw materials and energy risks. These actions include:

- converging national, international, and multinational policies in renewable energy, critical raw materials, and supply chain resilience – towards and within a single regulatory space;
- securing access to EU energy needs; and
- reducing dependence on non-renewable energy.

As Part I previewed, some of the instruments reviewed here link directly to other areas but have implications for GVC diversification and resilience. For example, the risks associated to climate change have driven action in mitigating climate change impact; meeting EU's climate commitments and goals; and finally, capacity building within the EU and foreign partners to drive new innovations and meet sustainability standards. Climate change is one of the policy objectives, which relies on multiple synergies and may have major implications for supply chains. This also relates to technological challenges and the need to build the EU's capacity in technology and innovation.

Finally, the risks listed above have a strong geopolitical component and require political engagement and solutions in terms of strengthening regional cooperation and external partnerships, and of preserving the EU's strategic interests and outreach.

4.2.5 Assessment of synergies: focus on impacts

According to the screening, the **EU-US TTC** may have a direct and major impact in this regard. Moreover, using our additional dimensions, we rank the TTC as having a positive and long-term impact. The relevance of the EU-US framework is clear, but it has been difficult to define the right platform for linking internal and external objectives in EU-US relations.

A potential synergy on the multilateral level is for the EU and the US to put forward joint initiatives around areas, where the EU and the US have an agreement on specific standard, product, and sectoral-level modifications. The existing literature and evidence suggest that the transatlantic relationship defines the shape of the overall global economy since for most countries, either the EU or the US is the largest trade and investment partner. This entails that the EU and the US can extend to other partners their agreed approaches e.g., semiconductors' approach identified above.

At the same time, one thing to note is the absence of the issue of secure supply chains in other high level bilateral engagement such as the recently held second High-level Economic Dialogue (HLED) between the EU and Japan. According to the briefing, the Ministers have only discussed the EU-Japan Connectivity Partnership and increasing synergies between the EU Global Gateway strategy and Japan's infrastructure and energy projects in third countries (European Commission, 2022). This absence highlights potential synergies moving forward where dialogues with key partners may be used to address supply chain concerns. We review this by looking at EU's existing and proposed FTAs.

Moreover, one area of importance for the EP is its active participation in such a forum and strengthening its relations with legislative branches in other countries, starting with the US. One of the rationales for this is ensuring continuity of initiatives beyond the term of the Executive Branches, but also ensuring the prioritisation of the EU-US relationship in Congress – here the rationale is that with US's Asia pivot and focus on strategic initiatives with partners elsewhere, there might be less monetary and time focus on the EU-US relationship. One of the difficulties moving forward will be for the EU to ensure US' interest in global supply chain management and resilience. As we highlighted in the table above, the TTC creates linkages to a range of external and internal policies and has the prospect to reinforce all three areas of action under EU's Trade Strategy.

In terms of the proposed **Corporate Sustainability Due Diligence** directive, the in-depth assessment suggests a direct and major impact, as well as positive impact in the long term. The IA in support of the Directive takes a detailed look into the synergies between internal and external aspects. It can serve as a template for other, similar measures since the Directive directly contributes to enhancing sustainability regarding all aspects of supply chain management. It is geared to address environmental adverse impacts and will apply to value chains of additional minerals currently not covered in the Conflict Minerals Regulation but possibly involving a similar adverse impact to human rights, climate, and the environment. It aims to complement the Batteries Regulation by introducing a value chain due diligence related to raw materials that are not covered by the Regulation but without requiring certification for placing the products on the EU market. It also complements the Regulation on deforestation-free products by introducing a value chain due diligence related to activities that are not covered by the Regulation on deforestation-free products but might be directly or indirectly leading to deforestation.

Regarding the FDI Screening directive, the assessments point to a direct albeit minor impact since critical supply chains are one aspect, addressed by the instrument. The assessment ranks the impact as minor based on the latest report published in September 2022. We note that the instrument does not interfere with the EU's openness – the report states that **less than 3 % of transactions result in an opinion from the Commission**, where the focus remains on security and public order. The European Union monitors the top five countries for the ultimate investor notified where in 2021 these were the US, the UK, China, the Cayman Islands and Canada. Importantly, it shows that Russian FDI accounted for less than 1.5 % of the cases and Belarus for 0.2 %. FDI covers a wide range of sectors, mostly manufacturing (44 %) which cover a diverse set of industries including defence, aerospace, energy, health and semiconductor equipment, and Information and Communications Technologies (European Commission, 2022f).

The **CBAM proposal** has a major but indirect impact since the EU's climate change ambitions have significant expected demand repercussions (as indicated in Part I). The CBAM instrument has the potential to

rewrite existing supply chains by addressing climate leakage, which is its primary aim. In terms of magnitude, the fact that it applies extra-territorially to all EU partners entails a potentially major impact on EU and global supply chains.

Finally, the revised **Public Procurement Instrument** has been in the pipeline for over 10 years, and it is perceived to have strengthened EU's bargaining power with third countries. Despite this anecdotal evidence, the impact is indirect since it does not cover critical supply materials, other raw materials, and energy explicitly. The impact can be perceived as long-term and positive, especially if it contributes to the expansion of the Global Procurement Agreement.

4.3 Interim conclusions

The efforts of the EU to reduce its dependency from natural gas as reflected in the Security of Gas Supply regulation and its amendments as well as the REPowerEU initiative should be complemented by more efforts to jointly purchase, stock, and distribute natural gas and LNG.

More generally, the EU should increase its efforts to cooperate with third countries in energy infrastructure and the promotion of renewable energy.

In view of EU initiatives to reduce its dependencies in the area of critical raw materials and products (chips and batteries), the EU should intensify its cooperation with third countries. The EU's trade policy should continue to focus on reducing the bloc's dependence on only a few suppliers for critical raw materials and related products. This could include negotiating new bi- and plurilateral trade and investment facilitation agreements with countries that are major extractors or producers of these materials, as well as strengthening existing agreements to secure more stable and predictable access. In addition, the EU should intensify to establish strategic partnerships with these countries to promote sustainable extraction and processing of these materials, and to develop joint research and development projects. Additionally, the EU should also continue to cooperate with other countries and international organizations to promote sustainable extraction and processing of critical raw materials and products, and to develop alternative materials and technologies. Furthermore, the EU should consider including more stringent sustainability criteria in its trade agreements and strategic partnerships to ensure that resources are extracted and processed in an environmentally and socially responsible manner. The EU could also focus on supporting the development of raw materials sectors in developing regions to increase the resilience of the EU economy to supply disruption.

When considering the conclusion of new or modernization of existing trade and investment agreements, the EU should consider the relevance of potential parties in view of supplies of energy and raw materials as outlined in chapter 3. In addition, the EU should propose to insert dedicated chapters on energy, raw materials, and co-operation in sustainable recycling.

5 Challenges of and potential for future synergies in EU Supply Security

This chapter is to address shortcomings of the existing political and legal frameworks as well as of international agreements, engagements, partnerships, and initiatives. For identifying weaknesses in trade in relation to GVC, chapters 3 and 4 analysed several factors that potentially impact on the EU's trade policy regarding GVCs. We have looked at the geopolitical and geo-economic risks that exist in the GVC for (critical) raw materials with a special focus on those that play a central role in the EU's efforts towards electrification, de-carbonisation, and the implementation of the Green Deal. Second, we provided for a comprehensive overview on how non-EU supply chains can be secured and made crisis-proof through diversification of countries of delivery. Chapter 4 also analysed the existing measures to promote new technologies and innovation that can lead to greater independence from imports of (critical) raw materials and make them more competitive with raw materials from third countries.

We examine which strategies in dealing with dependencies and potential sudden supply disruptions are considered appropriate by the research and economic partners around the globe. One sector that has received a lot of public attention in recent years is rare earth supply chains, where the EU is heavily dependent on imports and has little to no internal resources. We analyse the approach proposed by Salim et.al. on responding to dependencies in the rare earth sector in order to elaborate and discuss the main external and trade policy strategies to reduce dependency (Salim et.al. 2022). Likewise, we investigate approaches of different countries to reduce dependency using rare earth (Bartekova/Kemp 2016).

Regarding external policy strategies, supply chain diversification is seen as one of the most promising approaches to reduce dependencies and boost resilience against GVC disruption. We give an overview of supply chain diversification prospects for the EU in key sectors. Building on this analysis, we explore potential instruments for the EU's internal and external economic and trade policies to ensure more resilient global value chains in strategic sectors of the EU. Based on a sound review of literature with a focus on position papers and larger – scenario and forecasting – studies of academia, business and industry, NGOs and civil society organisations, and the EU's own inter-institutional think tank exercises within the European Strategy and Policy Analysis (ESPAS), we identify proposals for updating existing or developing new trade instruments (both internal and external) that aim at making the EU's supply chains more resilient to external shocks and disruption. By the same token, we address the question on how the EU could become more resilient in dealing with fast emerging challenges to international trade, e.g. sudden supply shocks in agricultural products due to trade disruption through international conflict. Here, we take key initiatives such as the Essential Goods Monitoring Initiative (EUI et.al. 2021), or the UNCTAD-ESCAP-WTO (2021) paper on "Readying regional trade agreements for future crises and pandemics" to address ways to help the EU to cope with disruption risks by means of international trade policy (see also Espitia, A., N. Rocha and M. Ruta 2020; Ciuriak, D. et al. 2020).

We screen and synthesize means to adapt to potential GVC disruptions in a systematic, based on our three dimensions of securing, diversifying, or substituting, by e.g.

- preventing export restrictions and price discrimination by actively using and developing further WTO disciplines, tackling today's trade agreements' specific exception clauses that allow parties to take exceptional measures in the event of a crisis to prevent the introduction of restrictive trade measures that may exacerbate supply chain disruptions under crisis,
- introducing new commitments in international agreements to reinforce the capacity of supply chains to operate during a crisis and to prevent the introduction of harmful measures (such as lim-

iting trade and investment policy discretion on essential goods; enhancing trade facilitation practices and regulatory cooperation; or creating ex-ante consultation mechanisms and cooperation in crisis situations (OECD 2022),

- assessing the means and potential to jointly respond to supply disruptions and critical shortages to keep markets open under crisis or emergency rule at bilateral, plurilateral or multilateral levels,
- promoting the diversification of supply chains by providing adequate coverage of supplier states under existing or new trade agreements in view of trade and investment facilitation,
- fostering bilateral, inter-regional, plurilateral or multilateral trade agreements with regard to commitments to keep markets open under crisis or emergency rule,
- tackling today's trade agreements' specific exception clauses that allow parties to take exceptional measures in the event of a crisis to prevent the introduction of restrictive trade measures that may exacerbate supply chain disruptions under crisis.

Building on our research results in the previous chapters, we can identify the limits of the EU's open strategic autonomy by highlighting vulnerabilities and critical goods that are heavily 'problematic' and least likely to be fixed even in the light of improved synergy in internal and external trade policy. The EU currently discusses ways to mitigate potential and lasting shortage by means of optimising the supplier portfolio to allow businesses to integrate their production processes vertically by taking over suppliers or using platforms of supplier aggregates run by investment funds. In this regard, the EU points to due diligence obligations since they gain in relevance precisely during such processes of reorganising production and supply.

5.1 The effects of the COVID-19 pandemic

European industries began reporting concerns in February 2020 owing to the Corona virus's spread in China. Lockdowns and other public health measures slowed commerce and the economy. Disruption extended along global supply networks, and limited movement of people, especially logistics workers, grounded airlines. Most affected were transnational, complicated GVCs. The largest economic depression was followed by the strongest comeback in the third quarter of 2020, with EU GDP and total goods trade with third nations growing rapidly. Most supply networks recovered quickly and were less impacted by subsequent waves of the pandemic. However, the economic recovery caused a second supply chain crisis during the epidemic. Global consumption rose due to stimulus programmes, unspent savings, and pent-up demand. Many firms underestimated the extent and pace of the comeback and didn't place enough medium- and long-term orders. Closures of industries and ports in areas with lower vaccination rates (or more infectious strains) and a reduction in air traffic created bottlenecks in supply chains. Recent figures suggest that global manufacturing delivery times are at a 23-year high. Parts, intermediate items, and products from Asia to the EU and USA are particularly affected. Two in five European firms report material and equipment shortages, the highest rate since Eurostat began its business surveys in 1985. Skyrocketing demand also led to soaring container costs internationally and on the China-northern Europe route. Shipping firms can't immediately extend their fleets since container ships have limited room. Delays at ports (ships wait six days to arrive in the EU's largest port, Rotterdam) and a scarcity of containers trapped at crowded ports or inland owing to inadequate personnel and drivers further reduce overall capacity.

Overall, then, GVC disruptions cause macroeconomic hazards. According to the European Central Bank, supply chain linkages transmit global shocks. Supply, intermediate goods, and manufacturing input disruptions hurt the EU's trade balance by reducing exports more than imports. The disruptions may have broader effects. Recent research found that supply chain disruptions caused a fourth of the pandemic-related real GDP decrease. In its October 2021 World Economic Outlook, the IMF lowered growth expectations, citing supply chain disruptions as one of the key causes. The Euro area posted its best growth rate in 15 years in July 2021, but this was followed by three months of falling growth and rising input costs owing

to supply chain constraints that slowed the industrial sector's recovery. While above the long-term average and like pre-pandemic levels, consumer confidence started to drop in October 2021.

The judgment is still out on whether the global economy will see enduring inflation or transient price hikes. Disruptions to supply systems drive inflation, which threatens economic recovery. In the worst case, this might lead to stagflation (high inflation and poor growth). Due to supply rigidities, prices rise, and central banks respond by rising interest rates, which hurts economic development. Most economic estimates indicate this won't happen, as current shocks are transient and a return to pre-pandemic growth and inflation is anticipated.

5.2 Policy reactions

Public policy may increase supply chain resilience by helping enterprises analyse and reduce supply chain risks. A recent OECD framework outlines public authorities' potential tools. These include shortening, reshoring, nearshoring, or diversification. Subsidies, tax incentives, tariffs, local content requirements, specific free trade agreement terms, and government ownership or investment in important industries, including public-private partnerships, may help. In addition, standardization improves options to substitute commodities and enables worldwide manufacturing and delivery during emergencies. Legal clarity in trade and the investment framework and supporting a robust international rules-based trading system assist establishing a stable environment, boosting global supply chain resilience. Public finance may also be used to help enterprises in important areas to monitor supply chains, increase transparency, assess risks, and build disruption scenarios and mitigation plans. Stress-testing supply networks with the private sector can assist. Public authorities can design risk management plans, sectoral guidelines, and early warning signs. They can identify risk-handling bodies and assess the function of different legislation to make the system nimbler and more adaptable. Special emergency measures can be prepared, such as shortened customs charges and border processing for crucial commodities. Public procurement may be used to establish consistent demand for key items and finance robust supply networks. This is important for developing alternate factories, diversifying sources, and stockpiling. Cross-border exchange of information on risk management, availability of necessary commodities, pricing, and point of contacts is vital to support effective procurement strategies and minimize supply interruptions. Regional or bilateral standardization of procurement procedures, joint procurement agreements, and lending agreements can help smoothing over temporary disruptions in the flow of goods by simplifying cross-border transactions, facilitating the sharing of goods and inputs, and improving small states' buying power. All these measures include the private sector; thus the EU and its member states' public authorities must build information-sharing platforms, engage companies' comments in policy choices, and create partnerships so there is high responsiveness and clear division of duties in supply chain crises.

5.2.1 The EU industrial strategy

Before the COVID-19 pandemic, supply chain resilience was explored to ensure the availability of resources for the EU's green and digital transitions. Having appeared in the Commission's foresight reports, it's relevant now. According to the 2020 Trade Policy Review, boosting the EU economy and supply chains is a cornerstone of the EU's push towards open strategic autonomy (OSA). Research for the European Parliament in October 2021 considered supply chain resilience one of the fundamental bases for EU autonomy. According to the Commission's DG Trade, OSA implies the EU will continue to advocate multilateralism and free trade while expanding its independence. In May 2021, the Commission updated its Industrial Strategy "Building a stronger Single Market for Europe's recovery" and analysed the EU's strategic dependencies. It looked at 5.200 imported items and identified 137 critical products for which the EU depends on foreign sources. A quarter of them (34 goods) are particularly susceptible due to little diversification and EU product displacement. China (52 % of EU imports) is followed by Vietnam (11 %) and Brazil (5 %). The analysis comprised six in-depth supply chain assessments in important domains that employ these materials: APIs,

batteries, hydrogen, raw materials, semiconductors, and cloud and edge technologies. The EU is less dependent on the US in vulnerable ecosystems than vice versa, although they both depend on China. This covers APIs, key raw materials, and goods for the green and digital transformation. The revised Industrial Strategy recommends that “the EU may opt to pool resources and establish stronger and more varied alternative supply chains with our closest friends and partners”.

The Commission's study on strategic dependencies and capacities describes a basic approach to supply chain resilience. By boosting and diversifying trade, the EU strengthens its position in GVCs. Diversifying import sources is also crucial to ensuring the EU satisfies its need for specific items. Stronger EU participation in multilateral cooperation and coordination is another option. Working via the G20 and WTO may assist monitor and sustain supply networks. New measures and existing mechanisms are mentioned in the Trade Policy Review and strategic dependence report. EU trade policy measures that promote access to new markets and global markets also strengthen resilience. Developing alliances with like-minded countries and engaging markets and third countries helps. Trade policy also ensures that EU companies can compete internationally. Better enforcing trade agreements and defending against unfair trade practices can achieve this. In July 2022, the co-legislators reached an agreement on the regulation on distorting foreign subsidies.

The EU can boost supply by increasing domestic output and strategic stockpiling. For the former, EU-level industrial alliances and the Important Projects of Common European Interest (IPCEI) tool give the scale and vision to overcome industrial disadvantages. Batteries and microelectronics have IPCEIs (including semiconductors, which are also an object of the recent Alliance on Processors and Semiconductor Technologies), focused on identifying and addressing gaps in the production of microchips, and the forthcoming Regulation establishing a framework of measures for strengthening Europe's semiconductor ecosystem (“Chips Act”). The European Raw Materials Alliance (ERMA) was founded in October 2020 to solve raw materials value chain concerns. The March 2020 Industrial Strategy calls for industrial alliances and ecosystems to realize the EU's green and digital transformation. In important industries and those with at-risk supply chains, a crisis-preparedness plan might include stockpiling and developing alternatives, perhaps with international partners. The 2020 Pharmaceutical Strategy for Europe is a sectoral policy that emphasizes diverse and secure supply chains.

Parliament, in its November 2020 resolution on the New Industrial Strategy for Europe, advocated for strengthening, shortening, and diversifying supply chains to avoid overreliance on a restricted number of markets and boost the EU's resilience. It also requested a sensible reshoring policy to redeploy sectors to the EU, enhance output and investment, and transfer industrial manufacturing. In its July 2021 resolution on trade-related aspects and implications of COVID-19, Parliament called for incentives for EU businesses to make their value chains more sustainable and to shorten or adjust their supply chains where it could benefit the EU's economy, resilience, geopolitical objectives, and strategic autonomy. MEPs argued reducing or modifying supply chains to the EU's neighbourhood and Africa might boost their economic growth.

The Commission believes public procurement can boost resilience. Smart procurement helps many industrial ecosystems meet EU green and digital transformation, innovation, and social goals. Public procurement promotes industrial ecosystems and supply chains by increasing demand and supporting important sectors. Strategic finance and research investments can assist strengthen domestic capacity and increase resilience; the Recovery and Resilience Facility can extend this sort of funding. EU research and innovation programmes can boost critical industrial capabilities. Horizon Europe promotes research and innovation in important sectors, such as raw materials, where supply bottlenecks remain. Its primary work strands include speeding the green and digital transformation and strengthening industrial resilience. The Commission also explores SMEs, which may need targeted support to diversify their supply networks and increase their resilience. Lock-in effects and high switching costs make it harder for SMEs to digest GVC disruptions. SMEs generally aren't prepared for such crises owing to low resources, which can have lasting effects. The

EU attempts to mitigate disruptions and vulnerabilities through the European Cluster Collaboration Platform and the Enterprise Europe Network. The Commission aims to assist EU workers establish home capability. In addition, the EU is implementing an original due diligence framework for supply chains to minimize human rights and environmental violations.

5.2.2 GVC policies in the USA

With the COVID-19 pandemic, the USA (ECI rank 11)⁸⁶ protected specific supply chains in the health and pharmaceutical sectors. President Biden launched a comprehensive examination of essential supply chains in his first week in office, involving all departments of government and important stakeholders. Risks, vulnerabilities, and a resilience strategy were identified. It culminated in a 100-day study issued in June 2021 that reviewed supply chains in four major areas: semiconductors, large capacity batteries, vital minerals and commodities, and medicines and APIs. As with the EU, China is the US's primary chain dependency. The study recommends “developing strong ties with friends and partners that share our values” to increase supply in these industries. Japan, South Korea, and the EU are US supply chain partners (the latter through the Trade and Technology Council). The government also used the Defence Production Act, which gives the President broad control over the private sector in emergencies, to improve domestic capacity and boost production of medical supplies and vaccinations. Both Presidents Trump and Biden issued executive acts to boost US medical supply chains, from direct financing to decreasing foreign sourcing. To boost resilience, the US has passed the Innovation and Competition Act (which seeks to launch a supply chain resiliency and crisis response programme and mentions working with the EU on supply chains within a meaningful transatlantic alliance), the Bipartisan Infrastructure Framework (to upgrade airports and ports), and the Build Back Better Act (to support domestic supply chains). In June 2021, President Biden launched the Supply Chain Disruptions Task Force to target transport- and logistics-related economic recovery obstacles and increase private sector cooperation to address delays and congestion at US ports. In June 2021, the White House announced to convene a global forum on supply chain resilience to assess vulnerabilities, develop common approaches to supply chain challenges, and build strength through diversity and shared prosperity.

5.2.2.1 Securing existing supply chains

Amidst the COVID-19 pandemic, the president of the United States announced the Build Back Better Act, an ambitious regulatory framework to invest in domestic programmes addressing social, infrastructural, or environmental concerns and the emerging issue of securing existing supply chains. It was divided into the American Rescue Plan (ARP),⁸⁷ the American Jobs Plan (AJP) and the American Families Plan (AFP). The ARP was built on the USD 2.2 trillion CARES Act of March 2020,⁸⁸ which included funds medical supply networks and air freight, as well as the expansive USD 2.3 trillion Consolidated Appropriations Act, 2021,⁸⁹ which addresses among other things food supply chain issues and provides funds to strengthen the resilience of supply chains of in manufacturing and defence industrial base. A typical project getting funded by CARES

⁸⁶ The Economic Complexity Index (ECI) is a comprehensive measurement of the productive capacity of major economic systems, often cities, regions, or nations. Specifically, the ECI seeks to explain how the knowledge gained by a people manifests itself in the economic activity of a nation or area. To do this, the ECI defines the knowledge accessible at a location as the average knowledge of the activities present there and defines the knowledge of an economic activity as the average knowledge of the locations where it is performed. The ECI was created by Cesar A. Hidalgo of the MIT Media Lab and Ricardo Hausmann of the Kennedy School of Government at Harvard University. The Observatory of Economic Complexity provides statistics on the Economic Complexity Index.

⁸⁷ <https://www.congress.gov/bill/117th-congress/house-bill/1319>

⁸⁸ <https://www.congress.gov/bill/116th-congress/house-bill/748>

⁸⁹ <https://www.congress.gov/bill/116th-congress/house-bill/133>

is the USD 6.8 million public-private partnership between the US Department of Defence and the Burlington Industries, LLS in which the latter will secure and stabilize the supply chain of dress military fabrics to the DoD (U.S. Department of Defence 2022b).

Key aspects of the USD 1.9 trillion ARP further include stimulus checks to individuals and investment programmes to strengthen agricultural supply chains and Small businesses (The White House 2021a). While the ARP came into force in March 2021, the AJP and AFP were merged to the Build Back Better Act (some objectives of the AJP were also shifted to the Infrastructure Investment and Jobs Act discussed below), which, however, did not pass the Senate and was ultimately scaled down substantially to the Inflation Reduction Act of 2022 (IRA).⁹⁰ Whereas Build Back Better would have amounted to USD 4 trillion in total, the IRA is expected to raise USD 737 billion and authorize USD 391 billion in spending on clean energy. With its focus on climate change (and health care), it still is the biggest investment programme of the US addressing the environmental crisis. IRA contains green energy tax incentives and provisions to secure critical minerals, specifically lithium used in electronic vehicles, however, it can be pointed out that due to the developed battery industry being predominantly located in the ASEAN region, this supply chain issue will need time to be resolved (Connors et al. 2022).

The Infrastructure Investment and Jobs Act,⁹¹ also known as the Bipartisan Infrastructure Bill, includes spending of USD 1.2 trillion in infrastructure to “strengthen supply chains by making long overdue improvements for our nation’s ports, airports, rail, and roads” (The White House 2021b). The package also includes investment programmes to address climate change issues such as zero-emission transit, clean-up of legacy pollution, or the replacement of lead pipes. Further, it provides funding to support access to clean water and high-speed internet in low-income communities.

In July 2021, President Biden signed an executive order to promote competition in the American economy. The order was issued against the backdrop of growing ambitions of China in the global technology sector as well as the Big Tech platforms undermining domestic competition. As with other orders and programmes, supply chain resiliency, also in the realm of intellectual property and patents, is prioritized (The White House 2021d). Further, the order targets other increasingly consolidated sectors, such as in agriculture, specifically the meat and poultry processing sector.

The “Make More in America Initiative” of the Export-Import Bank of the United States was born out of the 100-day supply chain assessment by the government. It came into force in April 2022 and consists of an investment plan to heighten the resiliency of supply chains in critical manufacturing sectors and create jobs in America. The finance programme, which is based on medium-and long-term loans, loans guarantees and insurances, and targets export-oriented domestic manufacturing SMEs, specifically operating in semiconductors, biotech, renewable energy, and energy storage (Export-Import Bank of the United States 2021).

On August 9, 2022, President Biden signed the “Creating Helpful Incentives to Produce Semiconductors and Science Act” of 2022 (CHIPS Act),⁹² a modified version of the United States Innovation and Competition Act of 2021. The CHIPS Act is another testimony of the increasing importance of the semiconductor industry, and how recent shocks, such as the COVID-19 pandemic, have laid open the vulnerabilities of global value chains in this sector. It aims at building a domestic supply chain and develop an American workforce to regain scientific and technological leadership. The CHIPS act includes USD 280 billion in investment, including in scientific R&D and commercialization (USD 200 billion), in semiconductor manufacturing and

⁹⁰ <https://www.congress.gov/bill/117th-congress/house-bill/5376>

⁹¹ <https://www.congress.gov/bill/117th-congress/house-bill/3684>

⁹² <https://www.congress.gov/bill/117th-congress/house-bill/4346>

workforce training (USD 52.7), as well as in tax credits (USD 24 billion) and frontier technology and wireless value chains (USD 3 billion) (Badlam et al. 2022).

5.2.2.2 Diversification

In July 2021, President Biden signed an executive order to promote competition in the American economy. The order was issued against the backdrop of growing ambitions of China in the global technology sector as well as the Big Tech platforms undermining domestic competition. As with other orders and programmes, supply chain resiliency, also in the realm of intellectual property and patents, is prioritized (The White House 2021d). Further, the order targets other increasingly consolidated sectors, such as in agriculture, specifically the meat and poultry processing sector, which is divided among only a handful of producers. The administration plans to use funding of the ARP to “expand and diversify meat and poultry processing capacity, [...], strengthen financing system for independent processors, [and] support workers and the independent processor industry” (The White House 2022).

The US-administration makes several efforts to strengthen supply chain resilience via oversight mechanisms and international diplomacy. In June 2021, President Biden launched the Supply Chain Disruptions Task Force to target transport- and logistics-related economic recovery obstacles and increase private sector cooperation to address delays and congestion at US ports. The Microelectronics Early Alert System established in October 2021 allows for “earlier detection of potential disruptions and supports faster problem solving and coordination with [...] trading partners and the private sector” (International Trade Administration 2021). In June 2021, the White House announced to convene a global forum on supply chain resiliency to assess vulnerabilities, develop common approaches to supply chain challenges, and build strength through diversity and shared prosperity. In July 2022, the supply chain ministerial convened to advance collaboration and reduce risk of short-term disruptions in value chains. Participating countries, including Australia, Canada, the EU, and Singapore, published a joint statement, propagating supply chain principles such as transparency, diversification, security, and sustainability (U.S. Department of State 2022a). Furthermore, in 2022, the multilateral Minerals Security Partnership was signed by the US, Australia, Canada, Finland, France, Germany, Japan, the Republic of Korea, Sweden, the United Kingdom and the European Commission to build robust, resilient and responsible critical mineral value chains, specifically those needed for electric vehicles and advanced batteries. The objectives of the initiative are to strengthen information sharing between partners and channel investment from governments and private businesses in key segments across the whole value chain which comply with the highest environmental, social and governance standards (U.S. Department of State 2022b).

5.2.2.3 Sustainability via substitution, reduction of consumption

In the last decade, the energy mix shifted from coal to shale gas – extracted via horizontal drilling and hydraulic fracturing – and renewable electricity. As energy security is of high-priority to the government, new policy responses are expected to secure the smooth and frictionless incorporation of new generation sources to the grid (International Energy Agency 2021b).

Many of the projects tackling climate change, the transition to clean energy and energy supply chain resiliency are dealt within the IRA or the Infrastructure Investment and Jobs Act. Furthermore, the National Climate Task Force, set up by the Biden-administration, works towards achieving the goals of “reducing U.S. greenhouse gas emissions 50-52 % below 2005 levels in 2030, reaching 100 % carbon pollution-free electricity by 2035, [and] achieving a net-zero emissions economy by 2050” (The White House 2021c).

In February 2022, the US Department of Energy launched the Mining Innovations for Negative Emission Resource Recovery (MINER) programme, backed by USD 44 million in funding. MINER targets projects that aim at securing the domestic supply of CRMs, including copper, nickel, or cobalt. These materials are crucial to secure the supply chain of batteries and foster the production of renewable energy necessary to propel

the transition from fossil fuels to clean energy. MINER will further support projects investigating in the potential of CO²-reactive ores to reduce the amount of energy needed to process minerals as well as fund innovations in the realm of negative emission technologies (arpa-e 2022). The preoccupation with CRMs was also addressed by the Department of Defense. Within the framework of the Executive Order on America's Supply Chains – the same that ordered the commission of the 100-Day supply chain review – it has channelled over USD 100 million in investments into rare earth material supply chain resiliency. In February 2022, for example, it awarded a contract to MP Materials Corp. to build a factory to process heavy rare earth elements in California (U.S. Department of Defense 2022a).

The IRA provides for new or increased financial assistance in the form of grants, loans, and loan guarantees. It includes clear requirements for the granting of the subsidies, which are intended to benefit domestic industry. "Made in USA" requirements run throughout the IRA programme. Nine funding lines worth at least USD 231 billion are included, from electric vehicles to wind turbine steel, batteries, solar panels, carbon capture technologies and the green hydrogen generation chain. Bonus credits will be given to US companies that comply with prevailing wages to ensure that well-paying, high-skilled jobs in the US are supported. In addition to the ambitious decarbonisation approach, however, the IRA reflects a hard-line industrial policy and geopolitical objective. On the one hand, the transition to a carbon-neutral economy is intended to create jobs in the United States. On the other hand, dependence on China is to be reduced and competitiveness vis-à-vis Beijing strengthened.

As a direct consequence, the IRA policy will keep EU products out of the US market. Even more seriously, it is also likely to shift investments from the EU to the USA. The IRA legislation clearly violates WTO rules. It discriminates against EU companies, violates the GATT agreement, the ASCM agreement on subsidies, and the TRIMs agreement on trade-related investments. In addition, the equal treatment principle of the MFN clause is not considered, as the IRA privileges products from Canada and Mexico.

5.2.3 GVC policies in Canada

5.2.3.1 Securing existing supply chains

Canada features #29 on the ECI index. In 2022, the Canadian minister of Transport established a National Supply Chain Task Force with the goal of examining existing supply chains and produce recommendations on how to improve their resilience and robustness. The final report, which was published on October 6, asks for immediate action to ease the congestion of transportation supply chains, specifically at port container terminals. Furthermore, it calls for a digitalization strategy of supply chains, an improvement of the labour shortage, the protection of corridors and border crossings as well as engagement with the US in order to foster reciprocal recognition of regulatory frameworks (Gattuso et al. 2022). Especially the latter indicates the importance of the US for Canada's value chain robustness. A study focusing on the Canadian pork supply chain during the COVID-19 pandemic argues that keeping the borders between Canada and the U.S. open for trade during the crisis contributed substantially to its resiliency (McEwan et al. 2021, p. 230).

The Canadian government addresses these issues by establishing the USD 4.6 billion National Trade Corridors Fund, which funds infrastructure projects across the country, including ports, roads, railways, and transportation facilities. The overall objective is to improve the flow of goods as well as increase exports and imports (Government of Canada 2021a). The money is spent over 11 years, from the Budget of 2022, USD 450 million are to be invested in the next five years. A typical project found eligible for funding is the Aero-logistics Cluster of the Mirabel International Aerocity, which receives USD 50 million for renovation

and extension of the cargo deck, the improvement of roads and construction of new warehouses (Government of Canada 2020b).⁹³ The same budget may also finance the creation of the Advancing Industry-Driven Digitalization of Canada's Supply Chain initiative, announced on October 14, 2022. The initiative aims at improving the collection and sharing of data in real time, optimizing existing networks, specifically in trade corridors such as the Pacific Gateway (Government of Canada 2022c).

5.2.3.2 Diversification

Canada has several FTAs with various partners or country associations. The FTA with ASEAN countries, representing the sixth largest trading partner in 2020, proceeded with negotiations in November 2021, emphasizing the importance of the agreement for the "strengthening cooperation on supply chain connectivity" (Government of Canada 2021c). The Trans-Pacific Partnership, which failed to come into force after the USA under the Trump administration withdrew from it, transformed into the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). In terms of trade, total export between Canada and five CPTPP countries, Australia, Japan, New Zealand, Singapore and Vietnam, grew at 8.3 % from 2019 to 2021 whereas imports grew at 11.3 %. In 2021, China as well as Taiwan expressed interests to join the agreement (Government of Canada 2021b). Further, Chang and Nguyen (2022, p. 41) argue that the grouping already exhibits strong GVC intra-member connections but if the countries China, Taiwan, Korea, and Thailand were to enter the agreement, it "could potentially create a consolidated Trans-Pacific production network and raise its profile to match that of the EU in terms of trade volumes, GVC participation and GVC interconnectedness."

Canada participated at the 2022 Supply Chain Ministerial Forum by the U.S. and adopted the Joint Statement, calling for transparency, diversification, security, and sustainability in supply chain management.

5.2.3.3 Sustainability via substitution, reduction of consumption

Like many other countries, Canada committed to net-zero emissions by 2050. By 2030, release of CO² should be below 30 % compared to 2005 levels. While coal will be phased out by 2030, the government has extended the life of its existing nuclear power reactors. In general, Canada's energy mix is made up to a large extent by renewables, in especially hydro, which, according to the newly devised hydrogen energy strategy, will be substantially developed to transform Canada into a world-leading user and exporter of hydrogen. The country further has considerable shale gas resources, with an LNG-sector eyeing towards the Asian market. The general climate change strategy is laid out in the Pan-Canadian Framework on Clean Growth and Climate Change (International Energy Agency 2022). The four pillars of the framework are "pricing carbon pollution; complementary measures to further reduce emissions across the economy; measures to adapt to the impacts of climate change and build resilience; and actions to accelerate innovation, support clean technology, and create jobs" (Government of Canada 2016, p. 2). In more concrete terms, the government introduced a carbon pricing scheme,⁹⁴ starting with CAD 20 per tonne in 2019 but recently raised to CAD 50 per tonne. As of 2023, the price shall rise every year by CAD 15 until it reaches CAD 170 in 2030. (International Energy Agency 2022). Furthermore, the Clean Fuel Regulations,⁹⁵ requires producers and importers to reduce carbon intensity of gas and diesel. The framework further introduces a credit market, which allows market agents to meet the criteria also via other actions such as diminishing the carbon intensity of non-renewables, supplying low-carbon energy or promoting advanced vehicle technologies (Government of Canada 2022d).

Besides the regulations, Canada established several funds to support and finance projects working towards the country's zero-emission goal by 2050. The Clean Fuel fund, an CAD 1.5 billion investment commitment

⁹³ A full list of projects can be found here: <https://tc.canada.ca/en/programs/projects-funded-national-trade-corridors-fund>

⁹⁴ <https://laws-lois.justice.gc.ca/eng/acts/q-11.55/>

⁹⁵ <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-140/index.html>

over five years embedded in the Budget 2021, supports capital-investment in construction or expansion in clean fuel facilities as well as feasibility studies and securement of biomass supply chains (Government of Canada 2022a). The Strategic Innovation Fund (SIF) has CAD 7.2 billion at its disposal over the next seven years. A large part of SIF will be spent within the framework of the CAD 8 billion net-zero accelerator, an initiative aiming at decarbonising large-scale heavy industry and develop clean technology, specifically viable battery ecosystems (Government of Canada 2022e). The CAD 680 million Zero Emission Vehicle Infrastructure Programme addresses the lack of refuelling opportunities for zero-emission vehicles across Canada and plans to support the construction of infrastructure, including charging and refuelling stations (Government of Canada 2022b).

With respect to securing supply chains of CRMs, Canada is currently working on a strategy to develop resilient, responsible, inclusive and sustainable value chains. It pursues partnerships with several countries or country associations, such as the US or the EU to promote bilateral interests in securing CRM supply chains. With the former (to which Canada supplies 13 out of the 35 CRMs of the US) it has devised an action plan to guide cooperation and promote cooperative initiatives in R&D (Government of Canada 2020a).

Resembling similar laws Due Diligence laws in other countries, such as Australia, Germany, or France, Canada is currently debating Bill S-211, an Act to enact the Fighting Against Forced Labour and Child Labour in Supply Chains Act and to amend the Customs Tariff.⁹⁶ The act has passed the Senate and will likely be approved by the House of Commons as well. It would require entities with certain qualitative and quantitative criteria, for example having at least CAD 20 million in assets or the import of goods into Canada, to write a publicly available annual report on the prevention and reduction measures taken to mitigate the risk of forced or child labour at any step along the value chain. Although the act includes penalties for breaching its provisions, including a CAD 250 000 fine, it does not stipulate that modern slavery or child labour are to be avoided in supply chains. Rather, it expects public backlashes and consumer boycotts against such practices as sufficient to guarantee for a prevention of these methods.

5.2.4 GVC policies in the People's Republic of China

The PRC ranks #28 on the ECI-scale in 2020. In past decades, it has experienced an exceptional growth in exports and became the world's export leader in 2020. While the rise of China was initially fuelled by its giant industrial sector and huge amounts of FDI, in more recent years, the country reoriented its economy towards becoming a global leader in core technologies, including semiconductors, electric vehicles, clean energy, or artificial intelligence. China's ambitions clashed with the protectionist policies of the U.S. (as outlined above) and led to curtailing campaigns by the latter, supported by the EU, against Chinese competitors such as Huawei or ZTE (Gereffi et al. 2022, p. 3). The country's management of its economy and subsequently its value chains is characterized by a rigid policy framework, including Five-Year Plans and national goals established by the central government. Specific development strategies in recent years (discussed below) include the Made in China 2025 initiative, the Belt and Road Initiative, and the Dual Circulation policy. Crucially, these strategic frameworks are put into practice at the local level, e.g., the city or province, which interpret and transform the guidelines into policies according to their capabilities and competitive advantages. Companies and businesses then react to the policies implemented by the local administrations and position themselves within the framework based on their own strengths and possibilities (Gereffi et al. 2022, p. 11).

The country's recent GVC-management cannot be assessed without considering the effects of the COVID-19 pandemic⁹⁷ and associated policy responses on the society and economy. China is a central node for many global production networks and, as shown in the case of Japan, global supply chains transmit and

⁹⁶ <https://www.parl.ca/legisinfo/en/bill/44-1/s-211>

⁹⁷ After protests, China abandoned major components of its zero-Covid strategy by the end of 2022.

magnify the effects of production shocks. In the case COVID-19, impacts are found to be even worse if the labour force is under quarantine (Sforza and Steininger 2020). Friedt and Zhang (2020) find that Chinese exports were very sensitive to the outbreak of the virus, and it is estimated to have reduced exports by as much as 40 % to 45 % during the first half of 2020, in large part due to GVC contagion. The case of the Hubei Province of China exemplifies the consequences of the country's harsh policies to mitigate the crisis, including prolonged lockdowns, on the economy. During the 76-day lockdown in the first quarter of 2020, the province's GDP decreased by an estimated 37 % compared to a scenario where there had been no lockdown. The policies, on the other hand, saved lives and also allowed for a quick rebound of the economy after the lockdown was lifted (Ke and Hsiao 2022). In 2022, however, China's zero-COVID strategy does not allow for a return to relatively normal social and economic conditions. In November 2022 the country experienced its highest daily new confirmed COVID-19 cases since the start of the pandemic in 2020. Newly announced lockdowns triggered protests among the frustrated population. Although the lockdowns do not affect factories, and technically do not impact integrated value chains on a large scale, the strategy also undermines China's reputation as a country capable of securing stable and robust supply chains (Tan 2022).

5.2.4.1 Securing existing supplies

The Made in China 2025 (MiC2025) plan was announced in 2015,⁹⁸ and originally based on the German Industry 4.0 strategy. MiC2025 identifies ten key sectors, including new information technology, energy saving, high-tech ships, or power equipment, which the country will promote and support, especially in research and development. The objective is to build a domestic industry for intelligent manufacturing and become independent of foreign technology imports. By moving up the value-added chain and integrating with the global manufacturing chain, China wants, eventually, to transform into a global powerhouse in high-tech industries. The strategy entails targets for companies, such as an increase in R&D, as well as green development goals, including a decrease in CO₂ emissions per unit of industrial added value of 40 % in 2025 compared to levels in 2015. The regulatory framework accompanying the strategy consists of the implementation of standards, the incorporation of testing and certificate systems, the creation of innovation centres, or the set-up of financial support. To be eligible for the latter, companies generally must use domestic IP rather than foreign IP. Financial support includes a fund for the development of semiconductors, the USD 3 billion Advanced Manufacturing Fund or the USD 21 billion National Integrated Circuit Fund (Institute for Security & Development Policy 2018). A study reviewing 94 policies which were adopted within the MIC framework asserts that there is no structure or systemic design in their release, but the authors find that, in line with the guidelines tendencies, innovation generally receives the highest attention (Wang et al. 2020). MiC2025 has stirred international controversies over forced technology transfers into China as well as weak IP protection and has thus contributed to the economic tensions between the US and China since the late stages of the Obama administration (Economist Intelligence 2018).

The Dual Circulation Strategy (DCS) was adopted within the context of the 14th Five-Year Plan between 2021 and 2025. DSC can be described as a "domestic consumption-driven economic rebalancing, [where] the ultimate objective is to build economic resilience against external uncertainties and risks" (Javed et al. 2021, p. 12). It therefore consists of expanding domestic demand and increasing domestic capacities, specifically in the tertiary sector, while remaining open to the world. Under DCS framework, the domestic market and the international market are in a reciprocal relationship, whereby the domestic market is to rebalance uncertainties and risks in the international market and guarantee for sustainable development (Javed et al. 2021, pp. 14–16). China's accession to the RCEP and its application to the CPTPP, for example, can be understood from the perspective of DCS's focus on diversifying international markets and reducing dependency on few partners, specifically the US. (Jiang and Yu 2021). An early study on the framework

⁹⁸ An English translation of the document can be found here: <https://cset.georgetown.edu/publication/notice-of-the-state-council-on-the-publication-of-made-in-china-2025/>

expenses. Before the epidemic, Japan reportedly had 7400 affiliates in China. Only 8 % planned to leave or reduce their participation in 2020. In October 2021, Japan appointed the world's first economic security minister, Takayuki Kobayashi, to “create policies and a legislative framework to strengthen economic security” with a concentration on semiconductors.

Since the 2011 earthquake and subsequent tsunami as well as failure of the Fukushima Dai-ichi Nuclear Power Plant, Japan is often cited as a prime example for an exogenous supply chain disruption. Ten years after the disaster, a study turning to the consequences of the disaster and taking supply-chain interlinkages into account, finds that it resulted in a 0.47 percentage point fall in real GDP growth in 2012 (Carvalho et al. 2021). Boehm et al. (2019) look into the US affiliates of Japanese multinationals and conclude that, due to their drop in output after the shock, rigid supply chains can result in a cross-country transmissions of shocks. On the other hand, in the sectors of automobiles and electronics, the supply-chain disruption did not lead to diversification, reshoring or nearshoring and did not interrupt trade in intermediate products as substantially as in final goods. Rather, importers with a high dependency on Japan shifted to new suppliers, which were predominantly located in developing countries (Freund et al. 2021). In the aftermath of the earthquake, then Prime Minister Shinzo Abe promised to introduce policies with the goal of making the society, economy – specifically supply chains – more resilient and robust. However, as became clear during the COVID-19 pandemic, Japan is still struggling to diversify its value chains, with many firms relying on Chinese producers and customers (Todo and Inoue 2021, pp. 304–305).

As shown below, new policies indicate Japan’s efforts to introduce protectionist measures and re-shore or on-shore production lines to Japan. Although this might reduce dependence on China itself, it does not necessarily lead to stronger supply chains, as natural disasters, like in 2011 might occur again. Various commentators point out that diversification should take place across numerous partners to ensure heightened resilience, rather than enforce onshoring in Japan, which can also lead to allocation distortions and market inefficiencies (Todo 2022).

5.2.5.1 Securing existing supplies

The government has recently launched numerous policies to attract companies away from China and reduce the dependence on one region. These policies usually fall within the responsibility of the Ministry of Economy, Trade and Industry of Japan (METI), which, in 2020, launched the Programme for Promoting Investment in Japan to Strengthen Supply Chains. The initiative, which has aptly been called “‘China Exit’ subsidies” (Akiyama 2020), has over the course of three rounds of funding issued JPY 574.7 billion (around USD 3.9 billion) to companies for reshoring their production to Japan. In the first round, funding was distributed to companies producing either strategically essential goods and products – such as aircraft parts, semiconductor parts, chemical fertilizers, battery parts and materials, medical equipment or CRMs – or materials fundamental for people’s health, for example COVID-19 test kits, medical gloves, masks and vaccines (Watanabe 2022). The second and third round also included funding for SMEs (Ministry of Economy, Trade and Industry 2021b). In 2021, Japan thus managed to attract the leading chipmaker company “Taiwan Semiconductor Manufacturing Co”, which will receive a government investment of JPY 400 billion to build a new factory in the southwest of the country (Nidumolu 2021). In 2022, the Japanese Parliament approved the Act on the Promotion of National Security through Integrated Economic Measures (Economic Security Act),¹⁰² which will come into force on February 18, 2023. The four key features the act establishes are, “(i) a system to ensure stable supplies of critical materials, (ii) a system to ensure stable provision of services using critical infrastructure, (iii) a system that supports the development of critical technologies and (iv) a secret patent system” (Itabashi et al. 2022). The purpose of the act is to ensure national security by promoting integrated economic measures. Accordingly, the act requires the government to formulate a basic pol-

¹⁰² <https://www.cas.go.jp/jp/houan/208.html>

icy towards the end of this goal. Taking (i) stable supplies of critical materials as an example, the act stipulates the following: Based on the policy described above, the government intends to formulate basic guidelines to ensure the stable supplies of critical materials, such as pharmaceuticals or semiconductors. Then, the minister under which responsibility these materials fall will develop policies to ensure stable supplies. Companies operating to secure a stable supply chain in these sectors may solicit support including in the form of subsidies and funds. The Minister is further granted substantial power by taking necessary measures to ensure stable supply if there is put pressure on the supply chain by stockpiling, or transferring or making the material available below market prices (Itabashi et al. 2022). Furthermore, the national government must establish a technology council, promote research by think tanks and finally under point (iv) may control the publication of a new patent if it concerns critical security technology. Although the impacts of the law are not clear yet, critiques point out that market interference and bureaucratic burden might entail negative consequences for Japanese firms (Takahashi 2022). In March 2022, the cabinet propagated the bill on the Act of Partial Revision of the Act on Promotion of Developing/Supplying and Introducing Systems Making Use of Specified Advanced Information Communication Technologies and the Act on the New Energy and Industrial Technology Development Organization. Here the cabinet makes specific reference to the “increasing risk of geopolitical conditions affecting their [high-performance semiconductors, M.D.] global supply chain” and that the government, therefore, “will take measures to facilitate businesses’ decisions to invest in the development and production of high-performance semiconductor production facilities and contribute to securing stable production in the country” (Ministry of Economy, Trade and Industry 2021c). To secure supply of semiconductors, the revisions establish a certification programme for plans to develop manufacturing facilities as well as provide support for certified producers, including provisions on duties or the establishment of a fund to finance grants (Ministry of Economy, Trade and Industry 2021c).

5.2.5.2 Diversification

METI further lunched the Programme for Strengthening Supply Chains, working towards the same goal of diversifying companies’ supply chains away from China, however, in this case not back to Japan but other countries, specifically Southeast Asia. Contrary to the Programme for Promoting Investment in Japan, the initiative does not subsidise firms to relocate their production lines, but rather provides support to cover the costs of new plants, usage of advanced digital technologies or feasibility studies. So far, the programme supports 92 projects, more than half of them located in Vietnam and Thailand (Watanabe 2022). Like Australia, Japan is part of the Supply Chain Resilience Initiative (SCRI) set up in April 2021 with the goal strengthening supply chains among participating countries but also to diversify the manufacturing sector away from China to other countries with low-cost labour in the Indo-Pacific region. Within that space, the trade ministers of the three countries met in March 2022 to discuss supply chain principles for the region, which will be finalized in 2023 (Satsuki 2022). Since 2019, the Japan External Trade Organization offers the Start-up City Acceleration Programme to support domestic start-ups during their expansion phase to overseas. In 2022, 126 start-ups can participate in a special course programme, benefitting from individual support by renowned accelerators (Japan External Trade Organization 2022).

5.2.5.3 Sustainability via substitution, reduction of consumption

Japan’s energy mix is still dominated by oil, coal, and natural gas but in recent years the country has managed to diversify its mix, reduce demand, and enhance efficiency, particularly of fossil fuel use. The strategy to achieve net zero greenhouse gas emissions by 2050 is driven by innovation and technology (International Energy Agency 2021b). The long-term plan to manage the goal of carbon neutrality is formulated in the Strategic Energy Plan, which has been formulated in 2002 under the Basic Act on Energy Policy (Act No.

71 of 2002)¹⁰³ and which has been updated for the sixth time in 2021. Its focus is on the careful reconstruction of the Fukushima Daiichi Nuclear Power Station as well promoting the S+3E strategy, which prioritizes stable and low cost energy supply by improving the efficiency while ensuring safety and pursuing of environmental suitability (Ministry of Economy, Trade and Industry 2022b). The new strategy further targets 36-38 % of power supply generated by renewables, contrary to 22-24 % as formulated in 2018. In line with other onshoring programmes, the plan further promotes measures to reduce risks for supply chain disruptions in the mineral resources sectors, including more financial investments, better usage of recycled resources and a reinforcement in the stockpiling system. With these measurements, the government wants to achieve a self-sufficiency rate of 80 % by 2030 (International Energy Agency 2022a). The national parliament enshrined the promise of carbon neutrality by 2050 into law when it passed the according legislation to amend the “Act of Promotion of Global Warming Countermeasures (Act No.117 of 1998, as amended)”.¹⁰⁴ METI developed the “Green Growth Strategy” in 2020. It identifies 14 promising sectors for future economic growth in the country, including wind power, solar, next generation heat energy, semiconductors, automobile, storage batteries, shipping, or resource circulation. Companies operating in these sectors are provided with action plans from the perspective of energy and industrial policymakers (Ministry of Economy, Trade and Industry 2022a). Furthermore, METI set up a Green Innovation Fund in the amount of JPY 2 trillion (around USD 14.2 billion). It is to support ambitious companies in their R&D projects and social implementation projects for the coming 10 years. The ministry formulated a basic policy guideline which stipulates that the fund should be distributed to fields where there are significant policy effects, and which require long-term and continuous support for public implementation. More precisely, projects eligible shall have average size R&D projects (JPY 20 billion) or more and must be innovative, or work with fundamental new technology. Finally, companies or institutions should be able to carry out the whole process of public implementation (Ministry of Economy, Trade and Industry 2021a). In 2017 and 2019, METI issued the “Basic Hydrogen Strategy”¹⁰⁵ and “Strategic Roadmap for Hydrogen and Fuel Cell” (Ministry of Economy, Trade and Industry 2019), which together sketch out the policy framework guiding the hydrogen sector until 2030 and form part of the core of the “Green Growth Strategy” outlined above. Among its key goals is the development of an integrated hydrogen supply chain, consisting of production, transportation, storage and consumption. The strategy, which includes a differentiation between “blue hydrogen” coming from fossil fuels and “green hydrogen” stemming from renewables, further includes plans to reduce costs of production by driving and implementing new technology for production, storage and transportation, as well as enhancing the demand of hydrogen and ammonia, also by supporting R&D for wide-spread use of the fuel power. To achieve the goal of a hydrogen powered society, Japan is developing international supply chains via various projects with partner countries, including Australia or Indonesia (Clifford Chance 2022). With the former, it has the “Japan-Australia partnership on decarbonisation through technology” under which Australia announced in 2020 a USD 150 million Clean Hydrogen Trade Programme with the primary objective of securing a stable supply chain of hydrogen to Japan (Australian Government Department of Foreign Affairs and Trade 2022). Japan published a detailed guideline on respecting human rights in responsible supply chains. The guidelines follow international standards and cover the downstream as well as upstream side of the value chain (Ministry of Economy, Trade and Industry 2022a). However, contrary to the EU, these provisions are not legally binding. Still the guideline is expected to increase pressure on companies as they might also anticipate future regulation (Crockett et al. 2022).

¹⁰³ <https://policy.asiapacificenergy.org/sites/default/files/Basic%20Act%20on%20Energy%20Policy%20Act%20No.%2071%20of%20June%2014%20of%202002%20%28%20%29.pdf>

¹⁰⁴ <https://policy.asiapacificenergy.org/ru/node/4465>

¹⁰⁵ <https://policy.asiapacificenergy.org/node/3698>

5.2.6 GVC policies in Switzerland

Switzerland has an exposure to a foreign demand shock of about 70 percent and of a little more than 40 percent to a foreign supply shock.¹⁰⁶ In both cases, the EU acts as the most important partner to Swiss GVC operations, however, in especially on the demand side, the United States play a relatively important role too (OECD 2021). Policies regarding the integration of the private sector in GVCs fall mainly within the domain of the SECO, the federal authority responsible for domestic and foreign economic policy. It aims at supporting SMEs and other companies with all operations related to exports, such as certification, logistics or customs duties, while also reinforcing sustainability criteria, specifically in the realm of climate, poverty, biodiversity, migration and nutrition (State Secretariat for Economic Affairs SECO 2022a).

5.2.6.1 Securing existing supplies

Switzerland is member of 33 FTAs, with 43 partners around the world. SMEs play an important factor in the Swiss economy and maintaining and creating an attractive and competitive environment for companies is a determined goal of the Swiss government. Between 2020 and 2023 Switzerland offers CHF 389.8 million in order to foster and promote the country as a competitive player amidst evolving global value chains (Bundesrat 2019). The money will be distributed in form of commitment credits for financing e-government activities of SMEs (CHF 21.7 million), promoting innovation, cooperation, and knowledge building in tourism (CHF 30 million), export promotion (CHF 90.5 million), and promotion of information about Switzerland as a business location (CHF 17.6 million). The biggest amount of money, CHF 230 million, will flow as financial aid in Switzerland's tourism.¹⁰⁷ A typical example of the projects benefitting from the strategy is les Hôtels des Cinq 4000, a corporation to manage 4 hotels in Grimentz-Zinal, Switzerland with the goal of repositioning the facilities and attracting enough guest for the whole touristic value chain to benefit from (State Secretariat for Economic Affairs SECO 2019, p. 14).

5.2.6.2 Diversification

The SECO Start-up Fund (SSF), provides financing for start-up businesses during their first expansion phase in emerging economies. The aim is to support young businesses with projects in markets generally perceived to be riskier to operate in than Western countries. Still the fund provides support only to those businesses that are commercially viable and adhere to social and environmental standards. To date, it handed out loans in the amount of CHF 7.8 million and committed CHF31 million in investments (State Secretariat for Economic Affairs SECO 2022c). The most recent Free Trade Agreements were concluded with Ecuador in 2020 and Indonesia in 2021. Several FTAs are in the negotiation phase, most importantly one with MERCOSUR¹⁰⁸, to which Switzerland predominantly exports pharmaceutical products and organic chemical. The FTA is expected to drastically reduce costs of customs duties – up to 180 million Swiss francs every year – and is bound to facilitate market access for Swiss service providers (State Secretariat for Economic Affairs SECO 2022b).

5.2.6.3 Sustainability via substitution, reduction of consumption

Switzerland's energy sector is dominated by hydro and nuclear generation and has thus a very low carbon intensity. However, in 2017, the population voted to end the use of nuclear power. The country's long-term energy strategy is described in its Energy Strategy 2050 (ES2050). The ES2050 goals include a reduction in

¹⁰⁶ As calculated above.

¹⁰⁷ The federal decrees can be found in the Bundesblatt Nr. 12 from the 26th March 2019: <https://www.fedlex.admin.ch/de/fqa/index/2019/3/12>

¹⁰⁸ Argentina, Brazil, Uruguay and Paraguay

energy consumption, an increase in energy efficiency and the promotion of green energy. Energy consumption, efficiency as well as the transition to renewable energy are dealt with in the Federal Energy Act¹⁰⁹ which came into force 1 January 2018. Among the many specifications, the act provides non-binding targets for consumption as well as production of energy for 2035 and regulates feed-in remuneration for green energy producers. Finally, eight ordinances have been revised or newly issued, such as the Ordinance for the certificate of origin and disclosure of primary fuels for electricity generation (International Energy Agency 2019). With 1 January 2022, the new CO²-Act¹¹⁰ came into force, with the aim of halving Switzerland's greenhouse gas emissions by 2030 compared to 1990. A direct impact is made via the increase of price of the CO² tax from CHF 96 to CHF 120 per ton. One third of the money shall be used to support the Cantons with buildings programmes for energy-efficient renovations and green heating as well as allocated to a technology fund. The rest will be redistributed among the population and economy. Furthermore, the act also encourages Switzerland to reduce emissions abroad where at least one quarter of the necessary emission reductions should be achieved.

In 2021, Switzerland passed the Ordinance on Due Diligence and Transparency¹¹¹ in relation to Minerals and Metals from Conflict-Affected Areas and Child Labour. It resembles the Due Diligence act of the EU and concerns the processing of so-called "conflict minerals" – tin, tantalum, tungsten, or gold – and requires businesses which operate in this sector and have an office, administration in Switzerland to produce an annual report if the minerals originate from conflict areas or if products and services containing these minerals are suspicious have used child labour. Furthermore, these businesses must actively manage supply chains and ensure traceability to show chain of custody (International Energy Agency 2022b). The above-mentioned FTA with Indonesia, which substantially revolves around the import of Indonesian palm oil, is first of trade agreement that includes concessions to sustainability issues. It therefore includes four sustainability standards such as the Roundtable on Sustainable Palm Oil (RSPO) Identity Preserved (IP) or the International Sustainability and Carbon Certification (ISCC) PLUS Segregated (Bundesamt für Landwirtschaft 2022).

5.2.7 GVC policies in South Korea

The country (ECI #4) was the first outside China to close factories due to COVID-19 pandemic. Its initiatives, like the U.S. and Japan's, aim to decrease geopolitical reliance on foreign supplies. South Korea began reshoring in 2014. According to the Ministry of Trade, Industry, and Energy, some 10 enterprises returned per year between 2014 and 2018, and South Korea's dependency on overseas supply chains has grown since 2013. Relocating companies can have their company taxes eliminated for the first five years and slashed by 50 % for the next two. The Korean Ministry of Trade, Industry, and Energy released a specific programme on Materials, Parts, Equipment 2.0 in July 2020. The programme aims to pre-emptively handle the shift in global supply chains post-pandemic and to cope with the fallout of export limitations enforced by Japan, whose commerce and economy is intimately tied with South Korea's. The Korean government will spend USD 1.3 billion over five years to create new materials, components, and equipment. Funding will also be available for reshoring subsidies, infrastructure expenditures, and tax breaks for high-tech ventures. The government is providing up to USD 16.8 million to enterprises relocating outside Seoul and up to USD 4.2 million to high-tech firms relocating to Seoul. It's also boosting the amount available to reshore enterprises who create smart factories or deploy industrial robots to USD 430 000).

¹⁰⁹ <https://www.fedlex.admin.ch/eli/cc/2017/762/de>

¹¹⁰ <https://www.fedlex.admin.ch/eli/cc/2012/855/de> (law) and <https://www.fedlex.admin.ch/eli/oc/2022/311/de> (ordinance)

¹¹¹ <https://www.fedlex.admin.ch/eli/cc/2021/847/de>

5.2.8 GVC policies in Australia

With a little more than 20 percent exposure,¹¹² Australia shows a relatively low vulnerability to a foreign demand shock. However, an exposure of 60 percent to supply indicates a high susceptibility to a foreign supply shock.¹¹³ As in the export-sector, the main concern regarding supply shocks are Asian markets whereas the EU only plays a subordinate role (OECD 2021), thus indicating the great dependency of Australia on large producers, in especially China (Kolev and Obst 2022, p. 13). A case in point is the Australian agricultural sector, whose value-creation heavily depends on trade in raw material. The farming sector has benefited from the opportunities that arose by the continuous and increasing global competition of processors. Their need for raw material exporters such as Australia has resulted in higher volumes of export. Furthermore, while processors are exposed to competitive pressures and fragmentation, primary producers are less vulnerable to these dynamics as they are bound to climatic conditions and natural endowments (Greenville et al. 2020). On the other hand, the farming sector might suffer serious economic damage if it was no longer able to import fertilisers or pesticides from Chinese companies. Issues like these were discussed in an inquire by the joint standing committee on foreign affairs, defence and trade, which was debating the strategic implications of COVID-19 on trade. The list of recommendations includes, among others, an assessment of those elements that are especially vulnerable to serious supply chain shocks (Recommendation 2) or to move critical supply chains to Australian sovereign suppliers (Recommendation 9).¹¹⁴

5.2.8.1 Securing existing supplies

Like the European Union, Australia supported the “Declaration on Trade and Essential Goods for Combating the COVID-19 Pandemic” which was proposed by New Zealand and Singapore amidst the global health crisis in April 2020 (Brenton et al. 2022, p. 133). In an effort to secure existing supply chain – specifically with regard to vitamins, antibiotics, medicaments, and pharmaceutical and medical goods – the Declaration demanded by each participant tariff elimination and Implementation, elimination of export restrictions, consultations on removing non-tariff barriers and the facilitation of trade in essential goods.¹¹⁵ A typical policy tool to strengthen the resilience of GVC are FTAs, which generally show a positive relationship to GVC-related trade (Ken Itakura and Hiro Lee 2019, p. 2). FTAs also serve to diversify existing GVCs, however, since Australia already is an open economy, FTAs and their provisions are more important to strengthen the integrity and rules of the global trading system (Petri and Plummer 2019). A prominent example for this was the entry into force of the Regional Comprehensive Economic Partnership Agreement (RCEP) on 1 January 2022. It established the largest trade bloc in history in terms of GDP and population. The FTA was signed by 15 Asian-Pacific states¹¹⁶ and is expected, among other things, to reduce import tariffs between the countries up to 90 percent in the coming two decades. The ultimate effects of the RCEP are to be evaluated in the future, preliminary studies, however, show mixed results. Petri and Plummer (2019) find that Australia would enjoy only a relatively modest increase of below one percent in most sectors. However, they emphasize the possible benefit of the RCEP in reinforcing a rules-based system. Wen et al. (2022) use simulations to estimate the effects of the RCEP on GVCs. They find that in the short run, postulated as 50 percent reduction in trade tariffs, the RCEP would not affect Australia’s relative position in GVC rankings but slightly increase participation across various sectors. In the long run, postulated as 100

¹¹² Calculated as a share of domestic value added in foreign demand, shown in percent of total domestic value added in 2015.

¹¹³ Computed as a share of foreign value added in gross output of the sector and illustrated percentage of total foreign value added.

¹¹⁴ A full list of all recommendations can be found at here: https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Foreign_Affairs_Defence_and_Trade/FADTandglobalpandemic/Report/section?id=committees%2freportjnt%2f024552%2f75332

¹¹⁵ <https://www.loc.gov/item/global-legal-monitor/2020-04-17/new-zealand-singapore-new-declaration-on-trade-in-essential-goods-for-combating-the-covid-19-pandemic/>

¹¹⁶ Australia, Brunei, Cambodia, China, Indonesia, Japan, South Korea, Laos, Malaysia, Myanmar, New Zealand, the Philippines, Singapore, Thailand, and Vietnam

percent tariff reduction, effects for both, relative position and participation in GVCs, are much more profound, even overstepping the USA in the Textile & Apparel sector.

5.2.8.2 Diversification

The Australian government follows several paths to diversify its existing GVC. In a joint statement in April 2021 Australia, India and Japan addressed the vulnerabilities of supply-chains caused by the COVID-19 pandemic and announced policy measures to further deepen the use of digital technologies and support diversification in trade and investment. They jointly launched the Supply Chain Resilience Initiative (SCRI), consisting of “(i) sharing of best practices on supply chain resilience; and (ii) holding investment promotion events and buyer-seller matching events to provide opportunities for stakeholders to explore the possibility of diversification of their supply chains” (Australian Government Department of Foreign Affairs and Trade 2021). The Australian government followed up on the announcement by establishing an SCRI grants programme amounting to USD 107.2 million in order to support Australian businesses operating in key sectors such as Resources Technology & Critical Minerals Processing, Food & Beverage, Medical Products, Recycling & Clean Energy, Defence, or Space, and which either address a critical supply chain vulnerability or work to strengthen already existing ones (Australian Government Department of Industry, Science and Resources 2020). Within the same space, Australia announced the Modern Manufacturing Initiative (MMI) offering USD 1.3 billion funding to businesses in the sectors outlined above. MMI was set up with the specific goal of integrating “Australian businesses into domestic and international value chains, propelling their goods and services into new markets” (Australian Government Business 2020). The co-funding aims to increase participation of the manufacturing sector in local and global value chains, foster the growth of high-value jobs and enhance competitiveness. The grant has already been distributed among applicants from various sectors, such as Noumed Pharmaceutical Pty advancing the country’s pharmaceutical manufacturing or Ltd, Core Lithium Ltd, and Lynas Rare Earths Limited, the latter two illustrating Australia’s pre-occupation with CRMs.

Besides, Australia runs several smaller initiatives to support the diversification of value chains (or secure existing ones). The Global Supply Chain Programme, for example, aims to embed SMEs in the global value chain of multinational companies such as Boeing or Rheinmetall that target the Defence sector (Australian Government Defence 2021). The Asia-Pacific Economic cooperation offers seminars towards the same goal, though without the focus on the Defence sector (Export Council of Australia 2022).

5.2.8.3 Sustainability via substitution, reduction of consumption

A major question concerning Australia’s management of the sustainability of GVCs is its energy supply, which is still highly dependent on coal, natural gas, and oil. Although the country wants to diversify its energy mix, for the moment the decline in oil production goes hand in hand with a higher dependency on global supply chains of oil. Concerns over energy security are also driven by issues of reliability of the power system (International Energy Agency 2021a). Although the newly elected Labour government of 2022 wants to follow through with its campaign promises of a more ambitious and rapid green energy transition, this intricate framework – further complicated by the agency of private companies – inhibits the necessary efforts (Kemp 2022). Among the many initiatives and programmes, Australia set up to foster low-emissions technology, one of the more ambitious is the Technology Investment Roadmap which plans to invest up to USD 20 billion in green energy technology by 2030. It plans to provide clean and cheap energy to industry and households, create job opportunities and capture new markets for the export of low emission commodities (Australian Government Department of Climate Change, Energy, Environment and Water 2020).

The Emissions Reduction Fund, which was set up already in 2015 via the Carbon Credits (Carbon Farming Initiative) Act 2011,¹¹⁷ provides businesses, communities and landholders with the opportunity to earn

¹¹⁷ <https://www.legislation.gov.au/Details/C2011A00101>

Australian Carbon Credit Units by running projects that either remove carbon from the atmosphere or prevent the emission of greenhouse gas. These credits can then be sold either to the government or to other businesses and landholders in the secondary market (Australian Government Department of Climate Change, Energy, Environment and Water 2022).

Finally, the Critical Minerals Strategy, first established in 2019 and updated in 2022, aims to integrate Australian companies into critical mineral value chains. Drawing on its large resources in CRMs – specifically in cobalt, lithium, manganese tungsten and vanadium – as well as its reliability as an exporter, its technical expertise and high environmental and labour standards, Australia plans to become a “critical minerals powerhouse” by positioning itself as a globally trusted supplier in CRMs (Australian Government Department of Industry, Science, Energy and Resources 2022, p. 9). To achieve this goal, the government offers strategic advice and policies as well as a USD 2 billion Critical Minerals Facility to co-fund businesses operating in CRM sectors. Furthermore, it provided USD 50 million to set up the National Critical Minerals Research and Development Centre to foster the innovation of safe and efficient mining techniques. Australia particularly focuses on cooperation within in the Indo-Pacific region for the diversification and security of CRM supply chains (Australian Government Department of Industry, Science, Energy and Resources 2022).

On the external side, Australia also plans to deepen existing partnerships with respect to sustainability goals. The Singapore-Australia Green Economy Agreement of October 2022 set about to “support economic growth, create jobs in green sectors, promote decarbonisation of economic activities and mainstream sustainability” (Australian Government 2022). The proposed mechanisms include an expansion of the environmental goods and services list, green shipping via the proliferation of clean hydrogen, co-innovation grants programme for SMEs or support for green business partnerships.

In 2018, Australia passed the Modern Slavery Act¹¹⁸. The act requires large companies and business entities with an annual revenue of at least USD 100 million to report on possible modern slavery risks in their global operations as well as present the actions taken by the entity to secure transparent and responsible supply chains. Reports must be conducted on an annual basis and are published through the government website.

Australia created the Cyber and Infrastructure Security Centre before the pandemic. The government announcement emphasized a dangerous environment, which relies heavily on outsourced and offshored supply chains. The Centre coordinates whole-of-government national security risk management and evaluation, boosting supply chain resilience. Like in many other countries, the epidemic exposed Australia's supply chain vulnerabilities and challenges managing its interactions with China, but the government's Productivity Commission concluded the risks are small and supply chain resilience is strong. The Australian government shifted course to increase economic resilience by focusing on supply networks. The USD 1 billion Modern Manufacturing Initiative helps Australian firms to scale up, turn ideas into commercial possibilities, and connect into worldwide supply networks. Space, medical applications, vital minerals, resources technology, food and drinks, defence, recycling, and clean energy are priorities. A Supply Chain Resilience Initiative pays enterprises up to USD 1.4 million to reduce supply chain risks for pharmaceuticals and chemicals. Funding will be utilized to create or improve a specific manufacturing capacity or associated activity targeting supply chain gaps for a crucial product or input defined in the Sovereign Manufacturing Capability Plan.

5.2.9 WTO and international cooperation

As the core of the multilateral trade regime, the WTO is an essential global forum to debate and address all related matters and monitor trade policies to ensure a smooth flow of goods and services. WTO ensures trade openness, which increases supply chain resilience by diversifying and spreading risks geographically.

¹¹⁸ <https://www.legislation.gov.au/Details/C2018A00153>

Reacting to the pandemic, the WTO Secretariat increased supervision of its members' pandemic-related commerce and trade-related policies. WTO members submitted 427 COVID-19 notices by 20 October 2021. The Global Trade Alert reports that the number of harmful interventions has almost doubled since 2019 (from 987 to 1976). The WTO's Economic Research and Statistics Division highlights the WTO's involvement in reducing export restrictions, which surged throughout the pandemic.

WTO rules (Article XI of GATT) prohibit export restrictions, but exceptions allow them in national security or health emergencies. During the pandemic export restrictions and underreporting rose. This has fuelled global debate over reshoring essential goods manufacturing because it revealed the fragility of supply chain production in a sudden and critical shortage. The surge in export restrictions led to a May 2020 joint G20 trade ministers' statement with short- and long-term actions to support global trade and boost supply chain resilience. Finally, the WTO helped like-minded members work together to address pandemic challenges. In the future, the WTO may assist monitoring trade policies more effectively, enhancing international coordination to avoid disrupting the logistics industry, and boosting supply chain resilience using digital technologies, especially through e-commerce discussions.

Global supply chain issues involve global parties, so international cooperation is key to addressing them. We suggest increasing resilience through formal international agreements, especially for supply chain research and innovation. Respective agreements should create supply chain networks and institutions. They must also leverage existing initiatives like Digital Innovation Hubs and Horizon Europe, which should be extended to third countries. The role of the public sector in setting industry standards, interoperability requirements, and regulatory cooperation is growing in cybersecurity of supply chains. As the EU and US are key players in boosting global supply chain resilience, their cooperation, and the involvement of other like-minded countries (such as Australia, Canada, Japan, South Korea and Taiwan) could be enhanced in multiple areas, starting with identifying common priority sectors, definitions, and methodologies to feed policies. Other ways to boost resilience include extending trade agreements with third countries to diversify markets and decrease dependencies, removing tariff and non-tariff barriers, and tightening cooperation on standards and regulations.

The OECD engages in a vast array of activities pertaining to supply chains. The joint OECD – WTO Trade in Value-Added (TiVA) programme evaluates the value contributed by each country to the creation of globally consumed products and services. Indicators for the Trade in Value-Added (TiVA) are intended to better inform policymakers by revealing fresh insights into the economic connections between countries. Access to the database is available at <https://www.oecd.org/industry/ind/measuring-trade-in-value-added.htm#access>. The AMNE database provides comprehensive information on the operations of foreign affiliates in OECD member countries (inward and outward activity of multinationals). The results demonstrate that the significance of foreign affiliates in the economy of host economies is growing. AMNE includes 17 variables broken out by country of origin (inward investment) or location (outward investment) and industrial sector for a significant number of OECD member countries. Access the database at <https://www.oecd.org/industry/amne.html>. The OECD Initiative on GVC "Production Transformation and Development" is a worldwide forum for policy conversation and the exchange of information between African, Asian, European, and American nations. It seeks to improve evidence and create policy recommendations to assist production transformation and equitable and sustainable participation in local, regional, and global markets. One may get further information at <https://www.oecd.org/dev/global-value-chains.htm>. The Inter-Country Input-Output (ICIO) Database of the OECD (<http://oe.cd/icio>), which was established mainly to provide measures of TiVA, also permits the development of indicators that might shed light on the sources of demand driving a country's employment. Estimates of employment supported by foreign final demand (or by exporting operations) may illustrate the degree to which the workforce of a country is dependent on its integration into the global economy. The Trade in employment (TiM) Database (http://stats.oecd.org/In-dex.aspx?DataSetCode=TIM_2021) provides employment indicators by industry, compatible with output

and value added in the TiVA database, for all OECD, European Union, and G20 countries. The OECD advises updating general and exemption provisions to foster collaboration. EU, US, and other partners should support WTO reform, including export restrictions and trade monitoring. How to mitigate international fair competition risks from tighter supply chains is unknown.

6 Conclusive remarks

EU trade policy is vital for achieving diversification and guaranteeing unimpeded access to raw materials. Since 2015, the Commission has proposed a dedicated Energy and Raw Commodities chapter in bilateral trade agreements, which includes key raw materials. These draft chapters contain essential fields that will aid in the **decarbonisation of the global economy** by opening the energy market, particularly in renewables, but also in the diversification of raw material and commodities supply. In addition, these draft chapters include rules on exploration and production authorization, raw material cooperation, and, most critically, the prohibition of import/export monopolies and dual pricing.

Horizontal provisions (for example, trade in goods, services, and investment) also contribute to undistorted trade and investment in vital raw resources. Regarding the more recent, post-Lisbon FTAs' Trade and Sustainable Development chapters, the EU and its trading partners make legally enforceable obligations to a variety of international environmental agreements and ILO norms. These chapters also offer means for civil society to vent concerns about environmental and social commitments' implementation, most notably through domestic advisory bodies and consultation processes, as well as a specific dispute resolution system.

The priorities in the Commission's strengthened approach to trade rule enforcement, as well as the priority of the Chief Trade Enforcement Officer, are **opening markets** to EU exports and investments, respecting other trade commitments that benefit EU operators and **ensure undistorted trade** in raw materials, **enforcing workers' rights and environmental commitments**, including regarding climate change. The Commission also considers initiating a debate at the WTO on the **limits imposed by local content requirement regulations** on the scaling up of a circular economy. Activating local content criteria is not only against EU and WTO standards, but it also undermines the fair playing field and cost-effective investments.

The EU rules of origin for industrial goods in FTAs are based on adequate production, which is often defined as a 50 % increase in value added or a change in tariff heading. The EU should not change its approach since rules of origin are primarily intended to establish the economic "nationality" of products traded under Trade Agreements and are not an appropriate tool for regulating the use of crucial raw materials on the internal market.

The EU actively promotes the **creation and distribution of international standards on responsible sourcing**, particularly within the OECD. Potential adjustments to the Responsible Minerals Regulation's product scope could be subject to a future review procedure. In this regard, the proposal for a Regulation on prohibiting products made with forced labour on the Union market (2022/0269(COD)) aims at effectively prohibiting the placement of forced labour items on the EU market. The draft Regulation is likely to include both local and imported items, as well as a prohibition and a strong, risk-based enforcement mechanism.

The Commission's Trade Policy Review Communication of February 2021 identified improved trade and investment relations with Africa as one of six sectors crucial to achieving the EU's medium-term goals. The EU-African Union (AU) Summit of February 2021 presented another chance to strengthen partnerships with Africa. The EU is also intensifying its cooperation with the United States and Japan to resolve international competitive distortions caused by non-market economy activities. In our view, the EU should remain steadfast in its determination to increase distortive export restrictions imposed by other countries, both bilaterally and at the WTO, if other options fail.

The 'weaponisation' of trade policy is becoming increasingly prevalent across the world (Council of the EU 2021, 2021a). Even though economic statecraft has always been a part of the toolbox for major powers' foreign policy, it has become more prominent and aggressive in recent years (Zaki Ladi 2008; Meunier/Nicolaidis 2019). One of the most glaring examples of this principle being put into practice can

be seen in the United States under the administration of Donald Trump. Under this administration, the US viewed trade as a zero-sum game, pursued an aggressive and unilateral trade policy, and used the pretext of "national security" to justify its departures from rule-based trade. At the same time, it used the privileged position of the US dollar to threaten European corporations with secondary, extraterritorial sanctions (Stoll/Blockmans/Hagemejer/Hartwell/Gött/Maurer 2020) and compel them to align their economic operations with US objectives. Many observers believe that there has been a large amount of continuity in the practice and content of US trade policy, even though the Biden administration has explicitly distanced itself from Trump's combative language and unstable behaviour. For some observers, Washington's recent rejection of the WTO ruling against US tariffs on steel and aluminium imports is another sign that what's left of internationally recognized trade rules are eroding as geopolitical tensions run high between the US, China and the EU.¹¹⁹ According to Politico, US Trade Representative Katherine Tai argued that the WTO ruling "really challenges the integrity of the system," blaming the decision on "unelected, not really accountable decision-makers in Geneva [who] second guess" America's national security judgment.

Meanwhile, China's use of economic statecraft has grown, particularly since its relative strength and confidence were enhanced after the 2008 global financial crisis. Positive inducements and forceful behaviours are sometimes used in the PRC's methods. The former may take the shape of 'subversive carrots', which are intended to weaken its targets' political institutions and procedures. The latest revelations of corruption scandals involving Chinese-funded investment projects in countries such as the Philippines and Malaysia best exemplify this. Coercive activities, on the other hand, might include prohibiting imports or commodities, engaging in an informal boycott of goods, or even prohibiting the export of strategic items (such as rare earth minerals). The PRC has not shied away from using punitive measures in reaction to perceived political slights, most notably against Lithuania.

China, however, is not the only country that employs such strategies: Because of a conflict between Tokyo and Seoul over reparations for wartime forced labour, Japan, for example, has significantly reduced exports of hydrogen fluoride, a critical resource for South Korea's semiconductor industry.

The rising **trend of using trade as a geopolitical tool has resulted in a 'silent war' for control of GVCs as a critical geostrategic resource**. This battle has raged for quite some time. As a result of the COVID-19 pandemic, which highlighted the susceptibility of GVCs in medical equipment, this pattern is becoming increasingly widespread. Because of this, the Biden administration made it a priority to "reshore supply networks so that we are never again dependent on China in a crisis".¹²⁰ The EU has recognised that preserving the resilience and variety of critical supply chains is a critical component of the concept of "strategic autonomy." While the United States and the European Union look to be more defensive, China appears to be more proactive. The PRC is definitely aiming to reduce its reliance on foreign natural resources by diversifying its supply chains in order to place itself "in a better position to weaponise trade with geopolitical competitors, while increasing the economic dependency of new and current partners."¹²¹

The pandemic of **COVID-19** influenced the dynamics of an increasingly divided and multipolar international environment. It served as **a catalyst in exposing Europe's vulnerability as a result of its reliance on GVCs**. At the same time, it both **accelerated current geopolitical tendencies** and functioned as a potential game-changer in other ways, emphasizing the need of equipping Europe with the appropriate instruments to take an active role in both circumstances. The pandemic **aggravated tensions** between the United States and China, as well as between the United States and the EU; it accelerated China's relative

¹¹⁹ Politico, 21 December 2022, <https://www.politico.eu/article/brussels-incensed-as-us-spurns-global-trade-rules-yet-again/>

¹²⁰ Hutzler, A./Carrasquillo, A. Biden's "Buy America" Plan echoes Trump, but puts China in its Crosshairs, Newsweek, 24 July 2020, <https://www.newsweek.com/bidens-buy-america-plan-echoes-trump-puts-china-in-its-crosshairs-1519747>.

¹²¹ Cissy Zhou/Su-Lin Tan, South China Morning Post, 7 September 2021, <https://www.scmp.com/economy/china-economy/article/3147774/china-australia-relations-demand-coal-surges-how-long-can>.

growth compared to the rest of the world, despite slowing down its economy; and it gave Beijing the opportunity to exacerbate rifts between EU Member States and exploit them to its advantage, through its so-called 'mask diplomacy'. In this context, the EU's desire for greater strategic autonomy must be understood alongside equivalent (if not identical) tactics undertaken by other major powers.

The Trump administration's hostile stance toward Europe and NATO has frequently been regarded as the main factor giving "renewed emphasis to the long-held aspiration for European strategic autonomy" (Aggestam/Hyde-Price 2019: 123). Indeed, the unilateralist rhetoric of 'America First' has frequently resulted in the United States' withdrawal and the formation of a global leadership vacuum, which other nations, such as China, have moved to fill, for example, by pursuing crucial positions in UN organizations. President Biden's promise that 'America is back' has been welcomed across the Atlantic, but several commentators have questioned whether a need to focus on pressing domestic issues (such as healing societal divisions, combating COVID-19, and shoring up the economy) may stymie his foreign policy ambitions.

For many years, the United States has been actively attempting to reduce its foreign dependencies, whether through Obama's plans for energy independence, Trump's attempts at decoupling from China, or Biden's 'Buy American' plan. On the opposite side of the Pacific, Beijing is focusing its economic policy on domestic consumption and import substitution as part of its 'dual circulation' plan. Given its leaders' perceptions of an increasingly complex and uncertain world, China's draft 14th Five-Year Plan (2021-2025) calls for properly handling the relationship between openness and independence, securing China's supply chains, and increasing self-sufficiency in agriculture, energy, technology, and industry (Sutter/Sutherland 2020). President Xi Jinping stated in an April 2020 speech to the Chinese Communist Party's Central Financial and Economic Commission that "efforts should be made to **build an independently controllable, safe, and reliable industrial chain and supply chain, striving to have at least one alternative source for all important products and supply channels, and to form the necessary industrial backup system.**"¹²²

Interestingly, the leadership of the PRC categorically condemns "the politicization and weaponisation of industrial networks and supply chains." President Xi argues that in "international economic and trade negotiations, we must promote the formation of international consensus and guidelines for maintaining the security of global industrial chains and supply chains and eliminating interference from non-economic factors and strive to stop the egregious acts against global industrial chains and supply chains through international cooperation". At the same time, Beijing wants to guarantee that other nations continue to rely on China for crucial commodities. President Xi advocated in this regard to "tighten the international industrial chain's dependence on China and form a strong countermeasure and deterrence against artificial supply cuts from the outside."¹²³ This capability for economic deterrence appears to have a defensive connotation, according to Xi, and is tempered by calls for international cooperation to build an international consensus on norms to protect global industrial and supply chains. Nonetheless, recent China-Australia relations have clearly demonstrated that Beijing would not hesitate to utilize economic reliance for hostile goals as well. China's political ambitions are apparent, driving measures such as the Belt and Road Initiative, the Regional

¹²² Xi, Jinping (2020), Major issues in the nation's medium and long-term social and economic development, speech delivered at the seventh meeting of the Central Financial and Economic Commission on 10 April 2020; <http://en.gsttheory.cn/2021-01/14/c581594>. The original version reads: 为保障我国产业安全和国家安全，要着力打造自主可控、安全可靠的产业链、供应链，力争重要产品和供应渠道都至少有一个替代来源，形成必要的产业备份系统。

¹²³ Xi, Jinping (2020), Major issues in the nation's medium and long-term social and economic development, speech delivered at the seventh meeting of the Central Financial and Economic Commission on 10 April 2020; <http://en.gsttheory.cn/2021-01/14/c581594>. The original version reads: 是要拉长长板，巩固提升优势产业的国际领先地位，锻造一些“杀手锏”技术，持续增强高铁、电力装备、新能源、通信设备等领域的全产业链优势，提升产业质量，拉紧国际产业链对我国的依存关系，形成对外方人为断供的强有力反制和威慑能力。

Comprehensive Economic Partnership (RCEP), and even the EU-China Comprehensive Agreement on Investment (CAI).

The **EU's campaign for strategic autonomy does not occur in isolation**. Parallel 'strategic autonomy' discourses have gained traction among other important international powers, but with differing features. The COVID-19 pandemic has hastened a drop in globalization that has been noted for years, but there is a risk that inward-looking measures taken by major powers in reaction to this trend would intensify it even more, as a self-fulfilling prophecy or as the result of a 'prisoner's dilemma'. Furthermore, such policies run the danger of creating a scenario known as a "security dilemma," in which **defensive measures adopted by one power are perceived as potentially aggressive by other countries, provoking reactions that lead to greater tension and fragmentation of the international system**.

6.1 The criticality of GVCs

Our analysis of the criticalities posed by both products and partners is a vital step in the process of addressing the strategic dependencies that the EU has on other nations. Since the EU is extremely reliant on outside sources for essential commodities, much of the political focus in the EU has thus far been concentrated on natural resources. The concentration of supplies has been the primary criterion that the European Commission has used to determine whether there is a supply risk, such as the danger of an interruption in the EU's supply of the materials.

CRMs account for a modest 0.7 % of total EU imports; all raw materials account for only 5 % of total EU imports. Even though the aggregate importance of CRMs in total extra EU imports is rather low, many CRMs are highly concentrated at the country level, and on top of that, they are often found in countries and regions that are characterized by low standards of governance.

As a result, the **precariousness of raw material supplies results from the concentration of providers as well as the character of the nations that are the sources of such supplies**, and in many instances, there are **no evident alternatives of substitution**. Most of the extraction phase raw material imports (including baryte, borate, and antimony) come from countries with poor economic freedom and somewhat low democratic ratings. When processing is taken into account, the import partners from whom the EU obtains borate, coking coal, cobalt, titanium, vanadium, and tantalum have both poor rankings for economic freedom and democracy. Several industries and products that are necessary are reliant on the availability of these CRMs. These include the aviation and defence industries (antimony, titanium, and vanadium), the battery industry (antimony, cobalt, and coking coal), the medical and chemical industry (baryte and titanium), the semiconductor industry (gallium and borate), and the automotive industry (gallium and borate) (vanadium, titanium).

Now, around 55 % of all CRM imports are covered, on average, by the investment agreements that were either formed by an EU member state on an individual basis or as EU-wide trade agreements that contain investment provisions. This indicates that the individual coverages might range from 0 % (for elements like cobalt and vanadium, for example) all the way up to 100 %. (e.g. for borate and phosphate rock).

The primary objective of the EU Raw Materials Diplomacy is to establish bilateral, regional, and multilateral frameworks of cooperation, with the intention of including dedicated chapters and provisions in upcoming and possibly existing free trade agreements (FTAs). **At the core of the EU's Raw Materials Diplomacy is the objective of increasing sourcing of CRM from partners that are considered to be "reliable."**

The EU's external policies need to be established with greater attention to meet the goal of enhancing the supply chain's resilience. This should be pursued while also acknowledging that **not only EU demand, but also the global demand for raw materials has and will continue to grow** as the overall global material use will more than double in 2060, compared to 2011, with the use of metals in particular increasing by

250 %. In most cases, the countries from which the EU obtains its raw resources are also the ones that provide the rest of the world with such raw commodities. As a result, **there will be an increase in the level of global rivalry for raw resources**. The significance of the ongoing worldwide discussion on raw materials is further highlighted by this fact.

Although there has been systematic attention paid to the significance of CRMs to the economy of the EU since well before the pandemic, the fragility of several critical product supply-chains, beyond CRMs, did not become apparent until the COVID-19 pandemic and even more so after the Russian invasion of Ukraine. If one is simply going to analyse how dependent the EU is on its non-FTA trading partners for imports, then **the PRC is the EU's single most important partner**. In addition, the direct import dependency of the EU on China does not consider the significance of **China's centrality as a trading partner of other EU suppliers**. This implies that China is able to "command" a bigger proportion of the world's export flows. This type of **network centrality** among EU direct import partners can in fact lead to a significantly increased total EU dependency on particular partners. The supply chain for electric vehicle batteries is a good example; key EU suppliers come from nations outside of the EU, namely Japan, China, and South Korea. In contrast, recent patterns show an increase in imports from South Korea, which mostly sells to China but has lately boosted its exports to the United States as well. Recently, South Korea has expressed concern that it may not be able to decrease its exports to China and increase those to the EU (as many people in Europe think is the best solution to excessive dependence on China), due to the likely retaliation that it would face from the PRC. This concern stems from the fact that many in Europe think this is the best solution to excessive dependence on China.

6.2 Developing synergies between external and internal policy instruments

The second part of this study screened the EU's most important policy instruments regarding the issue of GVCs in order to analyse if EU legislation covers identified weaknesses. We analyse probable synergies on two dimensions: direct vs indirect impact and substantial versus minor impact. In addition, we explore whether these instruments address short-term or long-term vulnerabilities.

Our screening's evidence shows:

- Most instruments do effectively link internal and external policy objectives.
- Most instruments address securing supply chains as a key objective: 22 instruments list safeguarding existing supply as a critical goal, while seven list diversifying foreign sources.
- Most instruments address long-term sustainability as an objective: 23 instruments identify building sustainable capacities (at home or abroad) as an important goal.
- Only two instruments (EU's FDI screening framework and InvestEU) focus on onshore supply chains.
- Regarding the implementation and enforcement of the instruments under review, our analysis reveals a potential implementation and enforcement gap: Only 12 instruments have binding obligations; 28 use best efforts. 22 instruments are to be implemented by the EU and other signatories and rely on partners' participation.

Our screening shows that the **EU has already taken action to solve existing gaps by focusing on each dimension**, where the short-term reaction to the COVID-19 outbreak and economic recovery are linked with long-term diversification and sustainability aspirations. **Due to the EU's unique competence and substantial bargaining strength, most instruments have been made in trade and investment.**

The appointment of the Chief Trade Enforcement Officer (CTEO) in 2020 highlighted the need to boost the execution of the EU's global, regional, and bilateral trade agreements and ensure that partners follow bilateral trade agreement commitments. The CTEO was introduced alongside tangible measures on implementation and enforcement, such as the Anti-Coercion Instrument and Trade Defence Instruments.

The EU's trade instruments have focus on

- strengthening the implementation and enforcement of trade and trade-related commitments,
- introducing new or revised instruments that target specific foreign activities, which may reduce EU access to CRM, and which address trade and investment distortions,
- negotiating new FTAs and modernizing existing FTAs in line with the need to remove import tariffs, reduce export restrictions such as export taxes or export quotas, and renegotiating existing FTAs,
- investing in renewable energy and sustainable materials manufacturing as a streamline objective.

A second category of instruments involves raw materials and energy hazards: Converging national, international, and multinational policies in renewable energy, vital raw resources, and supply chain resilience; safeguarding EU energy requirements; and lowering dependency on non-renewable energy.

Some of the instruments examined here pertain directly to other areas yet have supply chain diversification and resilience consequences. Climate change threats have pushed efforts to mitigate climate change's effect, achieve EU climate pledges and goals, and enhance EU and foreign partner capacity to generate new ideas and satisfy sustainability requirements. Climate change is a policy goal that relies on synergy and may affect supply chains. This pertains to technical issues and building EU tech and innovation capabilities.

Lastly, the **threats described above have a strong geopolitical and geoeconomic component, requiring action to promote regional cooperation and external relationships and preserve EU's strategic interests:**

- The EU-US TTC may have an influence in this regard, according to our screening. We assess the TTC as beneficial and long-term. The EU-US framework is relevant, but it's proven challenging to create the correct platform for combining internal and exterior goals.
- EU and US cooperative actions on standard-specific, product- or sector-specific issues might create multilateral synergy. **The transatlantic relationship shapes the global economy, as most nations' major trade and investment partner is either the EU or the US.**
- The study of the proposed Corporate Sustainability Due Diligence act reveals a direct, large, and long-term positive impact. The Directive can serve as a pattern since it improves supply chain sustainability. It will apply to value chains of additional minerals not covered by the Conflict Minerals Regulation but subject to human rights, climatic, and environmental concerns. It intends to supplement the Batteries Regulation by adding value chain due diligence for raw materials not covered by the Regulation, without needing certification for EU market placement. It complements the Regulation on deforestation-free goods by adding value chain due diligence for activities not covered by the Regulation but that may lead to deforestation.
- The FDI Screening instrument has a direct, if slight, influence on vital supply chains. FDI spans a wide range of sectors, but is most prevalent in manufacturing (44 %), which includes military, aircraft, energy, health, semiconductor equipment, and ICT.
- The CBAM plan has a huge but indirect influence because of EU climate change aspirations. CBAM aims to rewrite supply networks by tackling climate leakage. Its extraterritoriality might have a profound influence on EU and worldwide supply chains.
- The updated Public Procurement Instrument has been in the works for over a decade and is believed to have enhanced EU negotiating position with third nations. The impact is indirect because it doesn't cover crucial supply materials, raw materials, and energy. It might have a long-term favourable impact, especially if it helps to expand the Global Procurement Agreement.

7 Recommendations

During the last years, concerns have increased regarding the EU's reliance on trade, resources, and technology. Although there is evidence that some reshoring has occurred since at least 2011, there are still questions about whether the manufacturing of technologies should be transferred back to Europe. The idea that essential goods, technology, or raw materials may be in short supply during times of crisis or that reliance on third-party sources would limit political freedom motivates many to consider decoupling and/or reshoring as a response to geopolitically dangerous dependencies.

EU trade diversification and increased autonomy in vital technology fields ideally go hand in hand with open markets although a different line of thinking can also be observed to take shape.

Clearly, there may be benefits for the environment and sustainable development if EU trade rules and norms were to become more widely adopted throughout the world through trade diversification. However, any trade diversification strategy requires a greater understanding of the goods and industries that should be varied and grown inside the EU. Within the Internal Market, many products and services are interconnected among EU member states. This has the advantage of cushioning supply shocks, but as the first wave of the COVID-19 pandemic demonstrated, this is meaningless if governments withdraw behind national borders for crucial goods. Despite the presence of the Internal Market, the EU is significantly reliant on imported resources, goods, and technology.

The EU must be wary of succumbing to economic pressure in its trade relations. Future trade facilitation and trade defence measures should be based on a solid knowledge of whether a certain supplier is willing to manipulate or disrupt supply flows and if it actually has the capacity to do so.

Given the current state of the global trading system, the **EU should anticipate an increase in the frequency of potential attempts at economic coercion, whether through the imposition of sanctions against individual EU member states, the haphazard imposition of tariffs, or raw material export restrictions.** If the EU is to prepare for a more competitive and aggressive international trade system, it must guarantee that it is ahead of the curve in terms of supply security while staying open for business.

Lowering potentially detrimental dependences should coexist with EU initiatives such as material stockpiling, recycling, substitution, and the development of innovative technologies within the Union. The EU confronts enormous risks associated with trade diversification, which collectively conspire to limit the number of possible suppliers and partners for the EU's more sensitive dependences.

Existing EU trade agreements provide a solid platform for diversification. Recent FTAs require more time to mature, but the EU could utilize previous agreements to mitigate risks such as state instability, economic coercion, and climate vulnerability. Trade diversification is required to ensure supply security since the transition to a green and digital economy assumes an increased demand for vital minerals and goods.

To mitigate potential future raw material shocks, the EU should work to **establish enforceable bilateral and plurilateral resource and cooperative industry partnerships.** The latter is important to support those states, societies, and economies on their way to sustainable industrialisation. Especially in the interest of balanced, fair competition based on a rules-based order within the framework of the WTO, the EU should strive not to regard third countries alone as potential suppliers of raw materials! In our view, it would therefore be advisable not only to include comprehensive commodity chapters in future trade agreements. In addition, these chapters should be supplemented by instruments of **cooperative industrialisation** and **shared value creation** committed to sustainability principles.

The EU must adopt additional strategies to secure sustained access to essential commodities. Sustained financial investment might allow the EU to reduce its reliance on digital technologies by creating fundamental technologies. Furthermore, through creating material substitutes, the EU should focus more on

mechanisms to ensure that its economy has the basic material inputs for green and digital technologies. It may also defend market openness and safeguard its expertise by vetting foreign investments, all while fostering scientific collaboration. It may use current trade partnerships while also diversifying commerce to improve environmental standards and sustainable development. Any other method would be too risky in terms of geopolitics. The United States and China appear to be trapped in a trade war, and recent export and investment restrictions threaten to further politicize the issue. The EU has no choice but to advocate for international solutions.

To conclude, we suggest considering the following options:

1. Encouraging the development of domestic industries: The EU should continue to invest in research and development and support the growth of domestic industries to reduce reliance on imported goods and services. This would involve prioritising those – sustainable – industrial sectors that are crucial to achieving the EU's climate policy goals.
2. Promotion of interregional, cooperative trade: The EU should strengthen its “region-to-region”, plurilateral trade relationships with other regions, such as Africa, Asia and Latin America, to diversify its global value chains and reduce its reliance on a few key trading partners.
3. Supporting small and medium-sized enterprises: The EU should continue to provide financial and technical support to small and medium-sized enterprises, which can help these businesses to enter new markets and diversify the EU's global value chains.
4. Promoting sustainable and ethical practices: The EU should encourage businesses to adopt sustainable and ethical practices, which can help to reduce the environmental and social impacts of global value chains and make them more resilient.
5. Fostering collaboration and partnerships: The EU should encourage and facilitate businesses to collaborate and form partnerships with other firms, which can help them to access new markets and diversify their global value chains.

Only at first, cursory glance can the long-term security of GVCs be assessed independently of the EU's sustainability goals and value-based standardisation. However, if there is a trend within the EU to orient value chains towards climate, environmental, human rights, labour and civil rights goals and standards, we believe that GVC strategies should be focused accordingly. In this respect, we propose the following policy options:

1. Promoting sustainable production and consumption: The EU should continue to support the development of sustainable production and consumption practices, such as eco-design and the circular economy.
2. Encouraging the use of sustainable raw materials: The EU should encourage the use of sustainable raw materials, such as recycled materials and biobased products.
3. Supporting the development of sustainable technologies: The EU should develop dedicated instruments to invest and support the development of sustainable technologies, such as renewable energy and green chemistry.
4. Promoting sustainable economics: The EU should force businesses to adopt sustainable practices, such as fair labour practices and respect for human rights.
5. Fostering collaboration and partnerships: The EU should encourage businesses to collaborate and form partnerships with NGOs and research institutions, to promote sustainable and ethical practices in global value chains.
6. Promoting sustainable trade policy: The EU should consider supporting the development of sustainable trade, such as reducing tariffs on sustainable products and promoting sustainable supply chain practices.

Clearly, for the resilience of the EU economy and international trade relations it is crucial to develop a consistent EU response to possible negative consequences of external shocks with a coordinated approach at EU, inter-regional, and global level. We suggest the Commission to continue monitoring the supply chains,

especially those which are at higher risk, and to develop a multifaceted strategy for each sector or product concerned to be able to promptly address current and future shortages. Considering our evidence regarding the GVC policies of third countries, the EU should **establish a flexible policy that allows to avoid passing from a given dependency of today to another dependency of tomorrow.**

A unified and all-encompassing strategy for bolstering the EU's resiliency should be built around five pillars: (1) reshoring, greater domestic decarbonised production, and shortening of supply chains; (2) energy economies, efficiency, and recycling through binding targets to reduce material consumption; (3) cleaning up supply chains from human rights violation and deforestation or biodiversity deterioration through new legislation; (4) fostering inter-regional partnerships and stepping up investments in the green and social transition while ensuring that trade achieves the millennium development goals; (5) prioritizing global problem-solving processes and solutions. A strategy along these lines could also entail reworking the global trade system in such a way that it does not hinder the process of ecosystem regeneration but, rather, facilitates it. This would allow for the possibility of high-quality employment as well as the protection of environmental and human rights within the EU as well as in third countries.

To date, the EU is highly dependent on only few countries for critical raw materials. While enhancing its industry's capacity to extract, process, recycle, and refine (potentially) onshore critical raw materials, the EU should intensify its actions to develop a coordinated set of solutions aimed at increasing the resilience of EU supply chains through the creation of long-term, sustainable and inclusive development partnerships and alliances, diversification of suppliers, and adequate, targeted, and proportionate stockpiling of critical raw materials and products to manage market crises and price volatility, secure supply, and prevent speculation.

The EU Chips Act represents a decisive and important step in the EU's race for digital sovereignty and strategic autonomy to achieve independence in the supply of this category of semiconductors. Future investment, investment facilitation and trade agreements of the EU with relevant third countries should make collaboration in the field of semiconductors and along the entire semiconductor supply chain a key priority. New initiatives aimed at improving the salience of supply chains such as the Chips Act or the Single Market Emergency Instrument must comply with EU law. Impact Assessments and similar pre-cooking exercises towards similar instruments should always seek compliance with the WTO agreements and with commitments made under other trade and investment agreements to which the Union or the Member States are party. By the same token, legislative measures such as the directive on a Corporate Sustainability Due Diligence or the regulation on prohibiting products made with forced labour on the Union market should help to steer international rulemaking and GVC governance.

Regarding United States' IRA policy, the EU might try to search for a bilateral solution within the newly established IRA Task Force to remove the local production content requirements in the law itself. However, we would discourage the EU from asking for an exemption, as provided in the IRA for Mexico and Canada, as this would continue to flout WTO rules. Instead, the EU should file a case at the WTO, possibly together with other concerned partners. Filing such a complaint is not an act of unfriendliness, but rather a necessary step to keep the WTO as the key institution for GVC governance. **If the EU does not file a complaint against the IRA, it would damage its own trade policy strategy and the credibility of the multilateral trading system.** In addition to filing a WTO case, the EU should work with allies and countries also affected by the IRA, such as South Korea, Australia, New Zealand, and Japan. Moreover, the EU should also provide **a proper industrial policy response** to the IRA. More specifically, the Commission should **review the state aid framework in a targeted way.** It could consider allowing for additional subsidies focused on sustainable innovation. Anyway, **the EU should refrain from mimicking the IRA with some kind of "Made in EU" Act** as this would be incompatible with the WTO, and detrimental to the EU's credibility as a trading partner. As a rule, the EU should **refrain from entering a subsidy race**, but rather maintain and shape the rules-based multilateral trading system.

The development of the **EU toolbox of autonomous trade instruments**, including the trade defence instruments, the anti-coercion instrument, the foreign-direct-investment screening mechanism, the foreign subsidies instrument and the international procurement instrument **are important but reactive instruments**. They are crucial to rebalance trade relationships and foster more sustainable and protective-of-human-rights supply chains. Reactively oriented instruments of autonomous trade policy **should not**, however, be understood as **compensation for the lack of proactively oriented policies to modernize international trade policy**. It is highly likely that third countries will interpret such instruments as escalation stages of slowly developing trade conflicts and therefore deploy corresponding countermeasures. To avoid more dramatic escalations, the EU should therefore proceed cautiously, transparently and in a way that is comprehensible to third parties. At the same time, the EU should try to find ways out at the WTO level that make the use of its defensive trade policy instruments unnecessary.

The scarcity of raw materials and the effects of climate change are two interrelated challenges that must be carefully considered and planned for. On the one hand, the world's rising population and consumption of products and services are boosting demand for raw resources such as minerals, metals, and – at least in the medium term – fossil fuels. The mining, processing, and transportation of these commodities, on the other hand, contribute to greenhouse gas emissions and other environmental problems that worsen climate change. We suggest concentrating EU GVC policies on the following ways to balance the requirement for raw resources with the effects of climate change:

- **Reducing raw material demand:** Promoting circular economy, in which resources are utilized effectively, waste is avoided, and materials are recycled and reused as much as possible, is a strategy to lessen the demand for raw materials. This strategy has the potential to eliminate the requirement for additional raw materials as well as the accompanying environmental implications.
- **Employing renewable and low-carbon raw materials:** Switching to renewable and low-carbon raw materials could become another approach to lessen the environmental effect of raw materials. The utilization of renewable energy sources like solar and wind power, may help to minimize the carbon footprint of energy-intensive mining and processing processes.
- **Investing and assisting in sustainable mining practices:** Mining and extraction operations may be made more sustainable by decreasing waste, using energy-efficient technology, and lowering the environmental effect of tailings and other waste streams.
- **Increase supply chain openness and accountability:** Consumers and companies may help promote sustainable practices by demanding supply chain transparency and responsibility. This might involve assisting organizations that emphasize sustainable sourcing and supply chain management, as well as pushing for sustainable policy and regulatory frameworks.

Regarding the **EU's trade toolbox from a democratic-parliamentary point of view**, we witness a whole diversity of instruments with a spectrum of interinstitutional implications. In almost all instruments of the autonomous trade policy, the European Commission has the authority to take action via the use of implementing acts or delegated acts. Unilateral, autonomous trade policy tools are a key feature of the EU's CCP, since it is an area of exclusive EU competence that has historically been led by the Commission. Accordingly, it is appropriate to utilize implementing and delegated acts to adopt decisions under such instruments on the grounds that they are of an "executive" character, as opposed to a "legislative" one. In most of the cases, the European Parliament and the Council, as co-legislators, have established the relevant framework legislation and have delegated authority to the Commission to implement them.

However, one could adopt an alternative view seeking to diminish the utility of unilateral action by the Commission: Articles 218 TFEU and 207 TFEU establishes a decision-making process for international agreements, including trade agreements, in which both the Council and the Parliament play a decisive part. Given that the Council and the European Parliament thus fulfil a key function in bilateral, plurilateral

or multilateral trade policy measures, they should not be excluded from unilateral measures of autonomous trade policy. For the European Parliament, it is important to **note that the Council or the member state governments benefit from a power-political asymmetry based on Articles 290 and 291 TFEU.** This is because implementing acts are only at first glance "pure" executive acts of the Commission. In fact, however, the member states have a say and veto rights vis-à-vis the Commission. As to Parliament, Article 11 of the so-called "Comitology-Regulation"¹²⁴ provides for some kind of discretionary scrutiny on the Commission's draft in those cases, where the basic act is adopted under the ordinary legislative procedure. Accordingly, Parliament may indicate to the Commission that, in its view, "a draft implementing act exceeds the implementing powers provided for in the basic act. In such a case, the Commission shall review the draft implementing act, taking account of the positions expressed, and shall inform the European Parliament and the Council whether it intends to maintain, amend, or withdraw the draft implementing act." In the case of delegated acts,¹²⁵ however, the Parliament and Council can introduce, in the basic act's provisions on the delegation itself, a right to object to a draft act or even to revoke the delegation altogether. Whereas the Council can exercise such ex-post control instruments by QMV, the Parliament must vote by a majority of its constituent members according to Article 290(2) TFEU, which is a higher threshold than the default (majority of votes cast) prescribed by Article 231 TFEU.

Regarding the EU's free trade agreements, and in particular the Association Agreements that include FTAs, Parliament should also consider more intensively its role in those fields where the agreements perform as "living instruments". While the **agreements' "joint committees" are powerful bodies to interpret, amend and supplement the content** of (parts of) the agreements, **there is hardly any effective way for Parliament to give effect to its general policymaking, and control functions.** It should also be taken into account that the Council alone adopts restrictive measures and that here, in addition, the European Parliament is forced onto the observer's bench. This arrangement – as well as the entire delimitation of the EU's Common Foreign and Security Policy as an area of intergovernmental decision-making – was traditionally justified by the political and thus sensitive character of restrictive measures. Conversely, traditional trade policy measures were seen as technical, "non-political" measures to be administered by the supranational Commission as the EU's executive body. However, **in the age of geo-economics and the increasing, political "loading" of trade policy, this dichotomy has become untenable.** Trade policy is embedded in dynamic, geopolitical rivalries and is now – arguably more clearly than in previous years – intertwined with foreign and security policy. As a result, the case for independent action by the Commission without meaningful scrutiny or involvement of Parliament has become more difficult.

Geo-politicization makes trade policies more politicized. **Therefore, efficient, and democratic methods for accountability are required.** The instruments of the Comitology Regulation may not be the suitable tools for the EU to engage in "wars by other means". From a democratic point of view, we believe that there is too much at stake for politically sensitive decisions to be taken by the Commission alone – with the silent participation of the Member State governments – without the European Parliament being involved to any significant extent in the decision-making process.

At the same hand, making individual decisions subject to the normal legislative procedures would make it impossible for the EU to respond in a timely manner. A trend toward Council decision-making by consensus should also be avoided, as is the case with restrictive measures now. Recent events have shown that making decisions about foreign policy via unanimity distributes decision-making authority to third countries.

¹²⁴ Regulation (EU) No 182/2011 of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers.

¹²⁵ The rules of delegated acts have been agreed by Parliament, the Council, and the Commission within the Common Understanding on Delegated Acts, which is annexed to the Interinstitutional Agreement on Better Law Making of 2016, OJ L 123, 12.5.2016, p. 1–14.

These countries have the ability to thwart EU actions by using the influence they have earned over individual Member States. In addition, the action of the Council by means of a vote with a qualified majority, without any involvement of the European Parliament – an arrangement that currently exists for restrictive measures adopted based on Article 215 TFEU following an earlier CFSP decision adopted by unanimity – is not a democratic option either. In an area of exclusive competence like in CCP, indirect democratic legitimacy via the Council alone is inadequate. **It should be reinforced by direct democratic legitimacy through the European Parliament in order to be sufficient.**

We would **strongly advocate a larger use of delegated acts as one method to increase democratic supervision while still allowing for reasonably swift decision-making.** Delegated acts are to be favoured over implementing acts from the perspective of democratic legitimacy. When developing new unilateral trade policy instruments like the anti-coercion instrument, the EU's legislature should take advantage of this flexibility and give the Commission the authority to act through delegated rather than implementing acts so that they can design new trade policy instruments. Involving the European Parliament in the process of reforming the Comitology-Regulation is another approach that might be used to strengthen democratic accountability. It is important to keep in mind that the European Parliament participated in what is known as the "regulatory process with scrutiny" prior to the entry into force of the Treaty of Lisbon. When designing unilateral trade policy instruments, it is reasonable to anticipate that both Commission and Council will give preference to implementing acts over delegated acts. In order to guarantee adequate democratic oversight, regardless of whether the EU legislature grants the Commission the authority to act by delegated or implementing act, the European Parliament ought to be given more responsibility in the Comitology process.

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9 Appendix

Table 17. List of FTA partners supplying CRMs to the EU

CRM name	Partner country	Agreement type	Share in EU CRM imports (%)
Antimony	Turkey	Customs union	92.1
Antimony	Japan	Economic Partnership Agreement	0.2
Antimony	Vietnam	Free Trade Agreement	19.4
Antimony	South Korea	Free Trade Agreement	6.1
Antimony	Turkey	Customs union	0.5
Antimony	United Kingdom	Trade and Cooperation Agreement	0.3
Antimony	Japan	Economic Partnership Agreement	0.3
Baryte	Morocco	Association Agreement	19.3
Baryte	Turkey	Customs union	10.1
Baryte	Mexico	Global Agreement (2000)	4.3
Baryte	United Kingdom	Trade and Cooperation Agreement	1.7
Baryte	Canada	Comprehensive Economic and Trade Agreement (CETA)	0.2
Bauxite	Guyana (CARIFORUM)	Economic Partnership Agreement	5.7
Bauxite	Turkey	Customs union	4.2
Bauxite	Montenegro (Western Balkans)	Stabilisation and Association Agreement	1.5
Bauxite	United Kingdom	Trade and Cooperation Agreement	1.0
Bauxite	Bosnia and Herzegovina (Western Balkans)	Stabilisation and Association Agreement	0.2
Beryllium	Singapore	Free Trade Agreement	37.4
Beryllium	Ukraine	Deep and Comprehensive Free Trade Agreement	1.0
Beryllium	Kazakhstan	Enhanced Partnership and Cooperation Agreement	0.5
Beryllium	Serbia (Western Balkans)	Stabilisation and Association Agreement	0.5
Beryllium	United Kingdom	Trade and Cooperation Agreement	0.4
Beryllium	South Africa	Economic Partnership Agreement	0.4
Beryllium	Vietnam	Free Trade Agreement	0.3
Beryllium	Canada	Comprehensive Economic and Trade Agreement (CETA)	0.1
Beryllium	Kazakhstan	Enhanced Partnership and Cooperation Agreement	61.7
Beryllium	Switzerland	Agreement	1.6
Beryllium	United Kingdom	Trade and Cooperation Agreement	1.0
Bismuth	South Korea	Free Trade Agreement	11.9
Bismuth	Japan	Economic Partnership Agreement	2.5
Bismuth	United Kingdom	Trade and Cooperation Agreement	1.9
Bismuth	Switzerland	Agreement	0.4
Bismuth	Canada	Comprehensive Economic and Trade Agreement (CETA)	0.1
Borate	Turkey	Customs union	97.6

Borate	Chile	Association Agreement and Additional Protocol	0.3
Borate	United Kingdom	Trade and Cooperation Agreement	0.2
Borate	Turkey	Customs union	60.4
Borate	Peru (with Colombia and Ecuador)	Trade Agreement	0.8
Borate	South Korea	Free Trade Agreement	0.7
Borate	Japan	Economic Partnership Agreement	0.7
Borate	Chile	Association Agreement and Additional Protocol	0.5
Borate	United Kingdom	Trade and Cooperation Agreement	0.3
Cobalt	Canada	Comprehensive Economic and Trade Agreement (CETA)	16.4
Cobalt	Morocco	Association Agreement	11.2
Cobalt	Turkey	Customs union	8.9
Cobalt	Norway	Economic Area Agreement	8.0
Cobalt	United Kingdom	Trade and Cooperation Agreement	6.9
Cobalt	Japan	Economic Partnership Agreement	6.2
Cobalt	Mexico	Global Agreement (2000)	1.3
Cobalt	Madagascar (ESA)	Economic Partnership Agreement	1.3
Cobalt	South Africa	Economic Partnership Agreement	0.5
Coking Coal	Canada	Comprehensive Economic and Trade Agreement (CETA)	8.0
Coking Coal	Mozambique (SADC)	Economic Partnership Agreement	2.5
Coking Coal	Colombia (with Ecuador and Peru)	Trade Agreement	0.1
Coking Coal	Colombia (with Ecuador and Peru)	Trade Agreement	13.5
Coking Coal	Canada	Comprehensive Economic and Trade Agreement (CETA)	7.3
Coking Coal	Japan	Economic Partnership Agreement	5.6
Coking Coal	South Africa	Economic Partnership Agreement	1.1
Coking Coal	Ukraine	Deep and Comprehensive Free Trade Agreement	1.0
Coking Coal	United Kingdom	Trade and Cooperation Agreement	0.7
Coking Coal	Bosnia and Herzegovina (Western Balkans)	Stabilisation and Association Agreement	0.5
Coking Coal	Kazakhstan	Enhanced Partnership and Cooperation Agreement	0.2
Fluorspar	Mexico	Global Agreement (2000)	45.1
Fluorspar	South Africa	Economic Partnership Agreement	11.6
Fluorspar	Canada	Comprehensive Economic and Trade Agreement (CETA)	11.0
Fluorspar	Vietnam	Free Trade Agreement	11.0
Fluorspar	United Kingdom	Trade and Cooperation Agreement	3.4
Fluorspar	Morocco	Association Agreement	2.3
Fluorspar	Japan	Economic Partnership Agreement	0.8
Fluorspar	Turkey	Customs union	0.2

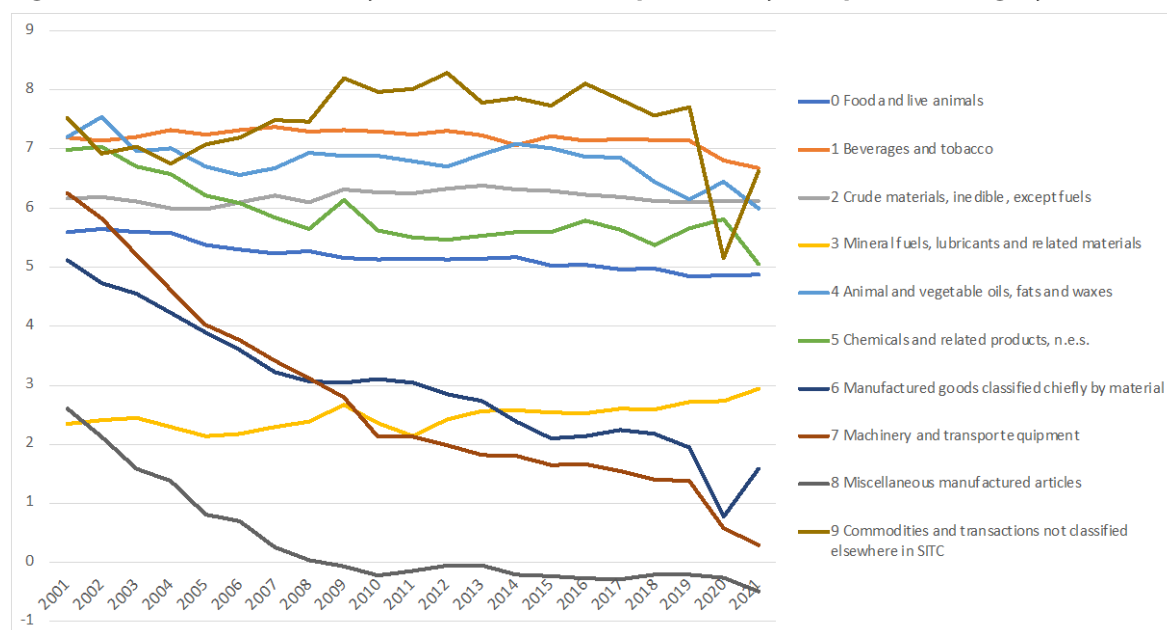
Gallium+Indium	Canada	Comprehensive Economic and Trade Agreement (CETA)	9.0
Gallium+Indium	Ukraine	Deep and Comprehensive Free Trade Agreement	1.5
Gallium+Indium	Japan	Economic Partnership Agreement	0.6
Gallium+Indium	United Kingdom	Trade and Cooperation Agreement	0.4
Germanium	Japan	Economic Partnership Agreement	11.0
Germanium	United Kingdom	Trade and Cooperation Agreement	6.2
Germanium	South Africa	Economic Partnership Agreement	3.1
Germanium	South Korea	Free Trade Agreement	0.6
Lithium	Chile	Association Agreement and Additional Protocol	59.3
Lithium	United Kingdom	Trade and Cooperation Agreement	6.6
Lithium	South Korea	Free Trade Agreement	1.4
Lithium	Switzerland	Agreement	0.3
Lithium	Turkey	Customs union	0.3
Magnesium	Israel	Association Agreement	4.0
Magnesium	Turkey	Customs union	1.8
Magnesium	Serbia (Western Balkans)	Stabilisation and Association Agreement	0.8
Magnesium	United Kingdom	Trade and Cooperation Agreement	0.8
Natural Graphite	South Korea	Free Trade Agreement	18.8
Natural Graphite	Japan	Economic Partnership Agreement	15.4
Natural Graphite	Madagascar (ESA)	Economic Partnership Agreement	8.1
Natural Graphite	Mozambique (SADC)	Economic Partnership Agreement	6.2
Natural Graphite	Norway	Economic Area Agreement	2.8
Natural Graphite	Canada	Comprehensive Economic and Trade Agreement (CETA)	1.6
Natural Graphite	Ukraine	Deep and Comprehensive Free Trade Agreement	1.4
Natural Graphite	United Kingdom	Trade and Cooperation Agreement	0.8
Natural Graphite	Turkey	Customs union	0.4
Natural Graphite	Mexico	Global Agreement (2000)	0.1
Natural Rubber	Vietnam	Free Trade Agreement	25.5
Natural Rubber	Côte d'Ivoire (West Africa)	Stepping stone Economic Partnership Agreement	8.2
Natural Rubber	Guatemala (Central America)	Association Agreement with a strong trade component	7.1
Natural Rubber	Cameroon (Central Africa)	Interim Economic Partnership Agreement	5.9
Natural Rubber	United Kingdom	Trade and Cooperation Agreement	0.8
Natural Rubber	Switzerland	Agreement	0.5
Natural Rubber	Ghana (West Africa)	Stepping stone Economic Partnership Agreement provisionally applied	0.4
Natural Rubber	Mexico	Global Agreement (2000)	0.4
Natural Rubber	Côte d'Ivoire (West Africa)	Stepping stone Economic Partnership Agreement	21.6
Natural Rubber	Vietnam	Free Trade Agreement	6.4

Natural Rubber	Ghana (West Africa)	Stepping stone Economic Partnership Agreement provisionally applied	1.9
Natural Rubber	Cameroon (Central Africa)	Interim Economic Partnership Agreement	1.1
Niobium	Canada	Comprehensive Economic and Trade Agreement (CETA)	16.4
Phosphate rock	Morocco	Association Agreement	26.7
Phosphate rock	Algeria	Association Agreement	9.5
Phosphate rock	Egypt	Association Agreement	6.2
Phosphate rock	South Africa	Economic Partnership Agreement	6.0
Phosphate rock	Israel	Association Agreement	4.5
Phosphate rock	Tunisia	Association Agreement	0.4
Phosphate rock	Kazakhstan	Enhanced Partnership and Cooperation Agreement	74.8
Phosphate rock	Vietnam	Free Trade Agreement	18.7
Phosphate rock	Japan	Economic Partnership Agreement	0.6
Platinum Group Metals (PGM)	South Africa	Economic Partnership Agreement	46.0
Platinum Group Metals (PGM)	United Kingdom	Trade and Cooperation Agreement	25.2
Platinum Group Metals (PGM)	Switzerland	Agreement	3.0
Platinum Group Metals (PGM)	South Korea	Free Trade Agreement	0.2
Platinum Group Metals (PGM)	Japan	Economic Partnership Agreement	0.2
Platinum Group Metals (PGM)	Liechtenstein	Economic Area Agreement	0.1
Rare Earth Elements	Norway	Economic Area Agreement	13.1
Rare Earth Elements	Japan	Economic Partnership Agreement	10.3
Rare Earth Elements	Canada	Comprehensive Economic and Trade Agreement (CETA)	1.3
Rare Earth Elements	United Kingdom	Trade and Cooperation Agreement	0.7
Rare Earth Elements	Singapore	Free Trade Agreement	0.3
Rare Earth Elements	South Korea	Free Trade Agreement	0.3
Rare Earth Elements	United Kingdom	Trade and Cooperation Agreement	3.2
Rare Earth Elements	Canada	Comprehensive Economic and Trade Agreement (CETA)	1.9
Rare Earth Elements	Japan	Economic Partnership Agreement	0.2
Rare Earth Elements	Turkey	Customs union	0.1
Scandium	Norway	Economic Area Agreement	0.5
Scandium	South Korea	Free Trade Agreement	0.4
Scandium	Switzerland	Agreement	0.1
Silicon metal	Norway	Economic Area Agreement	44.0
Silicon metal	Bosnia and Herzegovina (Western Balkans)	Stabilisation and Association Agreement	7.2
Silicon metal	Iceland	Economic Area Agreement	5.0
Silicon metal	Singapore	Free Trade Agreement	1.4
Silicon metal	Japan	Economic Partnership Agreement	1.3

Silicon metal	South Korea	Free Trade Agreement	0.4
Strontium	Japan	Economic Partnership Agreement	67.7
Strontium	Norway	Economic Area Agreement	1.3
Strontium	United Kingdom	Trade and Cooperation Agreement	0.6
Strontium	Switzerland	Agreement	0.3
Titanium	South Africa	Economic Partnership Agreement	28.4
Titanium	Norway	Economic Area Agreement	12.4
Titanium	Mozambique (SADC)	Economic Partnership Agreement	9.2
Titanium	Canada	Comprehensive Economic and Trade Agreement (CETA)	8.3
Titanium	Ukraine	Deep and Comprehensive Free Trade Agreement	6.4
Tungsten	United Kingdom	Trade and Cooperation Agreement	64.7
Tungsten	Norway	Economic Area Agreement	0.4
Tungsten	South Korea	Free Trade Agreement	0.3
Tungsten	Vietnam	Free Trade Agreement	13.6
Tungsten	South Korea	Free Trade Agreement	9.1
Tungsten	Israel	Association Agreement	3.5
Tungsten	Canada	Comprehensive Economic and Trade Agreement (CETA)	2.4
Tungsten	Japan	Economic Partnership Agreement	0.8
Tungsten	United Kingdom	Trade and Cooperation Agreement	0.3
Tungsten	Switzerland	Agreement	0.2
Tungsten	South Africa	Economic Partnership Agreement	0.1
Vanadium	South Africa	Economic Partnership Agreement	0.6
Vanadium+Tantalum	Singapore	Free Trade Agreement	12.5
Vanadium+Tantalum	United Kingdom	Trade and Cooperation Agreement	0.3
Vanadium+Tantalum	Morocco	Association Agreement	0.3
Vanadium+Tantalum	Lebanon	Association Agreement	0.3

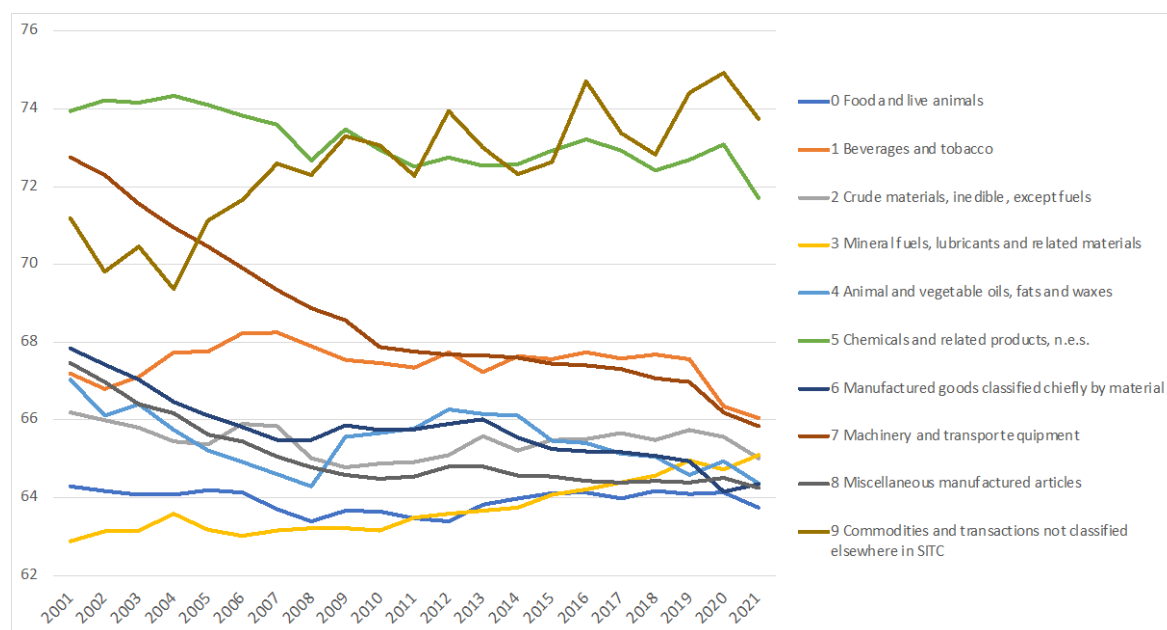
Source: own elaboration based on the list of FTAs found on European Commission website https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/negotiations-and-agreements_en, Eurostat COMEXT international trade data and CRM product codes identified based on European Commission work on CRMs. Partners shown are only those with shares in total EU imports exceeding 0.1 %.

Figure 29. Political score (Polity) of EU external trade partners, by SITC product category



Source: Own elaboration of the Eurostat COMEXT Data and Polity scores. Polity score takes values of -10 (hereditary monarchy) through 0 (autocracy) to +10 (consolidated democracy). Note: the number of countries is the 2022 composition of the EU, so it includes non-members of the EU before the relevant accessions that occurred within the analyzed period and does not include the UK. The Polity score is the value of the index from 2018 (latest fully available data) so any changes observed in the figure stem from changes in the composition of trade and not the changes in the Polity index.

Figure 30. Economic freedom score of EU external trade partners, by SITC product category



Source: Own elaboration of the Eurostat COMEXT Data and Heritage Foundation's Economic Freedom score. Economic Freedom score takes values of 0 to 100. However, in the 2021 edition the minimum score is 5 (North Korea) and maximum is Singapore (90). Note: the number of countries is the 2022 composition of the EU, so it includes non-members of the EU before the relevant accessions that occurred within the analyzed period and does not include the UK. The Economic Freedom score is the value of the index from 2021 so any changes observed in the figure stem from changes in the composition of trade and not the changes in the Economic Freedom index.

Table 18. Full list of specific (trade, association, or partnership) agreements

Agreement	Status	Limitations on export restrictions	Extended coverage of energy and raw materials	Sustainable development and/or sustainable value chains
EU-Australia Trade Agreement (Accessed 10 Feb 2023)	Negotiations launched on 22 May 2018	–	X (EU Textual Proposal only)	X (EU Textual Proposal only)
EU-Canada Comprehensive Economic and Trade Agreement (CETA) (Accessed 10 Feb 2023)	Entered into force provisionally in 2017	X	Article 25.4 – Bilateral Dialogue on Raw Materials	X
EU-Chile Advanced Framework Agreement (Accessed 20 Feb 2023)	Concluded negotiations on 9 December 2022	–	Cooperation on access to critical raw materials and clean energy	A new chapter on sustainable development
EU-China Comprehensive Agreement on Investment (Accessed 10 Feb 2023)	The agreement in principle was concluded on 30 December 2020	–	–	Section IV binds the parties to value-based investment relationship grounded on sustainable development principles subject to tailored implementation mechanism. ¹²⁶
EU-India trade agreement (Accessed 20 Feb 2023)	Negotiations re-launched in July 2022. Currently talks are ongoing	X	Separate chapter to facilitate trade and investment in energy and raw materials (EU Textual Proposal as of 30.03.2022)	Separate chapter on Trade and Sustainable Development (EU Textual Proposal as of 22.09.2022)
EU-Indonesia trade agreement (Accessed 20 Feb 2023)	Negotiations are ongoing. The 13 th round took place 6-11 February 2023	X	Specific rules for energy and raw materials to increase transparency in governance and investment, to improve market access and promote trade in sustainable energy goods	Separate chapter on Trade and Sustainable Development
EU-Japan Economic Partnership Agreement (Accessed 20 Feb 2023)	Agreement entered into force on 1 February 2019	X	–	Chapter 16 focuses on Trade and Sustainable Development

¹²⁶ On 30 December 2020, the President of the European Council, the President of the Commission, the German Chancellor, and the French President met with the Chinese President via video conference to announce the political agreement on the CAI. In view of the public criticism of China's handling of human rights, the two EU presidents, the German chancellor, and the French president, also emphasised the agreement's chapter on sustainable development. Unlike the free trade agreements that the PRC negotiated with Switzerland and Iceland in 2013, the EU obtained cautious commitments from Beijing regarding compliance with labour rights standards and the pending ratification of ILO conventions on the abolition of forced labour. However, in the agreement, the People's Republic only pledges to make "continuous and sustained efforts" with regard to the ratification of the ILO conventions in question. In addition to a dispute settlement mechanism, a separate working group on the chapter on sustainable development is to contribute to the implementation of these and other commitments. In terms of their functional scope and depth of intervention, these declarations of intent are far below what has been negotiated regarding the implementation and enforcement of international labour, human rights, and sustainability standards between the EU and other third countries since the entry into force of the Lisbon Treaty. For example, even a cursory comparison between Article 13.4.2. of the EU's free trade agreement with Vietnam and the corresponding Article 4 of the CAI shows that the EU's negotiators made significant concessions to China on labour and human rights standards that call into question the standard of protection, values and norms achieved over 20 years with other trading partners. For the European Parliament, the wording found in the CAI agreement ("continuous and sustained efforts") is too non-binding. On 20 May 2021, Parliament thus voted to halt ratification by 599 votes in favour, 30 against and 58 abstentions.

Agreement	Status	Limitations on export restrictions	Extended coverage of energy and raw materials	Sustainable development and/or sustainable value chains
EU-Mercosur agreement (Accessed 10 Feb 2023)	Trade part agreement in principle on 28 June 2019	–	Not proposed	X
EU-Mexico agreement (Accessed 10 Feb 2023)	Existing global agreement in force since 2000. Modernised trade part agreed in principle in April 2018	–	X (EU Textual Proposal only)	X (EU Textual Proposal only)
EU-New Zealand Trade Agreement (Accessed 10 Feb 2023)	Concluded on 30 June 2022	X	X	X
EU-Philippines Free Trade Agreement (Accessed 10 Feb 2023)	Not concluded, launched in December 2015	Not proposed	Not proposed	X
EU-Singapore Free Trade Agreement and Investment Protection Agreement (Accessed 10 Feb 2023)	Entered into force on 21 November 2019	X	Chapter on Non-Tariff Barriers to Trade and Investment in Renewable Energy Generation	X
EU-United Kingdom Trade and Cooperation Agreement (Accessed 10 Feb 2023)	Entered into force on 1 May 2021	X	X	X
EU-Vietnam Trade Agreement and Investment Protection Agreement (Accessed 10 Feb 2023)	Entered into force on 1 August 2020	X	Chapter 7 focuses on NTBs to trade and investment in renewable energy generation	X
EU-Albania Stabilisation and Association Agreement (Accessed on 21 Feb 2023)	In force since 2009	Article 39 includes a Shortage Clause of foodstuffs or other products essential to the exporting Party	–	–
EU-Algeria Association Agreement (Accessed on 21 Feb 2023)	In force since 2005	X	Article 61 covers energy and mining	X
EU-CARIFORUM Economic Partnership Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2008	X (Article 26 Prohibition of quantitative restrictions)	X (Article 138 Cooperation on innovation and renewable energy)	X (Part 1 – Trade Partnership for Sustainable Development)
EU-Armenia Comprehensive and Enhanced Partnership Agreement (Accessed on 21 Feb 2023)	Provisionally applied since June 2018	X (Article 117 Prohibition of quantitative restrictions)	X (Chapter 2 on Energy Cooperation and Chapter 12 on Mining)	X (Chapter 9 on Trade and Sustainable Development)
EU-Western Balkans Stabilisation and Association Agreement (Accessed on 21 Feb 2023)	In force since 2015	X (Article 40 on Shortage Clause)	X (Article 107)	X
EU-SADC Economic Partnership Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2016	X (Article 39 Prohibition on Quantitative Restrictions)	X (Energy listed as a cooperation priority)	X (Chapter 2 on Trade and Sustainable Development)
EU-Central Africa Interim Economic Partnership Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2014	X (Article 22 Prohibition on Quantitative Restrictions)	X (Energy listed as a priority area)	X (Chapter 5 on Sustainable Development)

Agreement	Status	Limitations on export restrictions	Extended coverage of energy and raw materials	Sustainable development and/or sustainable value chains
EU-Colombia, Ecuador, and Peru Trade Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2013	X (Article 23 on Import and Export Restrictions)	X (clean energy production highlighted under Article 257 on Climate Change)	X (Title IX on Trade and Sustainable Development)
EU-ESA Interim Economic Partnership (Accessed on 21 Feb 2023)	Provisionally applied since 2019, negotiations on modernisation began in 2019	X (Article 17 Prohibition of Quantitative Restrictions)	X (Article 27 on Energy)	X (Sustainable Development listed as an area of cooperation)
EU-Central America Association Agreement with a strong trade component (Accessed on 21 Feb 2023)	Provisionally applied since 2013	X (Article 86 Import and Export Restrictions)	X (Article 65 Energy – including renewable energy)	X (Article 67 Cooperation and Technical Assistance on Trade and Sustainable Development)
EU-West Africa Stepping stone Economic Partnership Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2016	X (Article 18 Prohibition of quantitative restrictions)	–	X
EU-Egypt Association Agreement (Accessed on 21 Feb 2023)	In force since 2004	X	X (Article 53 on Energy)	X
EU-Faroe Islands Agreement (Accessed on 21 Feb 2023)	In force since 1997	X	X	–
EU-Pacific Interim Partnership Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2014	X (Article 22 Prohibition of quantitative Restrictions)	X	X (Part 1 focusses on Trade Partnership for Sustainable Development)
EU-Georgia Association Agreement (Access on 21 Feb 2023)	In force since 2016	X (Article 32 on Import and Export Restrictions)	X (Chapter 2 on Energy Cooperations, Chapter 5 on Industrial and enterprise policy and mining, and Chapter 11 on Trade-related Energy Provisions)	X (Chapter 13 on Trade and Sustainable Development)
EU-East African Community Economic Partnership Agreement (Accessed on 22 Feb 2023)	Negotiations finalised on 16 October 2014	X	X (Article 80 on Energy)	X
EU-Turkey Custom's Union (Accessed on 22 Feb 2023)	In force since 31 December 1995		–	–
EU-Israel Association Agreement (Accessed on 21 Feb 2023)	In force since 2000	X	Article 51 on Energy	X
EU-Iraq Partnership and Cooperation Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2012	X (Article 16 on Prohibition of Quantitative Restrictions)	X (Article 91 on Energy)	X
EU-Jordan Association Agreement (Accessed on 21 Feb 2023)	In force since 2002	X	X (Article 74 on Energy)	X
EU-Kazakhstan Enhanced Partnership and Cooperation Agreements (Accessed on 21 Feb 2023)	Provisionally applied since 2016	X (Article 17 on Import and Export Restrictions)	X (Chapter 9 on Raw Materials and Energy)	X (Chapter 10 on Sustainable Development)
EU-Kosovo Stabilisation and Association Agreement (Accessed on 21 Feb 2023)	In force since 2016	X (Article 44 on Shortage Clause)	X (Article 114 on Energy)	X

Agreement	Status	Limitations on export restrictions	Extended coverage of energy and raw materials	Sustainable development and/or sustainable value chains
EU-Lebanon Association Agreement (Accessed on 21 Feb 2023)	In force since 2006	X	X (Article 54 on Energy)	X
EU-Moldova Association Agreement (Accessed on 21 Feb 2023)	In force since 2016	X (Article 153 on Import and Export Restrictions)	X (Chapter 11 on Mining and Raw Materials and Chapter 14 on Energy Cooperation)	X (Chapter 13 on Trade and Sustainable Development)
EU-Montenegro Stabilisation and Association Agreement (Accessed on 21 Feb 2023)	In force since 2010	X (Article 42 on Shortage Clause)	X (Article 109 on Energy)	X
EU-Morocco Association Agreement (Accessed on 21 Feb 2023)	In force since 2000, negotiations on modernisation began in 2013, on hold since 2014	X	X (Article 57 on Energy)	X
EU-North Macedonia Stabilisation and Association Agreement (Accessed on 21 Feb 2023)	In force since 2004	X (Article 38 on Shortage Clause)	X (Article 99 on Energy)	–
EU-Serbia Stabilisation and Association Agreement (Accessed on 21 Feb 2023)	In force since 2013	X (Article 42 on Shortage Clause)	X (Article 109 on Energy)	X
EU-South Korea Free Trade Agreement (Accessed on 21 Feb 2023)	In force since 2015	X (Article 2.9 on Import and Export Restrictions)	X	X (Chapter 13 on Trade and Sustainable Development)
EU-Switzerland Agreement (Accessed on 21 Feb 2023)	In force since 1973	X	X	X
EU-Tunisia Association Agreement (Accessed on 21 Feb 2023)	In force since 1998, negotiations on modernisation began in 2015, on hold since 2019	X	X (Article 57 on Energy)	X
EU-Ukraine Deep and Comprehensive Free Trade Agreement (Accessed on 21 Feb 2023)	Provisionally applied since 2016	X (Article 35 on Import and Export Restrictions)	X (Chapter 11 on Trade-related Energy, Title V Chapter 1 on Energy Cooperation)	X (Chapter 13 on Trade and Sustainable Development)
EU GCC Cooperation Agreement (Accessed on 22 Feb 2023)	In force since 1988. Structured discussions on trade and investment launched in 2017	–	X	–
EU-EEA Agreement (accessed on 22 Feb 2023)	In force since January 1994	X	X (Annex IV with specific provisions on Energy)	X
EU-Azerbaijan Partnership and Cooperation Agreement (Accessed on 22 Feb 2023)	In force since 1999	X	X (Article 51 on Mining and Raw Materials and Article 55 on Energy)	X

X (mentioned); – (not mentioned)

Table 19. Screening results for EU legislation

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
The EU Energy Union Package	The package, adopted in 2019, aims to decarbonise EU's energy system in line with the European Green Deal objectives.	25.02.2015	Ongoing		EU Green Deal; European Climate Law; Connecting Europe Facility (CEF)						Clean energy for all Europeans package. The package consists of 8 new laws on energy performance in buildings, renewable energy, energy efficiency, governance of the energy union, electricity regulation, electricity directive, risk preparedness and the Agency for the Cooperation of Energy Regulators (ACER).	Energy and Environment	A fragmented system characterised by uncoordinated national policies, market barriers and energy-isolated areas. EU's centralised sourcing of energy. The Covid-19 pandemic, climate change and sharp spike in gas and electricity prices.	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/ impact		
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
		Yes	Yes		Yes	1) A fully integrated internal energy market- enabling the free flow of energy through the EU through adequate infrastructure and without technical or regulatory barriers	Focus on decarbonising and looking for alternative energy sources from across the countries		1) A fully integrated internal energy market- enabling the free flow of energy through the EU through adequate infrastructure and without technical or regulatory barriers; 2) Improve energy efficiency to reduce dependence on energy imports, lower emissions, and drive jobs and growth; 3) supporting breakthroughs in low-carbon and clean energy technologies by prioritising research and innovation to drive the energy transition and improve competitiveness	Binding Commitments	EU	Building an energy union that gives EU consumers – households and businesses – secure, sustainable, competitive and affordable energy.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
Security of Gas Supply (SoGS) Regulations (EU) 2017/1938	This Regulation establishes provisions aiming to safeguard the security of gas supply in the Union by ensuring the proper and continuous functioning of the internal market in natural gas ("gas"), by allowing for exceptional measures to be implemented when the market can no longer deliver the gas supplies required, including solidarity measure of a last resort, and by providing for the clear definition and attribution of responsibilities among natural gas undertakings, the Member States and the Union regarding both preventive action and the reaction to concrete disruptions of gas supply.	28.10.2017	Ongoing	Security of Gas Supply Regulation No 994/2010	Connecting Europe Facility (CEF)						It lays down the framework for EU emergency preparedness and resilience to gas disruptions.	Energy and Environment	High dependence on third countries for natural gas. Gas supply disruptions may result from technical or human failures, natural disasters, cyber-attacks and other emerging risks, as well as from geopolitical disputes.	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
		Yes			Yes	1)cooperation between EU countries in regional groups to assess common supply risks (Common Risk Assessments) and to develop joint preventive and emergency measures			1) the facilitation of permanent bi-directional capacity on all cross-border inter-connections between EU countries by transmission service operators, unless an exemption is granted, 2) the preparation of EU-wide simulations of gas supply and infrastructure disruption, carried out by European Network for Transmission System Operators for Gas (ENTSO-G), provides a high level overview of the major supply for the EU	Binding Commitments	EU	Ensure an undisturbed access and transportation of natural gas to EU consumers.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
REPowerEU Initiative	REPowerEU is the European Commission's plan to make Europe independent from Russian fossil fuels well before 2030, in light of Russia's invasion of Ukraine.	18.05.2022	Ongoing		EU Green Deal; the EU External Energy Strategy; EU Solar Strategy; Biomethane Action Plan; Connecting Europe Facility				EUR 225 billion	Loan by the Recovery and Resilience Facility	Russian fossil fuels	Energy	Russia's unprovoked and unjustified military aggression against Ukraine, has massively disrupted the world's energy system.	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
			Yes				1) The newly created EU Energy Platform, supported by regional task forces, will enable voluntary common purchases of gas, LNG and hydrogen by pooling demand, optimising infrastructure use and coordinating outreach to suppliers, 2) energy saving mechanisms, and 3) accelerated roll-out of renewable energy			Best Endeavour/Cooperation	EU	Phase out EU's dependence on Russian fossil fuels and simultaneously tackle the climate crisis.		

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						Regulatory	Subsidisation	Capacity Building	Total					
The 2020 EU Industrial Strategy	The European Commission laid the foundations for an industrial strategy that would support the twin transition to a green and digital economy, make EU industry more competitive globally, and enhance Europe's open strategic autonomy.	10.03.2020	Ongoing		Umbrella policy guiding all the other related policies						Industrial strategy that would support the twin transition to a green and digital economy.	Industry and Environment	Climate change, global economic and geopolitical disruptions, lack of predictability, aftereffects of the Covid-19 pandemic	EU
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
			Yes		Yes		Diversifying international partnerships with Horizon Europe; fostering industrial alliances; monitoring strategic dependencies		developing transition pathways; recovery investments through the Recovery and Resilience Facility; multi-country digital and green projects; investments into Abundant, accessible, and affordable decarbonised energy	Best Endeavour/Cooperation	EU	Strengthen the resilience of the Single EU market. Accelerate EU's twin transitions to a green and digital economy. Improve EU's open strategic autonomy in key areas – raw materials, batteries, active pharmaceutical ingredients, hydrogen, semiconductors, and cloud and edge technologies.	Current alliances: Alliance for Zero-Emission Aviation, European Raw Materials Alliance, European Clean Hydrogen Alliance, European Battery Alliance Circular Plastics Alliance, European Alliance for Industrial Data, Edge and Cloud, Industrial Alliance on Processors and Semiconductor Technologies, Renewable and Low-Carbon Fuels Value Chain Industrial Alliance	

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
European Raw Material Alliance (ERMA) as a part of EU's Action Plan on Critical Raw Materials	The European Raw Materials Alliance (ERMA) aims to make Europe economically more resilient by diversifying its supply chains, creating jobs, attracting investments to the raw materials value chain, fostering innovation, training young talents and contributing to the best enabling framework for raw materials and the Circular Economy worldwide.	29.09.2022	Ongoing	Raw Materials Supply Group in the 1970s; Raw Materials Initiative in 2008	EU's Green Deal; new Industrial Strategy for Europe; the EU Recovery Plan					European Union	This initiative set out a strategy for reducing dependencies for non-energy raw materials for industrial value chains and societal well-being. ERMA covers the full range of elements and minerals required by Europe's green and digital transitions, from critical raw materials to base metals and industrial minerals.	Environment	1) The European Commission has designated raw materials as critical to Europe's future. Industrial ecosystems such as construction, automotive, low-carbon energy-intensive industries and aerospace are highly dependent on secure access to raw materials. 2) challenge of securing access to sustainable raw materials, advanced materials, and industrial processing know-how	Both
		Objectives			Specific actions required									
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
			Yes		Yes		value chain-specific consultation processes: 1) Identify and respond to raw material challenges along industrial ecosystems and within the wider society, 2) Provide tailored solutions to industry needs, 3) Unlock regulatory bottlenecks, and 4) Promote stakeholders' strong engagement and commitment through an open process		Investment channel for raw materials projects: 1) Select and prioritize cases to secure primary and secondary raw materials supply for European industrial ecosystems, 2) Install Raw Materials Investment Platform (RMIP) to bring investors and investees together, 3) Define case-specific financing strategies and mechanisms, and 4) Assess EU funding opportunities and financing sources for investment opportunities inside and outside Europe	Best Endeavour/Cooperation	Signatories	By 2030, ERMA's activities will increase the production of raw and advanced materials and address Circular Economy by boosting the recovery and recycling of Critical Raw Materials. Four key deliverables: 1) Establish an EU industry led-stakeholder consultation processes, 2) Support EU industrial policy to mitigate regulatory and financing bottlenecks, 3) Create a Raw Materials Investment Platform (RMIP), and 4) Create a deeper strategic awareness and forward oriented view of the role of raw and advanced materials in the transition to the Green Economy		

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						Regulatory	Subsidisation	Capacity Building	Total					
The Industrial Alliance on Processors and Semiconductors	The Alliance aims to identify current gaps in the production of microchips and the technology developments needed for companies and organisations to thrive, no matter their size.	19.07.2021	The activities of the Alliance will contribute to deliver on the EU's digital targets for 2030		The new Industrial Strategy; The European Chips Act; Chips for Europe Initiative; Connecting Europe Facility; Digital Europe Programme					European Union	The Alliance brings together key actors to design and produce microelectronics chips. It will provide the EU with the necessary capabilities in semiconductor technologies to power its critical digital infrastructure and communication networks. And it will support a range of sectors and technologies, including automotive, industrial automation, healthcare and AI-enabled systems.	Research and Innovation; Environment	1) Securing EU's digital sovereignty, 2) Existing current gaps in the production of microchips and the technology developments, 3) threat to critical infrastructure, such as energy and communications and the EU's internal and external security	EU
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
					Yes				1) Developing high performance computing, 2) Building and strengthening core AI capacities, 3) develop cybersecurity and trust, 4) Advance digital skills, foster greater specialisation in digital technologies and application, and bridging digital divide, 5) Deployment and best use of digital capacities and interoperability	Best Endeavour/Cooperation	EU	The Alliance aims to strengthen and promote Europe's capacities in key digital technology areas through large-scale deployment and in the private sector and in areas of public interest, to widen the diffusion and uptake of Europe's key digital technologies, promoting the digital transformation and access to digital technologies.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
The European Chips Act (Commission proposal)	The EU Chips Act aims to address semiconductor supply shortages and years of decline in semiconductor investment in the EU, boosting Europe's share of global chip production capacity to 20 % from its current level of about 10 %.	08.02.2022			Horizon Europe; Digital Europe Programme; Chips for Europe Initiative;			EUR 43 billion (aims to mobilise)		Union and Member States	Semiconductors	Research and Innovation; Environment	1) Global semiconductor shortages can force factory closures in a range of sectors, 2) Extreme global dependency of the semiconductor value chain on a very limited number of actors in a complex geopolitical context, 3) Evolution of semiconductor markets and technology	EU
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
					Yes				1) Leadership in research, innovation and equipment manufacturing, 2) Leadership in the design, manufacturing and packaging, 3) Boosting Europe's ecosystem and ensuring the security of supply, 4) Understanding the global supply chains and anticipating future crises	Binding Commitments	EU	To jointly create a state-of-the-art European chip ecosystem. This will include production, as well as connecting the EU's world-class research, design and testing capacities. The EU contributing to the rebalancing of the semiconductors global supply chain.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
IPCEI Hydrogen Technology "Hy2Tech"	The project aims at developing innovative technologies for the hydrogen value chain to decarbonise industrial processes and mobility.	15.07.2022	Ongoing		EU Green Deal; EU Climate Law; RE-PowerEU				EUR 5.4 billion in public funding, (which is expected to unlock additional EUR 8.8 billion in private investments)	EU Member States	The IPCEI will cover a wide part of the hydrogen technology value chain, including (i) the generation of hydrogen, (ii) fuel cells, (iii) storage, transportation and distribution of hydrogen, and (iv) end-users applications, in particular in the mobility sector.	Energy and Environment	Threats to EU's strategic interests; dependence on non-renewable energy sources	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
					Yes				Fostering research and innovation through funding projects that address a market failure or other important systemic failures in the hydrogen value chain	Best Endeavour/Cooperation	EU	It is expected to contribute to the development of important technological breakthroughs, including new highly efficient electrode materials, more performant fuel cells, innovative transport technologies, among which first time roll out hydrogen mobility ones. The IPCEI is expected to create approximately 20 000 direct jobs.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
IPCEI on Microelectronics	The IPCEI on Microelectronics – originally approved in December 2018 with Austria having joined in March 2021 – features 32 companies/RTOs from four EU member states (France, Germany, Italy and Austria) as well as the United Kingdom. The IPCEI allows the participating countries to support transnational cooperation projects with major synergies in microelectronics – thus maintaining and further expanding European competencies in this field.	13.12.2018 (first IPCEI on microelectronics approved by the commission)			The EU Chips Act				With EUR 1.89billion of public investments between 2018 and 2022, the participating states are expecting to unlock an additional EUR 6 billion from private investments over the same period			Energy	Lack of resilience in EU's chips supply chain	Both
		Objectives				Specific actions required								
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Yes			Yes				This IPCEI, which mobilises established, large companies as well as start-ups, will allow investing in major, innovative industrial capacities on all the choke points of the supply chain – critical raw materials, equipment, wafers, research, pre-production and design – to support Europe's leadership in microchips by closing supply gaps and enabling innovation.	Best Endeavour/Cooperation	EU	Increase Europe's innovation in the microelectronics sector as well as its security of supply. EU's capacity to produce the most advanced semiconductors will contribute to the development of all our industrial ecosystems, of EU's future industrial leadership but also our geopolitical weight.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
IPCEI on EUBATTIN	The IPCEI on EUBATTIN aims to sustainable process to extract raw and advanced materials, to produce innovative battery cells and systems, and safe methods for processing recyclable materials.	Jan-21	Ongoing		EU Green Deal; European Battery Alliance					EC	Batteries – the complete value chain, from material through the cells to the battery system and the final step of recycling.	Research and Innovation; Environment	Lack of resilience in EU's battery supply chain and high dependence on third countries	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
					Yes				1) development of sustainable innovative processes for the extraction, refining and purification of ores in order to obtain high-purity raw materials, 2) improve existing materials and develop new materials for innovative battery cells, 3) developing innovative battery cells and modules that meet the safety and performance requirements of the automotive industry and other applications, 4) developing innovative battery systems including battery management systems (software and algorithms) and innovative test methods, and 5) develop safe and innovative methods for the collection, dismantling, reuse, conversion and refining of recyclable materials.	Best Endeavour/Cooperation	EU	In pan-European cooperation, the European countries are enabled through IPCEI on EUBATTIN to derive maximum benefit from the complete battery value chain by supporting national research and innovation efforts and the industrial pilot production based on them.	Coordinated by the German Federal Ministry for Economic Affairs and Energy (BMWi) with the support of VDI/VDE-IT.	

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						Regulatory	Subsidisation	Capacity Building	Total					
IPCEI on European Partnership for Batteries (BATT4EU)	The vision of the European Partnership for Batteries (BATT4EU) is to establish by 2030 in Europe the best-in-the-world innovation ecosystem to boost a competitive, sustainable and circular European battery value chain and to drive the transformation towards a carbon-neutral society.	Dec-19	Ongoing		EU Green Deal; EUBATTIN; Horizon 2022				EUR 1.85 billion	EU commitments – EUR 925 million; Partner commitments – EUR 925 million	Battery value chain	Energy and Environment	Lack of resilience in EU's battery supply chain and high dependence on third countries	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
					Yes				1) Increase battery energy density, 2) increase battery power density and charging rate, 3) improve cycle lifetime, 4) Reduce batter cost, 5) Implement global BATS in manufacturing and recycling, and 5) enhance the sustainability of the main supply chains	Best Endeavour/Cooperation	EU	To establish by 2030 in Europe the best-in-the-world innovation ecosystem to boost a competitive, sustainable and circular European battery value chain and to drive the transformation towards a carbon-neutral society.		

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						Regulatory	Subsidisation	Capacity Building	Total					
The Africa-EU Energy Partnership	The Africa-EU Energy Partnership (AEEP) is a long-term framework for strategic dialogue aimed at sharing knowledge, setting political priorities and developing joint programmes on the key energy issues.	2007	Ongoing		Joint Africa-EU Strategy					European Commission and Germany	a long-term framework for strategic dialogue aimed at sharing knowledge, setting political priorities and developing joint programmes on the key energy issues.	International Energy and Development Cooperation	Lack of access to affordable, reliable, sustainable and modern energy for all in Africa	International
		Objectives				Specific actions required								
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
					Yes				1) Utilising green diplomacy to thrive key political processes on energy, 2) Charting progress and showcasing joint action towards SDG7 in Africa, 3) Generating Know-how and exchange	Best Endeavour/Cooperation	International	The overall objective of the AEEP is to improve access to secure, affordable, and sustainable energy for both continents, with a special focus on increasing investment in energy infrastructure in Africa.		

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EU Egypt Israel Memorandum of Understanding	The MOU aims to facilitate on cooperation related to trade, transport and export of natural gas to the European Union.	15.06.2022	It will be renewed automatically for two successive three (3) year periods.	The Memorandum of Understanding on a Strategic partnership on energy between the Arab Republic of Egypt and the European Union signed in 2018; The Memorandum of Understanding between the Ministry of Petroleum and Mineral Resources of the Arab Republic of Egypt and the Ministry of Energy of the State of Israel signed in November 2021; The East Mediterranean Gas Forum Statute signed on 22nd September 2020							The transport, trade and export of natural gas to the European Union and enhancing their cooperation on their respective green energy transitions.	Energy and Environment	Disruption in supply of energy, in particular natural gas	Both

Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes
Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)				
Yes				1) enabling a stable delivery of natural gas to the EU that is consistent with long-term decarbonisation objectives and based on the principle of market-oriented pricing, 2)Formulating a plan for the efficient utilization of infrastructure in order to accelerate the export and shipment of natural gas to the EU, 3) Developing a road map for attaining the requisite governmental and regulatory approvals, 4)Endeavouring to encourage by the EU for European companies to invest in natural gas exploration and production in Israel and Egypt, 5)Exploring possibilities to apply carbon capture and carbon sequestration, and assisting in the creation of a plan to reduce emissions of natural gas to international industry best-practice standards, 6)Exploring ways to make funds available, including by the EU to develop technologies, and provide best-practice standards, knowledge and technologies regarding emissions reduction and natural gas decarbonisation, 7) Encourage public and private sector corporations to cooperate on the means for achieving green energy goals and combatting climate change				Best Endeavour/Cooperation	Signatories	Regional cooperation between natural gas producing and consuming countries to support security of the energy supply.	

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						Regulatory	Subsidisation	Capacity Building	Total					
The Energy Community Treaty	The Energy Community Treaty creates an internal market in electricity and natural gas bringing together the 28 Member States of the European Union (EU) and 6 European states and territories in the Balkans.	01.07.2006	It was concluded for a term of ten years. Its application was extended for a new ten-year period by unanimous decision of the Ministerial Council dated 24 October 2013.							Each Party shall contribute to the budget of the Energy Community as set out in Annex IV. The level of contributions may be reviewed every five years, on request of any Party, by a Procedural Act of the Ministerial Council. Among the signatories, EU contributes a share of 94.9 %.	The Treaty creates an internal market in electricity and natural gas bringing together the 28 Member States of the European Union (EU) and 6 European states and territories in the Balkans	Energy and Environment	The absence of a single regulatory space that facilitates reducing stress on the state level gas and electricity systems and resolving local gas and electricity shortages.	Signatories
		Objectives			Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes		
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring					Developing sustainable capacities (at home and in foreign)	
		Yes				1) The Energy Community's activities involves the implementation of a part of Community legislation, or acquis communautaire, in all the States parties to the Treaty, on energy, environment, competition and renewable energies, as well as compliance with certain general European standards relating to technical systems, for example on the subject of cross-border transportation or connection, 2) The Treaty establishes a mechanism for operation of regional energy markets that provides a framework of measures relating to long-distance transportation of network energy, security of supply, provision of energy to citizens, harmonisation, promotion of renewable energy sources and energy efficiency, as well as in the event of sudden crisis on the network energy market in the territory of an Energy Community member, 3)The Treaty creates an energy market without internal frontiers between the parties, in which customs duties and quantitative energy import and export restrictions, and any measures having equivalent effect, are prohibited between the parties, unless exceptional circumstances apply, and 4)The Treaty also contains provisions on relations with third countries and mutual assistance in case of disturbance.				Binding Commitments	Signatories	The objectives are: 1) to create a stable legal and market framework capable of attracting investment in order to ensure a stable and continuous energy supply, 2) to create a single regulatory space for trade in network energy, 3) to enhance security of supply in this space and develop cross-border relations, 4) to improve energy efficiency and the environmental situation related to network energy and develop renewable energy sources, and 5) to develop network energy market competition	This integrated market may involve at a later stage other energy products and carriers, such as liquefied natural gas, petrol, hydrogen, or other essential network infrastructures.	

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						Regulatory	Subsidisation	Capacity Building	Total					
The EU-US Trade and Technology Council	The EU-US Trade and Technology Council serves as a forum for the United States and European Union to coordinate approaches to key global trade, economic, and technology issues and to deepen transatlantic trade and economic relations based on these shared values.	15.06.2021	Ongoing								The Council is a virtual space/forum for businesses, public authorities, innovators, researchers, civil society, and policymakers to shape the EU and US discussions in the Trade and Technology Council together.	Research and Innovation	Leverage the strength of EU-US partnership to counter non-market, trade distortive practices, and respond swiftly to Putin's war with unprecedented sanctions and export control measures.	Signatories
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)					
					Yes				The work of the TTC is carried forward via ten working groups. Specific actions include: 1) Deeper information exchange on exports of critical U.S. and EU technology, coordination of U.S. and EU licensing policies, and cooperation with other partners, 2) Development of a joint roadmap on evaluation and measurement tools for trustworthy Artificial Intelligence and risk management, as well as a common project on privacy-enhancing technologies, 3) Creation of a U.S.-EU Strategic Standardization Information (SSI), 4) An early warning system to better predict and address potential semiconductor supply chain disruptions as well as a Transatlantic approach to semiconductor investment, 5) A dedicated taskforce to promote the use of trusted/non-high-risk ICTS suppliers, 6) A new Cooperation Framework on issues related to information integrity in crises, 7) A stakeholder-focused Trade and Labour Dialogue to discuss policy options to promote internationally recognized labour rights, 8) An early dialogue on shared trade concerns regarding third-countries measures or initiatives, 9) A U.S.-EU guide to cybersecurity best practices for SMEs	Best Endeavour/Cooperation	Signatories	TTC prioritises promoting technology standards, trustworthy artificial intelligence, an open, reliable and secure Internet and combatting disinformation, foreign information manipulation and interference.		

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						Regulatory	Subsidisation	Capacity Building	Total						
International Tropical Timber Agreement	The Agreement aims to provide an effective framework for cooperation between tropical timber producers and consumers and to encourage the development of national policies aimed at sustainable utilization and conservation of tropical forests and their genetic resources.	Signed-03.04.2006; Entry into force – 07.12.2011	2026	ITTA 1994; ITTA 1983					Compulsory contributions by the consumer members of the ITTO are assessed primarily by the volume of imported timber. The EU contributes to the administrative account of the ITTO; the EU and its Member States can make voluntary financial contributions to planned actions.		International trade of tropical timber. The Agreement sets out the rules and procedures of the International Tropical Timber Organisation	Trade and Environment	Unsustainable timber forest management across the timber value chain	Signatories	
		Objectives				Specific actions required									
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes		
		Yes			Yes	1) to enhance members' capacity to export tropical timber and timber products from sustainably managed sources, 2) to address the problem of illegal logging of tropical timber, 3) to improve forest management and wood utilisation research, 4) to encourage tropical timber reforestation and restoration of degraded forest land, taking the needs of local communities into account;			1) to provide an effective basis for consultation, international cooperation and policy development regarding the world timber economy; 2) to establish a consultation forum to promote non-discriminatory timber practices; 3) to improve understanding of long-term trends in the tropical timber market; 4) to encourage the development of national policies that aim to conserve timber-producing forests and that maintain an ecological balance; and 5) to strengthen forest law enforcement and governance	Binding Commitments	Signatories	Promote the expansion and diversification of international trade in tropical timber from sustainably managed and legally harvested forests and to promote the sustainable management of tropical timber-producing forests.			

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
International Grains Council	The International Grains Council (IGC) is an inter-governmental organisation that seeks to further international cooperation in grains trade, promote expansion, openness and fairness in the grains sector, contribute to grain market stability and to enhance world food security.	23.03.1949	Ongoing								Grains, rice and oilseeds market conditions	Trade and Investment	Food insecurity	Signatories
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
		Yes				Improving market transparency through information-sharing, analysis and consultation on market and policy developments				Best Endeavour/Cooperation	Signatories	grain market stability and food security		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
International Sugar Agreement	The ISA, 1992 aims to ensure enhanced international cooperation in connection with world sugar matters and related issues, to provide a forum for intergovernmental consultations on sugar and on ways to improve the world sugar economy, to facilitate trade by collecting and providing information on the world sugar market and other sweeteners, and to encourage increased demand for sugar, particularly for non-traditional uses.	20.02.1992	Extended till 31 December 2023								Sugar and bio-energy from sugar	Trade and Investment	Keeping demand for sugar high especially in non-food use; free trade in sugar	Signatories
		Objectives				Specific actions required								
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Yes				ensure enhanced international cooperation in connection with world sugar and sweeteners matters as well as related issues, including bioenergy and fuel ethanol production from sugar crops; provide a forum for intergovernmental consultations; facilitate trade by collecting and providing information; and encourage increased demand for sugar and sugar crops, particularly for non-food uses				Best Endeavour/Cooperation	Signatories	Free and smooth trade in sugar	The 2022 amendment proposed by the EU to the agreement adds focus on bioenergy and fuel ethanol production from sugar crops . The International Sugar Council is the responsible body for the performance of all functions necessary to carry out the provisions of the ISA	

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						Regulatory	Subsidisation	Capacity Building	Total					
International Agreement on Olive Oil and Table Olives	The agreement aims to ensure uniform national and international legislation on olive oils*, olive pomace* oils and table olives to prevent obstacles to trade and consolidate international standards by increasing knowledge of olives' composition and characteristics.	Adopted on 9 October 2015	Ongoing	International Agreement on Olive Oil and Table Olives, 2005							Olives	Trade and Investment	Millions of families throughout the world, especially in the Mediterranean region, depend on olive crop.	Signatories
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)					
		Yes			Yes	facilitate the exchange of information on international trade flows; protection of geographical indications of olive products			study the interaction between olive growing and the environment, particularly with a view to promoting environmental conservation and sustainable production, and to ensure the integrated and sustainable development of the sector; promote technical cooperation and research and development; achieve uniformity in national and international legislation relating to the physio-chemical and organoleptic characteristics of olive oils, olive pomace oils and table olives in order to prevent any obstacle to trade; conduct activities in the area of physio-chemical and organoleptic testing in order to add to the knowledge of the composition and quality characteristics of olive products; coordinate studies and research on the nutritional qualities and other intrinsic properties; the transfer of technology through training activities	Best Endeavour/Cooperation	Signatories	Standardisation of research; improved olive production with the help of advanced technology; and promotion of the olive economy	The International Olive Council (IOC) acts as a forum for scientific excellence and a documentation and information centre	

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
International Coffee Agreement	The International Coffee Agreement (ICA) is an international commodity agreement between coffee producing countries and consuming countries aimed at strengthening the global coffee sector and promote its sustainable expansion in a market-based environment for the betterment of all participants in the sector	28.09.2007	Ongoing	6 preceding Coffee Agreements						Coffee economy	Trade and Investment	large dependency for livelihood on coffee; sustainability of the sector; better living standards and working conditions in Member countries; and imbalances in the production and consumption of coffee	Signatories	
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)					
		Yes			Yes	providing a forum for consultations on coffee matters among governments, and with the private sector; collecting, disseminating and publishing economic, technical and scientific information, statistics and studies;			encouraging Members to develop a sustainable coffee sector in economic, social and environmental terms; a forum for consultations seeking understanding with regard to the structural conditions in international markets and long-term trends in production and consumption; developing, evaluating and seeking finance for projects; encouraging Members to develop appropriate food safety procedures; training and information programmes designed to assist the transfer to Members of technology relevant to coffee; capacity of local communities and small-scale farmers to benefit from coffee production; and facilitating the availability of information on financial tools and services that can assist coffee producers, including access to credit and approaches to managing risk	Best Endeavour/Cooperation	Signatories	Stable coffee economy; sustainable management of coffee resources and processing	The International Coffee Organization, the controlling body of the agreement, represents all major coffee producing countries and most consuming countries.	

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						Regulatory	Subsidisation	Capacity Building	Total					
International Copper Study Group	The International Copper Study Group was established as an autonomous inter-governmental organization to increase copper market transparency and promote international discussions and cooperation on issues related to copper.	23.01.1992	Ongoing								Copper economy	Trade and Investment	lack of transparency in the international copper market	Signatories
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
		Yes				provide its membership with the most accurate, comprehensive, and timely information and data on capacities, production, usage, trade, stocks, prices, recycling, regulatory issues and other areas that may influence the supply and demand for copper				Best Endeavour/Cooperation	Signatories			

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted			
						Regulatory	Subsidisation	Capacity Building	Total								
International Cocoa Agreement	The International Cocoa Agreement 2010 aims to result in a major strengthening of cooperation between exporting and importing member countries and in an improvement of their cocoa economies through active and better focused project development and strategies for capacity-building.	25.06.2010	Ongoing	International Coffee Agreements in 1973; 1975; 1986; 1993; 2001; 2010							Global Cocoa Agenda for a Sustainable World Cocoa Economy	Trade and Investment	high dependence on cocoa in developing countries; lack of sustainable production, sustainable industry chain, sustainable consumption	Signatories			
						Objectives				Specific actions required							
						Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes
		Yes			Yes				appropriate framework for discussion on all cocoa matters among governments, and with the private sector; obtaining fair prices; transparency in the world cocoa economy, and in particular in the cocoa trade, through the collection, analysis and dissemination of relevant statistics and the undertaking of appropriate studies, as well as to promote the elimination of trade barriers; facilitate the availability of information on financial tools and services that can assist cocoa producers, including access to credit and approaches to managing risk				preparation, development and evaluation of appropriate projects to be submitted to the relevant institutions for financing and implementation and seeking finance for projects that benefit Members and the world cocoa economy; encourage research and the implementation of its findings through the promotion of training and information programmes; promote cocoa quality and to develop appropriate food safety procedures in the cocoa sector; enhance the capacity of local communities and small-scale farmers	Best Endeavour/Cooperation	Signatories	Strengthen cocoa economies; establish social, economic, and environmental sustainability in the sector; improve living and working conditions of those involved in the sector and strategic management of the cocoa sector.	The International Cocoa Organization is the governing body

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU's framework for screening FDI	The Regulation provides an indicative list of factors to help Member States and the Commission determine whether an investment is likely to affect security or public order.	11.10.2020	Ongoing		The new Industrial Strategy, Horizon Europe						Foreign Direct Investments into the EU	FDI	Foreign investments may represent a risk for security or public order in Member States or in the Union as a whole. A strong EU-wide approach to foreign investment screening is necessary in a time of public health crisis and related economic vulnerability.	International
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)					
				Yes (basis for better FDI in EU)				1) creates a cooperation mechanism where Member States and the Commission are able to exchange information and raise concerns related to specific investments; 2) allows the Commission to issue opinions when an investment threatens the security or public, or when an investment could undermine a strategic project or programme of interest to the whole EU; 3) encourages international cooperation on investment screening; 4) sets certain requirements for Member States that wish to maintain or adopt a screening mechanism at national level. The services of the European Commission, at the initiative of DG TRADE, have developed a form for providing information to be submitted to the cooperation mechanism. The Commission in 2017 established a group of experts from Member States.		Best Endeavour/Cooperation	EU	Preserve Europe's strategic interests while keeping the EU market open to investment		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU's International Procurement Instrument (IPI) – Proposed	The International Procurement Instrument (IPI) introduces measures limiting non-EU companies' access to the open EU public procurement market if their governments do not offer similar access to public tenders to EU companies seeking business.	The trilogues concluded successfully on 14 March 2022. Vote in the plenary pending.			WTO Global Procurement Agreement; EU-UK Trade and Cooperation Agreement; EU-Japan EPA; CETA					EC	The trade offensive tool, adopted with 554 votes for, seven against and 14 abstentions, will empower the Commission to determine whether and to what extent companies from a third country must be subject to an IPI measure, depending on the extent of the trade barriers.	Trade and Investment	Limited market access to EU business and their discrimination in the third-country markets.	International
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)					
			Yes				1) Where there is alleged discrimination against EU companies in the procurement market of a third country in an area not falling under the GPA or an FTA, the Commission may initiate an investigation; 2) When this investigation finds discriminatory restrictions vis-à-vis EU goods, services and/or suppliers, the Commission shall invite the country concerned to consult on the opening of its procurement market; 3) As a last resort, the Commission can, after consulting with the Member States, propose an implementing act that would impose a price adjustment measure			Binding Commitments	EU	By fostering reciprocity, its tool aims to open up these protected markets and to end the discrimination against EU companies in third countries.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
The Carbon Border Adjustment Mechanism (CBAM) – Proposed	The CBAM aims to equalise the price of carbon between domestic products and imports and ensure that the EU's climate objectives are not undermined by production relocating to countries with less ambitious policies.	(potentially) 01.01.2023			EU July 2021 Climate Target Package						CBAM is a climate measure that should prevent the risk of carbon leakage and support the EU's increased ambition on climate mitigation, while ensuring WTO compatibility.	Trade and Environment	Carbon leakage as non-EU countries have less stringent environment and climate policies in place	International
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
										Binding Commitments	EU	The CBAM will equalise the price of carbon between domestic products and imports and ensure that the EU's climate objectives are not undermined by production relocating to countries with less ambitious policies. Realising the EU's ambitious target of a 55 % reduction in carbon emissions compared to 1990 levels by 2030, and to become a climate-neutral continent by 2050.	Cannot be classified into the identified dimensions of actions as it focusses on an overarching policy objective of climate change.	

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
The InvestEU Programme and corresponding Regulation (specifically Annex II on areas eligible for financing and investment operations),	The InvestEU Programme provides long-term funding to companies and supports Union policies in sustainable recovery.	18.03.2021	Ongoing		EU Green Deal; Just Transition Scheme; the EU Recovery Plan				EUR 525 million – The main partner remains the EIB Group, which has successfully implemented and managed the European Fund for Strategic Investments since its launch in 2015 and which will be responsible for implementing 75 % of the EU guarantee. The remaining 25 % will be deployed by other implementing partners, which should help to enhance the geographical and sectoral outreach of the programme.		The Programme consists of InvestEU Fund, InvestEU Advisory Hub and InvestEU Portal. The Programme supports four main policy areas: 1) Sustainable infrastructure, 2) Research, innovation, and digitalisation, 3) SMEs, and 4) Social investment and skills.	Investment and Environment	Deep economic and social crises faced by EU businesses post pandemic. InvestEU also supports activities of strategic importance to the EU, in particular in view of enhanced resilience and of strengthening strategic value chains.	Both
		Objectives			Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes		
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)						
				Yes	Yes		InvestEU Fund: The InvestEU Fund will mobilise more than EUR 372 billion of public and private investment through an EU budget guarantee of EUR 26.2 billion. Annex II outlines the key criteria that the financing and investment operations can fall into. The criteria include projects that 1) develops EU's energy sector in line with the Energy Union priorities, 2) develops support the development of the trans-European transport network (TEN-T) infrastructure and other sustainable mobility solutions, 3) manage environment and resources, 4) develop digital connectivity, 5) facilitate research and innovation, and other factors.	1) InvestEU Advisory Hub: The InvestEU Advisory Hub complements the InvestEU Fund by supporting the identification, preparation and development of investment projects across the European Union. Together with the InvestEU Portal – the EU's online matchmaking tool – we aim to strengthen Europe's investment and business environment. 2) The InvestEU Portal brings together investors and project promoters on a single EU-wide database of investment opportunities available within the EU.	Best Endeavour/Cooperation	EU	The promotion of investment for recovery, green growth, employment and well-being across Europe is one of the EU's top priorities.			

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
The Anti-Coercion Instrument (ACI) - Proposed	The new framework is primarily designed to deter economic coercive action through dialogue and engagement. Further, it allows – as a last resort – to retaliate with countermeasures comprising a wide range of restrictions related to trade, investment and funding.	08.12.2021 – First Legislative Proposal								Extraterritorial economic and trade measures	Trade and Investment Measures	economic coercion amidst rising geopolitical tension; increasing use of economic tools for the pursuit of strategic and geopolitical aims; extraterritoriality; disruption to EU business and value chains	International	
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
		Yes				The new framework is primarily designed to deter economic coercive action through dialogue and engagement. But, it also allows – as a last resort – to retaliate with countermeasures comprising a wide range of restrictions related to trade, investment and funding.				Binding Commitments	EU	Secure a the rules-based international order, which is underpinned by multilateral cooperation and a globalised economy.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
Proposed Directive on Corporate Sustainability Due Diligence	The Directive aims to foster sustainable and responsible corporate behaviour and to anchor human rights and environmental considerations in companies' operations and corporate governance.	23.02.2022			EU Green Deal						Private sector sustainability	Environment	Adverse impact of private businesses on human rights and the environment. The increasing complexity and global nature of supply chains makes it challenging for companies to get reliable information on suppliers' operations. The fragmentation of national rules on corporate, sustainability-related due diligence obligations further slows down the take-up of good practices.	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting onshoring	Developing sustainable capacities (at home and in foreign)					
		Yes				This Directive establishes a corporate due diligence duty. The core elements of this duty are identifying, ending, preventing, mitigating and accounting for negative human rights and environmental impacts in the company's own operations, their subsidiaries and their value chains. The Directive also introduces duties for the directors of the EU companies covered. These duties include setting up and overseeing the implementation of the due diligence processes and integrating due diligence into the corporate strategy.				Binding Commitments	Signatories	Foster sustainable and responsible corporate behaviour and to anchor human rights and environmental considerations in companies' operations and corporate governance. The new rules will ensure that businesses address adverse impacts of their actions, including in their value chains inside and outside Europe.		

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						Regulatory	Subsidisation	Capacity Building	Total								
The European Council conclusions of 5 April 2022, which extend strategic autonomy to the economic and financial sector	The Conclusions prioritise achieving EU's strategic autonomy whilst preserving an open economy especially amidst dramatic changes in the geopolitical context.	05.04.2022			Communication from the Commission- The European economic and financial system: fostering openness, strength and resilience of 20.01.2021; Versailles Declaration of 10 and 11 March 2022						EU's economic and financial system	Strategic Autonomy	EU's dependencies; Russia-Ukraine war escalating geopolitical tensions; threat to EU's security and sovereignty	International			
						Objectives				Specific actions required							
						Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes
					Yes				The conclusions focus on: 1) Strengthening the international role of the euro, 2) A strong, competitive and resilient European financial sector servicing the real economy, avoiding risks arising from excessive reliance on third-country financial institutions and infrastructures, 3) Shielding and strengthening the resilience of financial-market infrastructure, 4) Developing an effective mechanism for managing sanctions, and 5) Cooperation with partners				Binding Commitments	EU	Achieving the EU's strategic autonomy whilst preserving an open economy.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
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The European Commission's 'fit for 55' package adopted in 2021	The Fit for 55 package includes a proposal for a revision of the renewable energy directive. The proposal is to increase the current EU-level target of at least 32 % of renewable energy sources in the overall energy mix to at least 40 % by 2030.	14.07.2021- (set of legislative proposals presented by the Commission)			Renewable Energy Directive II; EU Green Deal; European Climate Law						The set of proposals aims to revise and update EU's climate, energy and transport-related legislation to align the current laws with the 2030 and 2050 ambitions for emission reductions.	Environment	Reducing carbon emissions and meeting EU targets	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
										Binding Commitments	EU	Meeting the 55 % reduction in carbon emissions targets	Cannot be classified into the identified dimensions of actions as it focusses on an overarching policy objective of climate change.	

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
The EU's Trade Policy Review – the new EU Trade Policy	The new Trade Policy builds on the EU's openness to contribute to the economic recovery through support for the green and digital transformations, as well as a renewed focus on strengthening multilateralism and reforming global trade rules to ensure that they are fair and sustainable. The Commission puts sustainability at the heart of the new trade strategy.	18/02.2021	Ongoing		EU Green Deal; the European Digital Strategy; CBAM; EU-US Trade and Technology Council; FDI Screening Regulations; The Anti-Coercion Instrument (ACI) – Proposed; Trade Defence Instruments; Export Control Regulation; International Procurement Instrument						EU Trade Policy; global value chains	Trade and Investment	global uncertainty; growing unilateralism; technological evolution; economic adjustments; rise of China; climate change; digital transformation; COVID 19 pandemic	Both
		Objectives				Specific actions required								
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Yes	Yes		Yes	identifying strategic dependencies; promoting sustainable standards across value chains, promoting greater transparency and traceability in supply chains; use of autonomous measures like CBAM; effective implementation of the modernised Export Control Regulation on sensitive dual-use goods and technologies to support secured value chains	deeper engagement with African states; harness EU's broad network of trade agreements; closer cooperation with G20 partners; closer transatlantic partnership on the green and digital transformation; stronger economic integration with the Western Balkans and the Eastern Partnership countries; consolidate the EU's partnerships with key growth regions – in the Asia Pacific and Latin America		promoting responsible business conduct; promoting sustainable human and labour rights; mandatory due diligence; closer regulatory cooperation; supporting EU stakeholder to make the best use of EU agreements and online tools; deepen analytical and data collection efforts	Best Endeavour/Cooperation	EU	Accounting for the existing challenges and risks, EU's trade policy should foster 'a stronger Europe in the world'.		

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						Regulatory	Subsidisation	Capacity Building	Total					
The EU-Chile Association Agreement (modernisation)	This Agreement establishes a Political and Economic Association between the EU and Chile, based on reciprocity, common interest and on the deepening of the relationship in political, commercial, economic and financial, scientific, technological, social, cultural and cooperation fields.	Negotiations concluded in November 2021	Ongoing	The EU-Chile Association Agreement 2003	EU Green Deal					European Investment Bank and Signatories	political, commercial, economic and financial, scientific, technological, social, cultural and cooperation fields	Trade and Investment	climate change, insecure supply	Signatories
		Objectives				Specific actions required								
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Yes			Yes	exchange of information and development of databases; diagnostic studies; transfer of technology; common-infrastructure projects; involvement of private and public operators for innovation;			Technical assistance to Chilean institutions energy matters and policy; establishes a strategic alliance between Chile and the EU to develop Chile's National Green Hydrogen Strategy and the EU Green Pact	Best Endeavour/Cooperation	Signatories	Consolidate economic relation in key energy sectors identified		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU-Australia FTA	The FTA builds upon Australia and the EU's natural partnership, arising out of a shared commitment to the rule of law, global norms and free and open markets.	Negotiations launched in June 18, 2018	Ongoing								Objectives and Cooperation, Offshore Risk and Safety, Authorisation procedures, Third Party Access and Access to Infrastructure for Renewables, secure and reliable supply of energy and resources	Trade and Investment	post-pandemic slowdown and future disruptions	Signatories
		Objectives				Specific actions required								
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Yes			Yes	reduce or eliminate trade and investment distorting measures in third countries affecting energy and raw materials; foster exchange of market data in the area of energy; promote corporate social responsibility in accordance with international standards; grant non-discriminatory access to the energy infrastructure for the transport of gas and electricity; establish the conditions necessary for safe offshore, exploration and production of oil and gas in its territory		promote the dissemination of information and best-practices on environmentally sound and economically efficient energy and raw materials policies; promote research, development and application of energy-efficient and environmentally sound technologies; promote bilateral cooperation in pre-normative research in the area of renewable energy equipment and energy efficiency; cooperate to promote internationally those high standards of safety and environmental protection for offshore oil and gas operations	Best Endeavour/Cooperation	Signatories	post-pandemic recovery and secure supply; EU (energy and raw materials)- the Parties preserve their right to adopt, maintain and enforce measures necessary to securing the supply of energy goods and raw materials	Australia's negotiating preference is not to include a separate chapter on energy, but to include relevant disciplines, for example on competition, in core chapters		

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						Regulatory	Subsidisation	Capacity Building	Total					
EU-Indonesia FTA	The EU is negotiating a Free Trade Agreement (FTA) with Indonesia with the objective of facilitating and creating new market access, increasing trade and investment between the EU and Indonesia, and promoting sustainable development.	Negotiations launched on July 18, 2016	Ongoing								international production of and trade in raw materials and energy,	Trade and Investment	lack of global governance in terms of transparency and non-discrimination in investments, extraction and trade in raw materials and energy	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
Yes			Yes	Discussions focussed on disciplines relating to e.g., the scope, definition of energy goods, and authorisation procedures where some progress was made. Indonesia also proposed some new elements to be added to the text in relation to renewable energy.					Best Endeavour/Cooperation	Signatories	Facilitating and creating new market access, increasing trade and investment between the EU and Indonesia, and promoting sustainable development; sustainable energy goods such as renewable energy and energy efficient products	10th round of negotiations (FEB 2021) document mentions energy and raw material. No mention of progress in the 11th round document (NOV 2021)		

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						Regulatory	Subsidisation	Capacity Building	Total					
EU-Mercosur AA	The Agreement aims to increase bilateral trade and investment, create more stable and predictable rules for trade and investment, and promote joint values such as sustainable development.	Negotiations completed 28-06-2019	Ongoing								Improving access to raw materials essential to the EU economy by lowering or removing export taxes and eliminating export restrictions and export monopolies.	Trade and Investment	market access barriers	Both
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
Yes				Each Party shall ensure that owners or operators of transmission networks in its territory grant access to the energy infrastructure for the transport of natural gas and electricity of any entity of the Parties.					Best Endeavour/Cooperation	Signatories	removal of tariff and non-tariff barriers; reject protectionism; promote value-based trade agenda	The draft texts don't mention other aspects of trade and investment in energy and raw materials		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU-New Zealand FTA	The Agreements aims to create significant economic opportunities for companies, farmers and consumers, respect the Paris Climate Agreement and core labour rights, and cement EU ties with a like-minded ally in the economically dynamic Indo-Pacific region.	Negotiations completed 30-06-2022	Ongoing								Import and export monopolies; Export pricing; exploration and production of energy goods and raw materials; Assessment of environmental impact; Off-shore risk and safety; energy infrastructure for producers of renewable electricity; Cooperation on Standards, Technical Regulations and Conformity Assessments	Trade and Investment	unstable energy and raw materials supply chain	Signatories

Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes
Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)				
Yes			Yes					Best Endeavour/Cooperation	Signatories	Create significant economic opportunities for companies, farmers, and consumers; Respect the Paris Climate Agreement and core labour rights, enforceable through trade sanctions as a last resort, and Cement EU ties with a like-minded ally in the economically dynamic Indo-Pacific region. ENERGY AND RAW MATERIALS: The Parties aim to facilitate trade and investment to promote, develop and increase energy generation from renewable sources and the sustainable production of raw materials, including using green technologies. The Parties preserve their right to adopt, maintain and enforce measures necessary to securing the supply of energy goods and raw materials, consistent with the provisions of this Agreement.	A clear and specific draft chapter on energy and raw materials. Energy goods by HS codes: Solid fuels (HS code 27.01, 27.02 and 27.04), crude oil (HS code 27.09), oil products (HS code 27.10, 27.13 – 27.15), natural gas whether liquefied or not (HS 27.11), and electrical energy (HS 27.16), biogas (HS 38.25). Raw Materials (hs chapters): 25, 26, 27, 28, 29, 31, 71, 72, 74, 75, 76, 78, 79, 80, 81

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU-Turkey Customs Union Agreement	The Customs Union Agreement was established to expanded EU and Turkey's economic and trade relations. It was the EU's first substantial customs union with a non-EU country. It covers all industrial goods but does not address agriculture (except for processed agricultural products), services or public procurement.	31.12.1995	Ongoing modernisation		Ankara Association Agreement (12/09/1963)							Trade and Investment		Signatories
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
									Binding Commitments	Signatories	Expansion of trade and economic relations between EU and Turkey	In December 2016, the Commission proposed to modernise the Customs Union and to extend bilateral trade relations to areas such as services, public procurement and sustainable development.		

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU-Ukraine Deep and Comprehensive Free Trade Area	The EU and Ukraine have provisionally applied an Association Agreement since November 2014. As a part of this association agreement, a Deep and Comprehensive Free Trade Agreement (DCFTA) has been provisionally applied since January 2016. It reduces tariffs that European firms face when exporting to Ukraine. The agreement facilitates trade by making customs procedures more efficient and by gradual approximation of Ukrainian legislation, rules and procedures, including standards, to those of the EU.	01.01.2016	Ongoing (provisionally)		The Energy Community Treaty						Trade	Trade and Security	convergence of positions on bilateral, regional, and international issues of mutual interest; political, socio-economic, legal and institutional reforms; energy insecurity	Signatories
		Objectives					Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
Yes	Yes				exchange information and support regulatory reforms for restructuring the coal sector (focusing on the entire value chain – from exploration via production and processing to conversion and handling of residues from coal processing and combustion.	enhancing energy cooperation with Ukraine			Best Endeavour/Cooperation	Signatories	greater integration based on shared values			

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU-Colombia-Peru-Ecuador FTA	The EU-Colombia-Ecuador-Peru Trade Agreement includes full or partial tariff liberalisations, substantive duty-free quotas, the removal of regulatory or technical non-tariff barriers and the introduction of trade facilitating measures, such as customs procedures. The Trade Agreement also liberalises capital movements, investments, and public procurement markets. Not the least, the Agreement commits the parties to respecting human rights, guaranteeing employment rights and ensuring an adequate level of environmental protection.	01.01.2017	Ongoing	The EU-Colombia/Peru Trade Agreement was signed on June 2012						Trade	Trade and Investment	strengthen relations between the EU and the Andean Community; human rights violations; implementation of sustainable development; trade barriers; trade distortion in bilateral trade	Signatories	
		Objectives					Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
Yes					safety of trade supply chain;				Best Endeavour/Cooperation	Signatories	gradual tariff liberalisation; trade facilitation; liberalisation of services trade; reciprocal government procurement markets; foster investments; ensure sustainable development			

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU-Southern Med (Renewed partnership with the Southern Neighbourhood – A new Agenda for the Mediterranean; JOIN(2021) 2 final.)	The long-term objective of the trade partnership between the EU and its Southern Neighbourhood is to promote economic integration in the Euro-Mediterranean area, removing barriers to trade and investment between both the EU and the Southern Neighbourhood countries (Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine*, Syria, Tunisia), and between the Southern Neighbourhood countries themselves.	1995	Ongoing							Comprehensive Partnership	regional recovery		Signatories	
		Objectives				Specific actions required								
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)	Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
								Best Endeavour/Cooperation	Signatories					

Title of the instrument	Short description	Date of launch	Duration	Historical predecessor	Internal/external policy synergies	Budget				Funding Source	Coverage of issues	EU policy area	Risks identified	Actors targeted
						Regulatory	Subsidisation	Capacity Building	Total					
EU ACP Negotiating Directives	The purpose of the negotiations is to conclude a strengthened Partnership between the European Union (EU) and its Member States of the one part, and the countries of Africa, the Caribbean, and the Pacific of the other part. The new Agreement is envisaged as a comprehensive partnership with the aim to strengthen the relations between the Parties and generating mutually beneficial outcomes on common and intersected interests. The Agreement will aim to advance sustainable and inclusive development, based on the implementation of the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change as the overarching frameworks guiding the partnership.	2018	Ongoing							Comprehensive Partnership	Trade and Investment	environmental and climate change-related challenges, economic shocks, conflicts and political crises and epidemics and pandemics; transparency of energy markets	Signatories	
		Objectives				Specific actions required				Enforceability	Implementation and Enforcement	Expected outcome/impact	Notes	
		Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and/or in foreign)	Securing existing supply	Diversification of foreign sources	Promoting on-shoring	Developing sustainable capacities (at home and in foreign)					
		Yes			Yes	Fair, responsible, and undistorted access to extractive resources, fully respecting countries' sovereignty over their natural resources, and shall foster sustainable trade between African and EU operators			clean, diverse, cost-effective, and sustainable energy technologies, with a focus on renewable and low-emission energy technologies and the promotion of Africa-EU partnerships; focus on making extractive industries and processing sustainable, on sustainable renewable energy sector	Best Endeavour/Cooperation	Signatories	It will seek to bolster investment, support private sector development, and enhance regional integration. It will support the transition to low greenhouse gas emissions and to development and climate resilient economies, and will contribute to the creation of decent jobs for all. The Agreement will seek to eradicate poverty in all its dimensions.		

10 Abbreviations

ACER	Agency for the Cooperation of Energy Regulators
ACI	Anti-Coercion Instrument
ACP	African, Caribbean and Pacific Group of States
AFP	American Families Plan
AI	Artificial Intelligence
AJP	American Jobs Plan
AMNE	Activity of Multinational Enterprises (Database, OECD)
API	Active Pharmaceutical Ingredients
ARP	American Rescue Plan
ASEAN	Association of Southeast Asian Nations
BIT	Bilateral Investment Treaty
BRI	Belt and Road Initiative
CARES Act	Coronavirus Aid, Relief, and Economic Security Act (USA)
CATL	Contemporary Amperex Technology Co., Limited
CBAM	Carbon Border Adjustment Mechanism
CETA	Comprehensive Economic Trade Agreement
CHIPS	Creating Helpful Incentives to Produce Semiconductors
COM	European Commission
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
CRA	Common Risk Assessments
CRM	Critical Raw Materials
CTEO	Chief Trade Enforcement Officer
CU	Commercial Union
CUM	Cumulative
CWP	Commission Work Programme
DCS	Dual Circulation Strategy
DRC	Democratic Republic of Congo
ECI	Economic Complexity Index
EED	Energy Efficiency Directive
EPA	Economic Partnership Agreement
EPBD	Energy Performance of Buildings Directive
EPRS	European Parliamentary Research Service
ERMA	European Raw Materials Alliance
ES2050	Energy Strategy 2050
ESCAP	Economic and Social Commission for Asia and the Pacific

ESPAS	European Strategy and Policy Analysis
ETS	Emission Trading System
EU	European Union
EUROK	European Union–South Korea Free Trade Agreement
EV	Electric Vehicles
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
G20	The Group of Twenty
GBR	Great Britain (OECD Coding)
GDP	Gross Domestic Product
GSA	Global Arrangement on Sustainable Steel and Aluminium
GSC	Global Supply Chain
GVC	Global Value Chain
HEV	Hybrid Electric Vehicle
HHI	Herfindahl Hirschman Index
HLED	High-level Economic Dialogue
IA	Impact Assessment
ICSG	International Copper Study Group
ICT	Information and Communication Technology
ILZSG	International Lead and Zinc Study Group
IMF	International Monetary Fund
INSG	International Nickel Study Group
IPCEI	Important Projects of Common European Interest
IPEF	Indo-Pacific Economic Framework for Prosperity
IPI	International Procurement Instrument
IRA	Inflation Reduction Act
ISCC	International Sustainability and Carbon Certification
ISO	International Organization for Standardization
INTRACEN	International Trade Centre
LNG	Liquefied Natural Gas
MERCOSUR	Mercado Común del Sur
METI	Ministry of Economy, Trade and Industry (Japan)
MiC2025	Made in China 2025
MINER	Mining Innovations for Negative Emission
MMI	Modern Manufacturing Initiative
MNE	Multi-National Enterprise
MoU	Memorandum of Understanding

MS	Member States
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne
NGO	Non-Governmental Organization
NIS	New Industrial Strategy
OACPS	Organisation of African, Caribbean and Pacific Group of States
OECD	Organisation for Economic Cooperation and Development
PGM	Platinum Group Metals
PRC	People's Republic of China
PV	Photovoltaic Industry
RCEP	Regional Comprehensive Economic Partnership Agreement
RED	Renewable Energy Directive
RMIP	Raw Materials Investment Platform
RRE	Rare Earth Elements
RRFR	Recovery and Resilience Facility Regulation
RSPO	Roundtable on Sustainable Palm Oil
SCRI	Supply Chain Resilience Initiative
SECO	Secrétariat d'État à l'économie (Switzerland)
SIF	Strategic Innovation Fund
SITC	Standard International Trade Classification
SME	Small and Medium-sized Enterprises
SMEI	Single Market Emergency Instrument
SoGS	Security of Gas Supply
SPI	Sustainable Products Initiative
SR	Supply Risk
SSF	SECO Start-up Fund
TTC	Trade and Technology Council
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
US	United States of America
USMCA	United States-Mexico-Canada Agreement
VA	Value Added
WTO	World Trade Organization
ZSCA	Zone of South and Central America (OECD Coding)

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