

The EU's Road Towards Strategic Autonomy

A Mapping of Policy Progress and Gaps

André Wolf

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1 Background

In recent years, a series of overlapping political and economic shocks has put international trade relations in almost permanent crisis mode. With a protectionist-minded US-President in office and a range of trade conflicts remaining unsolved, Europe must be prepared for further attacks on its industrial supply chains. Moreover, the recent accumulation of crisis events provides fuel for the general trend of geoeconomic fragmentation, coupled with a “geopolitical turn” of trade policies. Trade policies are no longer purely calibrated to economic goals, but increasingly serve as a weapon in a global struggle for influence and power.

For the European Union (EU), this development exerts significant transformative pressure. This concerns both its general attitude towards free trade and unrestricted competition and the functioning of its convergence-based decision-making mechanisms. Addressing these challenges requires an expansion of the EU's existing policy toolkit. Two policy areas are central: trade and industrial policies. Historically, these areas were clearly distinct in Europe, both in terms of legal competencies (EU vs. national) and the dominant economic schools of thought. The EU's new vision of 'Open Strategic Autonomy' can be seen as an attempt to unify these policy areas under the banner of long-term resilience goals.

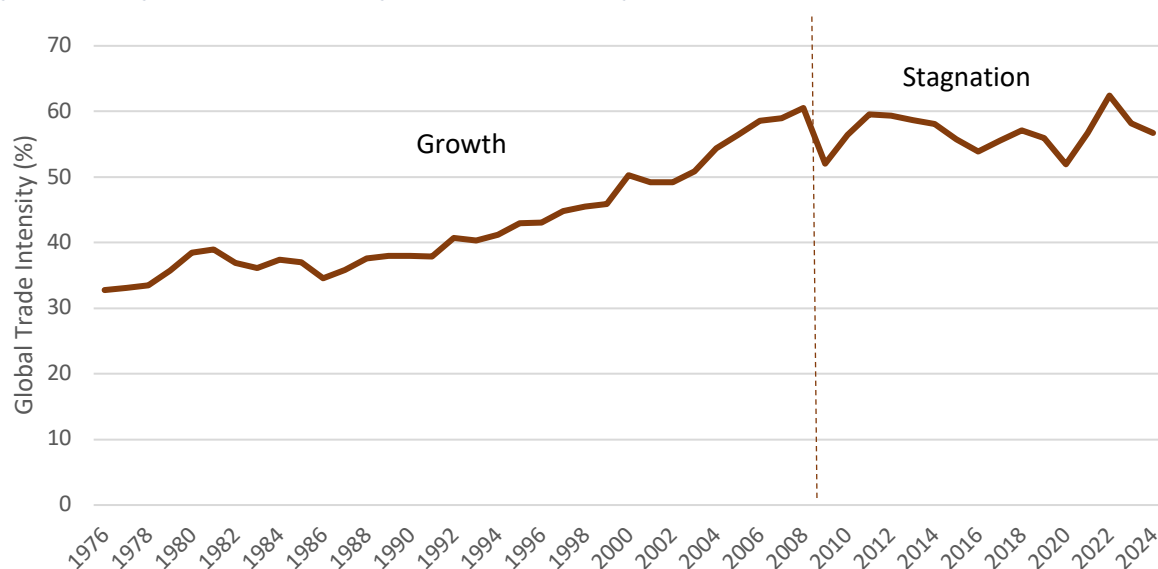
This Policy Brief investigates the status quo of the implementation of the EU's Open Strategic Autonomy agenda against the background of global framework conditions and industry needs. It starts with a description of global trade trends justifying a reorientation of the EU's economic policy. Then, it presents the new guiding concepts of the EU and mirrors these against policy trends in the US and China. It continues with a detailed mapping of current EU instruments in trade and industrial policies. From the perspective of basic requirements for resilient future supply chains, it identifies gaps and shortcomings of the current regulatory framework. Based on this, a set of central policy recommendations is derived.

2 General Policy Trends

2.1 Fragmentation, Resilience and Technological Leadership

For a long time, globalization appeared to be an unstoppable phenomenon. Since the end of the Second World War, trade in the global economy had shown a positive trend for decades. Economic crises caused only temporary setbacks, with international trade returning to its growth trajectory after a short time. However, since the last global financial crisis, this trend has changed: trade intensity now appears to fluctuate around a steady plateau (see Figure 1). While singular shock events such as the pandemic and the conflict in Ukraine have undoubtedly played their part, the causes are also structural in nature. On the one hand, this relates to the current paradigm shift in international trade policy. This is evident in fiercely contested tariff disputes, such as the US–China trade war, as well as in the stalemate in multilateral free trade negotiations and the ongoing deadlock in the World Trade Organization's (WTO) dispute settlement body.¹ At the same time, there has been a global increase in non-tariff trade barriers, i.e. measures that restrict trade other than tariffs, such as import quotas, licensing systems, and technical product specifications. Based on data from the Global Trade Alert Database, the International Monetary Fund (IMF) has identified a significant global rise in such trade-distorting measures since 2018.²

Figure 1: Long-term evolution of global trade intensity



Source: World Bank Group (2023); own illustration. Trade intensity: Trade volume / Global GDP.

The rise of emerging economies is contributing to an increase in trade conflicts. For example, China has increased its share of global industrial value added from less than 10% in 2004 to 30% in 2022.³ This growth is accelerating the transition to a new phase of development. Countries such as China and India are seeking to increase their involvement in global supply chains by moving into the higher-value

¹ Luckie, C. (2023). An Examination of the Prospects and Challenges to a Well-functioning WTO Dispute Settlement System. Case: Deadlock of the Appellate Body. Case: Deadlock of the Appellate Body (October 15, 2023).

² IMF (2022). Regional Economic Outlook for Asia and Pacific. International Monetary Fund.

³ World Bank Group (2023). World Development Indicators.

manufacturing of finished industrial goods. This challenges the current architecture of world trade and further fuels existing geopolitical rivalries.

Consequently, the concept of spheres of influence, which originates in foreign and security policy, is being increasingly applied to the economic sphere. This is reflected in an increase in regional free trade agreements. The focus is shifting from tariff reductions to general regulatory convergence. The aim of harmonizing regulations on product approval and environmental protection is to create common markets that will enhance the partners' influence in disseminating international standards.⁴ Beyond the regulatory sphere, influence can also be exerted by establishing a cross-border infrastructure tailored to the needs of a country's own economic structure. The best example of this is China's Belt and Road Initiative, which spans virtually the entire globe.⁵ The resulting lock-in effects for the partners involved further enhance the divide between economic integration areas. In this context, the International Monetary Fund (IMF) speaks of looming geoeconomic fragmentation.⁶

In the power struggle of such a fragmented world, the pursuit of technological leadership has become a cornerstone of geoeconomic strategies. It promises not only persistent productivity growth, but also a leading role in the design of new global markets through transnational processes that could redesign economic and political relationships. By aligning trade rules and technical standards with the technological expertise of domestic companies, long-term market dominance and monopoly rents can be secured. During the current period of technological transition, it is particularly important for Europe to gain leadership in climate-neutral and digital technologies in order to maintain prosperity and political stability.

The intensified technological competition represents a strategic challenge for Europe's growth model. A critical factor is the role of international cooperation in Research and Development (R&D), especially concerning the role that universities, Multinational Enterprises (MNEs) and centers of excellence play in the development and diffusion of new technologies. In times of a serious worsening of the geopolitical climate, the prevailing view on international cooperation in the Western world is shifting profoundly. Instead of embracing the fruits of an international division of labor, a cautious view on cooperation is spreading, stressing the risks for domestic competitiveness and in parts even national security. The EU is no exception in this regard, as evident in its Economic Security Strategy (see below) and the related legislative initiatives. Consequently, avoiding the risks of knowledge outflows through R&D joint ventures, goods exports or Foreign Direct Investment (FDI) might gain policy priority over exploiting the benefits of knowledge exchange with third countries.

As a consequence, trade and industrial policies increasingly merge to a joint toolkit serving the goal of realizing a resilient macroeconomic growth strategy that is compatible with long-term policy societal transformation goals like decarbonization and digitization. As the desire to transform and reduce external risks does not change the basic mechanics of international trade and competition, this

⁴ Rühlig, T. (2023). Chinese influence through technical standardization power. *Journal of Contemporary China*, 32(139), 54-72.

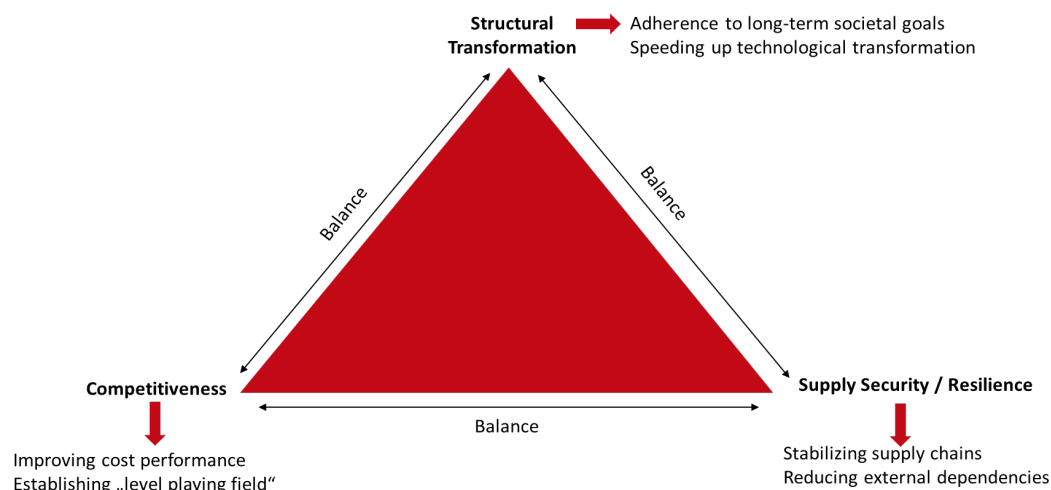
⁵ OECD (2018). The Belt and Road Initiative in the global trade, investment and finance landscape. In OECD, OECD Business and Finance Outlook 2018 (pp. 61-101). OECD.

⁶ IMF (2023). Geoeconomic Fragmentation and the Future of Multilateralism. International Monetary Fund.

inevitably requires dealing with fundamental policy trade-offs. In analogy to the traditional energy policy triangle, these can be visualized in the form of an industrial policy triangle (see Figure 2).

Accordingly, developing a sustainable industrial policy strategy requires balancing structural transformation in line with societal long-term goals (e.g. climate-neutrality) with the goals of ensuring competitiveness in the global markets and improving resilience of supply chains and sales channels. This requires making compromises on the speed and the rigorousness with which different goals are pursued. It also creates distributional conflicts, both in a time dimension (short-term adjustment costs vs. long-term transformation gains) and in a cross-sectional dimension (distribution of adjustment costs among industries and population groups). Managing these multiple dimensions asks for a differentiated set of policy instruments guided by an overarching strategy. In the following, main characteristics of the EU's current strategy are highlighted.

Figure 2: Industrial Policy Triangle



Source: own illustration

2.2 The Strategic Shift in EU Trade and Industrial Policies

2.2.1 The Concept of Open Strategic Autonomy

External trade policy is the exclusive competence of the EU. The increase in trade disputes and supply chain disruptions in recent years, even before the outbreak of the war in Ukraine, has led to a noticeable reorientation in this area. In its Trade Policy Review 2021, the European Commission introduced the concept of 'open strategic autonomy' as a new guiding principle for EU trade policy. On the one hand, it emphasizes that it will continue to work for open and rules-based global trade based on multilateral cooperation. But it also makes clear that the EU must be able to defend its strategic interests and values independently and confidently in the global trade order. This includes measures to increase the resilience and sustainability of its supply chains and the ability to tackle unfair trade practices by third countries. The Commission summarizes this reorientation in three medium-term trade policy objectives: 1) supporting the EU economy in the upcoming transformation towards decarbonization and

digitalization, 2) influencing global trade rules towards a more sustainable and fairer form of globalization, 3) enhancing the EU's ability to pursue its objectives through autonomous action.⁷

2.2.2 The Economic Security Strategy

On June 20th 2023, the Commission and the High representative published a joint Communication sketching the pillars and priorities of a future “**European Economic Security Strategy**”.⁸ It represents the first attempt of the EU to put the notion of economic security at the center of strategic action. It is motivated by the EU's perceived increase of economic vulnerability, which was demonstrated by recent shock events like the COVID-19 pandemic and the Ukraine war, and perpetuated by ongoing geopolitical tensions and a fierce international technology competition. Against this background, economic linkages with third countries are no longer viewed as a pure blessing, but under some circumstances also as a source of risk for European supply chains and competitiveness.

The central objective of the strategy is to provide guidelines for a better balancing of benefits and risks in the economic cooperation with third countries. The leitmotif is a both competitive and resilient European economy, which does not shy away from global competition, but addresses specific security gaps while using its weight to enforce a rules-based global trade order.

The first analytical step is to identify and monitor the types of risks the European economy is facing. The Communication distinguishes between four types:

- Threats to **supply chains**: Price and supply risks for critical inputs (e.g. raw materials and energy)
- Threat to **tangible infrastructure**: Physical and digital attacks on critical infrastructure (e.g. sabotage of undersea cables)
- Threats to **technological supremacy and security**: Protection against technology leakages (e.g. knowledge transfers through FDI, espionage)
- Risk of **weaponization of economic dependencies**: Blackmailing by third countries through policy measures targeting European economic vulnerabilities (e.g. export ban on critical inputs, blocking of EU investments)

The broad spectrum of risks covered is thus not limited to criminal practices and malicious attacks, but also encompasses policy measures by third countries and further disruptive market developments which are not policy-induced.

As priorities for risk prevention and management, the Communication proposes a three-pillar approach. The EU should i) **promote** its domestic competitiveness, ii) **protect** itself against identified security risks and iii) **partner** with third countries to reinforce economic security. While pillars i) and iii) are basically summaries of pre-existing strategic approaches, pillar ii) adds a genuine element to the Economic

⁷ European Commission (2021). Communication to the European Parliament, the European Council and the Council on the European economic and financial system: Fostering openness, strength and resilience. COM(2021) 32 final.

⁸ European Commission / High Representative of the Union for Foreign Affairs and Security Policy (2023). Joint Communication to the European Parliament, the European Council and the Council on “European Economic Security Strategy”. JOIN(2023) 20 final.

Security Strategy. The horizon of protective measures envisaged by the Communication addresses all four risk types and involves both physical protection of critical components and an arsenal of trade and technology policy measures. At the same time, the Communication propagates the principles of **proportionality** and **precision** for all measures seized, stressing that the danger of overreactions and conflict escalations are supposed to be kept in check.

2.3 Policy Trends among Major EU Trade Partners

2.3.1 USA

Since the first Trump administration took office, the US have started to follow an increasingly heterodox approach to industrial policy. This did not change substantially with the subsequent Biden administration. Eichengreen (2023) summarised the economic approach of the Biden administration as a combination of the following elements: a Keynesian expansive fiscal policy, a rigorous internal competition policy, and a geostrategic trade policy.⁹ Fiscal policy is based on the idea of a demand-pull effect through increased government spending and tax cuts. However, the goals pursued are not purely growth-oriented. Instead, the idea is to combine the goal of a short-term growth stimulus with the long-term goals of modernizing and transforming the economy. For example, measures such as the Inflation Reduction Act (IRA) do not simply aim to stimulate investment in general, but rather specifically in sectors and technologies that are necessary for the transition toward a climate-neutral economy.¹⁰ This form of fiscal policy thus attempts to combine growth-related with transformative goals. Under Trump II, these types of industrial policy instruments remain, but are being reprioritised. A notable change is the executive branch's effort to freeze or terminate parts of the IRA's grant-based programmes, prompting ongoing legal disputes. Tax credit provisions remain in statute. Overall, the previous approach under Biden has given way to a control-centric approach with deregulatory undertones and a more transactional attitude towards industrial projects and exports.

This is also visible in the area of trade policy, where one can identify strong continuities between the “America First” policy pursued by Trump during his first term in office and later adapted by Biden. While it is true that the Biden administration generally demonstrated a greater willingness to cooperate with its traditional allies from Europe, there was never a serious resumption of deep transatlantic free trade talks as in the days of the Obama administration. At the same time, the will to contain China's increasing global economic dominance remains unabated in the US, as demonstrated by the export ban on technology goods for the chip industry in China.¹¹ The second Trump administration continues these selective technology controls while also refocusing the trend towards protectionism through tariffs. In April 2025, the White House announced a universal “baseline” tariff, plus higher “reciprocal” rates for countries with trade surpluses vis-à-vis the US.¹² Litigation has since created significant planning uncertainty for sectors exposed to the global market. Overall, US trade policy is dominated by

⁹ Eichengreen, B. (2023). Bidenomics. *Intereconomics*, Issue 58(4).

¹⁰ Farber, D. A. (2023). Turning point: green industrial policy and the future of US climate action. *Tex. A&M L. Rev.*, 11, 303.

¹¹ Sheehan, M. (2022). Biden's unprecedented semiconductor bet. *Carnegie Endowment for International Peace*, 27th October.

¹² President of the United States (2025). Regulating Imports with a Reciprocal Tariff to Rectify Trade Practices that Contribute to Large and Persistent Annual United States Goods Trade Deficits. Executive Order April 2nd, 2025.

geostrategic interests rather than committed to the traditional American idea of safeguarding an international division of labour based on cost advantages.

In this sense, the US approach to “transformation” combines elements from quite different, sometimes opposing, schools of political and economic thought. It operates within a triangle of Keynesian fiscal policy, promotion of competitiveness, and “America First” trade policy, while attempting to preserve the economic importance of traditional industries like oil and automotives. Whether this heterogeneous mix is actually an expression of a conscious economic strategy is difficult to judge from the outside. In any case, the sheer global investment power of the US implies that this policy twist poses an enormous economic and regulatory challenge to international competitors, which is also reflected in the heated debates which the IRA has triggered in Europe.

2.3.2 People’s Republic of China

China's approach to industrial policy has always been highly specific, given the top-down nature of its political system and the close interconnection between the public and private sectors. In the course of the economic modernization of the country, the traditional central planning approach has been modified to become a hybrid one. At the top level, politics is steering the overall economic development through five-year plans and long-term initiatives like “Made in China 2025”.¹³ These comprise detailed development goals for domestic sectors identified as strategically important for China’s future prosperity. The selection of sectors is not based on maximizing short-term value added potential, but driven by expectations concerning the technological development.¹⁴ The prime goal is to achieve global leadership in hard-to-substitute future technologies, allowing China to maximize leverage on international supply chains. This reflects the idea of value chain upgrading as a strategy to reduce dependencies on raw material exports and international markets.¹⁵ Future economic growth is supposed to be politically channeled to achieve an economic structure that ensures the robustness of China’s socio-economic system.

This top-level, vision-oriented planning is combined with an implementation characterized by decentralized decision-making and competition at a local level. Competition takes place not only between companies, but also between local governments – a concept termed by Meng and Zhang (2025) a ‘three-dimensional market economy’.¹⁶ Within the strategic framework set at the national level, local Chinese governments compete for national fiscal support by maximizing their contribution to quantitative economic development goals. They possess considerable autonomy in terms of budget spending and the type of industrial policy they implement to attract private investors. Regions in China

¹³ Wübbcke, J., Meissner, M., Zenglein, M. J., Ives, J., & Conrad, B. (2016). Made in china 2025. Mercator Institute for China Studies. Papers on China, 2(74), 4.

¹⁴ Chen, L., & Naughton, B. (2016). An institutionalized policy-making mechanism: China’s return to techno-industrial policy. Research Policy, 45(10), 2138-2152.

¹⁵ Hongfu, N., & Ye, T. (2021). China's Industrial Upgrading and Value Chain Restructuring Under the New Development Pattern. China Economist, 16(5), 72-102.

¹⁶ Meng, J., Zhang, Z. (2025). Industrial Policy with Chinese Characteristics: The Political Economy of China’s Intermediary Institutions. Wenhua Zongheng 3(1).

thus become industrial policy laboratories, providing the national government with evidence on the success of different policy strategies.

The downside of this competitive attitude is the tendency for policy overshooting from a national perspective. In maximizing their economic performance in terms of indicators such as value added, Chinese regions are incentivized to create overcapacities in specific industries¹⁷, ignore environmental damage¹⁸, and raise public debt to dangerous levels.¹⁹ Such a system is therefore in constant need of recalibration to correct political incentives, which undermines the stability benefits of following long-term development goals. Moreover, the dominant role of state-owned industrial enterprises and financial lending institutions distorts the market, reducing transparency regarding the effectiveness of public spending and limiting the system's capacity to develop bottom-up innovation.²⁰ Short-term success in economic development strategies could worsen these problems rather than mitigate them, as they encourage stakeholders to continue abusing the existing incentive mechanisms. Against the background of these systemic deficiencies, the long-term sustainability of China's current growth model is uncertain.

3 Mapping of Current EU Policy Instruments

3.1 Trade and FDI Policies

3.1.1 Trade Defense Instruments

Instruments for managing external trade risks encompass the list of traditional tariff-based trade defense instruments. Based on the nomenclature in WTO law, these can be divided into three types of measures, depending on the occasion. **Anti-dumping measures** are aimed at eliminating dumping of imports through temporary tariff increases.²¹ Dumping occurs when producers from a third country sell goods in the EU below the selling price in their home market or below the cost of production. Such tariff increases can be imposed temporarily for a maximum of six months and permanently for a maximum of five years. A practical difficulty in many cases is the lack of reliable price and cost information to identify the occurrence and extent of dumping.

In contrast, the decisive criterion for **anti-subsidy measures** is the subsidization of products imported into the EU from third countries. The subsidy need not be specifically limited to exports. In this case, temporary tariff increases are intended to offset the level of subsidization and thus restore a level playing field in the internal market. Such tariff increases can be decided on a temporary basis for a maximum of

¹⁷ Chen, W., Gong, W., Jiang, Z., & Jin, P. (2021). Regional economic competition, fiscal subsidies, and overcapacity. *Journal of Global Information Management (JGIM)*, 30(6), 1-19.

¹⁸ Hong, Y., Lyu, X., Chen, Y., & Li, W. (2020). Industrial agglomeration externalities, local governments' competition and environmental pollution: Evidence from Chinese prefecture-level cities. *Journal of Cleaner Production*, 277, 123455.

¹⁹ Huo, X., Bi, S., & Yin, Y. (2023). The impact of fiscal decentralization and intergovernmental competition on the local government debt risk: Evidence from China. *Frontiers in Environmental Science*, 11, 1103822.

²⁰ Zhan, J., & Zhu, J. (2021). The effects of state ownership on innovation: evidence from the state-owned enterprises reform in China. *Applied Economics*, 53(1), 145-163.

²¹ European Commission (2022a). [Introduction to trade defence policy](#).

four months and on a permanent basis for a maximum of five years. The sensible use of this instrument also requires a high level of information, both on the amount of subsidies paid to companies and on their appropriate distribution among individual products. Moreover, even if applied accurately, they make imported products more expensive for domestic consumers and, in the case of intermediate products, for industry.

A third category of trade defense measures is **safeguard measures**. They do not require evidence of unfair trade policies by third countries, but are simply linked to the condition that imports of a particular product into the EU suddenly have increased sharply. Their purpose is to give domestic industry time to adjust to the unexpected increase in foreign competition. Provisional safeguard measures can last up to 200 days and definitive measures up to 4 years.²² Recently, the number of safeguard measures initiated by the European Commission has reached a record high.²³

Besides these conventional anti-distortive measures, the era of ambitious climate policies has brought up a fourth category of tariffs trying to compensate for differences in CO₂ pricing embedded in imports and domestically produced products. In this case, the purpose of import tariffs is to eradicate the competitive advantage of producers from less ambitious third countries on the internal market. With the Carbon Border Adjustment Mechanism, the EU is in the process of implementing an instrument that is supposed to directly compensate the CO₂ cost gap between imports and domestic products, initially however only for a limited set of basic materials.²⁴

Moreover, with the **Anti-Coercion Regulation**, the EU has implemented a central steering instrument for putting defense measures to use in cases of attempted economic coercion by a third country.²⁵ It is based on the official recognition of an economic coercion incident through an Implementing Act by the European Commission. This is defined as fulfilled if a third country imposes – or threatens to impose – a measure affecting trade or investment with the goal of forcing the EU or Member States to make certain policy decisions. The European Commission conducts examinations of potential cases both on its own initiative or as a response to a duly substantiated request by Union businesses and other private stakeholders. If economic coercion is diagnosed, the Regulation spells out a series of concrete counteractions. This starts with creating the opportunity for joint consultations with the accused third country, exploring options like direct negotiations or the submission to international adjudication to settle the matter. If this proves unable to stop the coercion, the Union shall take own unilateral response measures from a list of measures spelled out in the Regulation's Annex. These comprise a broad range of instruments from classic tariff-based countermeasures over exclusion from public procurement up to restrictions on IPR protection – even if this implies the non-performance of existing international

²² See European Commission (2022a).

²³ European Commission (2025). 43rd Annual Report from the Commission to the European Parliament and the Council on the EU's Anti-Dumping, Anti-Subsidy and Safeguard activities and the Use of Trade Defence Instruments by Third Countries targeting the EU in 2024. COM(2025) 428 final.

²⁴ Jousseume, M., Menner, M., & Reichert, G. (2021). CBAM: Damaging to Climate Protection and EU Export Industries. cepStudy.

²⁵ European Union (2023). Regulation (EU) 2023/2675 of the European Parliament and of the Council of 22 November 2023 on the protection of the Union and its Member States from economic coercion by third countries.

obligations. Moreover, the instrument also departs from the existing defense tools in that it is already applicable in stages where hostile measures are not yet implemented, but only brought up as a threat.

A common limitation of all these trade defense measures is that there is no guarantee that they will actually improve the overall competitive situation of domestic industries. Apart from the likely negative direct impact of higher import prices on domestic consumers and downstream industries, the wider impact on international trade as a whole is difficult to predict, as trade diversion and other market linkage effects may arise. Even if measures are undoubtedly WTO-compliant, the risk of retaliation by adversely affected third countries cannot be ignored, potentially reinforcing geoeconomic fragmentation tendencies and triggering a downward spiral for trade freedom. This also leads to potential conflicts with the objective of supply chain security.

3.1.2 Regional Trade Agreements and Strategic Partnerships

Another important pillar of the EU's autonomy strategy is the forging of new bilateral trade partnerships with third countries to increase supply chain diversification. A key immediate objective of diversification efforts is to reduce supply risks. These can be of a direct economic nature, such as the risk of global supply shortages and associated price increases for critical raw materials or components. They can also be political in nature, such as the risk of export restrictions imposed by supplier countries. Finally, they can be technical in nature, in the form of short-term capacity bottlenecks in production or failures of cross-border transport infrastructure. Moreover, partnerships can go beyond reducing direct trade-related costs by addressing more fundamental barriers caused by differences in market regulation. Enhanced regulatory cooperation can help creating a fair joint market with partners through levelling the playing field for firms.²⁶ This does not only fuel potentially innovation-enhancing competition, but can also improve future policy designs by initiating knowledge exchange among regulatory bodies.

One essential tool for forging partnerships are **regional trade agreements**. In recent years, the EU has been busy negotiating new agreements and modernizing existing ones. The range of negotiation partners shows a strong preference for geographical diversification. Currently, 44 preferential trade agreements involving 76 partner countries are in place.²⁷ Most recently, negotiations with Australia, India and Indonesia have been successfully concluded. The recent agreements go way beyond cutting tariffs or imports quotas. They also involve far-reaching commitments in the areas of investment protection, recognition of technical standards, environmental protection and labor rights.²⁸

Moreover, in its 2020 Action Plan on Critical Raw Materials, the European Commission has introduced a new form of cooperation. As a building block on the way to greater security of supply for mineral raw materials that are essential for the future, such as lithium, cobalt and rare earth metals, it aimed to promote **Strategic Resource Partnerships** between the EU and resource-rich countries. All available instruments of EU foreign policy are to be used for this purpose. The horizon is explicitly global, and both high-income economies with established mining sectors and resource-rich developing countries

²⁶ Santeramo, F. G., & Lamonaca, E. (2022). Standards and regulatory cooperation in regional trade agreements: What the effects on trade?. *Applied Economic Perspectives and Policy*, 44(4), 1682-1701.

²⁷ European Council (2026). [EU trade agreements](#).

²⁸ European Commission (2026). [Negotiations and agreements](#).

are mentioned as potential partners. In addition to the elimination of bilateral barriers to trade in raw materials, cooperation is also to include financial and practical support for the development of local production capacities and infrastructure, both in the field of raw materials extraction and processing. In this context, the Commission attaches particular importance to the concept of responsible sourcing, i.e. compliance with environmental and human rights standards. This is to be ensured through intensive cooperation in the area of local governance.²⁹

A whole series of additional resource-related partnership agreements were concluded since 2022, adding up to 14 partner countries at the beginning of 2025.³⁰ In addition, there are resource partnerships beyond minerals. For instance, the agreements with Egypt, Azerbaijan and Morocco relate to the development of supply relationships for energy sources (**Strategic Energy Partnerships**), in the case of Egypt specifically renewable hydrogen.³¹ In all of these cases, agreements merely took the form of memoranda of understanding outlining the main features of future cooperation.

Moreover, to enhance own innovation capacity, the EU has entered **technology cooperations**. With Japan, the EU has signed a first Science and Technology Cooperation Agreement in 2009 foreseeing exchange of R&D resources and a reciprocal opening of own funding programs.³² It has set the stage for the comprehensive EU-Japan Strategic Partnership Agreement (SPS) signed in 2019.³³ With South Korea, the EU entered a EU-Republic of Korea Digital Partnership in 2022.³⁴ With Australia, research cooperation dates back to a first Agreement on Science and Technology Cooperation in 1994.³⁵ Promoting joint research is also an integral part of the EU-Australia Framework Agreement from 2017 strengthening the bilateral partnership to tackle global challenges.³⁶ With Canada, the framework for research cooperation is set by the EU-Canada Strategic Partnership Agreement from 2016.³⁷

Most recently, the Commission has announced the formation of **Clean Trade and Investment Partnerships** (CTIPs) as an integral part of the Clean Industrial Deal. By combining elements of existing partnership agreements, they focus on improving the management of strategic dependencies and securing Europe's position in global value chains. They will mobilize investment for joint projects,

²⁹ European Commission (2020). [Critical raw materials resilience: charting a path towards greater security and sustainability](#). Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions. (2020) 474 final.

³⁰ European Commission (2025b). [Raw materials diplomacy](#).

³¹ European Union / Arab republic of Egypt (2022). [Memorandum of understanding on a strategic partnership on renewable hydrogen between the European Union and the Arab republic of Egypt](#). Sharm El-Sheikh, 16 November 2022.

³² European Union (2011). Agreement between the European Community and the Government of Japan on cooperation in science and technology.

³³ European Union / Japan (2018). Strategic Partnership Agreement between the European Union and its Member States, of the one part, and Japan, of the other part. OJ L 216, 24.8.2018, pp. 4-22.

³⁴ European Council/ Republic of Korea (2022). [European Union- Republic of Korea Digital Partnership](#).

³⁵ Australia / European Union (1994). Agreement relating to scientific and technical cooperation between the European Community and Australia. OJ L 188, 22.7.1994, pp. 18 – 25.

³⁶ Australia / European Union (2017). 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, pp. 7 - 35.

³⁷ Canada / European Union (2016). Strategic Partnership Agreement between the European Union and its Member States, of the one part, and Canada, of the other part. OJ L 329, 03.12.2016, pp. 45 – 65.

including funds from the Global Gateway Initiative.³⁸ They shall ensure fair competition in common markets for green products by harmonizing product-related regulations. They shall also support partner countries in their own decarbonization efforts through regulatory cooperation on energy and climate policies. A first dedicated CTIP has been concluded with South Africa, focusing on a range of technologies considered critical for the green transformation.

The legally non-binding nature of many of the agreements to date still guarantees a considerable degree of freedom for the practical shaping of partnerships in the future. For the EU, however, this also means that it still has a long way to go in building stable partnership relations. It must think carefully about which cooperation instruments are suitable in individual cases.

3.1.3 Screening of Inward FDI

Instruments targeting **FDI flows** start with screening mechanisms that analyze the impact of acquisitions or greenfield investments on the competitive situation for products and technologies. FDI transactions are assessed based on their riskiness for domestic economic sovereignty and technological leadership in critical areas. If an acquisition is found to pose a significant risk, restrictive measures could be imposed. In the strictest case, this could take the form of an outright prohibition of the transaction. Alternatively, authorization could be made subject to certain conditions, such as the unbundling (legal or purely economic) of firm assets within the corporate structure.³⁹

In 2020, a **Regulation establishing a framework for the EU-wide screening of inward FDI** went into force.⁴⁰ It created a cooperation mechanism among Member States and between Member States and the Commission to better supervise potentially risky FDI activities within the EU. Its intention was to link and (in the long-run) harmonize existing national FDI screening mechanisms that were already applied by many (but not all) Member States. To that end, Member States are asked to notify cases of national screening and to provide further information (e.g. identity of investor, economic sector, investment value) on single cases upon request by the Commission or other Member States. Based on the provided information, Commission and other Member States have the right to make comments (Member States) and issue opinions (Commission) on a case, which the affected Member State is supposed to consider in its decision on authorizing or prohibiting the investment. A revised version of the Regulation agreed in December 2025 aims to streamline the existing cooperation mechanism between Member States and to improve its overall effectiveness by closing loopholes.⁴¹ It foresees an obligation for all Member States to implement a screening mechanism. This involves the imposition of an authorization requirement for all foreign investments in the fields of dual-use technologies, semiconductor and quantum technologies, Artificial Intelligence (AI), critical raw materials, critical infrastructure and systemically important financial service providers. If, as a result of a risk screening, a

³⁸ European Commission / High Representative of the Union for Foreign Affairs and Security Policy (2021). The Global Gateway. Joint Communication to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. JOIN(2021) 30 final.

³⁹ Tingvall, P., & Hallberg, J. (2023). Economic Perspectives on FDI and Investment Screening. In *Weaponising Investments: Volume I* (pp. 117-139). Cham: Springer International Publishing.

⁴⁰ European Union (2019). Regulation (EU) 2019/452 of the European Parliament and of the Council of 19 March 2019 establishing a framework for the screening of foreign direct investments into the Union.

⁴¹ European Commission (2025). [Revision of the EU's Foreign Investment Screening Mechanism](#).

Member State concludes that a foreign investment is likely to negatively affect security or public order, it shall either prohibit the investment or at least demand mitigating measures (e.g. unbundling of certain assets). Hence, while not banning or restricting inward FDI in sensitive, knowledge-intensive fields in general, the proposed Regulation aims to spread a cautious, risk-oriented view among European regulators on these forms of international cooperation.

Future Cooperation in FDI screening is supposed to be further intensified according to the Commission's **Proposal for an Industrial Accelerator Act** (IAA).⁴² For the first time, it defines clear quantitative criteria Member States need to apply for authorizing FDI in emerging strategic sectors. This includes criteria for maximum foreign ownership, minimum requirements for the employment of local workers, the use of local inputs and local investments into R&D as well as obligations to share intellectual property. The criteria are partly substitutional, providing foreign investors with some flexibility, depending on the intensity of their engagement in the EU. Moreover, the conditions are initially only supposed to apply to a very limited set of emerging strategic sectors (batteries, critical raw materials, electric cars and PV) and only to investors from countries with significant share in global production capacities.

Moreover, foreign companies operating in the EU are subject to **Foreign Subsidies Regulation**.⁴³ It seeks to promote a level playing field on the internal market by giving the Commission the right to investigate and remedy the consequences of distortive foreign subsidies paid to companies operating in the EU. The Commission may issue requests for information to companies, conduct own market investigations and carry out inspections. It does so within three predefined procedures. The first procedure comprises the monitoring of foreign subsidies paid to firms involved in transactions in the form of firm acquisitions, mergers and joint ventures. The second procedure investigates bids in public procurement procedures that involve a significant foreign financial contribution. For both of these procedures, specific monetary thresholds are defined above which the parties involved are obliged to notify the Commission of any financial contributions received from non-EU public authorities in advance. Notified transactions may not be implemented without the approval of the Commission. The third procedure grants the Commission the right to collect similar information in all other market situations based on its own initiative. In its analysis, the Commission shall balance the distortive effect of foreign subsidies against potential positive effects (e.g. lower procurement prices, strengthened competition position of domestic firms through mergers). If the distortive effect is found to dominate, remedial action can be taken. These can take the form of commitment offers by the affected parties (e.g. repayment of subsidy, provision of certain assets) or by remedies imposed by the Commission itself. In all, this Regulation assigns much more significant monitoring and control rights to the Commission than the FDI screening framework.

⁴² European Commission (2026). Proposal for a Regulation of the European Parliament and of the Council on establishing a framework of measures for accelerating industrial capacity and decarbonisation in strategic sectors and amending Regulation (EU) 2018/1724, Regulation (EU) 2024/1735 and Regulation (EU) 2024/3110.

⁴³ European Union (2022). Regulation (EU) 2022/2560 of the European Parliament and of the Council of 14 December 2022 on foreign subsidies distorting the internal market.

3.2 Industrial Policies

3.2.1 Implementation of EU-wide Governance

Traditionally, industry promotion has been the domain of Member States and was therefore closely tailored to the specific national industry structures. With external dependencies seeing as common threat, and the resulting blending of trade and industrial policy goals, this has started to profoundly change. The most evident sign of this is the rapidly increasing number of dedicated industry strategies released by the Commission, targeting specific segments like automotive industry⁴⁴, basic metals⁴⁵, biotechnologies⁴⁶ and chemicals⁴⁷. Their common philosophy is to create a more conducive business environment for specific industries by addressing industry-specific economic, regulatory and technical barriers to competitiveness. The mix of policy instruments announced in these strategies is very broad, providing the basis for several new regulatory proposals and amendments of existing laws. The perspective taken in these strategies is mainly the point of view of investors, precisely the assessment of domestic production as a business case. Besides proposing regulatory adjustments, they also foresee new coordination devices between politics, industries and other stakeholders, including steering platforms and alliances. This approach reflects the influence of the school of new industrial policy, which stresses the need for close long-term private-public cooperation to overcome information asymmetries in policy-making.⁴⁸

The new governance strategies have already materialized in several pieces of regulation. They consist of a broad set of measures centered around EU-wide medium-term industry targets, with a specific focus on supply chain resilience. The **EU Chips Act** has been a frontrunner of this new type of legislation. Based on the target to double the EU's global semiconductor market share to 20% by 2030, it aims to mobilize more than EUR 43 billion in investments in domestic innovation and manufacturing capacity. It is composed of three pillars. Pillar 1 promotes innovation in value chain perspective, including both funding to research and support to testing and further later stages of the innovation cycle. Pillar 2 aims to boost investments in manufacturing capacities and Pillar 3 installs an early-warning monitoring scheme to anticipate further chips shortages.⁴⁹

⁴⁴ European Commission (2025). Industrial Action Plan for the European automotive sector. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions.

⁴⁵ European Commission (2025). European Steel and Metals Action Plan. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions.

⁴⁶ European Commission (2024). Building the future with nature: Boosting Biotechnology and Biomanufacturing in the EU. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions.

⁴⁷ European Commission (2025). European Chemical Industry Action Plan. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions.

⁴⁸ Rodrik, D. (2004). Industrial policy for the twenty-first century. John F. Kennedy School of Government Working Paper Series.

⁴⁹ European Union (2023). Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694.

The **Critical Raw Materials Act (CRMA)** applies a similar approach to the field of mineral raw materials critical for Europe's green and digital transformation. Based on the EU's lists of strategic and critical raw materials, it defines targets in the form of minimum shares of European extraction, processing, and recycling in the EU's raw material demand in 2030. A key instrument is the recognition of strategic investment projects in extraction, processing, recycling or material substitution. Such projects are supposed to benefit from faster permitting by setting shorter administrative deadlines, prioritized access to public funding channels and the status of highest national priority related to any legal disputes.⁵⁰ Recently, the Commission has in its ReSource EU Action Plan announced to further strengthen support by setting up a Critical Raw Material Financing hub, aiming to mobilize EUR 3 Billion within twelve months by coordinating means from InvestEU, the Innovation Fund, and national sources.⁵¹

The **Net-Zero Industry Act (NZIA)** extends the central industrial policy to the production of net-zero technologies. For a list of clean technologies recognized as essential for reaching the EU's climate goals, it defines 2030 targets for the share of domestic manufacturing capacities in EU-wide deployment needs. Again, the recognition and preferred treatment of strategic projects is an essential element, including deadlines for permit-granting. Moreover, the Regulation also aims to create favorable local ecosystems for manufacturers, by asking Member States to designate specific industry clusters as hubs of net-zero technology production and promoting cooperation on overcoming skill bottlenecks (see below).⁵²

3.2.2 Channeling of Fiscal Investment Support

Since the announcement of the European Green Deal, targeted monetary support to investors in transformative technologies has become a cornerstone of industrial policy-making at EU level. The goal of these funds is not merely to speed up the technological transformation. Following the philosophy of the Green Deal, it is centered on creating new resilient business models securing a long-term future for Europe as a location for value-added manufacturing and innovation. This requires overcoming existing external dependencies and increasing the ability to enforce own market rules at the global level. In this respect, investment support is also a central element of Europe's autonomy strategy.

Existing funds at EU level can be separated into central and decentral forms of support allocation. As a form of central, tender-based investment funding, the **EU Innovation Fund** has become a crucial funding source. Financed by the revenues from auctioning certificates in the EU Emissions Trading Scheme (ETS-I), it aims to invest a total of about EUR 40 billion in the implementation of innovative low-carbon technologies during this decade, depending on the evolution of the carbon price. Its scope extends the sectoral scope of the ETS-I, including applications in the buildings and mobility sectors.

⁵⁰ European Union (2024b). Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020.

⁵¹ European Commission (2025). RESourceEU Action Plan Accelerating our critical raw materials strategy to adapt to a new reality. Communication from the European Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions.

⁵² European Union (2024). Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and amending Regulation (EU) 2018/1724.

Support is provided in the form of grants, either allocated based on applications for calls of proposals or competitive auction formats. It also serves as a financing source for industry-specific such as the European Hydrogen Bank. Member States can also use the auction platform to award own national funding based on competitive auctions (“Auction-as-a-service”).⁵³

Two central EU-level funds provide location-dependent support. The **EU Modernization Fund** supports the modernization of energy systems and the improvement of energy efficiency in 13 low-income Member States. It is likewise financed through auction revenues from the EU ETS I, with total funding predicted to be about EUR 57 billion for the period 2021-2030. Support is allocated based on investment proposals by Member States to the European Investment Bank (EIB). The fund allows beneficiary Member States to decide on the form of support granted (grants, premium, guarantee instruments, loans or capital injections).⁵⁴ The **Just Transition Fund** focuses on supporting investments in EU regions (NUTS-3 level) most affected by the climate transition. It is financed out of the regular EU budget as well as NextGenerationEU, exhibiting a budget of EUR 17 billion over the current funding period 2021-2027. It finances activities that alleviate negative socio-economic impacts of the transition, which includes investments in low-carbon and digital technologies. Regions are selected based on Territorial Just Transition Plans prepared by Member States. Project selection lies in the hands of the national or regional managing authorities.⁵⁵

For decentral support provided through the EIB and its partner institutions, the **InvestEU programme** has become the crucial financing vehicle. It consists of the InvestEU Fund, the InvestEU Advisory Hub and the InvestEU Portal. Instead of directly providing EU funding, the InvestEU Fund operates indirectly through a guarantee mechanism. It uses a sum of EUR 26.2 billion from the EU budget as a guarantee to back investments undertaken by the financial partners. This raises their ability to bear risks, improving bankability and lowering financial costs for high-risk projects. The goal is to mobilize private investments into EU top priority areas, including the green and digital transition.⁵⁶

Operating until the end of 2026, the **Recovery and Resilience Facility (RFF)** is a massive decentral investment instrument supporting investments in the resilience and the climate, energy and digital transitions in the EU. Founded as a response to the economic crisis caused by the COVID-19 pandemic, it managed to raise EUR 724 billion through EU lending on capital markets. Support is allocated in a decentral manner via the Member States, based on national recovery and resilience plans featuring clear milestones and targets. At least 37% of the budget must be devoted to green and at least 20% to digital measures. Support takes the form of grants and loans.⁵⁷

Finally, with the publication of the **Clean Industrial Deal State Aid Framework (CISAF)**, the Commission has recently extended the flexibility for Member States to provide state aid based on national funding. Besides providing investment grant or loans, they may provide price-based subsidies to industrial electricity buyers from trade- and electricity-intensive industries. Price support may be

⁵³ European Commission (2026). [Innovation Fund](#).

⁵⁴ European Commission (2026). [Modernisation Fund](#).

⁵⁵ European Commission (2026). [Just Transition Fund](#).

⁵⁶ European Union (2026). [InvestEU](#).

⁵⁷ European Union (2026). [Recovery and Resilience Facility](#).

granted for up to 50% of a company's electricity consumption and price reductions may not exceed 50% of the wholesale price. Aid is only provided conditional on investments in energy transformation and is generally limited to a time period of up to three years.⁵⁸

3.2.3 Administrative and Technical Support to Investment Projects

The EU also aims to improve investment conditions for European industries by providing technical support. The main focus is on improving the efficiency of national permit granting procedures. Lengthy government approval processes pose a serious obstacle to industrial manufacturing projects. They increase uncertainty regarding the length of the ramp-up phase, tie up idle capital, and generate work that does not generate revenue throughout the approval period. Consequently, the financing costs of investments tend to rise. To speed up approval procedures, the Commission has made detailed EU recommendations to the Member States for the areas of energy infrastructure, critical mineral resources and production capacity for Net-Zero Technologies. In all cases, it essentially relies on a combination of three measures. To reduce transaction costs, the member states are to set up central contact points ("one-stop shops") to coordinate communication with the individual authorities and act as a point of contact for project owners. To reduce the risk of delays due to legal disputes, projects shall be given the highest priority status in national law for all legal matters. To put pressure on the approval authorities to be more efficient, ambitious time limits have been set for the total length of approval procedures.⁵⁹

Technical support takes the form of advisory services on project financing and project management, provided by institutions such as the EIB. Additionally, the EU has recently set up specialized market platforms for critical raw materials and hydrogen. These platforms bring suppliers and buyers together via a centralized mechanism. This reduces transaction costs in emerging markets and increases market transparency. By pooling the demand of European off-takers into a joint bid, the size of the European market is leveraged to secure favorable terms for the procurement of minerals and hydrogen.⁶⁰

3.2.4 Demand-Side Support through Resilience Criteria

To support domestic manufacturing on the demand side, the EU has started to make use of origin criteria. Their main purpose is to reduce one-sided import dependencies in industry segments considered to be of strategic importance. Origin criteria are applied to two governmentally regulated areas: public procurement and public support programs. The compliance costs of downstream industries and household consumers arising from switching to more expensive alternative producers can thus be passed on to the state budget, limiting the burden on specific consumer groups.

For a list of net-zero technologies, the EU Net-Zero Industry Act (NZIA) defines origin criteria in the form of resilience criteria applied to public procurement and support auctions for renewable energy. The criteria are defined as maximum thresholds for the share of net-zero technology equipment obtained from dominant supplier countries. This incentivizes bidders to diversify their procurement channels, thereby creating demand for inputs from alternative supply sources. Hence, even though the

⁵⁸ European Commission (2025). Communication from the Commission – Framework for State Aid measures to support the Clean Industrial Deal.

⁵⁹ See European Union (2024b).

⁶⁰ European Commission (2026). [EU Energy and Raw Materials Platform](#).

main goal of the NZIA is to foster the build-up of EU-internal production capacities of net-zero technologies, it avoids formulating resilience criteria in the form of explicit local content requirements. Instead, criteria refer to the goal of diversifying supply channels, i.e. reducing dependence on dominant supplier countries like China, not necessarily reducing import dependence in general. Moreover, the NZIA provides room for some cost- and feasibility related exceptions.⁶¹

With its proposal for an Industrial Accelerator Act (IAA), the Commission goes one step further. For a set of net-zero technologies and energy-intensive base materials, it proposes for the first time specific EU origin criteria. These criteria take the form of binding pre-qualification requirements for public procurement and public support programs, not allowing for a substitution by other criteria. For net-zero technologies, they specify the location for final assembly and production of specific components. For products containing base materials, they impose minimum shares for the use of base materials stemming from EU origin. At the same time, the protectionist nature of this measure is softened by extending compliance with EU origin to production in those third countries which are engaged with the EU in regional free trade agreements. In this way, the origin criteria could also become a strategic tool in EU trade negotiations.⁶²

3.2.5 Creation of Regional Ecosystems

The EU increasingly aims to couple direct investment support to industries with a strengthening of local ecosystems at industrial locations. The aim is to reduce distance costs and help companies exploit the benefits of agglomeration economies. This includes ensuring access to physical transport and energy infrastructure, but also to a local skill pool and a strong research base. In this way, new specialized industrial centers are supposed to emerge, creating resilient supply chains that match the EU's comparative advantages at the global level.

The set of policy tools features fiscal support to investments in local knowledge infrastructure such as training centers or testing facilities, with the EU's research program Horizon Europe as a central allocation device. It also encompasses support to capacity-building in regional transport infrastructure financed through the Funds of EU Cohesion Policies. Lately, as part of the NZIA, the EU has also started to engage in a harmonization of regional cluster planning through the concept of **Net-Zero Acceleration Valleys**. Net-Zero Acceleration Valleys are areas designated by Member States which are supposed to host future spatial clusters of net-zero industry activity. For each Net-Zero Acceleration Valley, Member States must set up a plan with concrete measures for increasing its attractiveness as a production location, including infrastructure development, dedicated investment support and measures for the upskilling and reskilling of the local workforce. To coordinate permit granting procedures, every Net Zero Acceleration Valley must be assigned a single administrative point of contact. In its proposal of the IAA, the Commission aims to extend this approach to the concept of Industrial Acceleration Areas, also comprising the automotive industry and production of energy-intensive base materials.⁶³

⁶¹ See European Union (2024a).

⁶² European Commission (2026). Proposal for a Regulation of the European Parliament and of the Council on establishing a framework of measures for accelerating industrial capacity and decarbonisation in strategic sectors and amending Regulation (EU) 2018/1724, Regulation (EU) 2024/1735 and Regulation (EU) 2024/3110.

⁶³ See European Union (2024a).

Moreover, to strengthen the local skill base in agglomeration areas, the NZIA also foresees the implementation of virtual **Net-Zero Academies**. Their task is to develop and disseminate specialized learning material to upskill and reskill workers for the production of net-zero technologies. The goals are to reduce skill bottlenecks and create high-quality jobs in the emerging green technology segments, thus making sure that the green transition becomes a job motor. By providing a joint qualification base, barriers worker mobility within the EU are supposed to be lifted.

3.2.6 Expansion of Cross-Border Infrastructure

The necessity to coordinate national infrastructure planning was recognized by the European Union already in the 1990s. First attempts in this direction took the form of Community Guidelines for the development of a Trans-European Transport Network (TEN-T).⁶⁴ In 2013, the definition and objectives of TEN-T were made subject of an EU Regulation⁶⁵ and subsequently updated in 2024.⁶⁶ In its present form, the legal objective is to establish a single multimodal transport network of high quality, which helps to create a European Transport Area. This area is characterized by the attributes “safe, sustainable, efficient and resilient”. This demonstrates the strong alignment of infrastructure policies with the wider economic and climate policy objectives of the EU.

One concrete instrument to speed up planning and implementation of strategically important cross-border projects in energy infrastructure is their recognition as **Projects of Common Interest (PCI)**. Being recognized as a PCI comes with several benefits. Firstly, to speed up implementation, a timetable for the single project stages is to be set up and progress to be regularly monitored by monitoring reports, including an investigation of reasons for potential delays and ways to overcome them. Secondly, if a project meets significant difficulties, the Commission may nominate a European coordinator whose task is to assist the stakeholders in project implementation. Thirdly, PCIs are granted a priority status in permit granting. Specifically, in national permitting, project shall be granted the highest status of significance foreseen in the national law. All judicial processes associated with a PCI shall be treated in the most urgent manner.

The traditional vehicle of the EU to support European infrastructure development is the EU Cohesion Policy. In the current 2021–2027 Multiannual Financial Framework, a total of 392 billion EUR is devoted to cohesion-focused projects, split across four EU Funds.⁶⁷ Among these, the **European Regional Development Fund (ERDF)** and the **Cohesion Fund (CF)** are of particular relevance for infrastructure investments. For the ERDF, improving connectivity by enhancing mobility is one of five current funding priorities.⁶⁸ To support cooperation across regions and countries, the ERDF finances dedicated Interreg programs with a budget of almost 10 billion EUR in 2021–2027, 6.5 billion Euro of which are granted to

⁶⁴ European Union (1996). Decision No 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community guidelines for the development of the trans-European transport network.

⁶⁵ European Union (2013a). Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU.

⁶⁶ European Union (2024a). Regulation (EU) 2024/1679 of the European Parliament and of the Council of 13 June 2024 on Union guidelines for the development of the trans-European transport network, amending Regulations (EU) 2021/1153 and (EU) No 913/2010 and repealing Regulation (EU) No 1315/2013.

⁶⁷ European Commission (2025d). [Available budget of Cohesion Policy 2021–2027](#).

⁶⁸ European Commission (2025). [European Regional Development Fund](#).

cross-border projects.⁶⁹ Moreover, during the 2014-2020 financing period, the EU introduced dedicated funds for supporting cross-border infrastructure network under the umbrella of the **Connecting Europe Facility** (CEF). Its purpose is to finance the development and modernization of trans-European network infrastructure in the segments transport, energy and digital services. In the current period 2021-2027, 33.72 billion EUR funding are allocated to the CEF, 60% of which are required to contribute to climate objectives. The lion's share goes to the CEF transport (25.81 billion EUR). Funding can be provided in the form of grants, but also through more innovative instruments like guarantees and project bonds.⁷⁰

4 Gap Analysis for EU Policies

4.1 Requirements of Resilient Future Supply Chains

The green and digital (“twin”) transition creates significant investment pressure for European industries. In many cases, it requires not only switching production technologies, but recalibrating whole supply chains. This starts with new input needs, causing fundamental changes in the geography of supply relationships. New supply channels in turn bring about new forms of economic risks, asking for alternative approaches to balance cost efficiency against resilience. While needs are industry-specific, commonalities between different sectors can be summarized in the form of six basic requirements.

The first requirement is to gain stable access to **clean energy**. In a decarbonized Europe, access to a stable source of clean energy will be essential for competitiveness. Direct electrification will be the most cost-efficient technological solution for many industries, particularly through the use of large-scale industrial heat pumps. Sectors whose processes are difficult to electrify will rely on gaseous renewables such as renewable hydrogen or bio-based energy carriers. Most of the clean energy will come from naturally fluctuating sources like wind and sun. Synchronizing these supply fluctuations with the electricity demand of industries and other new end-use sectors (transport and buildings) will require considerable changes to market institutions (need for efficient short-term price signals) and to the energy infrastructure (need for massive investments in grids and energy storage).

The second requirement are establishing resilient supply channels for the **raw materials** that will be essential for the production technologies of the future. Future demand growth in the area of industrial raw materials will focus on hard-to-replace minerals such as rare earths, cobalt and lithium. Most of the known raw material deposits are located outside Europe's sphere of influence and global raw material markets are currently dominated by strategic rivals that do not share the environmental and social standards essential to the EU's ethos.

The third requirement is getting access to up-to-date **technological knowledge and skills**. The high knowledge intensity and strong learning dynamics of many future technologies require companies to be firmly embedded in knowledge and innovation networks. Due to the cross-cutting nature of many of these technologies, knowledge, competencies and skills from various academic fields and industry

⁶⁹ European Commission (2025). [Interreg: European Territorial Co-operation](#).

⁷⁰ European Commission (2025). [About the Connecting Europe Facility](#).

segments are required. This means that R&D-intensive firms must team up with academic institutions, suppliers and sometimes even competitors. This places significant demands on the tangible and intangible infrastructure for research and training.

The fourth requirement is mobilizing sufficient **risk capital**. The long-term nature of investments in green and digital technologies, coupled with their dependence on future regulatory environments, entails significant financing risks, raising capital costs and jeopardizing bankability. Improving the financing base requires access to alternative channels beyond traditional bank loans and long-term equity. For external investors, this creates a need for new instruments for balancing risk, which can deal with heavily correlated systemic risks during the transition phase.

The fifth requirement is creating thriving **lead markets for** transformative technologies. Refinancing long-term investments in future technologies requires a clear outlook on stable, long-term revenue. New sales market segments need to emerge, enabling firms to offset the additional costs of switching technology through higher prices. In markets for homogeneous goods, where competition is primarily channeled through price setting, implementing such a transformation premium can be very challenging.

4.2 Need for Policy Action

The characteristics of the twin transition provide justification for targeted public support to investing companies. One reason is the **presence of strong learning externalities**. Many infantclimate-friendly technologies have not yet reached their peak of technological readiness. This means that by upscaling and using capacities, previously untapped cost reduction potential can be realized in the future. This will gradually improve their competitiveness towards fossil alternative. Technologies of artificial carbon removal are one example that has recently come into focus.⁷¹ Fundamentally, the prospect of such learning effects is a positive signal. However, it is also a source of market failure with respect to investment decisions. This is because industry-wide learning effects, insofar they do not manifest themselves in patentable knowledge, are a collective good. The externality consists in the fact that single investors do not consider the positive knowledge effects from their accumulated experience for the market as a whole. The result is insufficient investment activity in comparison with the socially optimal learning path.

Moreover, as argued above, the transformation does not only affect industry operations, but also sets new requirements for the organization of whole supply chains. In extreme cases, this can imply a complete switch of transport and distribution technologies, like, for instance, the turn towards renewable hydrogen or bio-methane as industrial energy sources. Under these conditions, the buildup of production capacities can only be profitable if both investments in the necessary transport infrastructure (e.g. new hydrogen pipelines) and in application technologies (e.g. hydrogen-based direct reduction of steel) keep pace with capacity development. As the relevant decision-makers are typically disintegrated, the design of these new supply chains is the outcome of several decentralized decisions, governed by different business agendas and regulatory incentives. As markets only emerge with the infrastructure, no central device for coordinating these mechanisms exists. The result is a **three-sided**

⁷¹ Wolf, A. (2024). [Paving the way for a European carbon market](#). cepInput No.1/2024.

chicken-and-egg problem between investments in production, distribution, and use, resulting in a wait-and-see attitude on all sides. As pointed out by Rodrick, this can be termed a negative coordination externality, as single investment decisions impose effects on the structure of whole supply chains without involving any immediate compensation.⁷² The task of regulators is to set effective signals that create confidence on the side of all supply chain actors, thus replacing decentralized coordination by a central impulse.

Finally, an important motivation for policy action is the negative effect of **long-term regulatory uncertainty**. For instance, in the case of low-emission technologies, this primarily concerns the future evolution of the price of CO₂. The CO₂ price that is set in the EU ETS I is not determined purely technologically by the companies' abatement costs, but is also a result of regulatory framework conditions, in particular regarding the development of the emissions cap and the future design of accompanying stabilization mechanisms (i.e. the market stability reserve). The organization into trading periods provides medium-term, but not long-term certainty about the regulatory path. There is also the risk of future discretionary regulatory intervention in the event of unexpected price developments or crisis situations. Such a price risk, which is dependent on many parameters and is massively influenced by social and macroeconomic factors, is difficult for market players to manage.

4.3 Existing Policy Gaps

4.3.1 Access to Clean Energy

Although Europe's overall use of renewable energy has increased in recent years, the industrial sector has not gained momentum. For example, the electrification of industrial production processes, which is a vital part of decarbonization, has not progressed much recently. The development of production and import capacities for renewable hydrogen has also stalled. Key internal EU factors include the difficulty of hedging long-term costs arising from the need to invest simultaneously in renewable energy supply, demand-side technologies, and grids. Integrating naturally fluctuating renewable sources into the system requires significant adjustments to overall energy system management. The costs of investments and short-term interventions to prevent grid bottlenecks are largely passed on to final electricity consumers, which worsens the business case for electricity-based technologies. Increased volatility in electricity supply leads to more volatile wholesale electricity prices, which are further fueled by the need for expensive fossil fuel imports for peak-load generation.

Improving system management requires the EU to tackle investment bottlenecks. Most importantly, the technical and financial barriers to expanding and modernizing grid infrastructure – the key bottleneck in matching renewable energy suppliers with industries – must be overcome. In this respect, achieving greater regulatory harmonization between Member States is crucial. Firstly, this concerns the revenue regulation of grid operators, particularly the need for a timely compensation of grid investment costs, which does not discriminate between financing or cost structure. Secondly, to manage grid connection queues, a harmonized, merit-based approach to allocating grid connection permits is needed. Finally,

⁷² Rodrik, D. (2004). Industrial policy for the twenty-first century. John F. Kennedy School of Government Working Paper Series rwp04-047.

to maintain electrification incentives despite persistently high electricity prices, EU state aid rules should grant Member States more flexibility in providing public price compensation.

Moreover, to build up external channels of clean energy supply, the EU should offer more targeted support to production and infrastructure capacities for renewable hydrogen in third countries. Beyond the existing Hydrogen Bank (see Section 3.2.2), this should involve dedicated support funds and a central procurement platform offering state-backed long-term sales contracts to hydrogen producers worldwide, following the example of the German H2Global-Fund. This would help to bridge the current gap between delivery costs and domestic willingness-to-pay. Moreover, it would provide central price signals, facilitating the establishment of private European hydrogen markets

4.3.2 Access to Critical Raw Materials

Prioritizing public funding for strategic raw materials projects through the provisions of the CRMA (see Section 3.2) is an important step towards strengthening the EU's raw materials security. However, targeted economic incentives are still needed to accelerate the development of alternative supply routes for critical mineral raw materials. This is particularly true with regard to investment in raw material extraction. A major issue is the long-term uncertainty surrounding the planning and approval of such projects. In particular, this relates to potential environmental risks and the associated obstacles to social acceptance. The regulations adopted to shorten approval procedures (see Section 3.2.3) do little to reduce this uncertainty as they do not impose any binding consequences, such as granting tacit approval if deadlines are exceeded. Another major source of uncertainty following project completion is how the currently dominant raw material suppliers will react in the market. They could attempt to prevent new competitors from entering the market by engaging in a price war. To mitigate these risks, intelligent risk-sharing mechanisms are required from the perspective of private investors. These include the targeted use of loan guarantees by the European Investment Bank, for example.

At a strategic level, a more coordinated approach to implementing strategic raw materials partnerships is needed. In partnerships with developing economies, this primarily involves incorporating value chain upgrades into future cooperation roadmaps. Partner countries should be given the opportunity to expand their role within joint value chains to include downstream processing steps over time. This will advance their industrial development while allowing them to benefit from internal knowledge and innovation. To this end, joint infrastructure and research projects should be designed with specific downstream applications in mind. Providing 'club goods', such as continuous cooperation in research and the development of standards, can reduce the risk of partner countries turning away from the EU.

Finally, realizing the potential of raw materials requires the EU to make greater use of recycling. These resources are free from the environmental risks associated with mining, and are not subject to price fluctuations or supply risks on global markets. The sharp rise in waste volumes from green technologies, such as wind turbines and electric cars, will significantly boost the supply of secondary raw materials over the next few decades.⁷³ However, the development of European recycling capacities for critical mineral raw materials is still in its infancy. Economic barriers include high fixed recycling costs,

⁷³ Rizos, V., Righetti, E., Kassab, A. (2022). Developing a supply chain for recycled rare earth permanent magnets in the EU. CEPS in-depth analysis 07/2022.

insufficient information exchange on technical product properties during waste treatment and the chicken-and-egg problem of establishing a collection and recycling infrastructure.⁷⁴

4.3.3 Access to Knowledge and Skills

The green and digital transition, along with the growing use of AI technologies, is also placing new demands on employees' skills. Companies are facing a significant need to upskill and reskill their workforce. According to the latest European Skills and Jobs Survey, upskilling needs are particularly pronounced in energy supply and manufacturing.⁷⁵ Simultaneously, educational institutions need to adjust their curricula to changed qualification demands. At the same time, only a minority of workers participated recently in training activities. In 2022, the EU-wide participation rate amounted to 24% for manufacturing workers and to 34% for workers in energy supply.⁷⁶ The problem is aggravated by a growing general supply bottleneck of workers in the engineering field. For jobs related to green technologies, the Center for Sustainability and Excellence estimated labor demand in Europe to grow by 11.6% from 2023 to 2024, while labor supply only grew by 5.6%. In the medium-term, the gap between labor supply and demand is projected to increase, potentially reaching a level of more than 100% in 2050.

To overcome shortages in the supply of young talent and experienced professionals, more central coordination at the European level is needed. The Net-Zero Academies currently implemented (see Section 3.2.5) provide an appropriate coordination platform. An important step is the expansion of university study programs that are closely tailored to the needs of an industry that is strongly research based. Specialized master's degree programs that involve an intensive exchange with local manufacturing companies can lay the foundation for regional "talent factories", overcoming the problems of finding the right matches on local labour markets, and providing companies with a reliable flow of highly qualified workers. At the same time, support for upskilling and reskilling of the existing workforce needs to be expanded. Specialized training centres that focus on the practical skills that are lacking (e.g. laboratory skills) can reduce the overall costs of retraining which arise from the structural change brought about by economies of scale. It makes sense to organize these centres as public-private partnerships, to cope with the risk of underinvestment on the company side (generation of positive externalities). In addition, this gives regions an influence over training content and enables them to create better coherence with regional economic development strategies. For the recruitment of skilled workers from non-EU countries, global recruitment campaigns are needed that convey the advantages of working and living in the EU. In the future, these should culminate in greater harmonization of high-skilled immigration policies, including common support programs for organizing the move to Europe.

4.3.4 Access to Risk Capital

In recent years, the EU has significantly expanded and strategically aligned its investment support with the objectives of the green and digital transitions. However, in light of the presence of significant, hard-

⁷⁴ Wolf, A. (2023). Recycling green technologies of the future. cepInput No.10/2023.

⁷⁵ JRC (2023b). Skills for the energy transition in the changing labour market. Joint Research Centre at the European Commission.

⁷⁶ Eurostat (2026). [Participation rate of employees in education and training](#). Eurostat Database.

to-diversify investment risks (see Section 4.2), there is still a lack of support instruments focused on risk absorption. Above all, de-risking policies should address the non-diversifiable investment risks associated with the green transition. These primarily concern the risks specific to investments outside the EU. As achieving self-sufficiency is unrealistic, Europe's resilience in the green transition will depend on increasing investment in third countries with high resource potential and/or strong market growth prospects. The EU should expand its toolkit for de-risking internal investments to include external engagement. To this end, the strategic approach of the EU's Global Gateway Initiative should be amended. Rather than defining a limited set of flagship projects, investment support should be decentralized and complemented by instruments compensating country risks.

4.3.5 Access to Lead Markets

Intense cost competition on global markets reduces the opportunity for European industry to offset the costs of investing in green and digital technologies. This issue is particularly acute for energy-intensive industries that face intense international competition. This, in turn, worsens the financing conditions for long-term investments in low-emission technologies.⁷⁷ Therefore, regulatorily binding minimum quotas for the use of low-emission products are important for creating specific lead markets for such technologies. Firstly, this improves access to the capital market for investments in green production technologies. Reducing sales uncertainty facilitates financing and helps to lower capital costs. Secondly, there is potential for a more rapid scaling of production capacities. This offers the prospect of faster cost reductions, particularly for emerging technologies with significant economies of scale.

4.4 Central Recommendations

- **Recommendation No.1: Implement local content rules for clean energy technologies based on a knowledge-focused and risk-based approach.** The manufacturing of many clean technologies is a fixed cost business that requires significant specialised knowledge, implying a strong role for scale economies. Therefore, in order to strengthen EU-based production in markets with initially small European market share, such as PV modules and batteries, some degree of protection will be required during the scale-up phase. Raising import tariffs for clean technologies could potentially undermine efforts to incentivize decarbonization. Instead, introducing local content criteria in public procurement and public support programmes would be a more targeted way of establishing a stable revenue base for emerging clean industries. The application of these criteria should be limited to final products and components with strong potential for experience-based cost reductions and cross-industry knowledge spillovers, thereby initiating self-sustaining growth. It is also essential to provide exceptions for producers from countries engaged in green partnerships with the EU.
- **Recommendation No.2: Create lead markets for recycled materials.** In order to strengthen autonomy in energy technologies, it is essential to exploit all existing domestic resource potential, including the significant raw material treasure embedded in electronic waste. To capitalise on this potential, the EU should consider intensifying its efforts to support the development of an EU-wide recycling economy for critical raw materials. In addition to providing investment support to recycling

⁷⁷ Wolf, A. (2024). The road towards a clean industrial deal. cepInput No.17/2024.

facilities, the introduction of binding minimum quotas for the use of recycled materials in production has the potential to stimulate demand. The recycling quotas for the manufacturing of industrial batteries defined in the EU Battery Regulation⁷⁸ should set a precedent for other technologies, with permanent magnets being the next suitable area of application. Furthermore, the EU should consider tightening its Waste Shipment Regulation⁷⁹ concerning the export of resource-rich waste to other countries. It is recommended that waste exports containing critical raw materials to non-OECD countries be prohibited in general, regardless of the designated treatment route.

- **Recommendation No.3: Engage in risk-sharing for outward FDI in clean energy projects.** Achieving self-sufficiency in clean energy technologies is not a viable option for Europe. In order to support the diversification of import routes, the EU should expand its toolset for de-risking private investments towards Foreign Direct Investments (FDI) in third countries. For instance, it would be worthwhile testing the creation of platforms to coordinate investments in so far unexplored markets in developing economies. The established model of public-private partnerships could be used as a basis for providing public equity capital as a risk buffer, with a view to attracting private investors. Furthermore, in order to encourage private investment, targeted mechanisms must be in place to protect investors against the most critical country- or region-specific political risk scenarios. The EU could collaborate with organisations such as the World Bank to increase the availability of publicly backed insurance against expropriation or the collapse of local institutions.⁸⁰
- **Recommendation No.4: Develop a strategic roadmap for energy and raw material partnerships.** A strategic roadmap for deepening economic cooperation should begin with a decision on which of the partner countries' capabilities should be prioritised for cooperation. The next step is to identify the most appropriate instruments for bringing a partnership to life. For example, regulatory cooperation with countries that excel in renewable energy exports should focus on developing a common market design for the cross-border trade and transport of green hydrogen or biomethane. For partners with strengths in manufacturing net-zero technology, the focus should be on creating a level playing field through industrial policy coordination. A similar approach is appropriate for infrastructure development. For countries with relatively high natural resource potential, programmes such as Global Gateway should initially focus on promoting tangible upstream infrastructure.

5 Conclusion

Looming geoeconomic uncertainty and strong fragmentation trends force Europe to recalibrate its trade-based model of economic growth. Reducing external resource dependencies and strengthening

⁷⁸ European Union (2023). Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC.

⁷⁹ European Union (2024). Regulation (EU) 2024/1157 of the European Parliament and of the Council of 11 April 2024 on shipments of waste, amending Regulations (EU) No 1257/2013 and (EU) 2020/1056 and repealing Regulation (EC) No 1013/2006.

⁸⁰ Wolf, A. (2025). De-risking green supply chains. cepInput No.15/2025.

technological leadership are essential to avoid marginalization in the current restructuring of global trade blocs. This has prompted the EU to align its trade and industrial policies within a new framework defined by the concept of 'Open Strategic Autonomy'. The practical implications of this are already apparent in a series of recent legislative initiatives, including the introduction of unprecedented policy tools such as anti-coercion measures and origin requirements.

This Policy Brief examines the foundations and status quo of this fundamental policy shift. It argues that recent EU policies are an attempt to balance partly conflicting policy goals and economic views concerning international trade, technological transformation and public industry promotion. It stresses that in the current phase of the green and digital transition, there are valid economic reasons for the EU to engage in a pro-active, transformative industrial policy. However, this may not tempt decision-makers to become blind for the social costs of market interventions. To ensure transparency and resource efficiency, the diverse set of policy instruments must be aligned with the overarching goal of establishing new, competitive and resilient supply chains for future technologies.

As new supply chains result from private investment decisions, policymakers must adopt an investor's perspective when identifying barriers to transformation. Firstly, this requires ensuring affordable access to critical resources such as clean energy, scarce minerals and specialized skills. Secondly, new, innovative support instruments are needed to help investors cope with the economic and regulatory risks inherent in the current transition phase. Thirdly, given the global nature of the challenge, the EU will need to collaborate with strong, like-minded partners. This requires a bold and flexible approach to new partnerships and forms of economic integration.