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Export Controls and the Green Agenda in the European Union

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Abstract

This article argues that critical and emerging technologies, evolving geopolitical dynamics and the urgent need to pursue the green agenda are changing the traditional approach of the European Union (EU) and its Member States towards their trade and security strategies, and this is particularly evident in the domain of export controls. In search of a balance between green energy, security and technological progress, this article explores the potential for a more cohesive and comprehensive regulatory framework for export controls at the EU level. It takes the debate beyond a technical level of export control lists to discuss geopolitical and strategic assumptions surrounding inter-State cooperation on the regulation of critical and emerging technologies and their components. The article underscores, in particular, the potential unintended repercussions of controls for the EU's technological future and the prospects of the green transition in Europe and beyond. Finally, it advocates for what is often overlooked in discussions: the necessity for the EU to set clear, long-term objectives for its export controls and to align them with the purposes and objectives of other EU economic instruments.

Keywords: European law; export controls; critical and emerging technologies; green transition; economic security; geopolitical dynamics; European Union dual-use regulation

1. Introduction

The global demand for the technologies needed to move beyond fossil fuels and build a more sustainable future, i.e. green technologies,[1] has increased since governments and consumers have begun to prioritise efforts to address the impacts of climate change. From floating wind turbines to hydrogen as an energy storage method,

[1] In this article, the term 'green technologies' refers to goods, software and technological advancements that are used or have the potential to be used in the production of items contributing to clean energy, energy efficiency and various environmental and sustainability initiatives: see J Watts and K Bagin, 'Critical Technology Assessment: Impact of US Export Controls on Green Technology Items' (United States Department of Commerce 2010) 3 <https://www.bis.doc.gov/index.php/documents/technology-evaluation/137-impact-of-u-s-export-controls-on-green-technology-items/file>.

there seems to be no shortage of innovations for sustainable development.[2] Cross-border trade in batteries, solar panels, semiconductors and other technologies and their components can further stimulate technological advancement and bolster production capabilities, thereby accelerating the green transition.[3]

Yet, innovations and technological developments are not insulated from the geopolitical and strategic assumptions guiding international relations. Governments face national security risks stemming from the capabilities of critical and emerging technologies with dual-use applications. The term 'dual-use items' refers to goods, knowledge, technologies and components that can have both military and civilian applications.[4] For example, artificial intelligence (AI) technologies are capable of supporting the creation of smart grids that flexibly respond to shifts in energy supply and demand, enabling the effective management and distribution of renewable energy sources.[5] At the same time, the use of AI-enabled autonomous weapons systems could revolutionise modern warfare.[6] Failure to regulate the trade in dual-use items adequately may result in the proliferation of weapons of mass destruction and the loss of domestic technological and military advantage as well as exacerbate vulnerabilities in critical infrastructures.[7]

The line between purely civilian and dual-use products has become blurred amid advances in the sophistication and application of technology.[8] Concerns about the elimination of barriers between the civilian and military sectors in China (civil–military fusion) and the potential misuse of critical and emerging technologies by rogue governments have led many States to treat such technologies with caution. For example, the United States of America (US) has begun to reevaluate its dependence on specific regions and suppliers and has extended the application of export controls to additional key technologies and their components.[9] Due to recent geopolitical shifts, the goals of US policies now go beyond traditional dual-use controls, seeking to reshape existing global supply chains to curb China's growth and hinder its technological and military progress.[10]

[2] N Zhao et al, 'Emerging Information and Communication Technologies for Smart Energy Systems and Renewable Transition' (2023) 9 AdvancesApplEnergy 100125, 1–2 <https://www.sciencedirect.com/science/article/pii/S2666792423000045>.

[3] L Bian et al, 'China's Role in Accelerating the Global Energy Transition through Green Supply Chains and Trade' (Grantham Research Institute on Climate Change and the Environment 2024) <https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2024/02/Chinas-role-in-accelerating-the-global-energy-transition-through-green-supply-chains-and-trade.pdf>.

[4] J Forge, 'A Note on the Definition of "Dual Use"' (2009) 16 Sci&EnginEthics 111, 117.

[5] M Noorman, B Espinosa Apráez and S Lavrijssen, 'AI and Energy Justice' (2023) 16(5) Energies 2110, 7 <https://www.mdpi.com/1996-1073/16/5/2110>.

[6] M Hirsh, 'How AI Will Revolutionize Warfare' (*Foreign Policy*, 16 April 2024) <https://foreignpolicy.com/2023/04/11/ai-arms-race-artificial-intelligence-chatgpt-military-technology/>.

[7] The use of digital tools creates more sophisticated channels for foreign cyber attacks, leading to potential disruptions, data breaches or sabotage and justifies the growing concerns about the cybersecurity of critical infrastructure: see RA Clarke and RK Knake, *The Fifth Domain: Defending Our Country, Our Companies, and Ourselves in the Age of Cyber Threats* (Penguin 2019).

[8] CH Wu, *Law and Politics on Export Restrictions: WTO and Beyond* (CUP 2021) 263.

[9] O Hrynkiv and S Lavrijssen, 'Not Trading with the Enemy: The Case of Computer Chips' (2024) 58 JWT 61, 65–68.

[10] ibid.

Green technologies increasingly rely on high-technology parts, materials and equipment that can be used for military purposes or have security implications and, consequently, are subject to export controls. Some high-technology parts used to produce green technologies already require an export license. These include materials and machinery necessary for wind turbine production, components for industrial gas turbines and thermal imaging cameras used for enhancing energy efficiency.[11] Forthcoming export controls and export restrictions on emerging technologies, like AI-powered solutions, can further affect the export of additional items and consequently slow down the advancement and adoption of sustainable practices worldwide. Furthermore, the intention of the US (and potentially other countries) to target the Chinese green energy sector directly must be considered, especially if robust policies are deemed necessary to counter China's increasing assertiveness, particularly in relation to Taiwan.[12]

For its part, China dominates the majority of global solar panel and electric vehicle battery production and a proportion of the international trade in wind turbines.[13] The 90 per cent decrease in the cost of solar energy generation observed in the last decade is primarily credited to China, with Chinese companies playing a dominant role in contributing between 75 per cent and 95 per cent of components across every value chain.[14] Moreover, Chinese companies are at the forefront of manufacturing clean hydrogen products, an energy source anticipated to expand significantly in the next decade.[15] The Chinese Government aims to keep other States dependent on China, using trade restrictions as a strategic tool to control dominant supply chains, including green products. China has already attempted to exercise its dominant position in some raw materials critical for economic development and the global energy transition as a way to retaliate against US trade restrictions. For example, China has enacted legislation mandating prior approval for the export of gallium, a crucial ingredient in semiconductor manufacturing, and graphite, a material vital for electric vehicle battery production.[16] If the tension between the US and China rises, China can be expected to explore other ways to exert leverage over the US and other Western democracies by further weaponising access to its supplies of other minerals and rare earth elements.

The strengthening of export controls in the US, retaliation by China and other tit-for-tat measures might lead to technological decoupling between the two States.

[11] Watts and Bagin (n 1) 2.

[12] O Gordon, 'Could a Chinese Invasion of Taiwan Derail the Net-Zero Transition?' (*Energy Monitor*, 5 October 2022) <https://www.energymonitor.ai/policy/net-zero-policy/could-a-chinese-invasion-of-taiwan-derail-the-net-zero-transition>.

[13] China holds a unique position in processing rare earth elements, with a market share exceeding 85 per cent, as well as in silicon and cobalt, all crucial for manufacturing high-energy-density batteries, wind turbines and solar panels: see O Canuto, 'A Tale of Two Technology Wars: Semiconductors and Clean Energy' (Policy Center for the New South 2023) 9 <https://www.policycenter.ma/sites/default/files/2023-11/PB_41-23_Otaviano%20Canuto.pdf>.

[14] ibid 8.

[15] ibid.

[16] L Brancaccio, 'What Technologies are Subject to Export Control in China: New Catalogue' (*China Briefing News*, 26 January 2024) <https://www.china-briefing.com/news/technologies-subject-to-export-control-in-china-prohibited-restricted-export-catalogue/>.

This could also mean that the European Union (EU) and its Member States would not be able to trade with both and would need to choose between US- or Chinese-dominated supply chains for green technologies and their components. Absent a clear understanding of common security threats and an adequate legal framework for EU-wide defence mechanisms, individual Member States with different visions of economic security and their technological future might not be capable of dealing effectively with the pressure from both the US and China. This scenario could result in higher prices and delays in delivery, and would have an impact on the advancement of emerging technologies and the security of their global supply chains in the long run. This may lead to uncertainty that would undermine innovation and investment in the EU and threaten to set back its progress on decreasing carbon emissions.

Against this background, this article argues that the development of critical and emerging technologies, evolving geopolitical realities and the urgent need to pursue the green agenda are changing the traditional approach of the EU and its Member States towards their trade and security strategies, particularly evident in the domain of export controls. In search of a balance between green energy, security and technological progress, this article explores the potential for a more cohesive and comprehensive regulatory framework for export controls at the EU level. The central challenge lies in designing an export control policy that accommodates the strategic and security interests of Member States and ensures EU economic security, while still fostering global collaboration in combatting climate change and advancing sustainable energy solutions.

The article proceeds as follows. First, it seeks to broaden the conceptual understanding of inter-State collaboration regarding export controls and their intended and unintended effects on the green transition (Section 2). Second, it reflects on how legal and political constraints within the EU shape the export control debate in Europe and the EU's cooperation with the rest of the world (Section 3). Third, it offers insights into how a more coherent and balanced EU-wide framework for export controls could bolster the EU's bargaining power without impeding competition and mutually beneficial cooperation with other States and foreign companies, which is crucial for advancing green technologies and facilitating the transition to environmentally sustainable practices (Section 4). It concludes by discussing legal and policy ramifications, particularly regarding the benefits of establishing the long-term goals of EU export controls and their role in addressing global issues like climate change (Section 5).

2. Export controls: continuity and change

Cross-border trade in certain green technologies and their components can pose traditional security risks, including unintended military use, cyberattacks and technology theft. Export controls on dual-use items consistently serve as crucial tools to address such risks in States' foreign and security policies.[17] Additionally, as a tool of economic Statecraft, these controls can be seen as bargaining instruments

[17] WJ Long, 'Global Security, Democratization, and Economic Development after the Cold War: New Goals for the US Export Control Policies' in G Bertsch, RT Cupitt and S Elliott-Gower (eds),

between States, adopted to incite change in the policies of other governments by exploiting their dependence on trade,[18] or as tools of coercive diplomacy used as an alternative to, or a substitute for, war.[19] Yet, beyond security considerations, cross-border trade in green technologies can also bring significant benefits by advancing the green transition worldwide. This article further argues that this potential could influence how nations craft their export control policies for green technologies and their components, as well as their readiness to cooperate in aligning these policies to improve their efficiency and ensure their credibility.

All States attempt to craft export control policies while navigating the tension between their national security interests and economic and societal benefits; however, the way in which they perform this balancing act varies significantly.[20] In practice, geography, economic incentives, political coalitions, domestic institutional processes, roles in alliances and ideology may each give rise to conflicts of interest.[21] No single policy prescription is possible since different combinations of national preferences require different forms of action to maximise net benefits.[22] The success of the cooperation between States depends on the alignment of the various national sets of policy preferences for the issue and the attendant matching of these policy preferences.[23] Since export controls directly affect a State's economic and technological resources, the extent and distribution of economic and technological capabilities are key factors in developing a common arrangement on export controls on existing and emerging technologies.[24]

The policy-making environment of a State is moulded by the intricate interplay of its domestic and international interests.[25] To the extent that domestic and international military, economic, political, institutional and technological forces vary across time and various export control issues, the consequent forms of cooperation will vary.[26] Deals at the international level and decisions at the domestic level inevitably affect each other: international deals reshape the character of domestic limitations, while changes in domestic politics pave the way for fresh possibilities in international cooperation.[27]

International Cooperation on Nonproliferation Export Controls: Prospects for the 1990s and Beyond (University of Michigan Press 1994) 59.

[18] RH Wagner, 'Economic Interdependence, Bargaining Power, and Political Influence' (1988) 42 IntlOrg 461, 463.

[19] See, e.g. N Ronzitti, 'Sanctions as Instruments of Coercive Diplomacy: An International Law Perspective' in N Ronzitti (ed), *Coercive Diplomacy, Sanctions and International Law* (Brill 2016).

[20] ibid 171.

[21] ibid.

[22] G Bertsch, RT Cupitt and S Elliott-Gower, 'Introduction' in Bertsch, Cupitt and Elliott-Gower (n 17) 6.

[23] ibid.

[24] ibid 11.

[25] ibid.

[26] ibid.

[27] PB Evans, 'Building an Integrative Approach to International and Domestic Politics: Reflections and Projections' in PB Evans, HK Jacobson and RD Putnam (eds), *Double-Edged Diplomacy: International Bargaining and Domestic Politics* (University of California Press 1995) 397.

History suggests that while unilateral implementation of export controls is feasible, in many cases, their effectiveness requires multilateral support.[28] For example, export controls may become less effective if the relevant goods or technologies are easily accessible from foreign suppliers. Even in situations where these items are not readily accessible from foreign sources, coordination may be necessary to prevent their unauthorised re-export.[29] Thus, imposing limitations on trade relationships with security adversaries, without the backing of geopolitical allies, may not be a feasible solution to address the vulnerability of technology supply chains, even for large and powerful economies.[30] Governments are likely to be more willing to compromise when they stand to gain economic or strategic advantages or obtain social benefits from cooperation on export control issues, such as improved energy access enabled by free trade in green technologies. Ultimately, the success of such cooperation will depend on the parties' bargaining power as well as their understanding of security risks and the advantages of mutual collaboration.

It is argued that when designing trade restrictions that target green technologies and their components, policy-makers need to consider both short-term security risks and the broader existential dangers posed by climate change should green technologies not be developed adequately worldwide. Climate change is gradually becoming not simply an environmental issue but a security threat.[31] It threatens national security through rising sea levels and extreme weather events, jeopardising States' military and defence capabilities, increasing migration and refugee flows, creating resource scarcities and contributing to unpredictable conflicts.[32] Climate change will also increase the pressure on food security,[33] which has been described as 'one of the quintessential functions of the state' and thus its essential security interest.[34]

In the past, a common narrative and mutual understanding of the threat were essential to establish effective multilateral cooperation on the export control of conventional arms and dual-use items.[35] It can be argued that a shared commitment to addressing climate change can also lead to more effective multilateral cooperation on trade in green technologies, encouraging information

[28] Bertsch, Cupitt and Elliott-Gower (n 22) 47.

[29] CA Casey, 'Export Controls—International Coordination: Issues for Congress' (Congressional Research Service, September 2023) 6 <https://sgp.fas.org/crs/row/R47684.pdf>.

[30] M Mastanduno, 'Hegemony and Fear: The National Security Determinants of Weaponized Interdependence' in DW Drezner, H Farrell and AL Newman (eds), *The Uses and Abuses of Weaponized Interdependence* (Brookings Institution Press 2021) 74.

[31] MP Nevitt, 'On Environmental Law, Climate Change, & National Security Law' (2020) 44 HarvEnvtlLRev 321, 323.

[32] T Fenton, 'National Security and the Threat of Climate Change' (*E-International Relations*, 14 May 2014) <https://www.e-ir.info/2014/05/14/national-security-and-the-threat-of-climate-change/>.

[33] JB Heath, 'Trade and Security among the Ruins' (2020) 30 DukeJComp&IntlL 223, 242.

[34] V Lapa, 'GATT Article XXI as a Way to Justify Food Prohibitions Adopted as a Response to COVID-19?' (2020) 15 GT&CJ 340, 343.

[35] K Donovan et al, 'The US, EU, and UK Need a Shared Approach to Economic Statecraft. Here's Where to Start' (*Atlantic Council*, 20 September 2023) <https://www.atlanticcouncil.org/in-depth-research-reports/report/us-eu-uk-need-shared-approach-to-economic-statecraft/>.

sharing, better coordination and a more targeted and transparent approach to restricting these technologies where necessary.

One prominent multilateral mechanism for coordinating export controls is the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (Wassenaar Arrangement).[36] Amending the Wassenaar Arrangement to extend to green technologies and their components would encounter significant challenges. These include the difficulty of reaching an agreement on subjecting new items to controls,[37] adapting to technological advancements and balancing the concerns and benefits that green technologies present. Unlike in the past, any talks today on the revised multilateral export control regime will need new thinking on emerging technologies, accounting for their stage of development, capabilities, contribution to States' green agendas and role in geoeconomic competition. They must also account for the close commercial ties between security competitors, such as the US and China, and the potential costs of decoupling between them. Due to these prevailing and emerging challenges, the prospect of establishing a multilateral framework for regulating the export of green technologies and their components appears improbable in the near term. Instead, it is more likely that coordinated bilateral or regional initiatives will take shape among like-minded States.

All this considered, this article argues that as the EU commits to continue its bilateral cooperation with both the US and China, it must take a more holistic approach to its export control policy that is not purely reactive to the policies or threats of these States but, rather, allows the shaping of the EU's technological future, defining its own export agenda and upholding its declared societal values, including the commitment to the green transition.

However, in a setting characterised by multitiered or multifaceted governance, the EU's ability to shape its export control policy faces constraints because of the divergent interests of its Member States, the limits of EU institutional power, the availability of financial resources at the EU level and the EU's commitment to free trade and sustainable development.[38] Because of its history and objectives, the EU has traditionally eschewed unilateralism.[39] Founded on security concerns,[40] the EU aims to provide peace and stability in Europe by linking economic cooperation, anti-terrorism, migration, cyberspace and the protection of human rights with EU

[36] Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, Guidelines & Procedures, including the Initial Elements, as amended and updated in 2001, 2003, 2004, 2007 and 2011 (adopted 19 December 1995) <https://archive.ph/zPhMr#selection-223.0-223.57>.

[37] See also EU Monitor, 'Explanatory Memorandum to COM(2024)22 – Advancing European Economic Security: An Introduction to Five New Initiatives' <https://www.eumonitor.eu/9353000/1/j4nvhdfdk3hydzq_j9vvik7m1c3gyxp/vma6oynogpw3>.

[38] Wu (n 8) 22.

[39] B O'Connor, 'European Union: Is the EU Becoming More Unilateralist?' (*NCTM Studio Legale*, 29 August 2018) <https://www.mondaq.com/export-controls-trade-investment-sanctions/731312/is-the-eu-becoming-more-unilateralist>.

[40] M Swisa, 'Future Stability in the European Union: Realism, Constructivism, and Institutionalism' (Claremont-UC Undergraduate Research Conference on the European Union, 2011) 129 <https://scholarship.claremont.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1057&context=urceu>.

security issues, in the pursuit of collective securitisation.[41] Multilateralism has been acknowledged as one of the critical features of European institutions and EU Member States since the beginning of the European integration process.[42] EU trade policy draws on rules developed by the Organisation for Economic Cooperation and Development (OECD) and multilateralised in the World Trade Organization (WTO).[43] It remains in the EU's interest to preserve compatibility between its model and the global trading system, and ensure that other States adhere to similar values and rules.[44] Thus, even when the EU reverts to unilateral measures, it portrays itself not as disengaging with multilateralism but, rather, as seeking to make progress that cannot be achieved through multilateral institutions.[45]

Further, the difficulty in striking a balance between the free transfer of technologies and security concerns in the EU has been compounded by the complexity of the EU system of allocation of power: on the one hand, following the Treaty of Lisbon, the EU has exclusive competence in the field of the Common Commercial Policy (CCP),[46] while, on the other hand, the Member States have sovereign power to take measures in their national security interests.[47] The Court of Justice of the European Union (CJEU) has held that export restrictions generally fall within the scope of the CCP and, thus, the EU's competence.[48] However, since Member States retain control over their national security under EU law, they are still allowed to impose national export controls in addition to the EU-wide controls.[49] This includes export controls to prevent the proliferation of weapons of mass destruction, a military end-use of certain items[50] and 'for reasons of public security, including the prevention of acts of terrorism, or for human rights considerations'.[51]

[41] J Sperling and M Webber, 'The European Union, Security Governance and Collective Securitisation' (2019) 42 WEurPol 228, 247.

[42] L van Langenhove, T Felicio and I Torta, 'The EU's Preferences for Multilateralism: A SWOT Analysis of EU/UN Relations' (2006) United Nations University Comparative Regional Integration Studies, Paper O-2006/21, 7.

[43] The Common Commercial Policy (CCP) of the EU is shaped by a set of norms that the EU and its Member States have developed as part of an OECD club model shaping binding WTO rules: see S Mendonca, 'The Role of the OECD in Shaping EU Trade Policy' (Directorate-General for External Policies, January 2016) <https://www.europarl.europa.eu/RegData/etudes/BRIE/2016/570455/EXPO_BRI(2016)570455_EN.pdf>.

[44] S Woolcock, 'The Role of the European Union in the International Trade and Investment Order' (2019) 26 JConstLEast&CenEur 1, 12.

[45] J Wouters and V Hegde, 'Reform of Global Trade Governance: The Role of the European Union' (2022) 44 JEuropIntegration 715, 724; see also O'Connor (n 39).

[46] Consolidated version of the Treaty on the Functioning of the European Union [2012] OJ C326/47, art 3.

[47] Consolidated version of the Treaty on European Union [2008] OJ C115/13, art 4(2).

[48] See, e.g. Case C-124/95 *ex parte Centro-Com v HM Treasury and Bank of England* EU:C:1997:8; see also P Eeckhout, 'Sanctions Policy' in P Eeckhout, *EU External Relations Law* (2nd edn, OUP 2011) 501–02.

[49] See, e.g. Case C-70/94 *Fritz Werner Industrie-Ausrustingen GmbH v Germany* EU:C:1995:328; Case C-83/94 *Criminal Proceedings Against Peter Leifer and Others* EU:C:1995:329.

[50] Council Regulation (EC) 2021/821 of the European Parliament and of the Council of 20 May 2021 setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items (recast) [2021] OJ L206/1, art 4(1) (Revised EU Dual-Use Regulation).

[51] ibid art 9(1).

It can be argued that, with an increasing number of nations recognising the vital significance of emerging technologies and geoeconomics in their national security agendas, keeping trade policy and national security separate might not be a practical solution, even for pro-trade institutions like the EU.[52] In response to this new geoeconomic reality, the EU must craft independent trade mechanisms to protect itself from the negative effects of the US and China's trade restrictions. Moreover, it must determine its course of action to cultivate influence and strategic advantage in the realm of critical and emerging technologies. Notably, while developing any new economic policies resulting in restrictions on trade with either the US, China or potentially other States, EU policymakers should consider the effects of these policies on the green transition in Europe and potentially beyond, underscoring the inherent interconnectedness between various EU policies and their objectives.

3. Revitalising the EU export control framework: a new approach?

Discussions on economic security within the EU began with concerns over the increased risks posed by emerging technologies, such as advanced semiconductors and AI, especially over the past five years. Due to security concerns, on a number of occasions Member States took action to protect their technology companies from national security threats. For example, the Dutch Government subjected the acquisition of the Delft-based chip company Nowi by chipmaker Nexperia, which is owned by a Chinese entity, to further examination.[53] The Ministry of Economic Affairs and Climate Policy was concerned, specifically, about the possible leakage of sensitive technology from the Netherlands to China.[54] For similar reasons, Germany prevented Elmos Semiconductor, an automotive chipmaker, from selling its factory to Silex, a Swedish subsidiary of China's Sai Microelectronics.[55] Four senior executives at the French semiconductor company Ommic SAS are presently under investigation for sharing confidential technology critical for developing a robust chip industry with companies in China and Russia while circumventing sanctions and export controls.[56]

Developments in the US have also served as a catalyst for the discourse on economic security in the EU.[57] Some European companies whose products fall under US export controls—because of a de minimis level of US-origin inputs in their products—opt to comply voluntarily with US legal requirements and

[52] E Benson, F Steinberg and P Alvarez-Aragones, 'The European Union's Economic Security Strategy Update' (*Center for Strategic and International Studies*, 26 January 2024) <https://www.csis.org/analysis/european-unions-economic-security-strategy-update>.

[53] S Olsthoorn, 'Ministerie Neemt Overname Chipbedrijf Nowi Onder de Loep' *FD* (Amsterdam, 23 January 2023) <https://fd.nl/tech-en-innovatie/1463624/ministerie-laat-overname-chipbedrijf-nowi-niet-zomaar-passeren>.

[54] ibid.

[55] M Toh, 'The US–China Chip War is Spilling Over to Europe' (*CNN*, 25 November 2022) <https://edition.cnn.com/2022/11/25/tech/us-china-chip-war-spillover-europe-intl-hnk/index.html>.

[56] M Ahmad, 'The Saga of Chip Technology Transfer Reaches France' *EDN* (Neu-Isenburg, 28 July 2023) <https://www.edn.com/the-saga-of-chip-technology-transfer-reaches-france/>.

[57] Benson, Steinberg and Alvarez-Aragones (n 52).

discontinue trading with prohibited companies to avoid US secondary sanctions.[58] Furthermore, the extraterritorial application of US export controls might further shape the decisions of certain EU Member States, inducing them to align their policies with the US rules and strategic interests, evidenced by the semiconductor negotiations between the US and the Netherlands.[59]

The adoption of the EU's Economic Security Strategy (ES Strategy) in June 2023 marked the notable initial step toward strengthening economic security in Europe.[60] The ES Strategy highlights four risk areas for EU economic security: first, the 'resilience of supply chains, including energy security'; second, 'risks to the physical and cyber-security of critical infrastructure'; third, 'risks related to technology security and technology leakage'; and, fourth, 'risks of weaponization of economic dependencies or economic coercion'.[61] According to the ES Strategy, the EU focuses on a three-pronged approach to deal with these risks: 'promoting the EU's competitiveness and growth'; 'protecting economic security and partnering'; and 'further strengthening cooperation with countries worldwide'.[62] In particular, focusing on the 'protect' limb of the ES Strategy, the European Commission (Commission) proposed enhanced EU coordination on export controls of dual-use items.[63] This initiative aims to position the EU as a unifying force among its Member States and as a leading player in promoting enhanced collaboration with its allies.[64] The proposed reforms have generated questions about the objectives of future export controls and the division of competences within the EU, the role of the EU in the geopolitical landscape and its ability to shape its own technological future while promoting a free-trade ideology and the green agenda, as discussed further below.

3.1. Reflecting on the past

Attempts to reform the EU export control policy are not new. After nearly six years of negotiations, in 2021, the EU upgraded its dual-use export control regulation (Revised EU Dual-Use Regulation), expanding the scope of export controls to include additional technologies and adding new objectives for its controls, such as human rights protection.[65] Pursuant to Article 9(4) Revised EU Dual-Use Regulation, the

[58] T Gehrke and J Ringhof, 'Caught in the Crossfire: Why EU States Should Discuss Strategic Export Controls' (*European Council on Foreign Relations*, 11 January 2023) <https://ecfr.eu/article/caught-in-the-crossfire-why-eu-states-should-discuss-strategic-export-controls/>.

[59] A Alper and D Shepardson, 'US Official Acknowledges Japan, Netherlands Deal to Curb Chipmaking Exports to China' *Reuters* (Washington, DC, 1 February 2023) <https://www.reuters.com/technology/us-official-acknowledges-japan-netherlands-deal-curb-chipmaking-exports-china-2023-02-01/>.

[60] European Commission (Commission), 'Joint communication to the European Parliament, the European Council and the Council on European economic security strategy' (Communication) JOIN (2023) 20 final (ES Strategy).

[61] ibid pt 2; see also I Morgott, 'Strategic Security in the Digital Age: The EU's Deep Dive into Critical Technologies' (*Inline*, 27 October 2023) <https://www.inlinepolicy.com/blog/eu_critical_technology>.

[62] ES Strategy ibid pt 3.

[63] ibid pt 3.2.

[64] ibid.

[65] Revised EU Dual-Use Regulation (n 50); see also O Hrynkiv, 'Export Controls and Securitization of Economic Policy: Comparative Analysis of the Practice of the United States, the European Union, China, and Russia' (2022) 56(4) JWT 633, 642–56.

Commission issues an 'EU compilation of national control lists' concerning the controls adopted by Member States.[66] The publication of such a compilation permits other Member States to apply these controls directly to their exports.[67] For example, in October 2023, the Commission published the first compilation containing national control lists officially adopted in 2023 by Spain, primarily regarding quantum computers, and by the Netherlands, primarily regarding the production of semiconductors.[68] Following the publication of the compilation, the other Member States can require that permission be granted before allowing these items to be exported from the EU, relying on the lists of controlled items created by Spain and the Netherlands. This mechanism is expected to accelerate the adoption and synchronisation of national export controls, empowering EU Member States to address substantial misuse of emerging technologies swiftly.[69]

However, despite the 2021 reforms and adoption of the Revised EU Dual-Use Regulation, the EU still faces numerous constraints on its ability to regulate exports,[70] which has resulted in, for instance, the EU relying on its sanctions regime rather than its export controls to enforce export restrictions on advanced technologies against Russia.[71]

First, export controls implemented by individual Member States generally affect exports outside the EU. Many technology supply chains span multiple EU Member States. Taking extreme ultraviolet lithography as an example, its supply chain is mainly Dutch but is also supported by a network of subcontractors across the continent, particularly in Germany.[72] Without any EU-wide coordination, a Dutch exporter, for example, might not be able to export lithography technologies from the Netherlands to China due to national security restrictions, yet they could still be sold to customers in another Member State without similar controls. Consequently, these items could be legally re-exported from that Member State to China, undermining the efficacy of Dutch national controls. This risk is particularly significant in the present context, where Member States might have varying approaches to the issues at play, such as emerging technologies, the importance of the green transition and dealing with China as a trading partner. This can result in varying degrees of motivation in relation to whether to regulate

[66] Revised EU Dual-Use Regulation ibid.

[67] ibid art 10(1).

[68] Compilation of national control lists under Article 9(4) of Regulation (EU) 2021/821 of the European Parliament and of the Council of 20 May 2021 setting up a Union regime for the control of exports, brokering, technical assistance, transit and transfer of dual-use items [2023] OJ C2023/441.

[69] M Duchâtel and F Godement, 'Europe's Economic Security and China: Where to Draw the Line' (*Institut Montaigne*, 4 September 2023) <https://www.institutmontaigne.org/en/expressions/europes-economic-security-and-china-where-draw-line>; see also Benson, Steinberg and Alvarez-Aragones (n 52).

[70] M Eitel, 'Export Controls – The Keys to Forging a Transatlantic Tech Shield' (*Center for European Policy Analysis*, 20 July 2023) <https://cepa.org/comprehensive-reports/export-controls-the-keys-to-forging-a-transatlantic-tech-shield/>.

[71] T Gehrke and J Ringhof, 'The Power of Control: How the EU Can Shape the New Era of Strategic Export Restrictions' (European Council on Foreign Relations Policy Brief, 17 May 2023) 14 <https://ecfr.eu/publication/the-power-of-control-how-the-eu-can-shape-the-new-era-of-strategic-export-restrictions/>.

[72] M Duchâtel, 'Europe in the New World of Export Controls' (*Institut Montaigne*, 15 February 2023) <https://www.institutmontaigne.org/en/expressions/europe-new-world-export-controls>.

exports. The increase in national controls observed in 2023 will most probably persist, underscoring the importance of concerted efforts to maintain their coherence within the EU.[73]

Second, the absence of a unified European approach leaves individual Member States and their companies vulnerable to retaliation from China. EU Member States have historically approached national security concerns individually rather than as a collective, which has enabled other States to exploit internal divisions. In the domain of energy security, for example, this enabled countries like Russia to use 'divide and conquer' tactics through gas exports to individual Member States, fostering instability and distrust between the Member States.[74] Similar concerns now arise regarding China's investments in critical infrastructure in Southern and Eastern Europe.[75] China also appears more empowered to restrict trade with separate Member States rather than the EU as a whole. For example, in 2021, when a Taiwanese Representative Office was established in Vilnius, China responded by severing all trade ties with Lithuania and issuing threats of sanctions against EU companies that utilised Lithuanian products, including German car manufacturers.[76] Given the extensive integration of the EU's single market, such secondary sanctions have great potential to affect intra-European trade and the EU's internal market.[77] Anticipating Chinese reactions to economic security policies like EU Member State export controls is challenging. Potential escalation in retaliatory actions from China might involve, for example, additional curbs on critical mineral exports essential for the energy transition or enhanced scrutiny of European companies operating in China.[78]

Finally, the absence of a unified European strategy leaves individual Member States and their companies vulnerable to external pressures to align their controls with those of the US, placing them in a disadvantaged negotiating position. For example, the imposition of additional controls on the export of semiconductor manufacturing equipment (SME) and tools to China has long been a significant subject of negotiation between the US and the Netherlands. To ensure the efficacy of new export controls due to the complicated global supply chain, the US needed to secure cooperation with other States that control crucial chokepoints for these technologies, such as the Netherlands.[79] Threatened by the Foreign Direct Product Rule, which extends US influence beyond its borders by regulating supply chains with a de minimis level of US inputs,[80] the Dutch Government arguably yielded to

[73] EU Monitor (n 37).

[74] See, e.g. KC Smith, 'Bringing Energy Security to East Central Europe' (Center for European Policy Analysis 2010) <https://csis-website-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/100402_Smith_BringingEnergySecurity_Web.pdf>.

[75] J de Kok, 'Foreignness in EU Investment Screening Law' in JH Pohl, T Papadopoulos and J Wiesenthal (eds), *National Security and Investment Controls* (Springer 2024).

[76] Gehrke and Ringhof (n 58) 15–16.

[77] ibid.

[78] Benson, Steinberg and Alvarez-Aragones (n 52).

[79] The Netherlands is at the forefront of the discussions, particularly because of the advanced manufacturing at companies like ASML: see also M Okano-Heijmans and A Ferreira Gomes, 'The European Union is Unwisely Defensive in its Economic Security' (*Clingendael Institute*, 26 June 2023) <https://www.clingendael.org/publication/european-union-unwisely-defensive-its-economic-security>.

[80] Export Administration Regulations (US) reg 734.4.

US pressure and implemented controls on the exports of the most advanced SMEs.[81] The ability of the US to condition European access to essential US technologies on increased alignment with US export control policies could effectively force the Netherlands and other Member States with important technological capacities into a position where they must prioritise cooperation with the US over their own strategic interests in the future, further eroding their autonomy and sovereignty in global trade and technology exchange.[82] Furthermore, more companies operating within the EU may find themselves compelled to adapt their strategies, including research and development activities, to conform with the stricter US regulations in order to avoid US secondary sanctions.[83]

3.2. Ongoing reforms

Unlike US initiatives to reduce the flow of advanced chips, chip design software and SMEs to and from China, or technological decoupling,[84] the EU has started addressing its security concerns over China's industrial policies by de-risking rather than decoupling.[85] In October 2023, the Commission unveiled plans to commence joint risk assessments with Member States across four technology sectors (advanced semiconductor technologies, quantum technologies, AI and biotechnologies), which could result in export controls.[86] According to the Commission, the technologies were chosen because of their 'transformative nature', their 'risk of civil and military fusion' and their risk of being used 'for human rights violations'.[87] In addition to these four technologies, the Commission listed six other technologies to raise with Member States, including green energy technologies and advanced materials as well as manufacturing and recycling technologies.[88]

In January 2024, the EU introduced incentives to advance the implementation of the ES Strategy, including more specific steps to enhance the EU's export controls on dual-use items in order 'to harmonize and coordinate related efforts within the EU'.[89] They indicate the Commission's aim to enhance coordination among competent

[81] A Hmaidi and R Arcesati, 'Why Europe Struggles with US Export Controls on China' *The Diplomat* (Washington, DC, 27 December 2022) <https://thediplomat.com/2022/12/why-europe-struggles-with-us-export-controls-on-china/>; see also A Alper, T Sterling and S Nellis, 'Trump Administration Pressed Dutch Hard to Cancel China Chip-Equipment Sale: Sources' *Reuters* (Washington, DC, 6 January 2020) <https://www.reuters.com/article/us-asml-holding-usa-china-insight-idUSKBN1Z50HN>.

[82] Gehrke and Ringhof (n 58).

[83] ibid.

[84] See also J Bateman, 'U.S.–China Technological "Decoupling": A Strategy and Policy Framework' (Carnegie Endowment for International Peace 2022) <https://carnegie-production-assets.s3.amazonaws.com/static/files/Bateman_US-China_Decoupling_final.pdf>.

[85] Benson, Steinberg and Alvarez-Aragones (n 52).

[86] Commission Recommendation (EU) of 3 October 2023 on critical technology areas for the EU's economic security for further risk assessment with Member States [2023] OJ L2023/2113.

[87] ibid.

[88] ibid annex.

[89] Commission, 'Communication from the Commission to the European Parliament and the Council on Advancing European Economic Security: an introduction to five new initiatives' (Communication) COM (2024) 22 final; see also Benson, Steinberg and Alvarez-Aragones (n 52).

national authorities, with the goal of bolstering the effectiveness of current EU controls and strengthening multilateral regulations.[90] The White Paper on Export Controls (White Paper) proposes both short-term and medium-term actions to address the EU's pressing concerns.[91]

In the short term, the Commission will present a proposal to establish consistent EU controls for 'items that were not adopted by the multilateral export control regimes due to the blockage by certain members'.[92] The Commission will also propose a platform for political coordination, facilitating discussions between the Commission and Member States to promote a unified EU stance on export controls.[93] As part of these endeavours, in January 2024, the Commission released updated guidelines on data collection and processing concerning export controls.[94] These guidelines aim to boost transparency by facilitating the reporting of domestic decisions on export licensing.[95] Looking ahead, in the medium term, the Commission plans to evaluate the Revised EU Dual-Use Regulation. It will identify and subsequently address any potential deficiencies in the effectiveness and efficiency of this regulation.[96]

The White Paper is notably similar to previous initiatives. There is still an emphasis on multilateral controls, although these efforts may not fully address the pressing concerns of all Member States, such as the extraterritorial reach of US policies and the influence of China in the global market. The EU's bottom-up risk assessment does not aim to safeguard specific technologies strategic for the EU or to identify the level of dependency on foreign suppliers deemed acceptable for the EU, in sharp contrast with the US's more straightforward geopolitical approach. Furthermore, in line with the Wassenaar Arrangement, the EU continues to maintain a country-agnostic (or country-neutral) approach to export controls and does not attempt to target China directly.[97] The EU has not presented a cohesive stance regarding limiting trade with China, nor has it officially embraced the objective of upholding military dominance over China as a security priority. Commission President Ursula von der Leyen expressly presented the EU's de-risking approach as distinct from the US's decoupling approach.[98] She

[90] D Marshall, 'The Big Reveal? Europe's New Economic Security Strategy' (*Institute of International and European Affairs*, 1 February 2024) <https://www.iiea.com/blog/the-big-reveal-europes-new-economic-security-strategy>.

[91] Commission, 'White paper on export controls' (Communication) COM (2024) 25 final (White Paper).

[92] ibid pt 5.1.

[93] ibid pts 5.2–5.3.

[94] Commission Recommendation (EU) 2024/214 of 10 January 2024 on guidelines setting out the methodology for data gathering and processing for the preparation of the annual report on the control of exports, brokering, technical assistance, transit and transfer of dual-use items pursuant to Regulation (EU) 2021/821 of the European Parliament and of the Council [2024] OJ L2024/214.

[95] S Nordin and O Berg, 'New Dual-Use Export Control and Outbound Investment Approach as Part of the EU's Economic Security Strategy' (*White & Case LLP*, 6 February 2024) <https://www.whitecase.com/insight-alert/new-dual-use-export-control-and-outbound-investment-approach-part-eus-economic>.

[96] White Paper (n 91) pt 5.4; see also EU Monitor (n 37).

[97] Gehrke and Ringhof (n 71) 13.

[98] 'EU Must Seek to De-risk rather than Decouple from China, von der Leyen Says' *Reuters* (Washington, DC, 17 January 2023) <https://www.reuters.com/world/eu-must-seek-de-risk-rather-than-decouple-china-von-der-leyen-2023-01-17/>.

emphasised that the EU must collaborate and trade with China regarding green technologies, advocating for fair competition instead of decoupling from the world's second-largest economy.[99]

3.3. Embracing the future

Harmonising export control coordination within the EU would require substantial regulatory adjustments. Extending controls for items beyond the multilateral export controls, such as the Wassenaar Arrangement, would require unanimous agreement among all EU Member States.[100] The revision process for the EU export control regime has historically been slow and meticulous.[101] Given that discussions within the EU regarding the economic security aspect of European security are in their early stages, it might seem premature to expect productive negotiations to overhaul the Revised EU Dual-Use Regulation anytime soon.[102] Unsurprisingly, the proposals to extend the EU-wide control lists by adopting a new regulation and/or granting licensing power to the Commission appear to be presently off the agenda. Instead, the EU is focused on improving cooperation and the exchange of information between Member States before the implementation of national controls and their enforcement. Thus, in the near future, cooperation between Member States will probably remain a matter of examining the pattern of national preferences with respect to each separate area of export controls and implementing specific national policies designed to achieve the most optimal outcomes, with the potential to expand such policies among like-minded Member States.

Even though such an approach leaves the decision on export controls to Member States, the existing EU framework provides oversight to ensure that the adoption of the national control regulations is necessary for the protection of public security or human rights considerations, and remains in line with the EU principle of proportionality. On multiple occasions, the CJEU has ruled that the ground of public security under EU law must be 'interpreted strictly' and should not be invoked unless there is a 'genuine and sufficiently serious threat to a fundamental interest of society'.[103] For example, the CJEU rejected the argument that an economic interest—such as the interest in ensuring the conditions of competition in a particular market or the prevention of 'a possible disruption of the capital market'—could justify the restriction of the free movement of capital, since this objective refers to the aim of advancing the competitiveness of national companies.[104] Furthermore, proportionality is recognised as a general principle of EU law that can apply to the review of the EU's and its Member States' actions in their relations with third States.[105]

[99] ibid.

[100] See also M Shagina, 'The Role of Export Controls in Managing Emerging Technology' in J Berghofer et al (eds), *The Implications of Emerging Technologies in the Euro-Atlantic Space: Views from the Younger Generation Leaders Network* (Springer 2023) 69–70.

[101] ibid 70.

[102] Gehrke and Ringhof (n 71) 19.

[103] Case C-171/08 *Commission v Portugal* EU:C:2010:412, para 45.

[104] ibid paras 70–71 referring to Case C-337/05 *Commission v Italy* EU:C:2008:203, paras 36–37; Case C-274/06 *Commission v Spain* EU:C:2008:86, para 44.

[105] W Sauter, 'Proportionality in EU Law: A Balancing Act?' (2013) 15 CYELS 441.

The EU's de-risking policy and its preference for multilateralism and country-agnostic trade restrictions are in line with its ideological commitment to the principle of free trade and, in principle, should comply with the rules of the WTO.[106] The problem with this approach is that if it proves to be too narrow to satisfy the pressing interests of Member States, it may incentivise them to bolster their national controls beyond reasons of 'public security' or 'human rights considerations',[107] even if it means violating EU law. Furthermore, lacking a robust and coherent policy on China and long-term objectives for export control policy, the EU's framework is less comprehensive and straightforward than that of the US. As a result, EU Member States might choose to rely on the diplomacy of other States, such as the US, instead of developing their own robust negotiating stance on economic security and emerging technologies.[108] This could prompt individual Member States to adopt overly restrictive export control measures, potentially hampering the advancement of green technologies and slowing progress towards the green transition.

It can be argued that keeping the distinction between the security and economic concerns of Member States does not necessarily imply that the Commission and national governments have their hands tied when it comes to the protection of their economic security or climate change goals; rather, it merely implies that different concerns and threats may require related but distinct policy actions that go beyond the objectives and scope of export control regulations.

By way of illustration, the EU economic strategy also encompasses the EU Critical Raw Materials Act, which is aimed at diversifying supply sources, and the Net Zero Industry Act, which aims to reshore manufacturing to Europe.[109] The EU can draw lessons from the past when de-risking policies liberated States from the unwanted influence of their partners. For example, following China's temporary ban on rare earth exports to Japan in 2010, Japan began developing alternative supply chains for green technologies, reducing its reliance on China for rare earths from 90 per cent to 59 per cent by 2020.[110] Similarly, the EU can hasten the process of reducing its dependence on China by partnering with the US and other Western allies as well as investing in mineral-rich States in Africa and South America.[111] Furthermore, the EU is exploring other tools to strengthen its resistance to economic pressure from other States. For example, in June 2023, the EU introduced an anti-coercion instrument. While intended as a last resort, the EU's response mechanisms to coercion by other States must consider EU interests and

[106] See also Hrynkiv and Lavrijssen (n 9).

[107] Revised EU Dual-Use Regulation (n 50) art 9(1).

[108] NM Hart and CA Casey, 'Transatlantic Leadership in an Era of Human Rights-Based Export Controls' (2024) 27 JIEL 130, 131.

[109] Commission, 'The Net-Zero Industry Act: Accelerating the Transition to Climate Neutrality' <https://single-market-economy.ec.europa.eu/industry/sustainability/net-zero-industry-act_en>.

[110] L Patey, 'The European Union Can Go Green and Lower Dependencies on China' (*Danish Institute for International Studies*, 2024) <https://www.diis.dk/en/research/the-european-union-can-go-green-and-lower-dependencies-on-china>.

[111] ibid.

potential impacts on other policies and administrative costs as well as ensure that measures are proportionate, targeted and temporary.[112]

The EU has yet to address how its export control measures and various other economic instruments, aimed at protecting its economic security by restricting the trade in green technologies and their components, align with its climate change objectives.

4. Balancing economic Statecraft, diplomacy and the green transition in the EU

The new geopolitical landscape, ongoing wars and internal political tensions within the EU collectively contribute to the uncertainty surrounding Europe's future, including its green transition. The potential of emerging technologies introduces further complexity to the discourse on the trajectory of EU economic Statecraft and its implications for sustainability policies. Addressing these uncertainties poses practical challenges and, like any new endeavour, progress will be accompanied by setbacks and learning experiences. However, akin to any significant paradigm shift,[113] this process also presents opportunities that can ultimately enhance the resilience and environmental sustainability of the EU. Some strides have already been made in this direction.

Despite divergences and frictions, the US and EU have successfully crafted and executed cohesive, multinational economic measures when they have shared a unified narrative and fully aligned foreign policy objectives.[114] This also includes cooperation in the regulation of technology and promoting climate change. For example, they have made progress on policy convergence through the Trade and Technology Council (TTC), a bilateral framework focused on transatlantic collaboration in trade and technology.[115] Within the TTC, the US and EU have established common principles and focal points for collaboration in export controls, including devising aligned control strategies concerning sensitive dual-use technologies.[116] Both parties have also committed to further exploring how to streamline trade in goods and technologies essential for promoting the green transition.[117] Another example is their cooperation in 2022 to impose unprecedented economic sanctions on Russia, aimed at depriving it of the financial and military resources necessary to sustain its war in Ukraine. Among

[112] 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 [2023] OJ L2023/2675, arts 2, 5, 11.

[113] See also M Daniels and J Krige, 'Paradigm Shifts in Export Control Policies by Reagan, Bush, and Clinton and the Evolving US–China Relations' in M Daniels and J Krige (eds), *Knowledge Regulation and National Security in Postwar America* (University of Chicago Press 2022) 231.

[114] Donovan et al (n 35).

[115] A Hedberg, 'Here's What to Expect on China, AI, Green Energy, and More When EU and US Officials Meet in Sweden' (*Atlantic Council*, 26 May 2023) <https://www.atlanticcouncil.org/blogs/new-atlanticist/heres-what-to-expect-on-china-ai-green-energy-and-more-when-eu-and-us-officials-meet-in-sweden/>.

[116] The White House, 'US–EU Trade and Technology Council Inaugural Joint Statement' (Press Release, 29 September 2021) <https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/29/u-s-eu-trade-and-technology-council-inaugural-joint-statement/>.

[117] ibid.

other measures, they implemented export restrictions to limit Russia's access to essential materials and components for military purposes, including semiconductors vital to many of its advanced weapons systems.[118] Beyond these examples, the EU and US have a track record of working together to combat financial crimes, human trafficking and transnational organised crime since their policies in these areas closely align.[119]

The situation is different when discussing restrictions on trade with China. There is no such alignment on China's security threat between the EU and US, or even within the EU itself. The positions towards cooperation with the US and China and the interests of many Southern, Eastern and Central European Member States that do not have a high-technology sector themselves substantially differ from those of advanced economies in North-Western Europe.[120] Member States that share a perception of significant security threats from unregulated exports of critical technologies and their components to China and that suffer the most from the extraterritorial effects of US measures can be expected to take a leadership position in persuading other Member States to embrace the new EU-wide arrangement. A recent example is the Netherlands' encouragement of increased coordination on export controls at the EU level following the controversy involving its advanced semiconductor industry.[121] Such proposals might encounter resistance from other Member States, but increased tension between China and Taiwan, or heightened Chinese pressure on EU Member States and their businesses, may lead to greater unity among Member States, also resulting in improved alignment between US and EU export control negotiations targeting China. Thus, geopolitical developments may incentivise EU Member States to embrace a new approach to economic Statecraft in the EU and to cooperation between the EU and other Western democracies.

In any case, before committing substantial effort to expand controls in collaboration with the US and potentially other States, the EU should assess whether it can gain sufficient support from its Member States to take such actions.[122] While the US has utilised its significant influence within the semiconductor supply chain to impose its rules of the game, the EU has great potential to influence strategic technology policies in other cutting-edge sectors where it remains unclear which States will take the lead and where potential 'chokepoints' may emerge.[123] The EU should ensure that forthcoming technology ecosystems do not create vulnerabilities that could be exploited against the EU.

What the EU requires, but currently lacks, is a long-term vision akin to that found in the US (although with certain reservations). The EU economic security doctrine should

[118] Donovan et al (n 35).

[119] ibid.

[120] B Dekker and M Okano-Heijmans, 'The US–China Trade-Tech Stand-Off' (Clingendael Institute 2019) 21 <https://www.clingendael.org/sites/default/files/2019-08/Report_US-China_stand-off.pdf>.

[121] J Valero, 'Netherlands Proposes Stronger EU Export Control Coordination after ASML Episode' *Bloomberg* (New York, 7 March 2024) <https://www.bloomberg.com/news/articles/2024-03-07/netherlands-proposes-stronger-eu-export-control-coordination-after-asml-episode>.

[122] Hart and Casey (n 108) 145.

[123] Gehrke and Ringhof (n 71) 24.

aim to align various de-risking policies and tools like export controls, anti-coercion measures and diversification efforts towards shared goals, fostering collaboration between the public and private sectors, between Member States' governments and between the EU and other States. Not all concerns arising from technology transfer and the exchange of sensitive information with China can or should be resolved solely through export controls. Neither should export controls be employed to serve the interests of other States rather than those of the EU and its private sector. The EU must proactively outline the goals of its export control policy, aligning them with those of its other economic instruments and establish the circumstances under which it may and should enact stricter measures, including those targeting China.

Achieving these targets will remain difficult, but comprehensive de-risking is the first step to bolster trade relationships with other partners while reducing dependencies and lowering the EU's vulnerability to China's retaliatory measures.[124] This, in turn, could enable the EU to remain resilient amid technological challenges and geopolitical strains, such as the possible Taiwan crisis, and contribute to shaping the global security landscape to suit its priorities, including clearing the path for the green transition.

5. Conclusion and recommendations

The EU faces two key challenges: improving its economic Statecraft, while advancing the green transition. Both are crucial for its existence. Ensuring the green transition is essential to safeguard the planet, while the ability to protect the EU's economic security and technological sovereignty is vital for maintaining the democratic, environmentally sustainable, market-oriented framework that underpins EU values and its relationships with non-Member States, including the US and China. Although restrictions on the trade of green technologies or their components may have less severe repercussions compared to embargoes on oil or gas,[125] emerging geopolitical dynamics could lead to widespread shortages of various technological inputs, significantly undermining efforts to combat climate change. In this respect, the Commission should take a leadership role in coordinating efforts among Member States, ensuring that they align with EU common objectives and values.

Critically, the EU must proactively shape its technological trajectory rather than merely reacting to measures implemented by other nations and either heavily relying on US diplomacy or succumbing to countermeasures from China. Enhanced coordination and unified action at the EU level could serve as a counterbalance to pressures from both the US and China, giving Member States a stronger negotiating position as a result of the collective scale of the single market. This approach could also ensure that any implemented controls are based on a comprehensive assessment of risks from technologies and consider EU-wide interests, which could potentially guarantee that the export of green technologies and their components from the EU remains largely unaffected.

[124] Patey (n 110).

[125] I Mazzocco, 'Balancing Act: Managing European Dependencies on China for Climate Technologies' (*Center for Strategic and International Studies*, 13 December 2023) <https://www.csis.org/analysis/balancing-act-managing-european-dependencies-china-climate-technologies>.

The EU has taken the first steps in this direction by adopting the ES Strategy and advancing different incentives, including those in the domain of export controls. However, these actions lack clear long-term objectives and goals that directly address the risks of trading with China and the extraterritorial pressure from the US. Nevertheless, it is noteworthy that the EU has recently acknowledged the necessity of safeguarding the economic security of its Member States and the Union as a whole, fortifying its economic strategies and formulating a strategic technology doctrine. The shift towards de-risking trade with allies is very new for the EU as an institution.

While the EU is still in the nascent stages of implementing a comprehensive economic security strategy, it is important to recognise the diverging interests and geopolitical concerns among Member States. Adopting a bottom-up approach to evaluating the risks posed by emerging technologies and adopting a neutral stance towards trade restrictions with various States should not necessarily be viewed negatively. Such an approach aligns with the EU's institutional constraints, as well as its ideological commitment to free trade. However, this does not imply that the EU cannot enhance its efforts. The EU must clearly formulate its own stance on EU-level export controls by defining the long-term objectives of its export control policy, enhancing its existing regulatory framework and bringing into the discussion its perspective on the unique nature of different exported technologies depending on their existing and potential applications. Furthermore, the EU should strive to foster synergies between various instruments, such as export controls, anti-coercion measures and diversification efforts, aligning them with common EU objectives, including the advancement of the green transition.

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