

2. Safe interdependence: Managing economic vulnerabilities

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KEY FINDINGS

- The supply chain disruptions caused by Covid-19 and the severity of their impact on Europeans' health and livelihood have heightened existing concerns about Europe's economic dependence on China.
- China has long set its economic policy on a trajectory of strategically managed interdependence that does not converge with OECD norms, requiring a careful rethink of these interdependencies in Europe.
- While China remains a long way from becoming self-sufficient, especially in high-tech industries, in many sectors it has managed to move up the value chain to produce increasingly sophisticated goods for export.
- Europe faces challenging decisions when it comes to securing critical supply chains and assessing the role of Chinese companies in Europe's ecosystem for emerging technologies.
- The EU's dependence on China for life-saving pharmaceutical ingredients and technology-powering batteries are weaknesses that could be exploited by China through coercive tactics.
- To handle growing risks of Chinese economic coercion, the EU should follow the lead of East Asian nations and better compartmentalize its relationship from an "economic security perspective."

1. CRISIS LESSONS: EUROPE NEEDS TO RECALIBRATE ECONOMIC INTERDEPENDENCIES WITH CHINA

When, in late January of 2020, China's economy began grinding to a standstill due to the rapid spread of the novel coronavirus, the ripple effects were quickly felt in the rest of the world. Before long, sustained factory closures in China meant European manufacturers faced shortages of crucial products and components from their Chinese suppliers. Europe's auto and electronics industries were among the hardest hit, but even more concerning were disruptions that carried severe public health implications: Europe experienced shortages in pharmaceutical ingredients and other critical medical supplies imported from China, ranging from personal protective equipment to ventilators, just as the pandemic spread across the region.

The supply chain disruptions caused by Covid-19 and the severity of their impact on Europeans' health and livelihood have heightened existing concerns about Europe's economic dependence on China. The pandemic is now widely cited as a real-life case study that has exposed Europe's trade vulnerabilities and the need to accelerate existing initiatives to increase the EU's strategic and economic autonomy. Meanwhile, fears that Beijing may exploit European trade dependencies to coerce companies or EU member states to toe the Communist Party line are also increasing, adding to these concerns.

The European Commission has long sought to reduce Europe's dependence on other countries for critical materials and technologies, as exemplified more recently by its *New Industrial Strategy for Europe*, launched in March.¹ But the pandemic has created a greater sense of urgency, causing many prominent voices to call for an immediate reassessment of the risks of economic dependence on China. EU politicians are now mulling European production requirements for strategic goods and drawing up proposals for the review of EU supply chain vulnerabilities and the diversification of import sources for critical supplies.² There are widespread calls to strengthen Europe's "resilience" by diversifying European supply chains that are predominantly rooted in China.

However, it would be rash to jump to the sweeping conclusion that Europe must reduce its interdependence with China in all areas of the bilateral economic relationship. As this chapter's analysis of three core issues shows, patterns of asymmetry and dependence vary in scope and risk level across different aspects of EU-China economic relations – from overall trade and investment relations and the EU's reliance on China for critical supplies and products, to Beijing's attempts to control the value chains of foundational emerging technologies. While acute vulnerabilities in some areas of the economic relationship undeniably pose risks to Europe's strategic autonomy and thus necessitate a rebalancing of ties with China, Europe's relative strength in other areas should embolden it to resist Chinese efforts at economic coercion.

Patterns of asymmetry and dependence vary across EU-China economic relations

China has long set its economic policy on a trajectory of strategically managed interdependence that does not converge with OECD norms. Given the long-term competitive risks this path poses to Europe, as well as the immediate vulnerabilities and potential for exploitation of dependencies for political gains, a careful rethink of these interdependencies is needed to strengthen European resilience. The challenge for Europe will be to settle on a unified and coordinated approach to evaluating and managing EU-China economic interdependencies at both the EU and member-state level.

2. CHINA'S TRAJECTORY: MANAGING INTERDEPENDENCE TO MINIMIZE VULNERABILITIES AND CREATE LEVERAGE

China's global importance as a manufacturer and exporter is the result of decades of carefully managed integration into global value chains. Since its accession to the World Trade Organization in 2001, China has rapidly cemented its position as a key producer and exporter of many manufactured goods, especially intermediate goods. Initially dubbed the world's factory due to its abundant supply of low-wage workers, cheap land and relatively lax environmental regulations, China has since moved up the value chain by manufacturing and exporting intermediate goods with increasing value added.³

China's rise to its position as a global manufacturing hub was driven by targeted state measures that incentivize foreign companies to move their manufacturing (and related know-how) into China while supporting China's domestic industrial upgrading efforts. China's industrial policy approach has shifted from prioritizing catching up with foreign manufacturing and technology capabilities to much more ambitious goals. Localizing global supply chains within China, upgrading Chinese industrial capabilities and dominating in emerging technologies from the start are key elements of Beijing's goal to transform the nation into a globally competitive manufacturing and technology superpower by 2049.

For at least the past 15 years, China's leaders have focused on indigenous innovation, core technologies and strategic mega projects to manage China's future interdependence with other countries in technologies. With a web of industrial strategies that have targeted strategic emerging industries and, since 2016, "innovation-driven development," Beijing has sought to capitalize on a new technological revolution to improve the country's relative strength and competitiveness. Its most well-known centerpiece, the *Made in China 2025* initiative, explicitly pushes for substituting foreign manufacturing components and core technologies in strategic sectors with "indigenously" made alternatives.⁴

US restrictions demonstrated to Beijing the urgent need to end its dependence on foreign tech

As Beijing actively strengthened the integration of Chinese industry in global value chains, the government also sought to manage and address the risks of interdependencies that result from deeper economic ties.⁵ It made concerted efforts to vertically integrate Chinese supply chains by reducing the country's own dependence on foreign manufacturing inputs and technology.⁶ The continuing escalation of US-China tech tensions have further fueled Beijing's national security concerns. Chinese companies getting cut off from crucial US-made technology demonstrated to Beijing the urgent need to end its dependence on foreign tech.

While China remains a long way from becoming completely self-sufficient, especially in high-tech industries, in many sectors it has managed to move up the value chain to produce increasingly sophisticated goods for export – and will continue to do so. China's resulting dominance in the production of new technologies such as lithium-ion batteries, and critical supplies such as rare earths, are increasingly causing concern in Europe.

That is because China's strengths in these areas are based on an industrial policy approach that builds on strategically managed interdependence. It fundamentally diverges from market-oriented principles and practices in the OECD. That includes the principle of 'competitive neutrality,' according to which private and state-owned firms should be able to compete on a level playing field.⁷ A major economic policy document, issued by the CCP Central Committee and the State Council in May this year, is an important and timely reminder that China's economic policy-making will continue to pay lip service to the importance of market forces while in reality championing the state-owned sector and strategically aligning the private sector through state intervention.⁸

Even more concerning, China is increasingly leveraging its importance as a supplier of sought-after goods for economic coercion. There are mounting examples of Beijing threatening European governments and individual companies that are dependent on its products with punishment or outright retaliation for acting against its interests.⁹

With China's coercive tactics increasing and unforeseen crises such as the Covid-19 outbreak laying bare the serious risks of economic dependence, Europe will need to systematically reassess certain areas of its economic dependence on China. The deterioration of US-China relations and sweeping efforts to decouple from one another add another layer of urgency: Europe must establish its own position on the risks associated with China's strategically managed interdependence.

3. KEY ISSUES: HIGH-STAKES INTERDEPENDENCE IN TRADE, CRITICAL SUPPLIES AND HIGH-TECH VALUE CHAINS DEFINE EU-CHINA RELATIONS

European decision-makers still hope to conclude an ambitious investment agreement with China. It is therefore imperative that they weigh the benefits of deeper economic integration and the offshoring of manufacturing against the associated risks. Doubling down on an increasingly asymmetric partnership with a state-led and distorted market economy could have serious negative repercussions for Europe's long-term competitiveness and economic security. At a minimum, these efforts need to be accompanied by measures to minimize the risks. In addition to negotiating a Comprehensive Agreement on Investment with the necessary guardrails, Europe faces challenging decisions when it comes to securing critical supply chains and assessing the role of Chinese companies in Europe's ecosystem for emerging technologies.

ISSUE 1 - TRADE AND INVESTMENT: MUTUAL DEPENDENCE AND ASYMMETRIES

The coronavirus crisis has given rise to a new narrative that Europe is overly dependent on trade with China. However, this narrative does not match with official trade data. These show that, on the whole, the EU single market – not China – is by far the most important trading partner for all EU member states.¹⁰ In 2018, the EU single market, on average, accounted for nearly two thirds of total exports of EU member states, whereas China accounted only for an average of 2.4 percent. Of course, trade with China varies across member states. But even Germany, which is generally seen as most vulnerable to Beijing's economic pressures, exported only 7.1 percent of its total exports to China that year, compared to 59 percent to the EU single market.

Furthermore, this narrative fails to take into account the importance Europe plays for China economically. Europe is not only a key export market for China, it also supplies China with goods that are still indispensable given the country's industrial upgrading ambitions. From advanced semiconductor manufacturing equipment to specialized machinery and tools, China needs European technology and know-how as it pursues its goals. Amid escalating US-China tensions and the continual tightening of US export controls, China may come to rely even more on its European suppliers and partners, as Chinese tech companies urgently search for alternative sources for key components and machinery.

Europe supplies China with goods indispensable for its industrial upgrading ambitions

The narrative of economic overdependency, then, may stem from the exposure of individual, large corporates. Germany's private sector is among the most invested in China, with an automotive industry that relies heavily on sales to Chinese consumers, but various major companies headquartered in other European countries – from Dutch semiconductor equipment company ASM International to British metals and mining corporations BHP and Rio Tinto – also rely on China for significant shares of their global revenue.¹¹ Such corporate dependencies open the door to Chinese retaliatory action against European governments, yet it is worth noting that Beijing has rarely followed through on threats to cut off European companies from the Chinese market.¹²

ISSUE 2 - CRITICAL SUPPLIES AND PRODUCTS: PHARMACEUTICALS, PPE AND RARE EARTHS

The coronavirus crisis has also exposed the vulnerabilities of some critical European supply chains that rely considerably on goods or components imported from China. In these specific supply chains, Europe is overly dependent on China, which has implications that go beyond commercial considerations to become a matter of national health or security.

In the medical space, Europe is highly dependent on foreign-sourced active pharmaceutical ingredients (API). Around 90 percent of APIs needed for the European production of generic medicines are sourced from China and India, with India itself 70 percent reliant on Chinese APIs.¹³ China also provides between 80 and 90 percent of the global supply of APIs for antibiotics. When it comes to medical equipment, the EU imported half of its personal protective equipment (PPE) from China in 2018, with an even higher reliance of 71 percent in mouth-nose protection equipment.¹⁴

One step further upstream, Europe also depends on China for metals such as cobalt, platinum and rare earths, many of which are critical materials needed for the production of high-tech products, medical devices and military equipment. The EU remains entirely dependent on imports for its rare earth supplies, most of which come from China.¹⁵

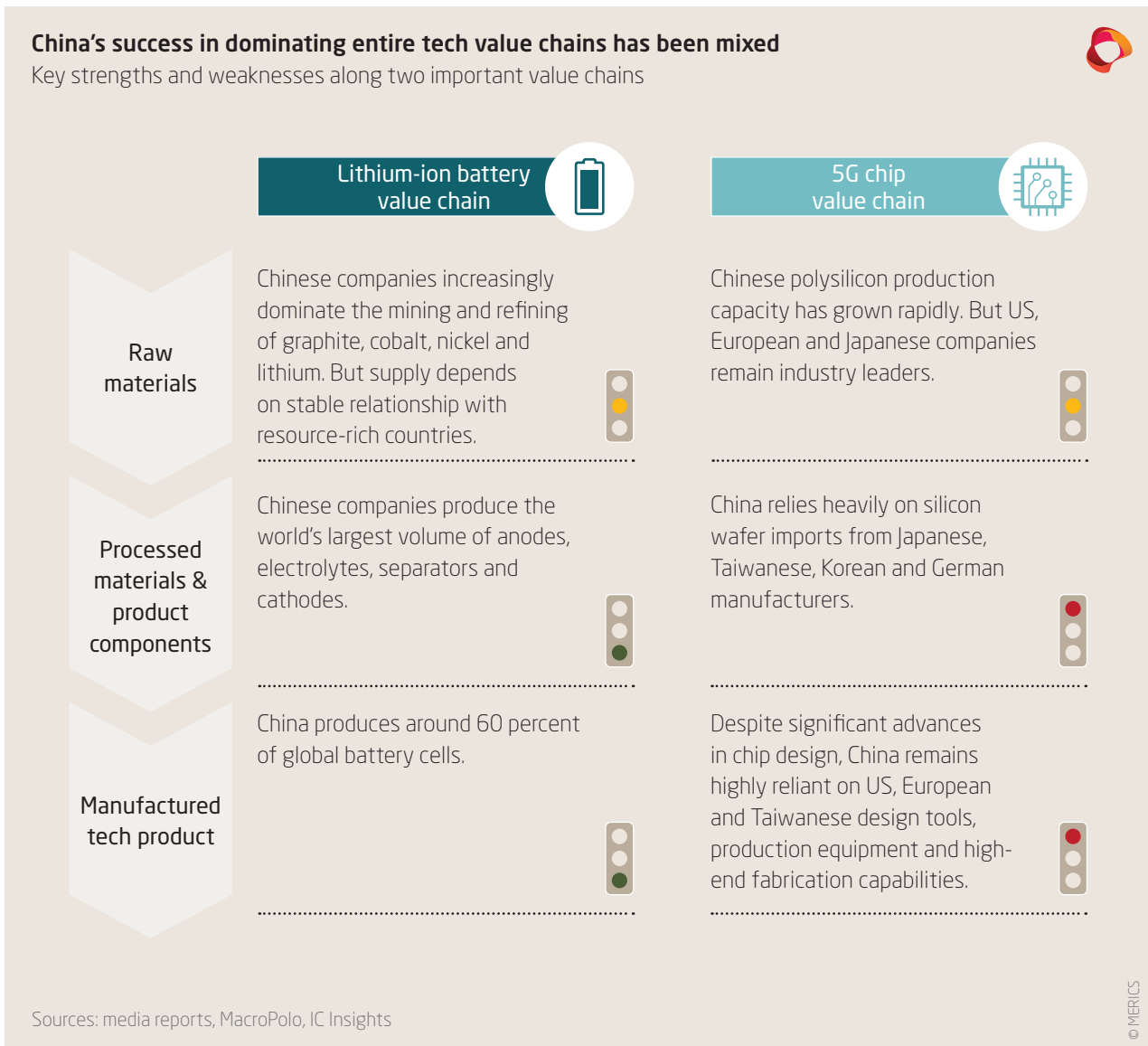
Already aware of these dependencies in critical areas, the EU had started funding several initiatives to tackle such dependencies long before the coronavirus crisis.¹⁶ However, diversifying import sources and repatriating the production of such goods is easier said than done for materials whose production requires large factory sites and causes severe environmental damage. China remains the most competitive environment to produce such materials and, for now, Europe remains vulnerable to any disruptions to these supply chains.

ISSUE 3 - EMERGING TECHNOLOGY VALUE CHAINS: ESTABLISHING CONTROL

China has been particularly keen in its efforts to dominate the global value chains for future technologies, from semiconductors to new energy vehicles and 5G. However, these very technologies have some of the most complex value chains. Fully dominating them would mean controlling the various points at which value is added, from the mining of raw materials, to the assembly or production of various components and the manufacturing of the finished product.

In some areas, China takes charge of the value chain from start to end

In some areas, China boasts considerable success in taking charge of the value chain from start to end. A good example is the value chain for the production of lithium-ion batteries, which power electric vehicles, consumer electronics and new energy storage solutions. Chinese companies dominate the mining and refining of most of the essential raw materials needed for battery production, including graphite and cobalt.¹⁷ Meanwhile, China produces the world's largest volume of midstream battery components, and its leading battery companies, such as CATL and BYD, produce 61 percent of the world's finished battery cells.¹⁸ Europe, which has a global battery cell manufacturing share of only around 3 percent, is highly dependent on importing battery cells as well as the components and raw materials needed for production.¹⁹ Despite EU efforts to scale up Europe's battery manufacturing capacity, many of Europe's upcoming local battery manufacturing facilities are still being built by Chinese companies.²⁰ To ensure consistent battery supply, European car giants are actively deepening their partnerships with Chinese battery makers.²¹



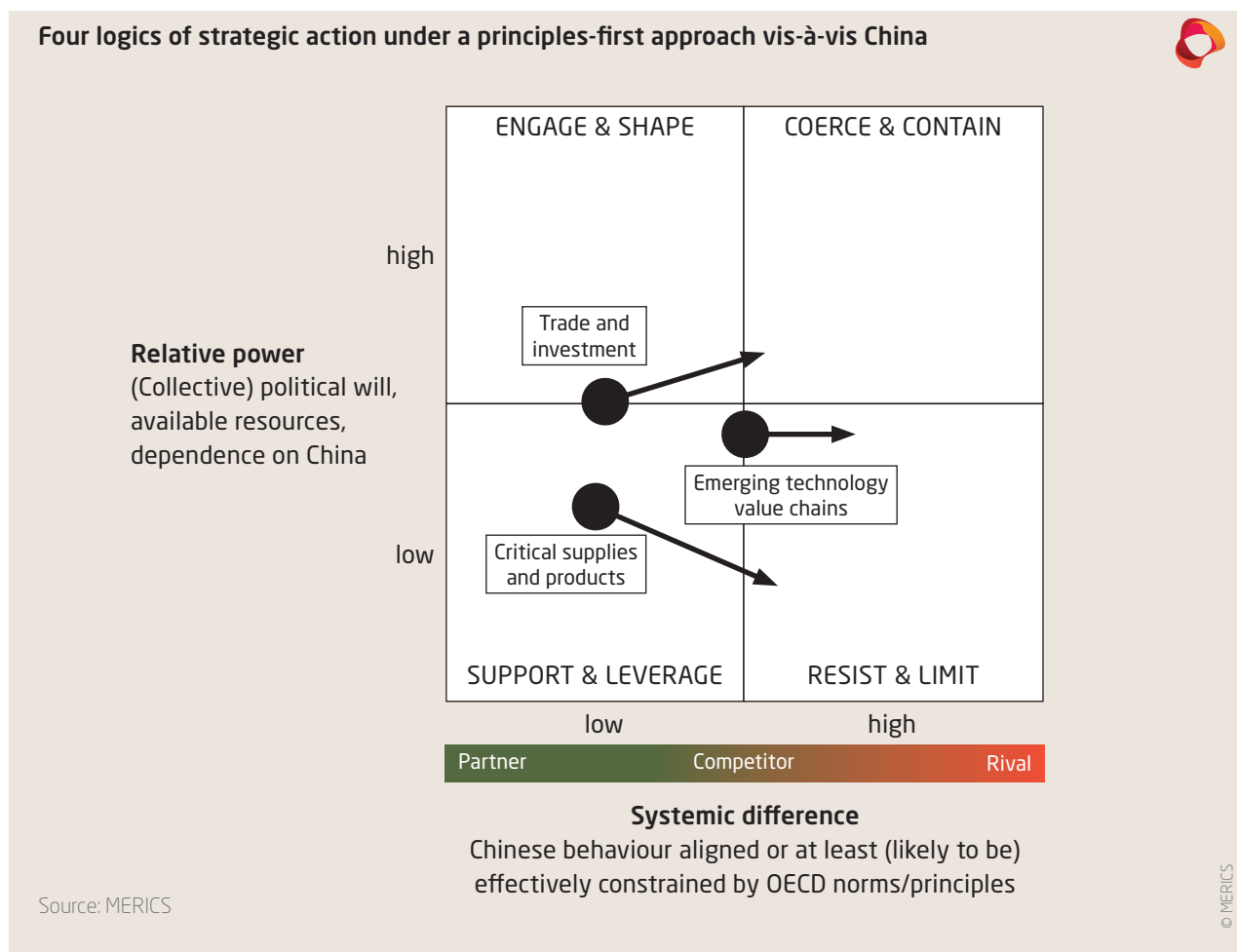
In public debates, China's dominant global role in foundational emerging technology and the resulting dependence of other countries on China, is often exemplified by Huawei's dominance in 5G network technology. According to Huawei, its equipment is being used in two-thirds of the commercially launched 5G networks outside of China and it has secured 47 commercial 5G contracts in Europe.²² Yet at the same time, 5G illustrates the significant weaknesses that remain in China's drive to control tech value chains. Crucial elements needed to build 5G base stations include Field Programmable Gate Arrays, for which Huawei relies on US suppliers Xilinx and Intel. It is also dependent on Taiwan Semiconductor Manufacturing Company, which fabricates the 5G chips designed by Huawei's chip subsidiary using US and Dutch semiconductor manufacturing designs and equipment. Following the tightening of US export controls, Huawei may struggle to procure or produce the chips it needs to build 5G base stations – exposing a major weakness in its technology supply chain.²³

4. EU-CHINA RELATIONS: EUROPE IS LESS BEHOLDEN TO CHINA THAN MOST THINK

The EU is China’s biggest trading partner – it is China’s most important export market, and the source of major direct investment and technological know-how. As such, the EU-China bilateral relationship in trade and investment has long been characterized by mutual economic dependence, rather than one-sided European dependence on China. European and Chinese companies trade, compete and cooperate around the world, while benefiting from investments in each other’s markets.

Certain aspects of the EU-China economic relationship, and certain sectors, reveal imbalances that point to European weaknesses vis-à-vis China. Supply shortages in the wake of the Covid-19 pandemic point toward an overdependence on Chinese inputs and imports in certain critical product value chains that make the EU vulnerable in times of crisis. Dependence on China for life-saving pharmaceutical ingredients and technology-powering batteries are weaknesses that could be exploited by China through coercive tactics.

Exhibit 4



However, more broadly speaking, Europe may be less beholden to China in its trade and investment relationship than recent narratives claim. Its biggest source of economic growth still comes from trade within the EU single market, while China itself is highly dependent on European imports of crucial high-tech machinery and chemicals – key European strengths. When it comes to China’s grasp of technology value chains, specifically, China has made considerable inroads. However, it still retains its own weaknesses and dependencies, often to do with the underlying basic research or manufacturing equipment. The EU therefore should not be overly fearful of economic interdependence with China and should have greater awareness of the strengths that give it leverage over China.

5. POLICY PRIORITIES: EUROPE NEEDS TO ASSESS VULNERABILITIES AND TAKE ACTION

The coronavirus crisis has brought to public attention the important risks of Europe’s economic dependence on China. While the pandemic should indeed be seen as a wake-up call, it should not lead to sweeping conclusions that economic interdependence with China is one-sided or harmful in and of itself. While the pandemic has demonstrated the risks of relying on global supply chains with heavy input from China, it has also showed the advantages: when it was Europe’s turn to shut down factories as the virus spread beyond China’s borders, China was able to get back to work and resume production, ensuring a continued supply of goods.

What is needed is a thorough assessment of the risks as well as the benefits of economic interdependencies with China. Europe should adopt a more systematic approach and recalibrate interdependence in a way that addresses European vulnerabilities while building on its strengths. This includes the need for concrete and unanimously accepted definitions of which traded goods and technologies are considered “critical.” It also requires the creation of EU-level mechanisms to support policy responses from an economic security perspective. There can be no blanket approach to building “resilient” or “robust” global supply chains, given their complexities. Different types of interdependencies – across different sectors, among specific value chains and individual corporations – require different policy solutions.

When it comes to the overall trade and investment relationship, the EU will have to change course to rebalance trade and investment relations with Beijing towards greater fairness and reciprocity, as negotiated first best options are likely to fail. While the EU should not overestimate China’s lackluster dedication to market reform or Europe’s own relative power, given certain member states’ or sectors’ relatively larger dependence on China, it should not underestimate the power of collective political action.

Based on a comprehensive audit of national and corporate-level dependencies on China, the EU should pinpoint its strengths and weaknesses and identify areas for coalition-building. Should a unified EU stance fail to advance European interests, it should look to its allies beyond Europe to exert pressure in areas where competitive risks from China’s managed interdependence are unbearable. To handle growing risks of Chinese economic coercion, the EU should follow the lead of East Asian nations and better compartmentalize its relationship from an “economic security perspective.” This would allow it to resist political pressure from Beijing while maintaining a stable trading relationship.

To handle growing risks of Chinese economic coercion, the EU should follow the lead of East Asian nations

Based on EU-level and national-level reviews of strategic industries and specific goods that are critical to national security, the EU should limit its exposure to China through a strategy that prioritizes diversification – and in some cases relocation – of critical supply chains. This will require serious resource commitments to enable the building of manufacturing capacity outside of China. In doing so, the EU should not aim for complete self-sufficiency through reshoring production – this is an unrealistic goal given the complexity of supply chains and China’s considerable manufacturing strengths.

Emphasis should instead be placed on rebalancing away from reliance on a single supplier. In addition to existing plans to stockpile emergency equipment and shore up investment in Europe’s domestic pharmaceutical and rare earth capabilities, the EU should review its other existing trading relationships with allies to identify opportunities for closer cooperation with the aim of reducing dependencies on China in critical, strategic goods. There is also a need for nuanced terminology and strategies so that efforts to strengthen Europe’s supply chain resilience do not slide into trade protectionism.²⁴

To tackle dependencies on China for foundational emerging technologies, new institutional mechanisms fulfilling the functions of an “economic security council” would enable member states and the EU to devise policy responses specifically for issues that lie at the nexus of technology, trade and security. Such mechanisms should be an essential part of the EU’s efforts to constrain the reach of China’s distortive economic and industrial policies; only in this way can the EU ensure that its policies are based on nuanced assessments of both Chinese and European strengths and weaknesses in technology value chains, and that member states are unified in their interpretation of political and economic risk.

The EU should strengthen support for its European ecosystems for technologies such as 5G

To be digitally sovereign, the EU should strengthen support for its European ecosystems for technologies such as 5G, semiconductors, and cloud technologies. At the same time, the EU must upgrade its safeguards to mitigate the potential risks stemming from the inevitable involvement of Chinese companies in European development of future technologies.

Finally, any European strategies to recalibrate global supply chains must be developed in close consultation with European firms, given the difficulties of adjusting complex value chains. Thus far, political rhetoric on the need for supply chain relocations has not yet translated into major corporate action. European companies are expressing concerns over the financial and logistical challenges of adjusting operations – all of which could take years. Continually growing market demand in China also means that many European companies will continue to pursue an “in China for China” manufacturing strategy. The EU must take into account industry representatives’ perspectives in order to conduct realistic scenario-planning and ensure the effectiveness of policy support measures.

3. Competing with China in the digital age

Rebecca Arcesati

KEY FINDINGS

- China sees the Covid-19 pandemic as an opportunity to rebuild its economy by putting digitalization first, in line with existing goals and plans.
- The crisis has not altered China's state-driven industrial and technology policymaking. The pandemic and decoupling from the US have added urgency to Beijing's indigenous innovation drive.
- For Europe, economic competition with China is increasingly playing out in the digital domain and new technologies. policymakers will be forced to integrate previously marginal policy issues into their China strategies.
- When it comes to collaboration with China in research and innovation, a risk-based approach is needed to prevent unwanted tech transfers.
- China's need for European technology and know-how, for instance in intelligent manufacturing and the industrial internet, could be leveraged to advance EU interests by making access and partnerships conditional.
- The EU will need to join forces with partners around the world if it wants to attain digital and technological sovereignty.

1. CRISIS LESSONS: COVID-19 HAS GIVEN CHINA'S DIGITAL TRANSFORMATION TOP-LEVEL ATTENTION

Chinese leaders' response to Covid-19 has underscored their longstanding ambition to turn China into a high-tech superpower, with digital technologies spurring innovation and transforming the economy.¹ As the crisis unfolded, the government worked closely with technology companies to tackle the emergency.² However, the pandemic also accelerated a broader trend: Much like the EU, China has identified the coronavirus as an opportunity to rebuild its economy by putting digitalization first.³

There is work to be done – while the lockdown boosted China's consumer-facing digital economy, digitalization in traditional industries like manufacturing is still lagging.⁴ Xi Jinping's leadership wants this to change, and therefore gave digital transformation top-level attention during the outbreak.⁵ As the country was hit by the virus, 5G network construction was ramped up. The technology, which is set to power the industrial Internet of Things (IIoT) along with intelligent vehicles, smart health systems and other disruptive applications, is a strategic priority of the Chinese Communist Party (CCP). The Ministry of Industry and Information Technology (MIIT) instructed telecom carriers and local governments to "forcefully advance 5G network construction".⁶ By the end of this year, Beijing wants to have over 600,000 base stations.⁷

For Europe, economic competition with China is increasingly playing out in the digital domain and new technologies. The EU has begun to address China's state-driven technology ambitions in the context of two major policy challenges – strategic acquisitions of European technologies and the presence of high-risk vendors Huawei and ZTE in the continent's

digital infrastructure. This year has seen the implementation of the defensive strategy Brussels crafted in response, with EU investment screening rules and cybersecurity measures for 5G now in the adoption phase.⁸ However, this is merely the beginning of work on a necessarily more strategic EU response to China's technology and digital policies – and member states are far from united on the matter.

Post-pandemic China will remain the formidable “economic competitor in the pursuit of technological leadership” the previous European Commission (EC) described in its March 2019 Strategic Outlook.⁹ Despite government calls for marketization and encouraging openings to foreign investors, Beijing will not abandon state capitalism and techno-nationalist policies any time soon.¹⁰ With economic recovery plans forcing both Europe and China to look inward, and negotiations for a bilateral investment agreement moving slowly, it looks increasingly unlikely that there will be progress on rebalancing economic relations within the year.¹¹

Against this backdrop, policymakers will be forced to recalibrate their strategies in ways that reflect China's policy direction and will have to integrate previously marginal policy issues. This chapter focuses on three specific dimensions:

- (1) If member states want to prevent unwanted tech transfers to China, they need to look beyond Chinese Foreign Direct Investment (FDI) and come to terms with the way Beijing utilizes foreign research collaboration as an industrial policy tool.
- (2) A realistic assessment of China's standardization strategy for ICT and emerging technologies would help European actors better understand where their competitor is headed.
- (3) Distortions in the digital economy caused by state interference should feature more prominently in ongoing debates on reciprocity and fair competition.

2. CHINA'S TRAJECTORY: COVID-19 AND DECOUPLING FROM THE US ADD URGENCY TO INDIGENOUS INNOVATION DRIVE

The coronavirus crisis has not altered China's state-driven industrial and technology policymaking

The coronavirus crisis has not altered China's state-driven industrial and technology policymaking. The latest business confidence survey conducted by the European Chamber of Commerce in China shows that Covid-19 has, rather, exacerbated existing trends: European businesses are experiencing an increasingly politicized environment and persistent market barriers in critical sectors, like ICT, and they expect state-owned enterprises to gain more opportunities at the expense of the private sector.¹² The rollout of 5G illustrates the contradictions of China's economic strategy, with selective opening in some sectors and protectionist industrial policy elsewhere. As of April, domestic vendors had secured 90 percent of the multibillion 5G contracts already awarded by state-owned telecoms operators.¹³

But the issues around 5G are not only about market access: 5G is where the Chinese government's technology policies and national security priorities converge. The CCP's top priority is to reduce reliance on foreign technology, which it sees as an existential threat. Mounting tensions with Washington have only accelerated China's quest for indigenous innovation, as decoupling in hardware, software, and even science and talent exchanges becomes a reality.¹⁴ The upcoming five-year plan (2021 – 2026) is expected to place a heavy focus on homegrown technological innovation to further ease China's dependence on the United States.¹⁵

From EV chargers to 5G networks: Beijing boosts technology deployment under “new infrastructure” banner



Illustration of key targets and relevant example projects

Type	Main goal	Key domestic players	Example of related local government or corporate initiative
5G network infrastructure 	Triple the number of 5G base stations across the country to 600,000 by the end of 2020 and have 5 to 5.5 million by 2025 to achieve nation-wide coverage	Ministry of Industry and Information Technology (MIIT); China Broadcast Network; China Telecom; China Unicom; China Mobile; Huawei; ZTE	Shenzhen: 45,000 base stations by end of August, part of RMB 411.9 billion (EUR 49.4 billion) planned investment in new infrastructure until 2025
Industrial internet platforms 	Build three to five internationally competitive industrial internet platforms by 2025, with 300,000 participating companies by 2020, to support the digital transformation of enterprises	Ministry of Industry and Information Technology (MIIT); Alibaba; Inspur; Huawei; CASIC; XCMG; Yonyou; Haier; Shanghai Baosight; Xiaomi; JD; other companies	Jiangsu: One national, cross-sectoral platform and 70 provincial-level platforms. Close partnership with Huawei for industrial internet and Internet of Vehicles
AI innovation zones 	Build 20 “AI Innovation and Development Pilot Zones” across the country by 2023	Ministry of Science and Technology (MOST); Baidu; Tencent; Alibaba; SenseTime; Hikvision; Megvii; Yitu; Huawei; CloudWalk; iFlyTech; other companies; research institutes	Beijing: first AI pilot zone launched in China (February 2019). Ten further zones announced across the country as of August 2020
Big data centers 	Accelerate the construction of big data centers across the country by 2025, sharpening the focus on industrial big data and intelligent computing	Tencent; Alibaba; Baidu; Huawei; Lenovo; Sugon; other companies	Alibaba: three new hyperscale data centers opened in Nantong, Hangzhou and Ulanqab; one million servers over next three years as part of RMB 200 (EUR 23 billion) investment plan to expand cloud infrastructure
Electric vehicle charging stations 	Add 12,000 additional EV charging stations and have 4.5 million charging points by 2020	State Grid Corporation of China; Qingdao Teld New Energy; Star Charge; Potevio; Jiangsu YKC; EV Power; Huawei; Alibaba; other companies	Shanghai: 100,000 new EV charging stations by 2022; construction of the country’s leading Internet of Vehicles infrastructure including 50 kilometres of autonomous vehicles test roads

Sources: CCID think tank; media reports; central and local government documents; industry associations; company websites

Towards this end, China's innovation policy relies heavily on central planning. Recent calls to liberalize the allocation of production factors, including technology and data, are therefore not likely to lead to structural shifts.¹⁶ It is reasonable to expect continued reliance on interventionist industrial policies designed to nurture indigenous innovation, especially for the development of 'strategic emerging industries' (SEI) – sectors that Beijing has decided to bet on in order to transform the economy and climb up value chains.¹⁷ In February, the MIIT identified nine SEI as policy priorities in restarting the pandemic-battered economy.¹⁸ The fact that the national memory chip champion YMTC and US EV company Tesla were given preferential treatment, so that they could operate amid the lockdown, is evidence of Beijing's determination.¹⁹

The Covid-19 crisis has catalyzed the push for digital transformation and hi-tech development.²⁰ The term 'new infrastructure' (新基建) – from 5G and industrial internet platforms to data centers and artificial intelligence (AI) – emerged as a major policy focus in post-pandemic stimulus measures.²¹ The goal is to speed up the adoption of digital and emerging technologies and their integration with traditional industries, in order to stimulate new growth drivers and boost China's future competitiveness.²² Although the bulk of Beijing's infrastructure stimulus will go to traditional projects, a think tank under the MIIT expects total investment in new to reach 10 trillion yuan (1.3 trillion euros) by 2025.²³

3. KEY ISSUES: FILLING GAPS IN EUROPE'S TOOLBOX TO ADDRESS CHINA'S STRATEGY FOR TECH SELF-RELIANCE

Technology and the digital realm have become terrains of great power competition

With Beijing accelerating its bid for self-reliance and global leadership in key technologies, Europe must brace for challenges. Europeans may not be used to seeing technology and the digital realm as terrains of great power competition, but shifting global trends force a rethink. The pandemic and an ever-fiercer contest for technology dominance between Washington and Beijing provide opportunities for Europe – even though it was a net loser in the first waves of the digital revolution – to revise policies around a number of critical issues set to influence technological and industrial competitiveness in the years to come.

ISSUE 1 - RESEARCH AND INNOVATION (R&I) COOPERATION: DOUBLE-EDGED SWORD

China already matches the EU-28 in R&D intensity, while Chinese companies have been increasing their investments in research much faster than their European competitors.²⁴ Despite pandemic-induced budget constraints R&D remains a priority, especially in basic research and core technologies.²⁵ China's vibrant innovation system offers tremendous opportunities for European firms, and Covid-19 has brought the importance of cross-border innovation into the spotlight. Europe could also benefit from attracting more talent flows as Chinese STEM researchers face growing barriers in the US.²⁶

Despite these opportunities, the lack of reciprocity in bilateral R&I ties is still a problem, particularly in terms of funding, data-sharing, and IP protection.²⁷ Even more importantly, collaboration with China requires substantial investment in risk assessment and due diligence. China's foreign research collaboration strategy poses long-term risks for Europe's competitiveness, security, and values. China's government seeks to leverage collaboration for industrial policy goals.

Europe needs to brace itself against unwanted tech transfers

Selected cases involving Chinese actors



Vector	Description	Country
Investments and acquisitions	Acquisitions of advanced semiconductor technology are instrumental for the Chinese government's pursuit of technological independence. UK semiconductor company Imagination Tech was acquired by Chinese private equity group Canyon Bridge, which is backed by a state-owned investor. The Chinese owner recently tried to seek control of the company, prompting an investigation.	UK
R&D collaboration (academia)	Researchers at Aalborg University collaborated with Hikvision to create an algorithm that tracks how online sentiments change, which could also be used for social repression. The researchers ignored that Hikvision, a leading manufacturer of surveillance equipment, is heavily implicated in human rights abuses in China's Xinjiang region.	Denmark
R&D collaboration (government)	Part of the know-how needed to build China's dual-use satellite navigation system, Beidou, reportedly came from the Galileo technology partnership between the Chinese government and the EU, which was dissolved due to controversies between the two sides.	Belgium
R&D collaboration (corporate)	Siemens has a strategic cooperation agreement with CETC aimed at testing and developing intelligent manufacturing solutions in electronic information. The state-owned military contractor is behind a computer platform used by the Chinese police for the surveillance and internment of ethnic minorities in Xinjiang.	Germany
Exports	Germany-based MTU supplied state-of-the-art diesel engines for PLA submarines.	Germany
Industrial espionage	Employees of Dutch chip machine maker ASML reportedly stole trade secrets and passed the information to competitor XTAL, which is owned by a Chinese company with ties to the Chinese Ministry of Science and Technology. ASML denied finding proof of Chinese government involvement in the theft.	The Netherlands
Academic espionage	A Chinese doctorate student and his supervisor were expelled from Norway after it was found that their research could be used by the Chinese military to develop hypersonic cruise missiles. The scientist had deliberately concealed his affiliation with the institution training the PLA's strategic missile forces.	Norway
Cyber theft	Chinese spies hacked Britain's largest defense company BAE, stealing sensitive data related to the multinational F-35 Joint Strike Fighter (JSF) project. Experts have warned that the PLA may have used the stolen data to build its own stealth fighters. Information was also stolen from US companies involved in the JSF program.	UK

Sources: media reports; ASPI; Human Rights Watch

Transferring foreign talent and technology is a strategic priority, accomplished through a sophisticated web of legal, extra-legal and illicit channels.²⁸ These range from setting up science parks and tech transfer centers and attracting European R&D to China, to sending military scientists to universities and engaging in industrial espionage.²⁹ In some cases, Sino-European partnerships have contributed to China's military technology R&D, or efforts to perfect mass surveillance.³⁰ Against this backdrop, a shift to a more clear-eyed approach to R&I collaborations with Chinese actors is overdue.

ISSUE 2 - STANDARDIZATION: TECHNOLOGY SPECIFICATIONS MEET CONNECTIVITY ALONG THE DIGITAL SILKROAD TRAIL

Europe must also come to terms with China's strategic approach to technology standardization, starting with a realistic assessment.³¹ Chinese companies' growing participation in standard-setting bodies and the standardization of emerging technologies (AI, 5G and IoT in particular) is entirely normal and critical for ensuring safety and interoperability; their market shares will depend on the quality of their technology and their success at commercializing it.³² At the same time, Beijing sees standardization as a tool for strengthening indigenous innovation.³³ To that end, it actively promotes and sponsors Chinese companies' participation in international standard-setting bodies.³⁴ Cases of firms forming coalitions to support domestic industrial policy goals have already emerged.³⁵

China is attempting to blend digital connectivity and standardization

Beijing also pushes the internationalization of Chinese technical standards in a range of industries through the BRI, with a strong focus on ICT, emerging technologies and the integration of these with industrial production.³⁶ By building fiber-optic cables, smart cities, data centers and digital service platforms, while encouraging developing and emerging economies to adopt Chinese standards as part of the Digital Silk Road (数字丝绸之路, DSR), China is attempting to blend digital connectivity and standardization and to leverage the lower cost of Chinese standards compared to Western alternatives.³⁷ While the content of most DSR memoranda of understanding (MoUs) is undisclosed, evidence points to an increased emphasis on standardization cooperation.³⁸ By 2019, China had signed 85 standards cooperation agreements with 49 countries and regions along the BRI.³⁹

This year, China will release a national standardization strategy incorporating the results of the 'China Standards 2035' project (中国标准2035项目), a major research effort aimed at streamlining the national standardization system and promoting Chinese standards globally.⁴⁰ Next-generation technologies like IoT, cloud computing, big data, 5G and AI are a focal point of this strategy.⁴¹

European businesses have long been concerned about the closed nature of Chinese standardization committees.⁴² If they were excluded from the 'China Standards 2035' process, while Beijing succeeded at exporting its preferred standards through the DSR, the playing field in the digital economy could be tilted in favor of Chinese competitors. Meanwhile, Chinese firms' first-mover advantage in the standardization of applications like facial recognition means China could acquire a greater say in emerging technology governance, thereby promoting interests that are not necessarily aligned with European ones.⁴³

ISSUE 3 - DIGITAL ECONOMY: EXPANDING THE REMITS OF UNFAIR COMPETITION

As EU Commissioner Thierry Breton put it, we are witnessing a "global battle for industrial data".⁴⁴ Like Brussels, the Chinese government is also upping its game to unleash the untapped potential of data in upgrading industry and transforming the economy through

platform business models and technologies like IoT, AI and cloud computing. Unlike internet users' data, data from production plants and machines in China is not yet shared and used to create value. The government wants this to change. While these efforts date back to the 2015 'Internet Plus' action plan, there is now a stronger focus on the industrial internet and the creation of an industrial big data system by 2025.⁴⁵

Data security is a top priority for Chinese regulators and a matter of national and regime security. This encourages them to place sweeping restrictions on the collection, processing, and cross-border transfer of personal and 'important' data. On July 1, the draft 'Data Security Law' was released for public comment.⁴⁶ By introducing a system for grading and regulating data, including industrial data, based on its importance for national security, the law could heavily impact foreign business. The law also codifies China's ability to retaliate against any country imposing trade and investment restrictions towards the PRC related to data and technology. These developments could further politicize the treatment of foreign technology in China and exacerbate competition distortions in the digital economy.

Data security is a top priority for Chinese regulators and a matter of national and regime security

Lastly, the EU and members states should also pay more attention to the DSR since Beijing is leveraging it to promote and finance the global expansion of domestic technology companies.⁴⁷ Despite the growing backlash against Huawei in developed countries, the unmet needs for digital connectivity in developing and emerging economies will continue to provide fertile ground for Chinese ICT and digital projects. These often consist of integrated hardware and software packages provided by state-backed companies, with the potential outcome of creating China-centered digital ecosystems in which European companies cannot participate.⁴⁸ Already dominant in China's closed digital market, Chinese tech giants could control increasing amounts of data and create entrenched monopolies in third markets.

4. EU-CHINA RELATIONS: LEVERAGING CHINA'S TECH DEPENDENCE BECOMES A PRIORITY FOR THE EU

Europe plays a central role in Beijing's high-tech ambitions. Despite increased scrutiny, most Chinese transactions in the then EU-28 in 2019 were in the ICT sector.⁴⁹ This is consistent with the trend of Europe being both target (through acquisitions) and willing partner (through R&D collaborations) of Beijing's MIC2025 strategy.⁵⁰ Additionally, European firms have experienced an increase in forced tech transfers in recent years.⁵¹ As China finds its access to US technology increasingly curtailed, it is likely that it will turn to Europe for alternatives. This is already happening in the semiconductor value chain, for example.⁵²

It was the appreciation that Europe's competitiveness and economic security were at risk that already led to a significant change in EU China policy. Following Brussels' call, more member states are adopting or upgrading investment screening tools and reconsidering the role of Chinese vendors in their digital infrastructure. Moreover, as part of an ambitious work program launched by the previous EC to fill gaps in the EU's defensive toolbox, reform proposals have been advanced in competition, trade and public procurement policy.⁵³

Despite these achievements, the EU and member states cannot effectively compete in the Fourth Industrial Revolution by only playing defense. To preserve the continent's digital and technological 'sovereignty', in February the EC therefore unveiled new industrial,

digital and data strategies aimed at strengthening EU competitiveness, making sure that the bloc masters critical technologies, especially AI.⁵⁴ Although the European concept of digital sovereignty is sometimes conflated with China's approach to the governance of cyberspace, its rationales differ fundamentally from China's, where state control over data and the digital economy is first and foremost a tool of information control.

The EU has many cards to play

Having rightly identified the nexus between industrial, competition and digital policy-making, the EU now needs to implement its offensive agenda. Momentum is building across the bloc and in the UK, a key partner in the technology and innovation contest with China. In a major shift, London decided to fully exclude Huawei from its 5G networks, and major EU economies like Italy are also placing restrictions on the company's involvement in network rollouts.⁵⁵ Meanwhile, Paris and Berlin are elevating the importance of digital and industrial policies as pillars of the post-pandemic recovery.⁵⁶

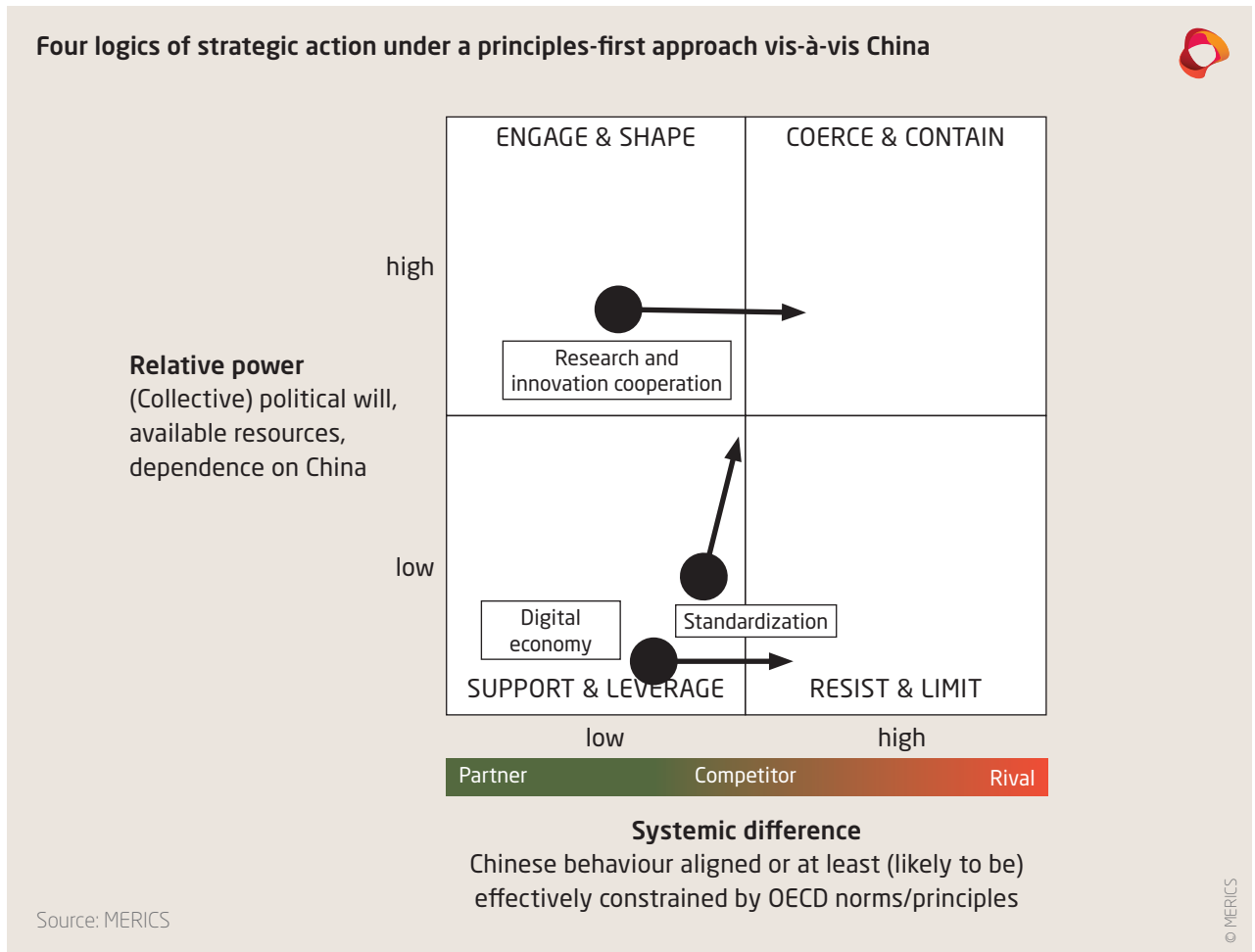
The EU has many cards to play, starting from a world-leading science and innovation base, talent, and lots of cutting-edge technology; the challenge is to overcome longstanding weaknesses in terms of digital market fragmentation, regulatory hurdles, and under-investment in scalable tech businesses.⁵⁷ China, by contrast, is very good at funding and commercial adoption of digital and emerging technologies. It has large digital businesses that adopt technology quickly and foster dynamic ecosystems – both domestically and increasingly also overseas – taking advantage of a favorable regulatory regime at home.

That said, the EU has some relative strength vis-à-vis China. For one, investing in internal capabilities and enforcing EU rules in the Single Market is unlikely to provoke substantial backlash on the Chinese side. Meanwhile, China's need for European technology and know-how, for instance in intelligent manufacturing and the industrial internet, could be leveraged to advance EU interests by making access and partnerships conditional. The bloc's relative power is high when it comes to R&I and standardization, both areas where Beijing is eager to partner with European institutions and industry. However, the EU is quickly losing ground as an innovation and standards power while China is doubling down on investment in these fields.

5. POLICY PRIORITIES: EUROPE NEEDS TO TRANSLATE INDUSTRIAL AND DIGITAL STRATEGIES INTO ACTION

The new EC's offensive agenda, which considers technology and the digital sphere to be critical elements in today's geopolitical competition, is Europe's best chance to respond to China's bold plans for high-tech leadership. Planned investments in 5G, AI, cloud, cybersecurity, and green technologies as part of the EUR 750 billion post-pandemic recovery package are steps in the right direction.⁵⁸

A challenge for Europe will be to position itself strategically as the US-China tech conflict heats up. Fully applying defensive tools to protect technology and critical infrastructure will be key, as restricted access to American technology forces Chinese firms to look elsewhere. Additionally, companies will need to adjust their scenario planning constantly to navigate the partial decoupling of American and Chinese tech ecosystems. Policymakers will face increased pressure to think even more strategically across policy domains and competences, which requires setting up new structures to tackle risks associated with emerging technology ties with China.⁵⁹



When it comes to R&I, a risk-based approach is needed to prevent unwanted tech transfers. This means shifting to a logic of coercing and containing with regard to those aspects of China's cooperation strategy that threaten Europe's competitiveness, security and values. It will be necessary to raise awareness among member states, universities and businesses and draft guidelines for R&I partnerships with Chinese entities, including red lines for partners and technologies that are off-limits. Aside from curbing unwanted tech transfers, increasing the Horizon Europe Program budget to EUR 120 billion, as recommended by the European Parliament, would boost the EU's ability to compete on the global stage.⁶⁰

On standardization, EU actors need to coordinate their lobbying efforts in China, especially in the context of China Standards 2035, as it is in the EU interest to engage and shape and promote emerging market-oriented forces.⁶¹ More resources should also be invested to help companies understand the standardization dimension of the DSR, while member states' standards cooperation format with China – such as the Sino-German Industry 4.0 Cooperation – should be leveraged whenever possible to achieve *European* regulatory objectives in the Chinese market.⁶²

In international standard-setting bodies, Europe does not need to copy China's state-led strategy to invest more resources and ensure continued relevance of its businesses. Beijing and Washington see standardization as terrain for geo-economic competition. If it wants to retain its industrial competitiveness in the digital age, the EU should shift from an overly technical to a more strategic approach.⁶³ Breton's recent call for greater EU engagement in the standardization of lithium for EV batteries in response to China's proposal to set up a new committee was timely.⁶⁴ The EU should also be prepared, in consultation with industry and like-minded countries, to coerce and contain China when it manipulates standard-setting processes.

As China seeks access to Europe's technology and digital market, Brussels and member states should insist on digital reciprocity as a new principle in bilateral relations. China's protected digital market, discriminatory standards and data regulations hurt the competitiveness of European businesses, and they are now being exported through the DSR. As it works on creating a unified data market, the EU should explore ways for making Chinese companies' access conditional.

The EU will need to join forces with partners around the world

Navigating China's emerging data regulations will be challenging, as the government will not change its approach to data security. Europe can only resist and limit. As it sets out to measure cross-border data flows and address unjustified obstacles as part of its European Strategy for Data, the EU should monitor competition distortions arising from unequal access to data in the Chinese market. The monitoring should include third markets where Chinese ICT and Internet players are creating new digital ecosystems, as data-driven market power or anticompetitive practices may arise.

Lastly, the EU will need to join forces with partners around the world if it wants to attain digital and technological sovereignty.⁶⁵ Many aspects of the China challenge, from forced technology transfers to digital protectionism, cannot be confronted alone. The UK's recent proposal to set up a group of like-minded democracies to fund secure 5G solutions is worth exploring.⁶⁶ For example, such grouping could invest in secure, sustainable and affordable digital connectivity in the developing world, thereby providing alternatives to China's DSR. At stake is not just Europe's competitiveness, but also its strategic autonomy and the very democratic values and fundamental rights it wishes to promote in the digital transformation.