RESILIENT EU2030

A future-oriented approach
to reinforce the EU's
Open Strategic Autonomy
and Global Leadership

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SPANISH PRESIDENCY
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EXECUTIVE SUMMARY

This non-paper was written by the Spanish Presidency of the Council of the European Union in close consultation with officials of the 27 Member States, the European Commission, the Secretariat of the Council of the EU, and several academics and private sector representatives. Its purpose is to contribute to the design of **a comprehensive, balanced and forward-looking approach to ensure the EU's Open Strategic Autonomy and global leadership by 2030.**

The introductory section provides an overview of some of the changes experienced in the international order in recent years. It acknowledges an increase in geopolitical frictions driven by the growing assertiveness of Russia and China and the search for greater self-reliance of the American and the Chinese economies. However, it also challenges the idea that a major breakdown of the multilateral order and inevitable economic fragmentation are looming. Based on this diagnosis, it suggests that the EU should respond to the current context by working simultaneously and evenly in two directions. On the one hand, doing all it can to enhance and protect the international order and prevent the world's fragmentation. On the other, to reduce its external dependencies and strengthen its position as a technological powerhouse and global actor.

Furthermore, this section identifies a number of concrete strategic vulnerabilities that the EU should address in this decade, based on the combined analysis of current economic trends, the long-term strategies approved by the European Commission and the forecasts provided by Member States, academics and private sector representatives. The list includes key present and future enabling technologies, digital services, and raw materials and semi-processed goods in four critical sectors: energy, digital-tech, health and food.

The following sections propose **nine lines of action to tackle the vulnerabilities identified in a systemic and realistic way,** aligned with the European principles of competitiveness and cohesion as well as with the EU's main economic, social and environmental goals and values.

Section one examines how to bolster and secure the EU's internal production capacities. It suggests a list of goods and technologies for which European production should be fostered or scaled-up to ensure its future economic security and prosperity. Moreover, it proposes a number of measures that could help achieve this goal by acting in the fields of innovation, industrial policy, Single Market integration and human capital. Finally, it examines some of the economic, social and environmental trade-offs that these measures could have in the future.

Section two discusses the need to monitor and limit foreign ownership or control over certain strategic sectors and critical infrastructures. It reflects on the challenges that the dominant presence of foreign companies in the EU's digital and green sectors poses in terms of security and national industrial development. It also reflects on the enormous benefits that they bring to European economies and citizens. Accordingly, it recommends preserving and encouraging the presence of foreign companies from like-minded countries, while working to gradually limit the dominance of those with links to non-like-minded countries through the use of competition and regulation.

Section three explores the possibility of setting new contingency plans to respond to future shortages. It advocates the establishment of common strategic reserves accessible to all Member States, the creation of minimum production capacities to ensure a basic supply in times of crisis, and the identification and development of production capacities that could be transformed or scaled upon demand, if needed. To design and coordinate these measures, it is recommended to reinforce strategic foresight capabilities, anticipatory governance mechanisms and real-time monitoring systems of Member States and EU institutions.

Section four touches on the need to achieve the EU's open strategic autonomy in full alignment with the environmental emergency that is gripping the planet. To this end, it suggests different measures to enhance the efficiency of our current production processes, and to reduce waste generation by using already competitive and available European technologies and methods.

Section five discusses how to reuse unavoidable waste by fostering circularity in the EU's economy and society. It showcases the enormous contributions that this line of work could provide to European resilience and proposes a number of cross-sectoral actions to pursue it. Among others, the development of mechanisms to recycle green technologies and installations that already exist in Europe, the exploitation of alternative and non-conventional sources of critical raw materials and the use of agricultural left-overs and livestock.

Section six explains how the replacement of many of the raw materials and components currently used in our industry by more accessible and sustainable alternatives could reduce the EU's foreign dependencies. A number of examples are analysed – from solid-state and sodium-ion batteries to the domestic production of algae, insects and microbes as ways to substitute a share of plant proteins brought in from abroad.

Section seven argues that, as much as the EU develops its internal capabilities and enhances its circularity and resource efficiency, it will always depend on the global economy to thrive. Thus, it recommends that the EU seizes the current window of opportunity to launch a new trade expansion aimed at securing and diversifying its sources of supply by revamping existing relationships and the establishment of new ones. The primary focus of this trade expansion should be like-minded countries, it should leverage the competitive edge of Member States, and it should focus on those raw materials, goods and services identified as strategic for the EU. Nevertheless, it should also provide more horizontal and mutually-beneficial deals to its foreign partners in order to build long-lasting and resilient relationships.

Section eight highlights the need to rebalance economic relations with China. It acknowledges that China is an essential trading partner for the EU, and the fact that decoupling from its economy is neither a viable nor a desirable option. However, it also argues in favour of maintaining and reinforcing the various mechanisms deployed by the Commission to de-risk and

reduce the EU's dependence on Chinese imports, protect the integrity of the Single Market and achieve a more level playing field.

Section nine claims that the EU should promote and lead the reform of the multilateral system as an effective way to mitigate its foreign vulnerabilities and defend its interests around the world. To that end, it recommends that the EU should advocate greater inclusivity and representativity in the system, along with targeted reforms that would enhance the performance of international institutions and an increased multi-stakeholder and multi-level approach.

The concluding section of the non-paper reflects on the real capacity of the EU to adopt all the afore-mentioned measures and overcome the challenges of this time. Building on data, it shows that, despite its many weaknesses and vulnerabilities, the EU remains one of the most socially-advanced regions in the world and one of its economic and geopolitical powerhouses. Accordingly, the section argues that imagining an EU in 2030 with top-tier technological companies, non-polluting and cheap energy, high quality and affordable services and higher living standards is an empirically-based, reasonable forecast. And it states that the future of the EU is not to prevent its decline but to lead a new era of global prosperity.

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FOREWORD

International openness is a fundamental pillar of the European Union. Much of the social and economic progress achieved over recent decades would not have occurred without it. However, it is undeniable that the development of globalisation, both in trade and capital flows, has also made the EU acquire several dependencies on third countries that, during recent crises such as those caused by the Covid pandemic and the Russian military aggression against Ukraine, have turned into significant risks for the well-being of Europeans. Moreover, there are strong reasons to believe that these vulnerabilities might worsen and multiply in the future, due to increasing geopolitical tensions, growing competition for some technologies and raw materials, and the impact of megatrends such as climate change and demographic ageing.

In recent years, the concept of Open Strategic Autonomy has emerged as an interpretive key to address such vulnerabilities, and the European Commission has drafted valuable studies and ambitious policies to develop it. Nevertheless, the EU still lacks a comprehensive and concrete vision on how to strike a new balance between resilience and competitiveness, as well as between assertiveness and rules-based cooperation that would allow it to tackle its economic vulnerabilities while maintaining its role as a global actor in this new world order that is taking shape.

Over a year ago, in July 2022, we decided that helping to craft that vision would be one of the main priorities of the Spanish Presidency of the Council of the EU, which will run from 1 July to 31 December 2023. We also decided that the Spanish contribution would meet three guiding principles: it would be forward-looking, it would be evidence-based, and it would be a fair reflection of the points of views of all Member States, thus reinforcing the European unity that these challenging times demand.

To achieve such a vision, we launched the most ambitious strategic foresight project that has been carried out to date at an EU level. This project lasted approximately ten months, between September 2022 and June 2023, and involved thousands of hours of research, information exchange and working meetings. In total, about 250 experts and government officials from over 80 ministerial departments and prime ministers' offices from all 27 Member States participated. This international group worked under the framework of the EU-wide Foresight Network, with support from the Secretariat of the Council and the European Commission, and under the coordination of the Spanish National Office of Foresight and Strategy. Several academics and business representatives were also consulted.[1]

This non-paper is based on this collective work. It aspires to be a fair and balanced reflection of the points of views of the 27 Member States and relevant EU institutions. However, its sole official author is the Spanish Presidency, which is the only body responsible for the ideas and proposals it contains. The purpose of the non-paper is twofold. On the one hand, it aspires to advance a comprehensive, ambitious and balanced vision of how the EU's Open Strategic Autonomy could be reinforced in this decade. On the other hand, it hopes to challenge the widespread pessimism and highlight the numerous competitive edges and strengths that the EU has, to not only become a more resilient, competitive and sustainable economy, but also a beacon of innovation, collaboration and stability that could lead the world into a new era of global prosperity.

Pedro Sánchez
President of the Government of Spain


A CHANGING
GEOPOLITICAL
LANDSCAPE

In the 20th Century, Europeans and North Americans led the creation of an international order based on the liberal principles of freedom, openness and multilateralism that was recognised and observed worldwide.[2] After the collapse of the Soviet Union in the early 1990s, European countries assumed that this international order would solidify and endure indefinitely, supported by the expansion of democracy and market capitalism,[3] and they built their economic and security systems based on that assumption. Companies expanded their supply chains across thousands of kilometres, seeking cost-effective production. And governments slashed military expenditure in half, while simultaneously increasing their contributions to multilateral organisations.[4] This liberal international order brought stability and prosperity to most European nations, which enjoyed immense progress from the 1950s onwards.[5]

Nevertheless, in recent years, the once widely-considered beneficial international order has started to be challenged.[6] On one hand, by emerging countries such as China, India, Brazil and South Africa, which argue that their values and substantial contributions to the global economy are not adequately recognised.[7] On the other hand, by Western nations, where some citizens believe that the open-based system is giving rise to unfavourable phenomena (offshoring, job losses, a relative decline of the standard of living of the middle classes, tax evasion and unfair competition) that undermine their own interests.[8] Thus, the belief that trade liberalisation would be a positive-sum game for all countries is now giving way to the belief by some that it is a zero-sum game and a source of vulnerability amidst current geopolitical tensions.

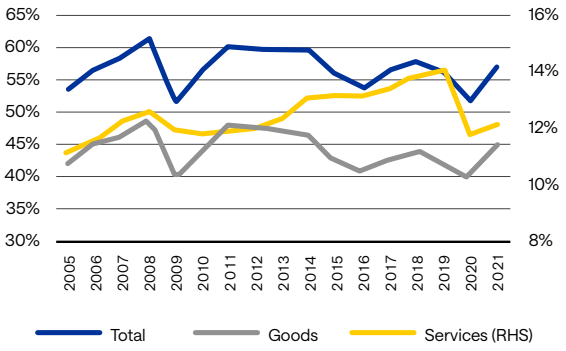
This has prompted various reactions that, to a certain extent, signify a questioning of the previously dominant paradigm. National governments have taken a more proactive approach, employing industrial policies and implementing incentives, loans and subsidies to bolster domestic companies in the face of foreign competition.[9] New trade tariffs and bans on critical raw materials and technologies have been introduced.[10] The signing of multilateral trade agreements has declined, leading crucial negotiations to stall, and the number of bilateral and regional trade agreements has doubled.[11] Commercial disputes and disruptions have become more frequent and "harmful interventions" have surged by 80% in just five years.[12] Meanwhile, many multilateral organisations have been questioned or directly bypassed, and companies have started to consider the relocation of some key stages of their production chains to closer or like-minded countries.[13]

Based on these trends, many observers have concluded that the open-based, multilateral order is on a path of decline and that the world is deglobalising.[14] **It should be noted, nonetheless, that there are many stylised facts that challenge this view.** Data indicate that the world's openness to trade has been plateauing since 2008, without showing a declining trend. This is due to the dynamism of services and sectors driven by technological progress, which have offset the moderation in the exchange of manufactured goods. In fact, after the collapse caused by the pandemic, trade flows have rebounded and regained pre-crisis levels.[15] It is true that the

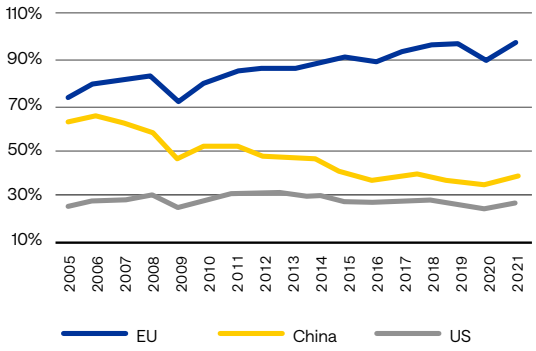
pace of trade expansion is slower today than it was in the past. However, it is important to remember that this "slowbalisation" did not begin with the US-China tariffs war, Covid or the invasion of Ukraine, but with the global financial crisis of 2008.[16]

Furthermore, there is a lack of conclusive evidence supporting the notion of a widespread "regionalisation" or "friendshoring" of global trade. Data suggest that exchanges between countries within highly-integrated economic regions (such as the EU, NAFTA, MERCOSUR or the Asia-Pacific region encompassed by the RCEP) have not increased in recent years, while long-distance commerce has continued to grow.[17] Regionalisation does not appear to be taking place, even between the US and China. Commerce between these two global powers has declined in recent years, but it is still strong, despite the hostile rhetoric and the establishment of new tariffs and trade bans.[18] In fact, Western trade from "like-minded countries" (defined as those sharing similar UN voting behaviour) has not surpassed that from countries that are more closely aligned with China.[19]

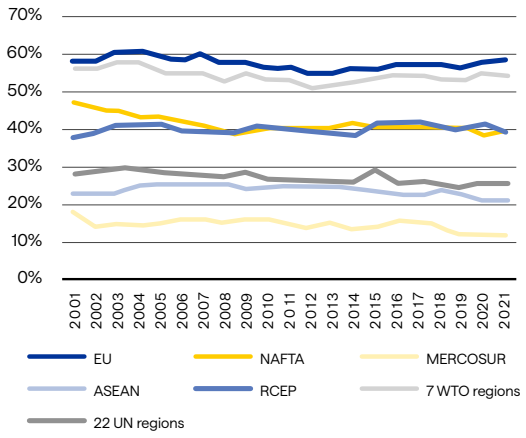
World Trade (sum of imports and exports, % of GDP)



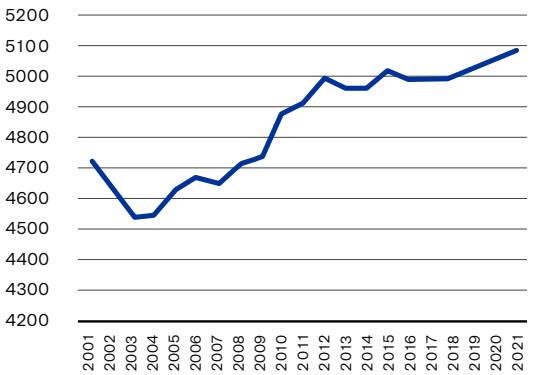
Trade openness by region (sum of imports and exports, % of GDP)



Intra-regional trade by area (% of total trade)



Average distance traversed by merchandise trade (km)



Source: UNCTAD and IAP[20]

What is observed is a strengthening of the European economic space. In recent years, there has been a significant reduction in the number of European and non-European companies relocating part of their production processes outside the EU.[21] At the same time, the number of foreign companies establishing capabilities in the EU has increased. In 2009, there were 76,000 European companies controlled by foreign capital; by 2020, this figure had risen to 102,000.[22] In a world of increasing geopolitical tensions and environmental and social concerns, Europe is emerging as a stable, secure and competitive space to invest in and operate from.

In conclusion, while certain changes are taking place, it does not seem as if a fundamental shift has occurred in the structure of the global economy at this time. **How would geopolitical powers and globalisation rebalance in the coming years?** It is hard to say. The future is shaped by many factors that are impossible or nearly impossible to anticipate, and the data analysed above have a time lag of some months, which prevents us from seeing changes that might be occurring at present.

Experts have presented a wide variety of forecasts. The most probable ones fall within the range of two opposing scenarios. **The first scenario envisions a relatively smooth, targeted remodelling of the current multilateral order.** It assumes that emerging powers would acquire a more prominent role in global governance and that China would be accommodated within the group of hegemons, alongside the US and Europe, in exchange for moderating its expansion and dominance ambitions and aligning more closely with human rights and the market economy. Global supply chains might experience some degree of further regionalisation. But global trade would endure. This process would generate severe economic and political friction. However, it will ultimately occur within the existing frameworks and result in an update rather than a breakdown of the open-based, multilateral system.[23]

The second future scenario is much grimmer, as it opens up the possibility of a more fragmented, polarised and protectionist international order in the medium term.[24] It foresees a world rigidly divided into two major blocs - the West and the East - each with its own coalitions of like-minded countries, trade spaces, capitalist systems, technologies, standards and multilateral organisations. These two blocs would decouple from each other and engage in competition dynamics similar to those that existed during the Cold War. This would perhaps be even more acute, given that Chinese economic and technological powers are significantly more advanced than those held by the Soviet Union.[25] This could include a new arms race that threatens humanity, espionage, far-reaching embargoes, proxy wars and a beggar-thy-neighbour economic policy that would eventually leave most countries in a worse situation than today.

Which of the scenarios will prevail? The first, the second, something in-between or an entirely different scenario altogether? The truth is that European governments can only provide an honest answer to their citizens: "at this point, nobody knows". The future remains unpredictable. Partly because the future is not what will happen, but rather what the different actors involved will make of it. That is why, in our view, **the EU should respond to the current context by working in two directions simultaneously and evenly: 1) doing all it can to prevent and counteract the world's fragmentation, and 2) preparing itself for this potential eventuality.**

AIMING FOR THE BEST: A RENEWED, OPEN, RULES-BASED INTERNATIONAL ORDER

The globalisation of the last 30 years has had some downsides for Europe. For starters, it has facilitated the offshoring of a significant portion of its industry to countries with lower costs, taxes and environmental and labour standards.[26] This has resulted in the structural change of millions of jobs and the loss of relative weight in traditional sectors such as metallurgy, agriculture and clothing,[27] and it has exacerbated issues such as tax dumping by millionaires and large multinational corporations, which in turn has limited the revenue-raising capacity of many Member States and their ability to sustain their welfare states.[28] Moreover, international openness is also associated by some scholars with an increase in inequality, both between territories (e.g. cities vs. rural areas) and individuals (e.g. highly-skilled workers vs. low-skilled workers),[29] and with greater labour polarisation and social unrest.[30] Lastly, openness has made the EU more vulnerable to external shocks (e.g. pandemics) and reduced the ability of national governments to control certain parts of their domestic realities and ensure the well-being of their citizens.[31]

Acknowledging these negative effects is essential to wake the EU up from the age of innocence in which it has lived for too long and to undertake an intelligent reform of its economic policies. **Nevertheless, it would be a mistake to forget that, despite its numerous and significant drawbacks, the internationalisation of value chains, financial flows and trade has been beneficial for Europeans.** Consider these figures: Europe comprises only 3% of the Earth's surface area, 6% of raw materials and 6% of the global population.[32] Yet, it accounts for 15% of the world's economy and 54% of its social welfare spending.[33] This means that for every two euros that governments around the world invest in making their citizens healthier, more educated and safer, one goes on European citizens.

There are multiple factors that contributed to this achievement – some more honourable than others. However, there is no doubt that **the existence of an open, rules-based global order has been key.** Open markets and the abolition of barriers have provided the EU with access to raw materials, innovation, talented individuals and countless opportunities that were not available within its borders. This access has enabled Member States to establish a greater number of companies than would have been possible in a fragmented world, resulting in the creation of more jobs than those lost due to globalisation.[34] In fact, it is estimated that one in every five jobs that exists in the EU today is directly or indirectly linked to external trade.[35]

On a global scale, international openness has allowed a more efficient division of labour. Goods and services are produced in countries where it is more cost-effective to do so, and then exchanged worldwide. This has resulted in increased added value, productivity and economic growth for the EU.[36] Moreover, it has brought about greater competition, which, combined with the afore-mentioned factors, has led to more innovation, more choices and better prices for European consumers.[37]

International openness has also benefited the rest of the world. Although it is difficult to establish causality in such large processes, there is ample empirical evidence to suggest that

globalisation has contributed to the growth of most economies, particularly smaller and less developed ones.[38] It has also helped lift over 1 billion people out of poverty, reduce inequality between countries, mitigate the number of armed conflicts and improve living conditions for a significant portion of mankind.[39] All of these factors have, in turn, resulted in increased security, freedom, well-being and prosperity for Europeans themselves, whose circumstances are inherently intertwined with those of the rest of humanity.

The benefits that the EU has obtained from international openness could only be matched by the losses that fragmentation and protectionism could create. Experts believe that the imposition of tariffs and trade restrictions would result in a significant decline in export volumes. This, in turn, would lead to a misallocation of resources and a loss of competitiveness. The production of goods and services would shift from efficient locations to suboptimal ones, resulting in higher costs, lower quality and limited resource availability. Such a scenario would likely bring about inflationary pressures, job losses and a substantial reduction in economic growth. In fact, it is estimated that in a severely fragmented global economy, the world GDP could shrink by 8% to 12%.[40] Europe, with its open market, would be particularly damaged in this paradigm shift, experiencing a substantial decline of its GDP growth.[41]

The breakdown of global markets and the rise of economic blocs would also hamper innovation. In order to thrive, innovation requires interconnected and open environments, where ideas, talent and resources can freely flow across borders. Fragmentation and protectionism could disrupt these flows, limiting access to crucial investment and collaborative opportunities. As a result, the EU could face difficulties in effectively tackling pressing global challenges such as climate change and adapting rapidly to ageing population dynamics.[42]

Geopolitical fragmentation would also make European economies more vulnerable to domestic shocks. Protectionist strategies could reduce dependency and increase exposure to international crises. In addition, it would also increase countries' vulnerability to unforeseen domestic episodes by reducing the portfolio of products and partners to which they can turn in case of need.[43]

By the same token, fragmentation would make it more difficult to articulate effective and fair policy responses to some of the greatest challenges of our time, such as global warming, immigration, drug trafficking, cybercrime and violence, which require strong multilateral cooperation and cross-border actions. In fact, some studies suggest that fragmentation could increase tensions between nations and lead to an escalation of military conflicts.[44]

All of the above would ultimately lead to a serious deterioration of the well-being of Europeans.[45] **In a polarised and fragmented world, EU citizens would most likely end up having higher prices, a lower variety of products and services, fewer jobs, lower incomes and more uncertainty than they have today.**

In short, the EU benefits from the world maintaining an open economy and a robust multilateral architecture that can mediate between countries and coordinate their efforts in pursuit of mutual benefits. **Nevertheless, this does not mean that the EU's goal should be to preserve the status quo.** It should not because, as pointed out, the multilateral order of recent decades also has many shortcomings that need to be addressed. Thus, instead of simply preserving the current international order, what the EU needs to do is foster its improvement and renewal, make it more efficient and trustworthy for everybody, and better able to deal with the new political, technological and environmental realities of the world.

PREPARING FOR THE WORST: MANAGING DEPENDENCIES IN A FRAGMENTED ECONOMY

Despite being a key global player, the future rebalancing of the geopolitical order will not solely depend on the EU's actions. There are many actors involved, and some structural trends are already unfolding that may lead to increased military tensions and a more fragmented world.

The first of those trends is Russia's growing assertiveness and direct attack on the international order. After years of hybrid warfare against its neighbors and illegal occupations, Russia`s unjustified and violent invasion of Ukraine has triggered an abrupt decoupling from the West and has put the world on a path of uncertainty and tensions unprecedented in the 21st Century. The Kremlin's ambitions go far beyond Kyiv. Its confessed goal is to "eliminate the vestiges of the dominance of the United States and other unfriendly countries in world politics" and to regain Russia's lost influence, at least in the former Soviet sphere.[46] Therefore, Russia's actions constitute a direct threat to the European Union and its Member States that could lead to further instability, insecurity and economic stagnation in the long term.

The second trend to consider is the rise of large emerging countries, some of which now display more economic and demographic dynamism than the West. The most prominent case is, of course, China. After a century of poverty and struggle, this nation has regained its historical position as one of the world's largest economies and a leader in numerous cutting-edge technologies. China is now transitioning from the era of "reform and opening" to an era of "security and control", with the new explicit goal of becoming a political and military hegemon, at least in the Eastern Hemisphere. This development has led to escalating tensions with Europe and North America - two regions that have officially declared China an "economic competitor and a systemic rival."[47] But also with neighbouring countries like India, which could become the world's third-largest economy by 2030 and a valuable ally for the West.

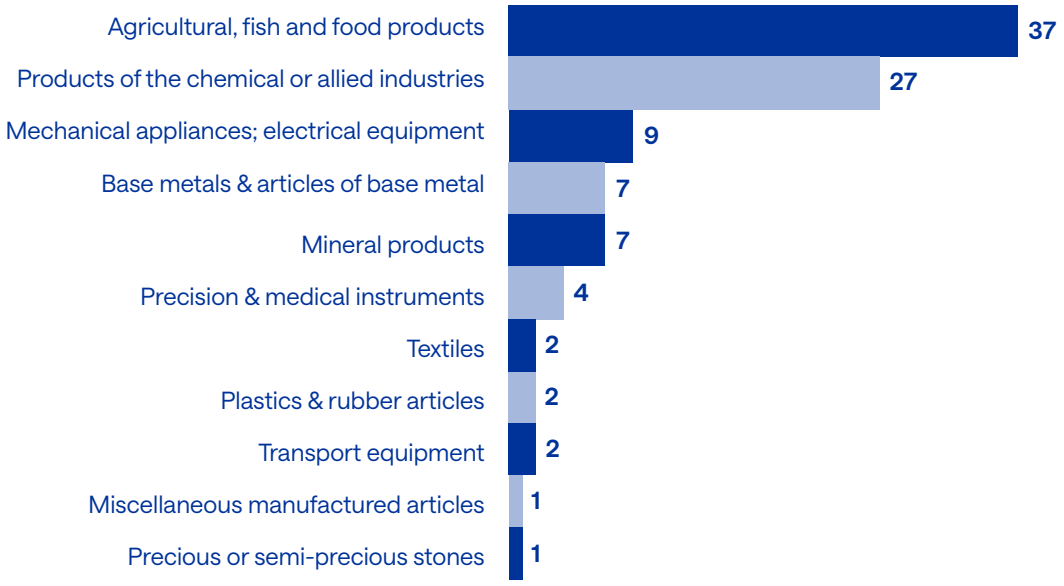
The third trend is the escalating competition for natural resources among both legacy and emerging powers. This competition is fuelled by the combined effects of climate change, population growth and shifting consumption patterns across a significant portion of the global population. For decades, citizens in the West have consumed resources at levels well above the Earth's capacity. In recent years, this consumption has reached an unsustainable point, exceeding six times the planet's boundaries.[48] This unsustainable pattern of consumption has been facilitated by the fact that 14% of the global population consumed significantly less than their fair share. However, the landscape is changing.[49] In the Global South, 1.7 billion people are transitioning into the middle classes and adopting consumption patterns similar to those of the West, something that could potentially double the global demand for natural resources in the coming decades.[50] It remains uncertain whether the Earth would be able to sustain such an accelerated pace of resource consumption in the long run. But one thing seems certain: in the short term, the competition for resources will intensify, leading to rising tensions between those nations that possess abundant resources and those that do not.

The EU needs to prepare to navigate these trends. That is why, at the same time as it strives to renew the international order, it should work to tackle its internal vulnerabilities and strengthen its position as a global actor. Part of that work will need to be undertaken in the field of security and defence. That is those European countries that are members of NATO have reaffirmed their commitment to the North Atlantic Alliance, and why most Member States have increased their military spending and agreed to reinforce common capabilities and the European military industry by 2030,[51] while duly abiding by human rights and fundamental freedoms.

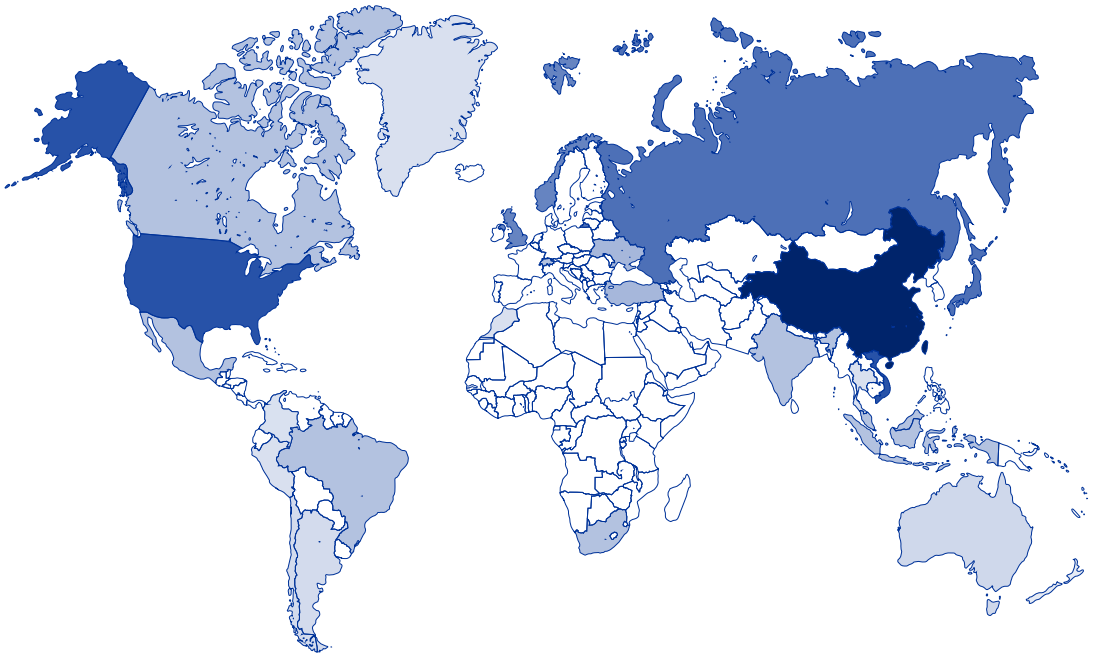
However, the same priority should be given to economic security, which is where the greatest challenges but also the greatest opportunities lie for the EU over this decade.[52] The assumption that the open international order would be maintained indefinitely led European countries to outsource a significant portion of their economic activity and build supply chains primarily based on relative cost criteria. This made them acquire several material dependencies on third countries that became serious vulnerabilities during the worst international shocks of recent years. During the Covid pandemic, Europe's inability to produce its own ventilators, masks and personal protective equipment resulted in thousands of deaths and millions of euros in losses. Subsequently, the difficulties in accessing gas, cereals and critical raw materials due to Russia's blockades and the military aggression against Ukraine caused a loss of 1.5% of GDP and triggered an inflationary crisis from which we are still suffering.[53]

The challenge is that these shortages could be just the tip of the iceberg. Research conducted by the European Commission and the European Central Bank (using trade data specifically tailored for this study) shows that the EU has a high foreign dependency on more than 300 products.[54] This includes raw materials, energy inputs, goods and technological components that are critical for our economy and have a limited potential for diversification and substitution, since their production is highly concentrated in a few non-EU countries.

Distribution of 323 dependent products across trade sectors (%)



Distribution of 323 dependent products by origin (% value of total imports; colors reflect concentration)



Source: Own elaboration based on Arjona et. al., 2023.

It is impossible to quantitatively anticipate the future evolution of these dependencies, since that would require forecasting changes in supply and demand across the entire global economy. However, by combining the analysis of current economic trends with the long-term strategies already announced by the European Commission, and the qualitative expectations of Member States, academics and businesses, we have identified some of the key strategic vulnerabilities that the EU will have to address in this decade.

Key enabling technologies

To become a fair and prosperous, carbon-neutral society by 2050, the EU will need to triple its solar and wind energy production, and boost the electrification of sectors such as transportation and residential housing by 2030.[56] This will entail a significant increase in demand for green technologies.[57] For instance, estimates suggest that the need for wind turbines will double, sales of heat pumps will quadruple and the number of electric engines will increase sixfold.[58]

The challenge is that the EU's current internal capabilities would only be able to meet a small fraction of this demand. The rest would have to come from outside sources – mainly from China - which currently concentrates the bulk of the raw materials required and has dominant market shares in the intermediate stages of the supply chain. For instance, it produces between 35% and 55% of the world's solar panel and wind turbine components and 90% of the permanent magnets needed for the production of heat pumps and electric motors. The EU only holds a prominent position in the assembly of wind turbines and heat pumps, with a global market share of more than 30%.[59]

Furthermore, to address the intermittent nature of renewable energy sources and ensure a reliable and affordable energy supply, the EU will have to increase the overall flexibility of its systems by fostering sector integration, balancing and baseload mechanisms, demand

response and storage capabilities. This will skyrocket our demand for lithium-ion batteries, fuel cells and electrolysers, which is expected to multiply between 10 and 30 times in the coming years. The EU has a strong industry in the intermediate and assembly phases of the latter (where it holds more than 50% of the global market share), but it relies heavily on China when it comes to lithium-ion batteries and fuel cells that are, for the time being, crucial for the decarbonisation of mobility. This dependency affects the intermediate stages of the supply chains of both current and future technologies.[60]

Overall, this indicates that, without implementing strong measures, the European energy ecosystem could have a dependency on China by 2030 of a different nature, but with a similar severity, from the one it had on Russia before the invasion of Ukraine.

A similar scenario could unfold in the digital-tech space. Forecasts suggest that the demand for digital devices such as sensors, drones, data servers, storage equipment (CPUs, GPUs and DRAMs) and data transmission networks will rise sharply in this decade. The EU has a relatively strong position in the latter, but it shows significant weaknesses in the other areas. For instance, it only produces 6% of the world's drones and 1% of data servers and storage equipment.[61]

By 2030, this foreign dependency could seriously hinder the productivity gains that the European industry and service sector so urgently require. Furthermore, it could impede the modernisation of its agriculture systems, which will be essential for addressing climate change; and the digitalisation of its healthcare systems, which will rely on new wearables, prostheses and other new medical devices to cope with an ageing population. [62]

The inability to secure a stable supply of semiconductors could have even greater impacts.[63] European companies play an important role in providing the equipment and high-purity materials used in the production of chips. However, their presence in other phases of the supply chain is insignificant. This market is dominated by South Korea, Taiwan, China and the US, which account for the majority of global R&D spending, manufacturing and cutting-edge models.[64] In fact, the EU's global market share has decreased from 20% in the 1990s to its current level of 9%. As a result, almost 80% of suppliers to European firms operating in this industry are headquartered outside the EU.[65]

Digital Services

Unlike previous technological revolutions, the one currently underway relies on software as much as hardware. Artificial intelligence (AI) alone will determine the prosperity or downfall of entire industries and will have a tremendous impact on the physical and economic security of citizens. Its application will expand to numerous areas, ranging from traffic control to medical diagnosis. It is projected that from now until 2030, the global AI market will experience an annual compound growth rate of more than 30%.[66] Yet, despite its importance, the EU is lagging behind China and the US in the AI race. Europe only accounts for 7% of global AI patenting and 22% of the global AI software market, which is half of the US's share.[67]

The EU is also falling behind in cloud and edge computing, which are expected to be key elements of the business models of 75% of European companies by the end of this decade.[68] Today, only 14% of the cloud services used in the EU are produced by EU companies, and less than one-tenth of the data generated by Europeans is stored on European soil.[69] The **same applies to digital commerce and its associated services.** European companies control less than 25% of the marketplaces and 10% of the digital payments used in the EU.[70]

Other future vulnerabilities can be found in the fields of quantum technology and cybersecurity. The US is the global leader in both, well ahead in private-sector initiatives, patent acquisition, start-up establishment and investment. China is closing in fast. Meanwhile, the EU holds only 14% of the global quantum technology market and 13% of the world's leading cybersecurity firms.[71] And it has no production of key components, such as high-resolution cameras and superconducting magnets.[72]

If nothing is done, the EU could lose the race in many of these technologies, thus acquiring new strategic vulnerabilities and missing out on major economic opportunities, particularly in those digital services that, unlike other industries, tend to create "winner-takes-all markets", which leave little or no room for the second or third players.

Raw materials and semi-processed goods

No matter how much we digitalise our economy, its foundations will still be material. Thus, to successfully undertake the green and digital transitions, the EU will need to consume a significant quantity of specific raw materials. Among others, it will require increasing quantities of lithium, boron and rare-earth elements (REE) to produce batteries, electric motors and medical devices. Likewise, the EU will need more magnesium, cobalt and silicon to manufacture semiconductors, computing components and solar panels; and substantial amounts of platinum group metals for the production of electrolysers and medicines.

This projected demand poses an immense challenge to the EU for three reasons. First, because Europe accounts for less than 7% of the world's production of these critical raw materials and relies almost exclusively on imports from the Global South.[73] Second, because deposits of these materials are highly concentrated in a few countries that act as quasi-monopolistic suppliers. For example, the EU imports 79% of its lithium from Chile, 97% of its magnesium from China, and 99% of its boron from Turkey.[74] Third, because it is estimated that global demand for many of these materials will multiply more than fivefold in this decade.[75]

In addition, the EU might also face growing competition to access other raw materials and semi-processed goods that will be essential for ensuring its future food security. For starters, the EU could suffer from a scarcity of chemical fertilisers and the raw materials needed for their production, despite the increasing use of organic fertilisers associated with the expansion of organic farming. The EU is dependent on phosphorus, 86% of which is imported from Kazakhstan and Vietnam; phosphatic fertilisers, mostly sourced from North Africa; and natural gas, needed to produce ammonia and nitrogen fertilisers, mainly imported from Algeria and Russia. Without these components, the productivity of European agriculture could be seriously compromised.[76]

The EU could also face supply difficulties in agricultural products used to produce animal feed, such as soybeans and oil-cake (solid residue after extracting the oil from seeds).[77] Every year, its livestock sector requires nearly 300 million tonnes of plant-based feed, of which over three-quarters are imported from non-EU countries – mainly Brazil, Argentina and the US. In fact, only 3% of the EU's agricultural land is given over to producing vegetable proteins for animal feed, and the production of these crops is likely to be affected by more frequent droughts and limited water availability.[78]

Finally, the EU may also struggle to obtain certain commodities that are critical for its healthcare sector. This includes **enriched uranium, and target materials** such as Oxygen-18 and

Ytterbium-176, required to produce medical isotopes, which in turn are crucial for diagnosing and treating cancers, Alzheimer's, Parkinson's and heart diseases.[79] The EU is also highly dependent on **blood plasma**, the demand for which is projected to rise at a compound annual growth rate of 9.4% until 2030 due to ageing demographics and the rising prevalence of immunodeficiency disorder. [80]

Similarly, the EU could face challenges in accessing certain basic **Active Pharmaceutical Ingredients (APIs) and precursors** that are essential to produce ibuprofen, and common-use antibiotics like amoxicillin. When considering APIs with a CEP (Certificate of suitability to the monographs of the European Pharmacopoeia), only one-third of such certificates are held by European manufacturers. For one-sixth of the APIs for which information is available, there is no European production at all. What is more, China and India hold over 50% of all CEPs, and it is estimated that more than 70% of API precursors are sourced from these Asian countries.[81]

In conclusion, the EU faces numerous potential vulnerabilities that, if not addressed, could seriously undermine its economic security, social welfare and freedom to defend its values and interests globally. What needs to be done?

THE EU'S RESPONSE: OPEN STRATEGIC AUTONOMY

Over the past few years, an understanding has emerged among Member States regarding the need to strike a new balance between resilience and competitiveness, as well as between assertiveness and rules-based cooperation to allow the EU to tackle its economic vulnerabilities while maintaining its role as a global actor. This understanding has been defined under the concept of "Open Strategic Autonomy" (OSA), which is accepted as an imperfect yet useful reference by nearly all Member States, and which is loosely defined by the Council of the European Union as the "capacity to act autonomously when and where necessary and with partners wherever possible".[82]

Several policy actions have been undertaken or announced under the OSA framework. These include significant regulatory, fiscal and structural measures intended to protect the Single Market from foreign interference and predatory practices, ensure the EU's security of supply and technological leadership in sensitive sectors, and strengthen its trade and political influence in the world.

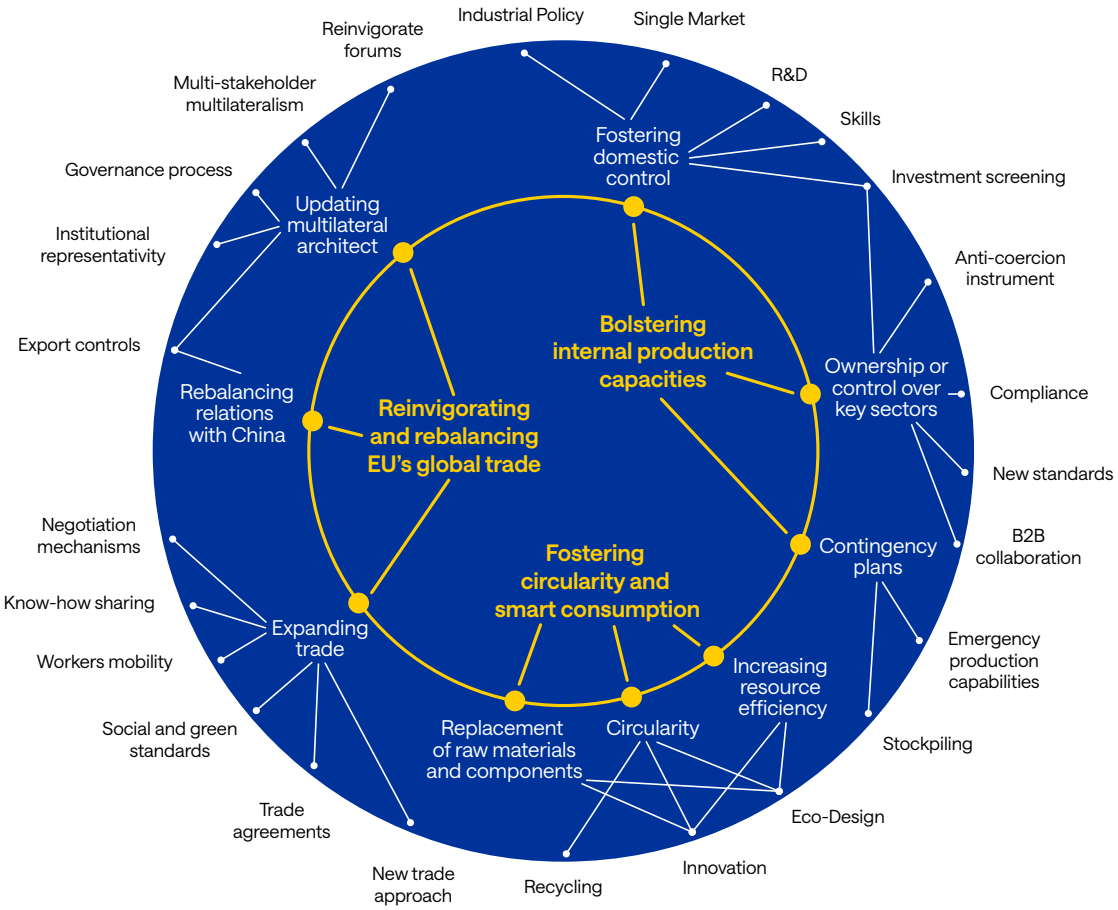
What we need now is a comprehensive framework that allows us to transform this OSA concept and the ongoing measures into a true future-oriented strategy for the EU. Suggesting a blueprint for such a framework is the primary goal of this non-paper. Building on the agreements reached by European leaders at Versailles in March 2022, the seminal work of the European Commission, the knowledge of the 27 Member States and the latest academic research, **it presents a comprehensive, balance and forward-looking OSA strategy to ensure the economic security of the EU and its global leadership by 2030 in four critical sectors (energy, digital technology, health and food).**

	Nine lines of actions are identified:
Bolstering and securing internal production capacities	1. Fostering domestic production of key goods, services and raw materials 2. Monitoring and limiting foreign ownership or control over strategic sectors and infrastructures 3. Setting contingency plans to respond to future shortages
Enhancing circularity and smart consumption	4. Enhancing resource efficiency 5. Fostering circularity in economy and society 6. Replacing raw materials and components by more accessible alternatives
Reinvigorating global trade and the multilateral system	7. Launching a new trade expansion 8. Rebalancing economic relations with China 9. Leading the renovation of the multilateral architecture

The proposal is based on the following ideas:

- The strategy should reflect the agreements and interests of the 27 Member States.
- The pursuit of greater open strategic autonomy should not be pursued at the expense of other previously-agreed economic, social and environmental goals, but in coordination with them. By the same token, it should not be achieved by increasing the existing gaps between Member States, but by building a more cohesive and convergent EU.
- The solutions to the vulnerabilities of the EU lie in the future, not in the past. The focus should be on technological innovation and new evidence-based policies.
- It is necessary to overcome the false binary logic that often associates openness with vulnerability and self-sufficiency with resilience. The European economy, like any advanced economy, is deeply intertwined with the rest of the world. This interconnection is a source of risks but also the best way to address them.
- The global economy is not, and should not become, a zero-sum game. The EU will only thrive if the rest of the world prospers, and vice versa.
- There are no silver bullets to solve the vulnerabilities of the EU. What is required is a systemic approach that combines different solutions, leveraging the synergies between them, assessing their potential impacts and calibrating their trade-offs.
- Measures should be developed in a market-orientated manner, taking into account cost-effectiveness, technological development and fair competition. Governments must play a regulatory and facilitating role. But ultimately, it should be the private sector that takes the necessary steps to manage risks and ensure the resilience of its global supply changes.

Lines of action



BOLSTERING AND SECURING INTERNAL PRODUCTION CAPACITIES

The days of unchecked offshoring and blind reliance on imports are over. The EU needs to secure its economy to protect its citizens from future external shocks. To achieve this, it will be essential to bolster and secure the EU's internal production capacities by:

- **Fostering and scaling-up domestic production of key goods, services and raw materials.**
- **Monitoring and limiting foreign ownership or control over strategic sectors and critical infrastructures.**
- **Establishing contingency plans to respond to future shortages.**

1. FOSTERING DOMESTIC PRODUCTION OF KEY GOODS, SERVICES AND RAW MATERIALS

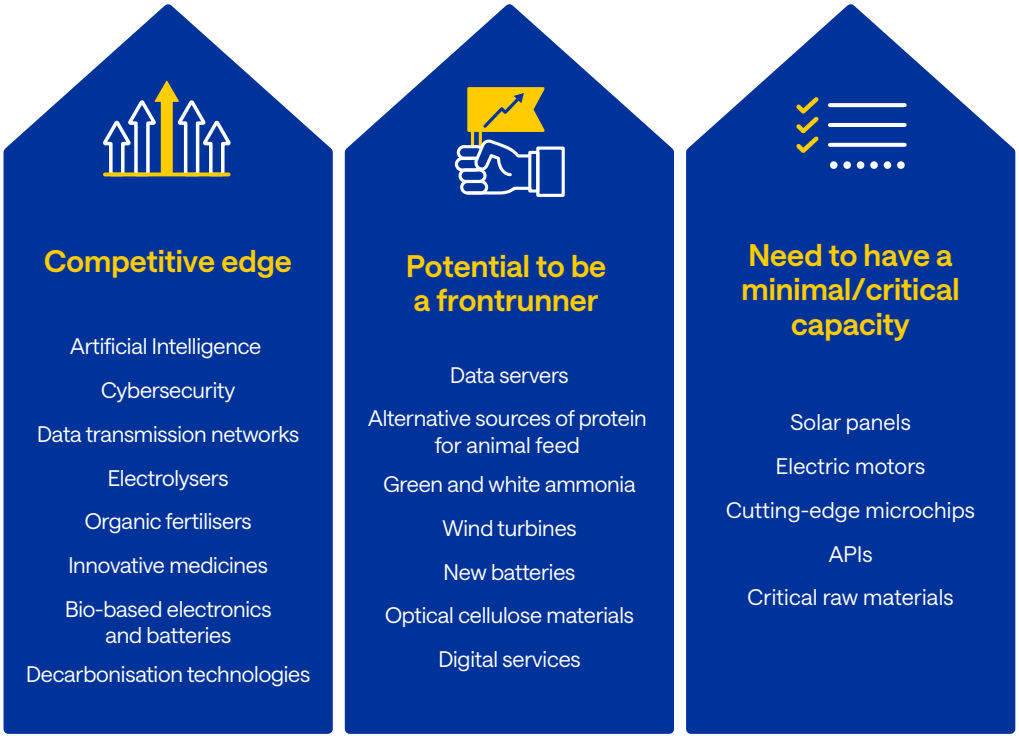
The world is experiencing a variety of technological, social and political changes that, if harnessed well, could help the EU to increase its competitive edge, strengthen its productive capacities and consolidate its technological leadership in this decade. Relative costs will continue to play an important role in companies' allocation decisions. But they will no longer be the only criteria. On the one hand, the increase in environmental and social demands will foster production on European soil, a region that is closer to consumers and leads the global race in sustainability and labour quality. On the other hand, the expectation of future geopolitical tensions will discourage offshoring movements and attract companies in search of economic stability, regulatory security and a non-polarising geopolitical position to the EU.

Moreover, the growing importance of digital services and advanced industries, rising environmental taxes and the adoption of technologies such as advanced robotics, AI and 3D printing will contribute to narrowing the production cost gap between Europe and many emerging countries. This reduction will be particularly evident in sectors that offer higher added value, where the availability of cheap labour is less important.

There is an understanding regarding the need to seize this opportunity to strengthen the EU's internal production capacities. However, **the key questions are: which ones exactly and how?** Having a clear and shared list of priorities is essential. The EU should not attempt to produce everything that it currently imports. There are areas where its capabilities are limited, hard or not worth expanding. Thus, the EU's future efforts should focus on enhancing the internal production of goods that meet at least one of the following three criteria: 1) the EU already possesses a competitive edge, 2) it has the potential to establish itself as a frontrunner, or 3) it needs to have adequate capacities as they are crucial for its future economic security.

As a general rule, this approach should focus on the production of goods with high added value and the potential to create high-quality jobs. There should, however, be room for it to encompass the internationally-competitive production of basic goods that are crucial for survival (for instance, medicines and active pharmaceutical ingredients), on the basis of high-tech production processes.

Enhancing Internal Capacity: Goods and Technologies



Based on these criteria, the following priorities are brought forward:[83]

First, the EU should enhance its manufacturing capacity for components and assembly of green technologies. For some technologies, this will entail increasing the European output of certain critical segments of the supply chain, including low-carbon silicon, polysilicon, wafer, cell production for **solar photovoltaics** and **battery components** like anodes, cathodes and membranes. For others, like **wind turbines**, the focus should be on scaling up existing technologies like offshore wind and creating capabilities with a more innovative and long-term outlook. Noteworthy examples include the development of alternative generators that reduce reliance on rare-earth elements, and superconductor-based generators.[84] For those Member States relying on gas, geothermal and nuclear energy, it will also be important to ensure the domestic production of the new generation of these technologies.[85]

As regards **digital technologies**, the EU should consolidate its pre-existing capabilities and foster its innovation efforts in next-generation solutions. Building on its considerable market share in the value chain of **data servers and storage**, the EU should step up its production of components like copper semis, epoxide resins and silicon carbide, and develop minimum strategic capabilities in assembly. The creation of green zero-emission data centres is a promising line of action.[86] To increase the resilience of **data transmission networks**, the EU should build additional cable system capacities, address the rising concentration of submarine cable ownership and ensure the successful deployment of 5G technology through public and private investment.[87] Finally, the EU should begin building capacities in **cutting-edge microchips,** including those with nodes as small as two nanometres and below, as supported by the European Chips Act.[88]

The EU should also improve its internal capacity in **digital services**, particularly in the fields of AI and quantum computing, and incentivise their adoption among companies and public authorities. Areas that could help achieve this include the creation of new Public-Private Partnerships, the promotion of open-source projects to facilitate technology transfer and the establishment of a European Agency of Future Tech to support start-ups, boost digital sovereignty and prioritise industrial applications in strategic sectors.[89] It would also be useful to further foster interoperability between digital goods and services, and to enhance synergies between digital services – for instance, by supporting the implementation of generative AI techniques in developing cybersecurity tools - or the use of digital twins for the design of new advanced materials and smart factories.[90] By the same token, the EU should boost its **connectivity infrastructure** through new terrestrial and submarine cables, but also satellites, Internet exchange points and data centres.

Other areas in which the EU needs to enhance its **minimum production capacities are mining, refining, reclying and the processing of critical and essential raw materials.**[91] Recent discoveries of REE deposits in Sweden, Finland and Greece, and the presence of lithium in Austria, the Czech Republic, Portugal, Spain and Germany, are just a few examples of the promising prospects for sustainable mining in the EU.[92] Implementing the investments identified by the European Raw Materials Alliance (ERMA) would enable the EU to meet 20% of its rare-earth magnet needs internally by 2030.[93] The expansion of mining should be coupled with the enhancement of **refining capabilities** to maximise the added value from the raw materials extracted. In the case of batteries, a refining capacity for lithium, nickel and graphite is feasible, and will considerably reduce supply risks for downstream manufacturers.

In the **agricultural sector**, the EU should focus on two priorities. On the one hand, reducing its dependence on chemical fertilisers.[94] The most effective way to achieve that would be by expanding **organic farming**. The second-best solution would be to strengthen the EU's **organic fertiliser production** in order to make European countries less dependent on foreign natural gas and phosphorus, improve soil quality and mitigate volatility in agricultural production costs. The EU currently holds a strong position in this area: it accounts for 25% of global production, and it has introduced a number of measures to encourage farmers to adopt sustainable techniques.[95] In the future, this industry could be scaled-up through the development of green, white and low-carbon ammonia, which are produced from green hydrogen, recovered waste streams and low-carbon hydrogen, respectively. Equally important would be to foster new smart and precise agriculture techniques, such as improved nutrient management, integrated pest management and biological alternatives to chemical pesticides.

On the other hand, the EU would have to **promote the domestic production of plant-based proteins** (soy, rapeseed and lupin) and **encourage the utilisation of alternative sources of protein for animal feed** in order to enhance the competitiveness and sustainability of its livestock sector. Projections indicate a substantial increase in soy and rapeseed production by 2030, without a significantly higher use of agricultural land.[96] In turn, the widespread adoption of leguminous, clovers, lucerne and vetches plants which are rich in foliar proteins as new sources of animal feed will be crucial to reduce our dependence on a limited range of crops.[97] Simultaneously, **on-farm production of animal feed should be promoted through financial incentives** for farmers.[98]

The EU should also promote the enhancement of its **pharmaceutical production capacity**, which has experienced a significant decline over the past two decades.[99] One priority should be the manufacturing of antibiotics, anaesthetics, haematological and oncological drugs,

vaccines and "less profitable medicines" that are needed to treat diseases like neurodegenerative disorders and paediatric cancers.[100] Another should be the **establishment of a green and sustainable ecosystem for API production**, [101] to which end it will be crucial to expand domestic capacities in nitration and fermentation in segregated plants to avoid the cross-contamination of penicillin. [102]

Ensuring the EU's health security will also require ensuring a **reliable and sustainable supply of the isotopes needed for radiopharmaceuticals.** For that, it would be advisable to update those enrichment facilities that are reaching the end of their lifespan, the construction of new facilities for electromagnetic and distillation and to foster the production of high-assay low-enriched uranium in line with the ongoing SAMIRA efforts.[103]

Beside medicines for human use, attention should also be paid to veterinary medicines, which could play a key role in combating future zoonoses or epidemic outbreaks.

Means to an end

To enhance the afore-mentioned strategic industries, the EU will need to deploy coordinated and sustained efforts on four main fronts.

1.1. Boosting innovation

For starters, the EU will need to position itself at the forefront of science and deep tech. This will require increasing public and private investment in R&D to reach the goal of 3% of GDP on a country-by-country basis.[104] It will also require enhancing knowledge development in academia and its transference to businesses, improving the management of intellectual property, enabling experimentation spaces, developing innovation-friendly regulations, fostering data sharing, increasing the availability of capital for start-ups and scale-ups in deep tech and creating regional innovation hubs all over Europe. *The New Industrial Strategy* and the *European Innovation Agenda* already mark the way forward.[105]

These innovation efforts should pay close attention to develop solutions that will reduce the EU's future vulnerabilities. They should respect the principle of technological neutrality, but they should also prioritize those solutions in which Europe has a competitive advantage. For instance, on the green technologies front, a specific priority should be to **increase efficiency and extend the lifespan of solar panels and electrolysers, while also improving the processes to recycle them**. For instance, the EU should support the development and optimisation of perovskite solar cells to make them more commercially viable and competitive, and improve their resistance to harsh environmental conditions and durability.[106] An exemplary initiative making strides in this field is the *Clean Hydrogen Partnership*.[107]

There is also tremendous potential in exploring **incipient energy storage solutions**. These include technologies like solid-state and sodium-ion batteries (particularly important for electrifying heavy transportation), thermochemical heat storage (as an alternative to fossil fuels in heating systems), hydrogen banks, and long-duration options such as flow batteries, green hydrogen, pumped hydro storage and compressed air energy storage.[108] In addition, the EU should make an effort to enhance its capabilities in carbon capture techniques, as stated in the *Net Zero Industry Act*.[109]

Another promising line is the development of the bio-economy and the **bio-based materials,** which can reduce the EU's foreign dependencies while acting at the same time as a carbon sink to fight climate change. The biggest potential is for the replacement of non-critical parts and the production of new alternative components, such as bio-plastics and batteries with lignin from trees.

In digital technologies, the EU could achieve leadership in generating smaller and faster **chips** and reinforce its capacities in chip design, manufacturing and packaging, as suggested in the *European Chips Act*.[110] In parallel, it should accelerate the development of the **Quantum Communication Infrastructure** (QCI) and leverage innovative solutions like **End-to-End Encryption** (E2EE) to ensure secure communications and safeguard against unauthorised access.[111]

Technological advances in the **miniaturisation of materials** could play a vital role in decreasing the overall demand for critical raw materials in the production of electronic devices. **Discovering substitute materials** that can effectively replace existing raw materials without compromising their properties is another important area of focus in order to replace permanent magnets used in electric motors or to develop low- or zero-PGM (Platinum Group Metal) catalysts for fuel cells.[112]

In the agricultural sector, innovation should pursue the **development of alternative methods for large-scale animal feed production**, including legumes adapted to forthcoming climate conditions, insect proteins and fat, microalgal biomass and single-cell proteins, which utilise biotechnology to convert CO2 into protein for animal feed. In addition, it would be good to pursue manure management practices to improve soil nutrients, as well as to effectively convert wastewater sludge and manure into valuable fertilisers.[113] Finally, further enhancements in smart and precision farming technologies, such as drones, state-of-the-art sensors, and oil microbiome tests are essential to minimise fertiliser use, improve soil quality, prevent water pollution and promote the reduction of water consumption.[114]

Increasing R&D investments in the **production of green APIs and key starting materials**, as well as improving the sustainability of excipients and packaging materials used in pharmaceutical production will enable us to reduce our vulnerabilities in the supply chains of pharmaceuticals while also mitigating our carbon footprint. Also, decisively investing in the R&D of new pharmaceutical products and advanced therapies, in which Europe is lagging behind vis-à-vis China and the US, will help cope with the rise of such illnesses as cancer, maintain Europe's competitiveness in the pharmaceutical industry and ensure affordable access to innovative medicine by EU citizens.[115]

1.2. Revitalising industrial policy

Fostering the development of some of the afore-mentioned solutions will likely require close collaboration between the public and private sectors, particularly in a context in which most of the world's largest nations are deploying massive subsidy programmes that need to be counteracted. The EU's industrial policy must therefore step up and fight for European interests, following four fundamental principles. First, this **industrial policy should aim to strengthen the EU's technological global leadership by promoting the development of key competitive advantages in innovative and knowledge-intensive ecosystems**, with a focus on ensuring their sustained development beyond the specific policy's duration. Targeted interventions will be key to preventing unintended negative consequences for the economy, such as capital misallocation or decreased competition in product markets.

Second, **the EU's industrial policy should be framed to stimulate competition** whilst minimising any distortions on overall competitiveness. Research shows that, while State aid may be suitable for achieving industrial goals, it can also lead to negative spillover effects, such as productivity losses, detrimental trade practices and potential retaliation measures, acting as de facto tariffs.[116] To avoid them, European industrial policy should aim to keep State aid based on competition and open markets with effective rules that guarantee a level playing field, steering clear of simplistic temptations that stem from protectionism and market distortions.[117]

Third, the **EU's industrial policy should be implemented according to European, rather than national, logic**. This means that the reindustrialisation process should not exclusively consider criteria like economies of scale or the pre-existing capabilities of certain territories, but also factors such as balanced regional development and fairness, and the need to foster economic, social and territorial convergence. The risk of a subsidy race between Member States should also be minimised. The excessive loosening of State aid rules could lead to an uneven playing field in the Single Market and to a widening gap in the economic and technological capabilities of Member States.

Fourth, it should be structured in a way that **incentivises private investment**. To enhance its industrial capacity, the EU will require significant amounts of public funding, both national and European. To ensure its availability, it will be important to streamline administrative procedures, reinforce some of the current common financing tools, and explore the creation of new ones. Nevertheless, it will be equally crucial to mobilize more private funding. One effective tool to achieve that could be the Important Projects of Common European Interest (IPCEIs). National IPCEI funding and EU funding instruments should be combined to maximise investment and avoid unbalanced participation between larger and smaller Member States, while ensuring compliance with relevant financial and competition rules, and promoting the participation of SMEs.[118]

1.3. Developing the integration of the Single Market

Strengthening the Single Market is a prerequisite to improving the EU's long-term competitiveness and economic resilience. This is true for two reasons. First, because this would provide European businesses with opportunities to scale up on a genuine level playing field, promoting synergies between different regions and the creation of European value chains. Second, because a robust Single Market would help the EU to establish global quality standards in areas like environmental protection, human rights and fair competition.

To achieve further integration, it will be necessary to **enhance regulation**. The EU has a unique set of pioneering rules and standards designed to combine market efficiency with individual protection that could become a reference for the rest of the world and provide a major competitive edge for Member States. But in order to fulfil this purpose, regulations need to be improved. The Single Market needs to have a common, clear and consistent legal framework that encourages cross-border activities, allows innovative European industries to scale up and creates legal certainty for investments. To achieve this, the EU should rationalise its regulatory deployment, unify standards, overcome existing overlaps and contradictions, simplify bureaucratic procedures, ensure the predictability and stability of rules and harmonise enforcement and governance mechanisms. Instruments on Better Regulation should be consistently applied, paying close attention to both ex-post evaluations of existing legislation and ex-ante impact assessments of new legislative proposals at an EU level.

It will also be necessary to create more favourable conditions for transnational investment. In this regard, access to venture capital available across the EU should be facilitated by completing the Banking and Capital Markets Union, and tools like the *Critical Raw Materials Act* and the *Net Zero Industry Act*, which can contribute to stimulating the availability and the scaling-up of key materials, technologies and services across all 27 Member States, including the removal of obstacles to cross-border trade.[119]

Another priority should be establishing new rules and **truly cross border European data spaces** in order to foster R&D and improve evidence-based policy design and decision-making among national governments and businesses. Initiatives like the European Health Data Space should be replicated in as many areas and with as many stakeholders as relevant.[120] By the same token, the EU should strive to make e-Government services more integrated at a European level, fostering the use of European Digital Identity Wallets and various electronic trust services, and emphasising the "digital by default" approach.

On the energy front, it will be essential to achieve an effective **European Energy Union** by adapting regulations, expanding and modernising its infrastructure and increasing interconnections beyond the agreed 15% electricity interconnectivity target for 2030.[121] If the EU wants to ensure its energy security and competitiveness, it needs to develop a European Smart Grid and a European Hydrogen Network that enable sharing the electricity and hydrogen generated across the Continent, combining the different energy mixes of Member States, and capitalising the time difference that exists in demand peaks between the East and the West. Increasing its energy efficiency will be also crucial.

On the **healthcare front**, it will be essential to reinforce the EU's supply chains, ensure access by all Member States to pharmaceutical products and strengthen the joint procurement of medicines at an EU level, using the opportunity created by the Pharmaceutical Strategy.

Finally, it will be crucial to ensure **solidarity obligations among Member States** and the proper functioning of the Single Market in times of emergency. Episodes like those experienced during the early weeks of the pandemic, where some Member States prohibited the export of medical supplies to others, should not be repeated. To prevent these situations, future contingency plans should clearly outline the measures and conditions under which "solidarity" among Member States, as stated in EU legislation, can be requested and constitutes an obligation.[122] They should also prohibit unjustified export restrictions.[123]

In addition to furthering the integration of the Single Market, the EU should work to expand it. In this sense, the **future enlargement of the Union** is expected to play a prominent role in increasing the EU's economic security, reducing its dependencies, and strengthening its global position.

1.4. Improving human capital

By 2030, the EU is expected to experience a decrease of 3.6 million working-age people due to demographic ageing.[124] This reduction could lead to intense labour shortages and pose a significant challenge to the future development of European industrial capabilities. For instance, it is estimated that the green transition will require over 800,000 new workers by 2030 compared with a business-as-usual scenario,[125] and the Digital Decade strategy will demand over 20 million ICT specialists in Europe in this decade alone.[126]

To meet this demand, the EU will have to act on two fronts. On the one hand, it will have to boost its ability to educate, upskill and re-skill its population, both at VET and higher education levels.

Particular attention should be given to training professionals throughout the value chain of green energy and low carbon technologies, semiconductors and medical devices, but also professionals that master advanced therapies and sustainable farming techniques.
On the other hand, the EU will need to increase its ability to recruit foreign talent from beyond European soil. At present, many Member States already heavily rely on non-EU foreign-trained workers to maintain activity in sectors such as healthcare and agriculture.[127] By 2030, these migrant professionals will be even more crucial to address generational replacement.[128]

Trade-offs: anticipating and tackling potential negative effect

The relocation of a part of current production back to European soil will be beneficial in many dimensions; however, this will also come with additional costs and potentially negative consequences that must be minimised.

In **economic** terms, reshoring efforts may result in suboptimal resource allocation and decreased competition in the global market, thereby undermining incentives for productivity improvements and innovation.[129] The pursuit of greater production autonomy could result in price increases due to the adoption of stricter quality standards, regulatory compliance, the influence of workers' bargaining power and rising production costs and raw materials. These factors could directly impact affordability by reducing domestic consumption and fixed investment, which in turn has a disproportionate impact on low-income households and small firms.

Alongside concerns about competitiveness, certain specific changes in production processes could also generate productivity losses. For instance, the transition from mineral to organic fertilisers could adversely impact field productivity, reduce supply and further exacerbate the spiral of price increases. Furthermore, the reduction in external exposure through increased domestic production could result in unintended consequences, potentially increasing the vulnerability of economies to disruptions in domestic supply and demand.[130] For this reason, it is crucial to promote substitutability and diversify supply sources within the EU while actively seeking reliable partners overseas.

The increase in internal production also raises concerns about potential **environmental degradation**. Despite stricter environmental regulations in the EU, the internal production of certain strategic goods could still result in increased air pollution and environmental harm. Implementing renewable energy sources like wind turbines and solar photovoltaic technology can also have adverse impacts on landscapes, biodiversity, water consumption and land use in certain territories.[131] In addition, the increased cultivation of some crops like soy and rapeseed poses environmental challenges due to their high water requirements. [132]

Finally, there are also **several social challenges** that may give rise to local unrest, influenced by a range of factors. The loss of purchasing power due to potentially higher inflation and the growing automation of domestic production processes due to technical progress and labour shortages could contribute to economic uncertainty and job insecurity, heightening social tensions. Moreover, the development of renewable energy projects and mining in certain territories could generate a sense of comparative grievance in the territories they are undertaken.[133] For instance, while major cities consume significant volumes of energy and natural resources like water, the implementation of renewable energy infrastructures primarily occurs in rural areas, widening the rural-urban divide and creating a sense of inequity.[134] Finally, another source of discontent may

arise from the challenges faced by certain sectors in achieving climate neutrality goals while maintaining the profitability of their businesses. A prime example of this is the agricultural sector.[135] This requires the EU to work towards ensuring that the development of internal capacities is not only environmentally sustainable but also socially sustainable.

Of course, all the afore-mentioned threads could be avoided or overcome. Renewable energies can be deployed without harming ecosystems and local communities. Sustainable and competitive agriculture can be achieved through circularity and innovation. The right policies could help to tackle inequality, support vulnerable sectors and guarantee a socially fair transition for all European citizens and territories.

2. MONITORING AND LIMITING FOREIGN OWNERSHIP OR CONTROL OVER STRATEGIC SECTORS AND CRITICAL INFRASTRUCTURE

Over the past three decades, the economic openness of the EU has attracted thousands of foreign companies into the Single Market, some of which have gained a significant presence in critical sectors. For instance, these companies provide 84% of cloud services, 75% of e-commerce, and 90% of digital payments used in the EU.[136]

The presence of foreign companies becomes particularly evident when looking at the European critical infrastructure map. The EU relies on a vast network of infrastructure that extends from the depths of the seabed to outer space, and includes assets such as data and electric grids, gas pipelines, refineries, storage facilities, wind and solar farms, ports, airports, railways, roads, hospitals, laboratories, cloud centres, telecommunications antennas, satellites, desalination plants and dams. Many of these infrastructure facilities are now partially in the hands of foreign companies. Ports are a prime example of this: China has stakes in 7 out of the 10 largest ports in the EU and handles about 10% of Europe's shipping container capacity.

The significant presence of foreign companies poses two challenges for the EU. **The first concerns security**. Foreign firms could leverage their position to gain access to sensitive information, put Member States against each other, coerce the EU into advancing their economic and policy goals, and ultimately disrupt vital telecommunications, energy systems and supply chains in the event of a conflict with their home countries. This risk is particularly high in the case of digital services, which could be shut down in a matter of seconds.

The presence of foreign companies also poses a challenge to the industrial development of the EU. There is a substantial body of research that demonstrates that the dominance exerted by big tech, energy and food companies in the US has resulted in less innovation, higher prices for consumers, lower wages for workers and reduced entrepreneurial activity.[137] The danger now is that this same pattern could happen in the EU, at a time when these things are more necessary than ever.

Nevertheless, against this background, the enormous benefits that the presence of foreign companies brings to the EU should be considered. In the last decade alone, these firms have created over 24 million jobs, accounting for 16% of today's total employment in the EU.[138] They help train workers, giving them access to knowledge and experience that they could not find elsewhere.[139] They provide European companies, governments and the self-employed with access to highly advanced goods and services that they need to remain competitive.[140] And, in many cases, they also serve as catalysts for innovation and entrepreneurship, fostering the development of start-ups and the growth of SMEs around them.[141]

Moreover, it is important to realise that the presence of foreign companies is an inevitable consequence of commercial reciprocity. A reciprocity that is essential for maintaining an open international economy and that, in general, is highly advantageous for the EU. This is particularly true in the case of the US. American big tech companies dominate the European market. But it should not be forgotten that, in the bigger scheme of things, the EU has a trade surplus in goods of 150 billion euros with the US.[142]

It is therefore in the interest of the EU to preserve the presence of foreign companies, and even leverage its strategic advantages to attract new companies. At the same time, however, the EU should endeavour to mitigate risk by **gradually limiting the dominance of foreign companies with links to non-like-minded countries in strategic sectors and critical infrastructures.** This could be accomplished through the use of regulation, strengthening tools such as the common framework for FDI screening and the new rules for ensuring resilience of critical entities. **However, this should primarily be attained through competition, respecting the principles of the rules-based international order and fostering the development of European companies in these critical sectors.** To that end, it is important to ensure that large foreign companies operating in the Single Market become facilitators of European innovation and entrepreneurialism, rather than hindering it.

At the same time, the EU should raise security and predictability requirements in conformity with WTO rules for those foreign companies providing strategic services, for instance, by expanding cyber proofing standards. When doing so, the EU should be cautious not to hinder the development of European SMEs. Some of the legislation introduced in the past with the aim of impeding the growth of foreign leaders ended up harming EU companies, which tend to have fewer resources and compliance capabilities.[143]

3. SETTING CONTINGENCY PLANS TO RESPOND TO FUTURE SHORTAGES

Even if the EU reinforces its internal production capacities and secures its critical sectors and infrastructure, it will always be exposed to a certain level of risk. No European government can prevent a natural disaster, armed conflict or accident from disrupting global supply chains hundreds of kilometres from its borders. However, what they can do is prepare for it. That is why it is important for the EU to reinforce the structural efforts mentioned above with the development of comprehensive contingency measures.

Over the past two years, the European Commission has launched important initiatives on this front, implementing new tools and plans to guarantee access to essential goods and resources in times of crisis.[144] In the future, they should be reinforced through the development of other responses.

One of these responses could be **the establishment of common strategic reserves**. There was a time when companies used to maintain ample stocks of raw materials and components; unfortunately, the desire to reduce costs put an end to this practice. It might now be time to partially recover this practice. The EU has the RescEU reserve, which includes emergency-related items such as firefighting planes, field hospitals and basic medical supplies, and HERA is now seeking to reinforce this with critical medical countermeasures.[145] However, the variety and quantity of these reserves are very limited. Therefore, it would be prudent to expand these reserves at an EU or country level and on a voluntary basis to also include critical raw materials, technological components and energy resources that are beyond Europe's production capacities – as is already done with oil and gas stock-holding obligations. These reserves should be located in such a manner that they are easily accessible to all Member States.

Moreover, the EU should encourage and support Member States to develop both common and national contingency production capacities that ensure a minimum supply in times of crisis. Some of these capacities could be set up permanently and receive public support from national governments or EU institutions in the form of tax exemptions or public procurement contracts.

The EU should also identify and develop production capacities that can be transformed or scaled upon demand. The pharmaceutical sector provides interesting examples in this regard. On the one hand, there is the Network of Ever-warm Production Capacities for Vaccines and Therapeutics Manufacturing (EU-FAB), an initiative launched by HERA, which reserves production capacities to manufacture vaccines when needed.[146] On the other hand, there is the "Evolutive Vaccine Facility," which is fully digitalised and capable of initiating the production of a completely new vaccine in under 15 days. Similar capacities should be developed to manufacture other essential goods that may experience temporary shortages during crises.

To successfully design and update these measures, Member States and EU institutions should reinforce their **strategic foresight** capabilities, their anticipatory governance mechanisms and their real-time monitoring systems.

ENHANCING CIRCULARITY AND SMART CONSUMPTION

The reinforcement of the EU's open strategic autonomy cannot be achieved while turning a blind eye to the environmental emergency that is gripping the planet. Rather, it should be achieved through a profound and coordinated response. Current production and consumption systems are unsustainable. Humanity has already trespassed 6 out of the 9 planetary boundaries;[147] it is emitting 40 billion tonnes of greenhouse gases every year that the atmosphere cannot absorb, and it is depleting natural resources at a faster rate than the biosphere needs to regenerate them.[148] If things continue this way, the global consumption of materials will double in the coming decades and waste generation will increase by 70%, posing a severe threat not only to European security but to humanity as a whole.[149]

Therefore, it is crucial for the EU to align its search for greater economic security with a far-reaching transformation of its production systems by:

- **Increasing resource efficiency.**
- **Fostering circularity in the economy and society.**
- **Substituting current materials with more sustainable alternatives.**

4. INCREASING RESOURCE EFFICIENCY

Over the past three decades, the EU has significantly reduced its consumption of natural resources despite the fact that its population and economies have grown. For instance, its raw material consumption has decreased by 14% since 2000, its overall household energy consumption has dropped by 5%, and its use of nitrogen fertilisers has seen a reduction of 13% during the same period.[150] Europeans have been learning to do more with less for decades. Today, we have the technology and knowledge required to achieve even greater productivity gains in our strategic sectors.

Consider the energy field. Estimates indicate that just by deploying already available technologies (such as renewable and efficient heating and cooling systems, building insulation solutions and smart-home applications), the average European household has the potential to reduce its energy consumption by 18% by 2030.[151] This means that, through this approach, the total energy consumption of Member States could be lowered by 5% to 7% in this decade alone.[152]

And that is just the tip of the iceberg. The conversion of the current fleet of internal combustion vehicles into electric and fuel cell-powered vehicles, coupled with a shift towards more public

transport and active mobility, along with improvements in urban transport planning, could contribute an additional reduction of 25% by 2030.[153] Likewise, the adoption of new production methods in the steel industry (e.g. electric arc furnaces) and the capture and reutilisation of carbon in the petrochemical and other emitting industries could lead to energy reductions of up to 16% by the end of the decade.[154]

In short, the possibilities are immense. Accordingly, the EU should increase its support for this kind of intervention as part of its strategic toolbox, and raise its current energy reduction targets for 2030,[155] as recently suggested by the Council and the European Parliament.[156]

Productivity gains could also be monumental in our agri-food sector. In the EU, there are already hundreds of organic, vertical or automated farms that employ new crops, robots, drones, sensors and satellites to enhance their irrigation, fertilisation and harvesting processes.[157] They are capable of producing vegetables using much less water and fertiliser than traditional systems.[158] And breed healthy cattle with a quarter of the antibiotics of conventional large-scale holdings.[159] Our priority for the coming years should be to expand these smart and sustainable farming techniques. This will assist in reducing the EU's external dependencies and counteract the potential decline in agricultural productivity caused by climate change and the increase in forestry and urbanisation.[160]

We could also achieve major efficiency gains in the healthcare sector by speeding up the modernisation of our hospitals with the next generation of medical tech. Consider, for instance, the case of MRI scanners. Today's devices require a regular supply of 1,500 litres of helium to function, a material that is only found in a limited number of countries such as the US, Qatar and Algeria. However, there are already new models that only require 7 litres.

In addition to enhancing the efficiency of their production processes, Europeans must also reduce waste. This does not imply embracing those "degrowth" theses that advocate a reduction in global production as the sole path to achieving environmental sustainability. Rather, it involves addressing the numerous areas in which our countries employ raw materials, energy, space and human resources to produce goods that are either unused or misused.

Take the case of the healthcare industry. People and livestock in Europe are overmedicated, meaning that sometimes they consume more medicines than they actually need. For instance, it is estimated that 10% of EU citizens take antibiotics without a prescription.[161] A significant reduction in these percentages would allow us to save millions of medication doses annually, which would, in turn, yield numerous economic and health benefits. To achieve this, we must prescribe more accurate dosages, foster the implementation of AI-based diagnostic systems, encourage the use of wearables and implanted devices in our national healthcare systems, and prioritise preventive medicine treatments over long-term symptom management.

A restrictive approach should also be taken in the **veterinary field**. Estimates are that, in the EU, animals receive one-third more antibiotics than the recommended amount.[162] In the last three years, approximately one third of the 50% reduction target of veterinary antimicrobial sales for 2030, established in the Farm to Fork Strategy, has been achieved. Nonetheless, further efforts must be maintained and stepped up in order to achieve the afore-mentioned 50% reduction target.

Greater efficiency should also be sought in the food sector. Every year, 59 million tonnes of food are wasted in the EU.[163] Around 10% of this food waste occurs in primary production, where farmers often find themselves forced to let their crops rot to prevent oversupply and maintain fair prices. This constitutes a huge loss for producers, companies and households, a serious

misuse of valuable natural resources like water, and a serious threat to the climate that accounts for nearly one tenth of global greenhouse gas emissions. However, today we have both the means and the incentives to put an end to this waste. The EU should actively promote the development of databases and digital tools that allow farmers to anticipate harvests and gain insights into market trends and demand. Even more crucially, it should facilitate the distribution of surpluses across the Single Market and beyond, encourage the consumption of local and seasonal products, and assist farmers in transitioning from crops prone to oversupply to those for which EU production remains insufficient. [164]

The remaining 50% of food waste comes from households.[165] To reduce this, the EU should enforce regulations requiring food retailers to provide consumers with clear information on proper storage requirements, accurate expiration dates and recommended portion sizes.[166] It should also actively promote more responsible consumption habits among citizens, and foster the development of mechanisms for collecting and reusing food, since unsuitable foodstuffs for human consumption are still suitable for animal feed production.[167]

Taken together, these and other measures will help us significantly reduce waste generation in Europe. And for the waste we cannot avoid generating, we must find ways to harness it.

5. FOSTERING CIRCULARITY IN THE ECONOMY AND SOCIETY

Each year, the EU imports over 250 million tonnes of metals from foreign countries to sustain its production processes.[168] Simultaneously, it generates a staggering 94 million tonnes of scrap, of which only 76% is recycled.[169] The rest is either dumped into European landfills (0.7%) or shipped back abroad (23%), predominantly to developing nations with lower environmental and social standards.[170] The same applies to many other raw materials and products consumed in the EU – from paper and cardboard to textiles, minerals and plastics.

The EU remains trapped in a linear model of consumption (extract, import, use and dispose) that is causing serious harm to the planet and increasing its dependency on third countries. We must abandon this linear model and embrace a circular approach, where products are reused, repurposed or recycled. By doing so, we would greatly reduce our foreign vulnerabilities and reduce our environmental footprint.

Achieving full circularity will not be easy. It will require fundamental transformations across all stages of the majority of our value chains – ranging from the initial phases of eco-design to the recycling of materials when products reach the end of their useful life. It will also entail developing new business models where services, rather than products, are commercialised [171] and establishing new mechanisms for transparency to ensure a competitive edge for circular material flows, similar to those being discussed in the context of the EU Battery Pass.

The good news is that the EU is taking significant steps to foster this paradigm shift. In recent years, the European Commission and Member States have approved and implemented various mechanisms and laws to foster circularity. They have also set ambitious recycling

targets, such as the requirement to collect at least 65% of electronic waste and 15% of critical raw materials by 2030.[172]

These efforts will have to be accompanied by additional cross-sectoral actions. **One crucial priority should be the development of mechanisms that enable the recycling of materials from existing green technologies in Europe.** The first generation of wind turbines installed on European soil is projected to reach it's the end of its useful life by 2030. Solar panels will endure a few more years, but they would also need to be disposed of eventually. It is therefore imperative for the EU to establish the appropriate collection, dismantling and recycling processes and ensure a fully-functioning intra-EU cross-border trade in waste and secondary raw materials. This will facilitate the reuse of rare-earth elements and other primary materials present in these devices, effectively meeting a substantial portion of future demand.[173]

In addition, it will be essential to **explore alternative and non-conventional sources of critical raw materials, including those obtained from extractive waste, old mining tailings and spoil heaps.** Promising initiatives include the recovery of iron, gallium and rare-earth elements from bauxite residues generated in the production of alumina, the use of internal combustion engines as a source of platinum for electrolyser manufacturing, the use of bacteria to recover rare-earth elements from industrial sewage or the recovery of iron, aluminium and copper from electronic waste.[174] By the same token, it will be crucial to recycle more commonly found materials that can be easily recycled. A good example of this is steel, which is extensively used in construction and is easy to recycle.[175] By using scrap steel instead of newly mined ore, we could reduce energy consumption by 75% and save approximately 90% of raw materials.[176]

The European agri-food industry can also become an immense source of circularity. Every year, it generates 6 million tonnes of waste, which causes severe environmental issues and high management costs.[177] However, today we have the technology to prevent this waste or to transform it into valuable resources, as set out in the "Moerman Ladder" framework. Agricultural left-overs can be used to produce animal feed, bio-based products and biofuels that may replace oil in our internal combustion engines in the near future.[178] Likewise, livestock manure can be turned into RENURE fertilisers that can substitute the mineral fertilisers we currently import, primarily from Russia and Egypt.[179]

Circularity can also fuel the medical industry. Between 3% and 8% of medicines sold in Europe for human use are wasted.[180] Part of this waste is managed through take-back programmes designed to ensure health and environmental safety. Unfortunately, only a tiny fraction is currently reused. This needs to change. Although the purity requirements for medicines pose a challenge for their second life, there are several recovery techniques with great potential.[181] For instance, some active pharmaceutical ingredients can be reused in new formulations through green engineering techniques.[182] On a different level, there are also methods to use radioactive waste to produce medical isotopes.[183]

Governments could support the development of the afore-mentioned circularity practices in various ways: directing public R&D towards eco-design and recycling, establishing realistic yet ambitious waste collection and recycling quotas for industries, providing incentives for companies to modernise their production processes, and promoting circularity in public procurement and in trade agreements with non-EU countries.[184] Schemes such as the deposit refund scheme, where a deposit fee is charged when purchasing a product with a container and refunded when the container is returned, should also be established at an EU level.[185] On the demand side, it would be good to establish trustworthy product labels that inform customers about reparability. These labels could contribute to shifting consumer preferences towards circular products.[186]

Ultimately, the goal should be to transform the European industrial arena into a symbiotic system in which the residues from one sector become a resource for others. This would reduce the EU's demand for non-renewable primary materials and decrease its dependency on imports, and it would help enhance environmental sustainability.

Such a paradigm shift could be achieved without substantially increasing costs or compromising the competitiveness of our industries. Becoming the first developers of circular production systems would provide our companies with a competitive edge, helping them thrive in a world where environmental concerns and greater pressure on raw materials are practically a certainty. In addition, circularity will create new sectors responsible for activities such as recycling, which, according to some estimates, could increase the EU's GDP by 0.5% and create 700,000 additional jobs by 2030.[187]

6. REPLACING RAW MATERIALS AND COMPONENTS BY MORE ACCESSIBLE ALTERNATIVES

In this world, almost nothing is irreplaceable. That includes most of the materials used in our production systems. They were selected decades ago, primarily based on cost considerations. But now, things have changed. New criteria have become relevant, the geopolitics have shifted, and science has dramatically expanded the range of possibilities. In the coming years, European industries will have to adapt to the new circumstances and use those opportunities to replace many of the materials currently used in their production processes with more available, safer and more environmentally-friendly alternatives. Governments will have to facilitate this transformation through incentives for innovation and the right regulations.

The possibilities are plentiful. Consider, for instance, **the energy sector**. In the short term, the lithium-ion batteries used in today's vehicles could, to some extent, be replaced by nickel-rich and lithium iron phosphate batteries, two technologies that are rapidly maturing and whose raw materials offer a broader supply diversification.[188] In the medium term, they could be replaced by solid-state batteries (which have a higher energy density and are made of common polymers, oxides and sulphites) and sodium-ion batteries might also become a major factor for energy storage. On a wider perspective, the use of hydrogen and pumped hydro-storage could help reduce the need for batteries and other storage equipment that consumes raw materials altogether.

By the same token, permanent magnets found in wind turbines, electric cars and heat pumps could be produced out of ferrite and aluminium, instead of rare earths. Alternatively, they could be entirely replaced by multi-polar synchronous generators, squirrel cage induction generators, and superconductor-based generators, which are currently being developed by the industry.[189] These changes will significantly reduce some of the EU's key foreign dependencies and make our energy ecosystem more resilient.

Similarly, in the **ICT sector**, there is a potential for replacing platinum, which is currently utilised in data storage and servers, with ceramic capacitor producers that employ nickel-based

electrode systems. These alternative materials not only offer cost-effective solutions but also alleviate the challenges associated with availability. Moreover, it is crucial to invest in reducing the dependence of data transmission networks on permanent magnets that contain rare-earth elements like dysprosium and terbium, which are predominantly concentrated in China. By decreasing or even completely eliminating reliance on such elements, we can enhance the sustainability and resilience of our ICT infrastructure.[190]

The same applies to our agri-food sector. Currently, the majority of plant proteins used to feed our livestock comes from soybeans, mainly imported from Brazil and the US, and rapeseed, produced in the EU but with a lower protein content. In the near future, a large share of these plant proteins could be replaced by the cultivation of legumes, which has a significant untapped potential in European farming. Another share could be replaced by algae, insects and microbes, three technologies that are already being used by the industry.[191] In fact, by 2030, European production of insects for animal feed is expected to reach 1 million tonnes, and the demand for algae is projected to increase from the current 270,000 tonnes to 8 million tonnes.[192] This means that at least 2% of animal feed consumed in Europe will come from these sources. The benefits of this change will be enormous. Algae, insects and microbes require lower land and water usage than traditional sources, and have the potential to transform food waste into nutritious feed.[193] What is now needed is to optimise their production processes and scale them up to make them competitive in terms of price. This will not only drastically reduce our dependence on imports but will also have the potential to generate between 40,000 and 63,000 direct jobs and €11.3 billion in annual revenue for the EU by 2030.[194]

REINVIGORATING GLOBAL TRADE AND THE MULTILATERAL SYSTEM

As much as the EU develops its internal capabilities and invests in circularity and efficiency, it will always depend, to a certain extent, on third countries. The more factories it has, the more it will need to import raw materials, components, innovation and talent from abroad, and the more important it will be to access foreign markets to sell part of its production. Moreover, it is worth noting that, in the coming years, the EU will have to face global challenges like climate change, migration and security that will require further collaboration between countries. That is why the EU cannot choose between reinforcing its internal capabilities and boosting its participation in global trade and governance; it has to do both.

To achieve the latter, it is essential to develop in three directions:

- **Launching a new trade expansion.**
- **Rebalancing economic relations with China.**
- **Leading the renovation of the multilateral systems.**

7. LAUNCHING A NEW TRADE EXPANSION

In recent times, buzzwords like "deglobalisation", "fragmentation" and "decoupling" have become commonplace in newspapers and round tables, and there has been an increase in the number of voices that consider that the EU should quickly transform its entire economy to prepare for this imminent scenario.

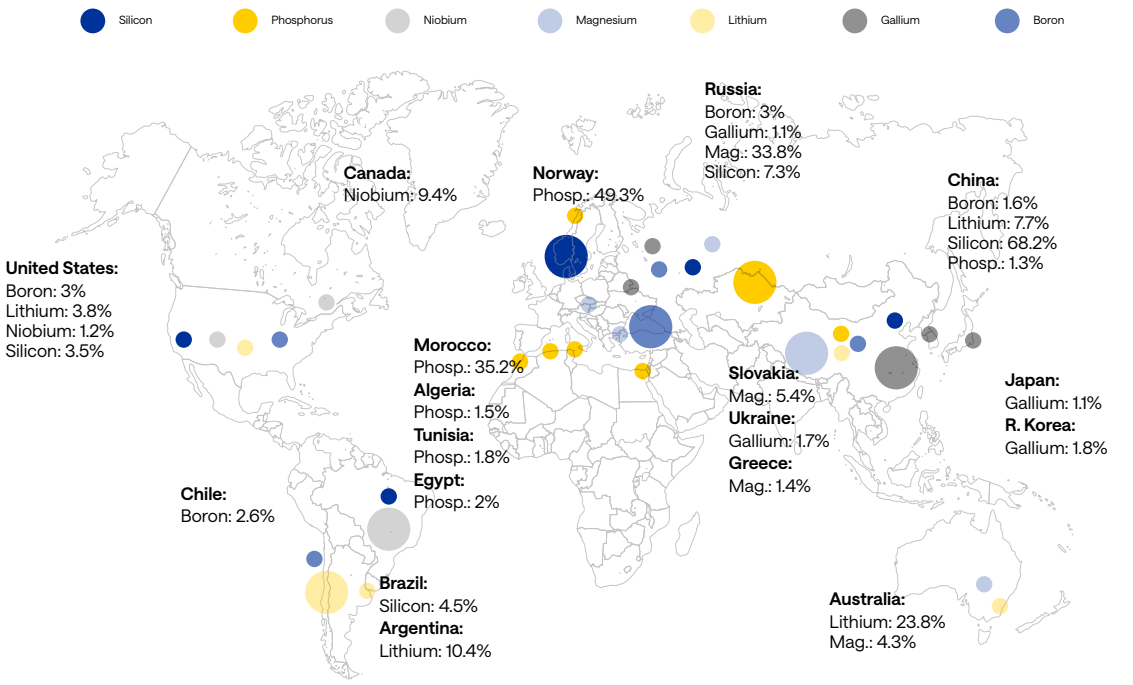
Nevertheless, the truth is, as we have already seen, that this doomist trend is nowhere to be found in the empirical evidence. The US and China are indeed becoming increasingly self-reliant – they have been doing so since the early 2010s. But data show that global trade flows are neither declining nor fragmenting into blocs of like-minded countries. More importantly, there are strong reasons to assume that they will not do this in the future either. First, because trade flows are already highly regionalised.[195] Second, because most economic actors have already expressed their intention to support global openness and not foster sum-zero competition.[196] Third, because most of the factors that spurred the expansion of global supply changes in the past continue to operate. Long-distance trade still contributes to specialisation and economies of scale. It still provides access to raw materials and labour that may be more expensive, scarce or simply unavailable in a given region. And it is still competitive in cost, since shipping rates are actually falling and green taxes are still low.

Thus, instead of just preparing the EU to survive in a fragmented world that may never materialise, the priority should be to prepare it to compete and prosper in a global economy that is certainly changing but that is by no means showing signs of exhaustion.

The window of opportunity is huge. On the one hand, the US is closing it by itself, raising its tariffs and stopping the establishment of new FTAs.[197] On the other hand, China's aggressive expansion to third countries is starting to be perceived as unbeneficial by many, due to its coercion practices, debt traps and the disregard by Chinese companies for local workers, communities and laws.[198] Meanwhile, the EU continues to be the largest trading agent in the world, and its model is becoming increasingly appealing to a majority of countries that do not want to increase geopolitical tensions and seek to improve the social and environmental conditions of their citizens. In fact, surveys show that, although the Global South tends to see the EU as a more limited actor than the US and China when it comes to mobilising investment and developing infrastructure, it considers it to be the best partner to establish fair, stable and mutually-beneficial trade relations, as well as to foster environmental and social progress in their own countries.[199]

The EU should seize this opportunity to launch a new trade expansion aimed at revamping its existing relationships and establishing new ones with a primary focus on like-minded and trustworthy partners. This includes natural allies of the EU, such as Australia, Canada, Japan, New Zealand, UK, the US and the Balkans and Eastern partner countries. But also other low- and middle-income countries in Latin America, Africa and Asia. The direct economic gains of these new relations may be modest at first. However, their contribution to the EU's interests could be enormous, since they could help reduce its foreign dependency by diversifying its sources of supply. After all, many of the raw materials and manufactured products that we currently import from a single country could be found or produced in other countries with which the EU has trade relations. For instance, the rare-earth materials that, at present, are mainly acquired from China, could also be acquired from Australia, Brazil, Canada, South Africa, Thailand and Ukraine.[200] The phosphorus that the EU currently buys from Vietnam and Kazakhstan also exists in Algeria, Mexico and Morocco. The APIs that the European pharmaceutical industry acquires from China and India could also be produced in Latin America.

Main suppliers (large bubbles) and potential suppliers (small bubbles) of critical raw materials for the EU (% of global mineral reserves)



Source: Author based on USGS [201]

The new trade expansion should be deployed on the basis of competitiveness and reciprocity, and in a smart way, amending past mistakes made by Europeans, taking advantage of the shortcomings of the Chinese and American models, and capitalising on the growing alignment that exists between European values and the needs and aspirations of a significant part of the world's population. In this regard, the EU should cast itself as a non-polarising and trustworthy agent that offers its partners a horizontal and mutually-beneficial relationship that would help them become more resilient, competitive, environmentally sustainable and socially advanced.[202]

Accordingly, the EU should devote more efforts to helping trade partners develop manufacturing and service industries, and not just primary activities such as agriculture and mining. Many low- and middle-income countries are tired of the exclusively extractive relationship that global powers have with them. They want their economies to modernise too, and the EU must become their best option to do so.

In that spirit, the EU should increase its technical and financial support for the enhancement of local capabilities, with the Global Gateway as its centrepiece, and expanding initiatives such as the TAIEX, the MAV+, the Twinning instrument, and the EU-LAC Digital Alliance to cover other critical areas.[203] Moreover, the EU should help those countries with critical natural resources to improve their refining and processing capacities, facilitating their integration into the value chain of key enabling technologies like batteries, as has recently been done with Namibia.[204] Similarly, the EU should extend its R&D collaboration with its trading partners, facilitating knowledge exchange, promoting voluntary technology transfer and fostering the creation of cross-regional innovation ecosystems.

Particular efforts should be devoted to increasing trade in digital services, in line with the EU's Digital Strategy. This sector shows great potential[205] and the EU is already leading globally in regulating and facilitating digital service flows. Continuing with this effort would allow the EU to earn a privileged position in areas concerning movement of data, e-commerce and investment which will be crucial in the future.[206] Progressing in the development of common frameworks for interoperability would also help foster more exchanges in areas such as the data economy and secure connectivity. In this regard, the notions of cyber-proofing and data free flow with trust are fundamental blocks to build upon.

One way to complement the EU's trade offer could be by offering partners ways to improve their human capital. Europe has the best educational ecosystem in the world and is the preferred place to study and work for the majority of citizens from the Global South. Meanwhile, the EU has a strong need to attract workers and students. This creates a potential win-win situation that should be explored. For instance, the EU could sponsor the creation of training centres in emerging countries, increase its temporary mobility agreements for workers and students, and facilitate travel and residence – particularly at university and VET levels. Programs like Youth Mobility for Africa and Erasmus+ are good examples to follow.

Furthermore, the EU should also **encourage greater participation in its trade relations with European and non-European SMEs**, which account for 85% of European exporters and 28% of global exports.[207] To achieve this, it would be advisable to better reflect the needs of SMEs in present and future FTAs, connect with business incubators worldwide, strengthen financing mechanisms such as the European Enterprise Network and facilitate bureaucratic procedures. For the latter, the EU could develop online tools to help SMEs obtain electronic certificates and acquire direct information on exporting SMEs through Access2Markets. It could also create help-desks in third countries to provide information and regulatory assistance to their local SMEs.[208]

Finally, the EU should leverage its globally-acknowledged ability to set rules and standards that combine market efficiency with social and environmental protection as an added value of its trade activity. Many countries need to enhance their standardisation and certification systems, and strengthen their regulation in fields such as environmental protection, food security, labour conditions, human health, data and emerging technologies. The EU should become a source of technical support and compliance pressure for them.[209] At the same time, it should back the "trade and sustainable development" provisions in its FTAs as a way to reinforce adherence to international treaties on labour rights and environmental protection.

To undertake this trade expansion, the EU would need to update many of its 46 FTAs and sign new ones, both multilateral and bilateral[210] – something important considering that over 60% of the EU's external trade still takes part outside of preferential agreements. These FTAs could be complemented with new model agreements[211] (like the Sustainable Investment Facilitation Agreements) and new sectoral partnerships, which can help achieve a similar purpose, without having to deal with the difficulties that come with FTA negotiations.[212] When deploying these new associations, priority should be given to like-minded countries, social rights and environmental sustainability. Nevertheless, we should carefully calibrate the conditionality of our FTAs in order to facilitate trade diversification and the mitigation of the EU's dependencies.

8. REBALANCING ECONOMIC RELATIONS WITH CHINA

China is the world's second largest economy, an industrial powerhouse, and the EU's largest trade partner in goods.[213] Yet, it is undeniable that the EU-China economic relationship has deteriorated in recent years. The EU trade in goods deficit has more than doubled (jumping from €182 billion in 2020 to €396 billion in 2022)[214] and its dependency on key Chinese raw materials and technology components has increased.[215]

This imbalance has not happened by chance. Rather, it is the result of a State-led Chinese strategy aimed at reducing the role of foreign trade and technology in its internal market while extending the global economy's dependence on China. Such a strategy has been stated by the Chinese authorities themselves and includes a broad set of aggressive measures: targeted tariffs and subsidies, selective opening/closure of sectors, forced technology transfers, violation of intellectual property rights, strong support for State-owned enterprises, discriminatory procurement policies and even interference in digital markets.[216] These actions are hampering European companies' access to the Chinese market, distorting reciprocity between these two economies, and threatening fair competition and sound trade worldwide.

Decoupling from the Chinese economy is not a viable or a desirable option for the EU. Nor is subscribing to the idea of a zero-sum game. On the contrary, it is in the world's best interest for the EU and China to have stable and fluid relations. However, in order to achieve this, the principles of transparency, predictability and reciprocity should be observed. Thus, China should eliminate the afore-mentioned distortions, guarantee compliance with international rules and standards, ensure a level playing field and open its market to European companies, so that the EU does not have to close its own.

The European Union has taken important steps to promote that change, dealing with China simultaneously as a partner for cooperation, an economic competitor and a systemic rival.[217] Among other things, it has adopted new tools to protect Member States from foreign economic coercion, to combat foreign subsidies that distort the internal market and to screen FDI flows related to strategic assets and infrastructure. In addition, it has developed industrial plans to cut dependency on Chinese and other foreign suppliers in some strategic areas.

In the future, these actions should be maintained and reinforced with others not particularly targeted at China, but at all countries. For instance, the EU could explore the possibility of creating a joint risk framework to control and restrict the export of certain sensitive technologies, and of establishing specific guidelines for research collaboration in higher education between the two regions, aimed at preventing unwanted knowledge transfer and the dual and unintended use of findings (e.g. military use of civilian technologies). The new European Economic Security Strategy successfully marks the way forward in this area.[218]

The EU should explore and deploy these measures with prudence, so they do not hamper foreign investment or undermine the integrity of the Single Market. **But it should also act with confidence, remaining faithful to its interests and values, and aware of its significant strengths.** After all, the EU accounts for more than one-quarter of the total FDI stock of China, as one of the largest foreign investors in the country.[219] There are entire sectors of the Chinese economy that depend on the know-how and technology of European companies, and the balance of trade in services is €21 billion in favour of the EU.[220]

9. LEADING THE RENOVATION OF THE MULTILATERAL ARCHITECTURE

One of the best ways for the EU to mitigate its future vulnerabilities and defend its interests in the world is to become a key player in improving the multilateral system. For decades, multilateral institutions have played a vital role in global governance, facilitating agreements, alleviating tensions between States and promoting economic and social development worldwide.[221] Nevertheless, in recent times, many of these institutions have fallen into a deep crisis, driven by a questioning of their legitimacy and effectiveness.[222]

The EU should advocate a reform of these multilateral institutions and play a leading role in it.[223] It should do so in pursuit of its own interests and by speaking with a single voice – "delivering as one to succeed as one".[224] Four priorities should be considered.

First, the EU should promote greater inclusivity in the system, so it better reflects the diversity of the international community. [225] Many emerging economies demand and deserve a stronger voice and participation in global decision-making processes. This might pose some challenges to the international community. Yet, it is in the EU's interest to address these economies' demands and find ways to better adjust the membership quotas and voting systems of multilateral organisations. A failure to do so may accelerate the fragmentation of the traditional multilateral order and the creation of a parallel multilateral system led by China.[226] The potential expansion of the BRICS countries, the growth of development banks like the Asian Infrastructure

Investment Bank (AIIB) and the New Development Bank (NDB), and the proliferation of agreements such as the Cross-Border Interbank Payment System (CIPS) and the Regional Comprehensive Economic Partnership (RCEP) show the need to counter this threat.

Secondly, the EU should foster improvements in the performance of multilateral organisations, which need to become more responsive and effective to keep up with an increasingly fast-paced world.[227] To achieve this, the EU should actively promote the use of plurilateral negotiations, sectoral agreements and ad hoc alliances, such as the Joint Statement Initiatives of the WTO.[228] By the same logic, it should support the strengthening of those judicial institutions and binding mechanisms that help address non-compliance, resolve disputes and enforce global rules.[229] Issues such as the dysfunctionality of the Dispute Settlement Mechanism of the WTO need to be solved as soon as possible. At the same time, it would be advisable to demand more transparent and comprehensive procedures for auditing, access to information and the evaluation of the results of multilateral institutions.[230]

Thirdly, the EU should advocate an increased multi-stakeholder and multi-level approach in the multilateral architecture.[231] Greater participation from civil society (academia, NGOs, private companies, trade unions, foundations and CBOs) in multilateral organisations would help boost their legitimacy and improve their delivery – as demonstrated by the experience of the EU itself. Similarly, collaboration with different tiers of government should be fostered, both within European territory (national parliaments, regional parliaments and local governments) and with other regions (such as the African Union, the Organization of American States, the Association of Southeast Asian Nations, the Organisation of African, Caribbean and Pacific States, and the League of Arab States).[232]

Lastly, the EU should lead the modernisation and revitalisation of forums that host global debates on emerging challenges, such as Internet governance, AI, cybersecurity, space and trade sustainability.[233]

Taken together, these measures would contribute to the modernisation and strengthening of the present multilateral system, enabling the EU to address its foreign vulnerabilities and defend its interests in the world more effectively and peacefully.

CONCLUSIONS: A COMPETITIVE EUROPE FOR A PROSPEROUS WORLD

Scanning today's headlines, one might conclude that the EU is doomed. That it has irremediably lost the innovation race due to its excessive bureaucracy and the complacency of its population. That its excessive adherence to environmentalism and social welfare has undermined its competitiveness. And that, thanks to this, it will lose its global importance and that the future international order will be entirely determined by the US and China.[234]

Nevertheless, it is worth noting that **this feeling is neither new nor grounded in facts**. Europeans have been announcing their own collapse (and attributing it to these same factors) long before Europe existed as a political reality. In the 1930s, bestselling author Arnold J. Toynbee argued that Europe had lost the "spiritual force" required to succeed and foresaw its downfall by the year 2000 at the hands of a dictatorial Chinese power resulting from a "fusion" of communism and capitalism.[235] In the 1960s, the construction of the Berlin Wall was interpreted by many as a sign of the definitive fracture of Europe into two irreconcilable parts. In the 1970s, the economic recessions caused by the two oil crises led doom-mongers to announce the end of European growth and prosperity and the dawn of an age of scarcity. In the 1980s, the European Economic Community's enlargement to the South was interpreted by critics as a fundamental mistake that would break the EU project. In 2008, it was said that the financial crisis would provoke the collapse of the euro and the return of national currencies. In 2016, experts confidently predicted that Brexit would be "the beginning of the end of the EU" since the UK would be followed by many other Member States.

These are just a few examples. The forecasts of Europe's demise have been repeated incessantly throughout the past century. So much so that George Steiner, a Franco-American philosopher widely recognised as one of the most prominent Western polymaths, did not hesitate to consider the obsession with its own declinism as one of the "five signs of European identity".[236]

In reality, what Europe has done over the last 50 years has primarily constituted progress. Its income per capita has grown by 147%, its exports have increased by 30 percentage points and its patent production has multiplied sevenfold.[237] Most importantly, Europeans have managed to translate this economic development into greater social welfare for the vast majority of people, and to decouple CO2 emissions and economic growth, thereby achieving a crucial milestone in the history of sustainability.[238]

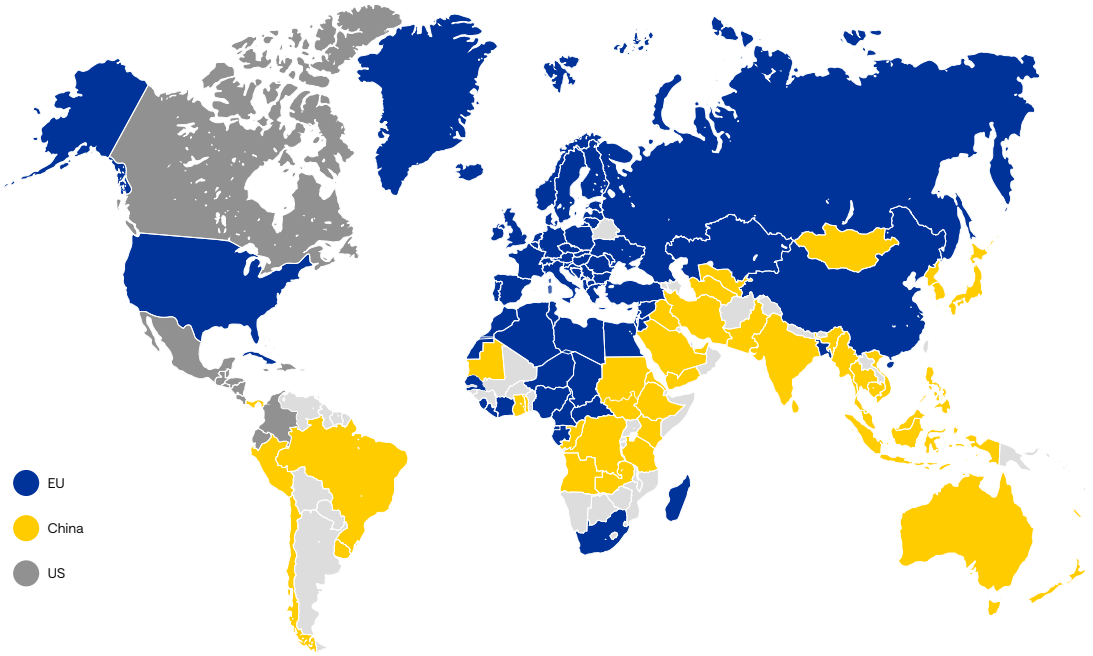
It is true that, in relative terms, Europe has lost its global weight in many areas. However, in most cases, this is not because Member States have regressed or stopped progressing, but rather because other countries in the Global South have emerged and closed the gap, often thanks to Europe's support. For instance, it is worth remembering that, in just the last decade alone, the EU has provided about 7.5 billion euros in official development assistance to China.[239]

Thus, there are no empirical arguments to say that the EU is declining. Nor are there arguments to suggest that it is doomed to decline in the future. Critics often portray Europe as an old and outdated continent that must resign itself to accommodating its inevitable decline to the new

global order that the US and China will create and dominate. However, data reveal a very different reality, showing that, **despite its many weaknesses and vulnerabilities, the EU remains one of the most socially-advanced places in the world and one of its economic and geopolitical powerhouses.**

The EU is the world's third-largest economy, accounting for 15% of global GDP, slightly behind the US (15.7%) and China (18.6%) – which has three times its population.[240] This is partly due to the fact that the EU is the largest global trading entity in both manufactured goods and services, acting as the top trading partner for half of the world's countries.[241]

Main trading partner (by value of exports and imports in goods and services), 2020



Source: UNCTAD[242]

Europeans often complain about the excesses of the bureaucracy of its institutions and how this discourages investment. And they are right. But still, we must be doing something right when **the EU is the main recipient of foreign direct investment in the world**, with 28% of total global FDI.[243] Likewise, the EU is the world's largest investor. All outward FDI stocks from the EU reach 34% of world stocks of outward FDI whereas China has a share of 6% and the US a share of 21%.[244]

In terms of **business**, the EU also holds a position of global strength. It only hosts 8% of the world's unicorns and 8% of the largest companies by market capitalisation.[245] But it has global champions in key industries such as automotive, pharma, biotech, banking, infrastructure, retail, renewable energy and telecommunications, and one of the most dynamic and competitive SME ecosystems on the planet.[246] And, if we can draw a lesson from the experiences of the Covid pandemic and the war in Ukraine, it is that the European business fabric is far more resilient and adaptable than we often presume.

Beyond strictly economic aspects, the EU also holds a position of great strength in many of the areas that will determine the development of nations in the future. In terms of **human capital**,

the EU workforce is one of the most qualified in the world, surpassing the US and China.[247] It is also one of the most productive, with GDP output per worker of $98,000, slightly lower than the figure for the US, but above the OECD average ($96,600) and almost three times the figure for China ($33,300).[248]

In terms of **innovation**, the EU is lagging behind in some crucial areas, as has been discussed. However, it has the second most powerful regional innovation ecosystem in the world (56.5), trailing behind the US (61.8) but ahead of China (55.3).[249] In fact, more than half of the top 20 countries with a higher economic complexity are European Member States.[250] While American and Chinese companies have the upper hand in sectors such as AI and cloud services, the EU maintains its global leadership in other cutting-edge sectors, such as industrial robotics, quantum research, next-gen materials and future cleantech.[251]

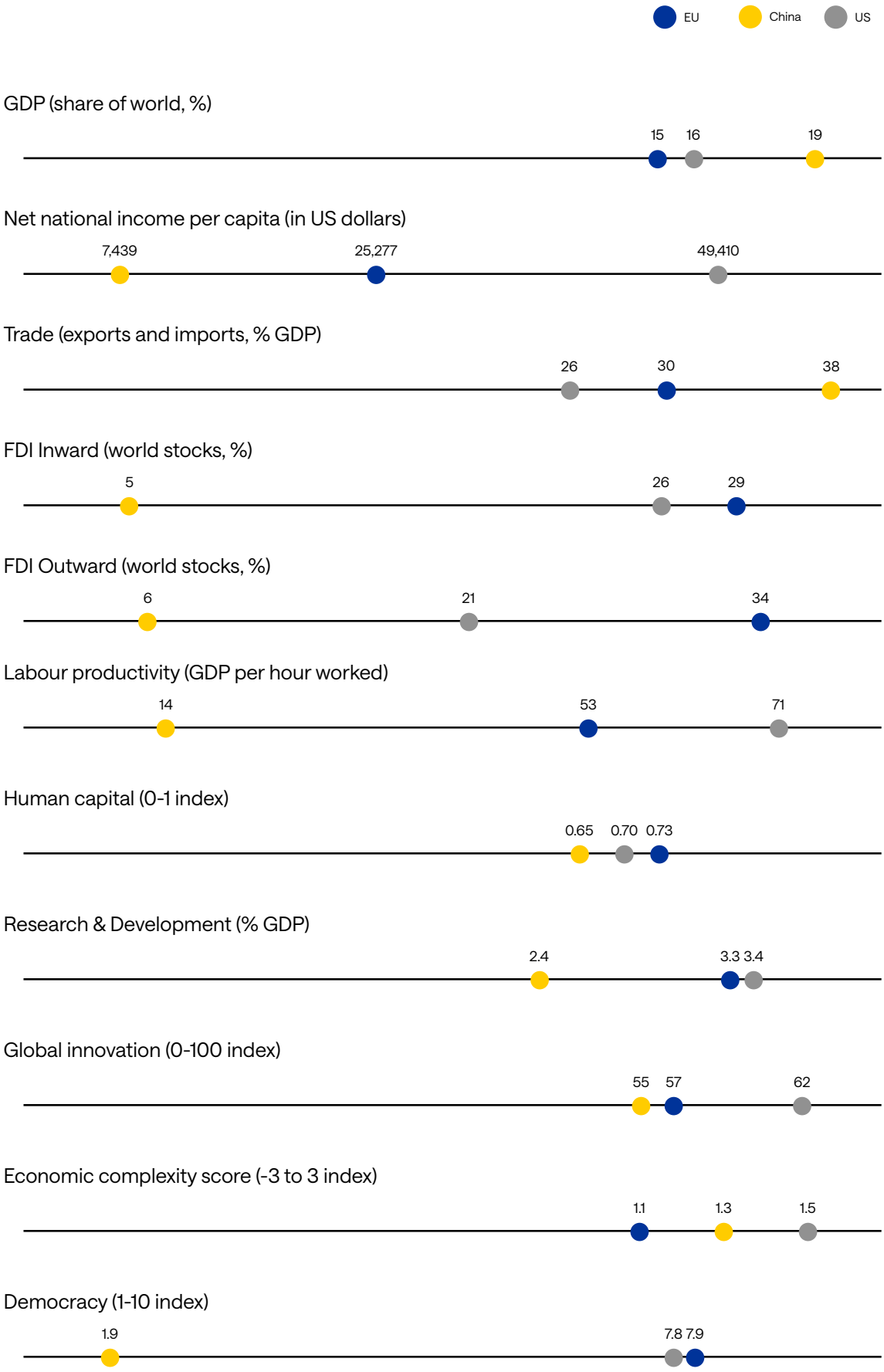
The EU also stands out for the **quality of its institutions**. European Member States often top global rankings in regulatory quality, political stability, rule of law, accountability, transparency, the digitalisation of public authorities and government effectiveness, with scores consistently higher than those of the US and China.[252] Moreover, the EU often plays a leading role in the setting of new international rules and standards, thereby shaping the functioning of global economics.[253]

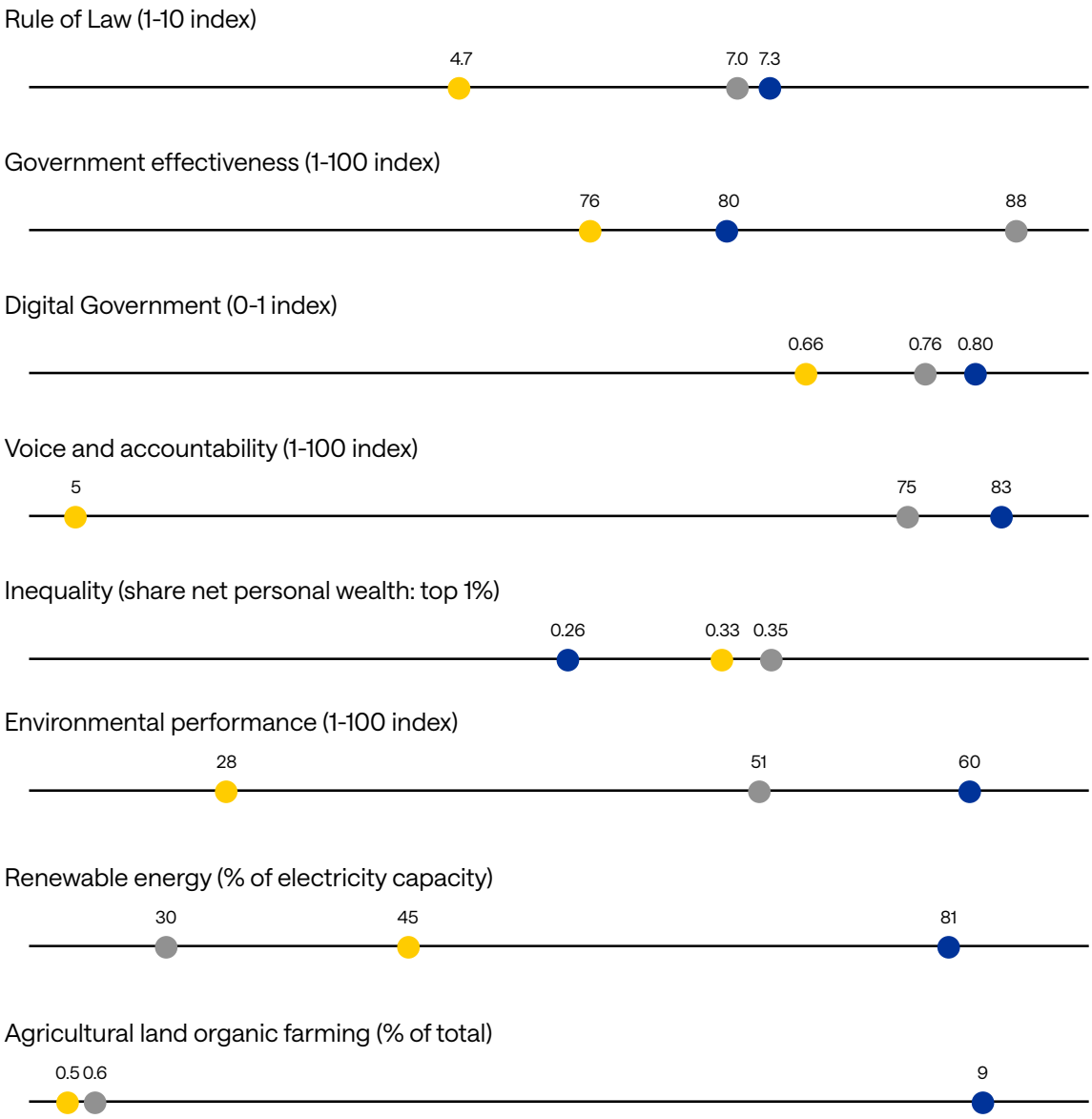
The EU is also recognised as the **least unequal region of the world**, according to various indicators.[254] This is fundamental because a better distribution of opportunities and lower inequality ultimately lead to higher growth, increased productivity, more dynamism and greater stability.[255]

Finally, the EU stands as **the most environmentally-sustainable region on the planet**, with an Environmental Performance Index (EPI) score of 59.9 – significantly higher than that of the US (51.1) and China (28.4).[256] Among other reasons, this is due to the fact that the EU is decarbonising its economy faster than other regions and leading in areas such as organic farming, renewable energy and clean mobility.[257] In the future, the regions that will thrive the most will be those that can grow within the planetary boundaries, and today, the EU is the one that is closest to achieving that goal.

In conclusion, the EU is far more competitive than is often assumed. It does have significant vulnerabilities. Some of them are so systemic that, if left unattended, they could seriously hamper the welfare and freedom of its citizens. But the evidence discussed in this non-paper shows that the EU has everything it takes to overcome such vulnerabilities and create a more competitive, sustainable and resilient economy in this decade. This includes a robust industrial base, high-quality research, skilled workers, top-notch infrastructures, clean and affordable energy, advanced circularity systems and a leading position in global trade and multilateral organisations. **Now is the time to mobilise and scale up these capacities in a coordinated fashion to ensure the EU's economic security and technological and trade leadership by 2030.**

EU, US and China in data





Various sources.[258] Dates range from 2020 to 2022

This non-paper has suggested a number of principles and actions to achieve this goal. Ultimately, its many ideas can be summarised in **five priorities of equal importance:**

1. **Internal production:** The times of unchecked, cost-driven offshoring are over. The EU needs more factories and more businesses within its territory. And governments and the private sector must collaborate to make this possible. This industrial effort, however, needs to be targeted and smart. It should be effectively coordinated at an EU level and it should be aimed at developing those goods and services with high added value in which the EU a) already possesses a competitive edge, b) has the potential to establish itself as a global frontrunner, or c) needs to have a minimum level of capacity to guarantee its future economic security. In this regard, a special priority should be given to the production of AI systems, cutting-edge semiconductors, data servers and transmission networks, renewable energies systems, electrolysers, electric motors, new batteries, innovative pharmaceuticals, APIs, organic fertilisers and alternative sources of protein for animal feed, among others.

2. **Integration:** To ensure its economic security and global leadership, the EU will have to make concrete and substantial progress towards greater integration. This includes the completion of a resilient, enhanced and fully functioning Single Market that acts as a "base camp" for EU companies in the face of international competition, but also progress in areas such as digital services, AI, the capital markets union and the energy union. The interests and sovereignty of Member States must always be respected. But they should be coordinated so that they do not undermine Europe's unity or strength.[259]

3. **Innovation:** The solutions that the EU needs do not lie in the past, but in the future. Member States should not replace many of the goods, services and raw materials that they currently import from abroad with equivalents produced domestically or in other foreign countries, but with those new and more available, competitive and sustainable alternatives that science has to offer. To achieve this, a decisive commitment to R&D and the adoption of new technologies and organisational forms in compliance with the precautionary principle will be paramount. Supporting further capacity-building in areas like new infrastructure and skills will also be essential.

4. **Internationalisation:** The best way to ensure the EU's economic security is not by closing itself off from the global economy, but by increasing its participation and leadership. To achieve this, the EU should deploy a threefold strategy. First, it should foster the enhancement of the multilateral system and the strengthening of those binding mechanisms that help address non-compliance, resolve disputes and enforce global rules. Second, the EU should launch a new trade expansion aimed at rebalancing, diversifying, revamping and increasing its economic relationships, especially in the Atlantic basin. This trade effort should be based on the principles of openness, sustainability and assertiveness, and it should have a primary focus on like-minded partners like Australia, Canada, Japan, New Zealand, South Korea, the US, and the Balkans and Eastern European countries, but also other low- and middle-income countries in Latin America, Africa and Asia. Third, the EU should reinforce its capacity to act swiftly and robustly as a geopolitical entity. This includes the ability to protect its global supply chains, neutralise and respond to hybrid threats, and shape the economic environment of external actors that threaten its security.

5. **Inner confidence:** The world has changed much over the past decades, and yet Europe has remained a leading power. Imagining an EU in 2030 with top-tier technological companies, non-polluting and affordable energy, high-quality medical care, affordable and nutritious food, higher incomes and better standards of living is not naïve or delusional — it is simply recognising that the progress that has been ongoing for the past 200 years will not stop now. The future of the EU is not to prevent its decline; it is to lead a new era of global prosperity.

ENDNOTES

A changing geopolitical landscape

[1] This project was conducted in close coordination with the European Commission and the making of its new 2023 *Strategic Foresight Report.*

[2] Lake, David A. et al. "Challenges to the liberal order: Reflections on international organization." *International Organization*, vol. 75, no. 2, 2021, pp. 225-257, doi:10.1017/S0020818320000636.

[3] Fukuyama, Francis. *The end of history and the last man*. Simon and Schuster, 2006.

[4] For more details on cost effective production see Baldwin, Richard. *The great convergence: Information technology and the new globalization*. Harvard University Press, 2017. Regarding military expenditures, between 1990 and 2020, the EU reduced its average military expenditure from 2.3% to 1.5% of GDP. For more details on military expenditure see Stockholm International Peace Research Institute. Military Expenditure Database, 2022, https://www.sipri.org/databases/milex. For more details on multilateral development finance see *Multilateral Development Finance 2022*. OECD, November 2022, doi:10.1787/9fea4cf2-en.

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[6] Wolf, Martin. *The crisis of democratic capitalism*. Penguin Press, 2023.

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[10] Examples of unilateral country actions can be found in Biden's Inflation Reduction Act (IRA) and Chips and Science Act, Japan's ban on Russia, India's ban on wheat exports, Russia's exports restrictions on raw materials. Lastly, the US-China trade war is the most extreme scenario. For more details on Japan's ban on Russia, see Aljazeera, "Japan tightens Russia sanctions, expands export ban list." *Aljazeera,* 27 January 2023, https://bit.ly/3Q6k1FW. For more details on India's ban on wheat exports, see Jadhav, Rajendra, "India bans wheat exports as heat wave hurts crop, domestic prices soar." *Reuters*, 16 May 2022, https://bit.ly/43FJ99B. For more details on Russia's exports restrictions on raw materials, see Bloomberg News, "Russia to Restrict some Raw-Material Exports, but Omits Details." *Bloomberg*, 8 March 2022, https://bloom.bg/3rHpjxe. For more details, see Bown, Chad P. "The US–China trade war and Phase One agreement." *Journal of Policy Modeling,* vol. 43, no. 4, 2021, pp. 805-843, doi:10.1016/j.jpolmod.2021.02.009.

[11] For evidence regarding the decline in the signing of multilateral agreements, see Ioannou, Demosthenes et al. *The EU's Open Strategic Autonomy from a central banking perspective. Challenges to the monetary policy landscape from a changing geopolitical environment*. European Central Bank, March 2023, https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op311~5065ff588c.en.pdf. On the other hand, bilateral agreements jumped from 180 in 2008 to 356 in 2023. For more details, see World Trade Organization. Regional Trade Agreements Database, 2023, http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx.

[12] Harmful interventions entail the use of tariffs, subsidies, import controls, trade defence measures, public procurement and localisation policies. For more details, see Dadush, Uri. "Is the post-war trading system ending?" Bruegel, *Policy Contribution*, no. 04, 2022, pp. 1-12, https://www.bruegel.org/sites/default/files/wp-content/uploads/2022/02/PC-04.pdf.

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[14] Van Bergeijk, Peter A. G. *Deglobalization 2.0: Trade and openness during the Great Depression and the Great Recession*. Edward Elgar Publishing, 2019.

[15] The degree of trade openness, measured as the import and export value over the world's GDP, has been stable and close to the level of 57% over the last decade. Over the period from 2011 to 2019 (pre COVID-19), trade in goods decreased from 48% of GDP to 42%, while trade in services rose from 12% to 14% of GDP in the same period of time. After the 2020 slowdown, evidence suggests a total recovery in the trade of goods and a progressive rise of trade in services. For more details, see UNCTAD STAT, https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx. For more details, see Kataryniuk, Ivan et al. "(De-)Globalisation of trade and regionalisation: A survey of the facts and arguments." Bank of Spain, *Occasional Papers*, no. 2124, 2021, pp. 1-35, https://www.bde.es/f/webbde/SES/Sec-

ciones/Publicaciones/PublicacionesSeriadas/DocumentosOcasionales/21/Files/do2124e.pdf. For more details, see Baldwin, Richard. "The peak globalisation myth: Services trade did not peak." Columns, 3 September 2022, https://cepr.org/voxeu/columns/peak-globalisation-myth-part-4-services-trade-did-not-peak. CEPR.

[16] For more details, see Irwin, Douglas A. "The pandemic adds momentum to the deglobalization trend." *Realtime Economics*, 23 April 2020, https://www.piie.com/blogs/realtime-economics/pandemic-adds-momentum-deglobalization-trend. Peterson Institute for International Economics. Antràs, Pol. "De-globalisation? Global value chains in the post-COVID-19 age." National Bureau of Economic Research, *Working Paper Series*, no. 28115, 2021, pp. 1-51, https://www.nber.org/system/files/working_papers/w28115/w28115.pdf; Goldberg, Pinelopi and Tristan Reed. "Is the global economy deglobalizing? And if so, why? And what is next?", *Brookings Papers on Economic Activity Conference Drafts*, 2023, pp. 1-51, https://www.brookings.edu/wp-content/uploads/2023/03/BPEA_Spring2023_Goldberg-Reed_unembargoed.pdf.

[17] For more details, see UNCTAD STAT, https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx. Ioannou, Demosthenes et al. *The EU's Open Strategic Autonomy from a central banking perspective. Challenges to the monetary policy landscape from a changing geopolitical environment*. European Central Bank, 2023, https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op311~5065ff588c.en.pdf. Altman, Steven A., and Caroline R. Bastian. "Don't overestimate shifts from globalization to regionalization." *Industrial Analytics Platform*, January 2023, https://iap.unido.org/articles/dont-overestimate-shifts-globalization-regionalization. Insights.

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[20] World Trade Organization's seven regions are (1) Africa, (2) Asia, (3) Commonwealth of Independent States, (4) Europe, (5) Middle East, (6) North America, and (7) South and Central America, Caribbean. United Nations 22 regions are (1) Australia and New Zealand, (2) Caribbean, (3) Central America, (4) Central Asia, (5) Eastern Africa, (6) Eastern Asia, (7) Eastern Europe, (8) Melanesia, (9) Micronesia, (10) Middle Africa, (11) Northern Africa, (12) North America, (13) Northern Europe, (14) Polynesia, (15) South America, (16) South-Eastern Asia, (17) Southern Africa, (18) Southern Asia, (19) Southern Europe, (20) Western Africa, and (21) Western Asia and (22) Western Europe. For more details, see Altman, Steven A., and Caroline R. Bastian. "Don't overestimate shifts from globalization to regionalization." *Industrial Analytics Platform*, January 2023, https://iap.unido.org/articles/dont-overestimate-shifts-globalization-regionalization. Insights. For more details, see UNCTAD STAT, 2023, https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx.

[21] For more details, see Eurofound. European Restructuring Monitor, 2022, https://www.eurofound.europa.eu/observatories/emcc/european-restructuring-monitor.

[22] Growth in European firms controlled by foreign capital is also observed in relative terms, when measured as a share of the total amount of European firms. For more details, see Eurostat. Foreign control of enterprises by economic activity and a selection of controlling countries [FATS_G1A_08], https://ec.europa.eu/eurostat/databrowser//product/view/FATS_G1A_08.

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[82] For more details on the Council of the European Union's definition of Open Strategic Autonomy, see Council Conclusions on implementing the EU global strategy in the area of security and defence. CFSP/PESC 906, 14 November 2016, https://www.consilium.europa.eu/media/22459/eugsconclusions-st14149en16.pdf. Two of the most salient and up-to-date definitions of OSA are the ones contained in the European Commission's Industrial Strategy and the European Commission's Trade Policy Review. For more details on the European Commission's Industrial Strategy, see Commission Staff Working Document. *Strategic dependencies and capacities.* SWD(2021) 352 final, 5 May 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021SC0352. For more details on the European Commission's Trade Policy Review, see Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. *Trade Policy Review: An open, sustainable and assertive trade policy.* COM(2021) 66 final, 18 February 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX-%3A52021DC0066.

Bolstering and securing internal production capacities

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[90] European Commission. Shaping Europe's digital future: quantum, 2023, https://digital-strategy.ec.europa.eu/en/policies/quantum.

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[92] While the EU's exploration budget is increasing, it remains very low compared with other world regions, accounting for about 2% to 3% of global exploration expenditure in 2010-

2022, while the European continent represents around 7% of the Earth's landmass (Finland, Sweden and Spain accounted for 50% of total spending). For more details, see European Union, European Commission. *Proposal for a Regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/1724 and (EU) 2019/1020.* SWD(2023) 161 final. European Commission, 16 March 2023, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52023SC0161.

[93] For more details, see European Raw Material Alliance. 2023, https://erma.eu/; Carrara, Samuel et al. *Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU–A foresight study*. Joint Research Centre, March 2023. https://publications.jrc.ec.europa.eu/repository/handle/JRC132889.

[94] Currently organic farming represents 9% of the EU's crops. Assuming this, we can expect that 91% of the rest of the crops use any type of mineral fertiliser. If the EU reaches the target of 25% of organic agriculture by 2030, the use of chemical fertilisers would be reduced but would still represent 75% of total manure. As regards chemical fertilisers, we expect an increase of 2% in Potash fertilisers and a reduction of 1% and 4% in Phosphate and Nitrogen fertilisers, respectively, until 2032. For more details regarding the target of reducing the use of fertilisers, see *Farm to fork strategy. For a fair, healthy and environmentally-friendly food system*. European Commission, May 2020. https://ec.europa.eu/food/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf. For more details regarding the use of chemical fertilisers, see *Forecast of food, farming & fertiliser use in the European Union 2022-2032*. Fertilisers Europe, December 2022, https://www.fertiliserseurope.com/wp-content/uploads/2023/01/Forecast-2022-32.pdf.

[95] As part of the From Farm to Fork strategy, the European Commission aims to see a reduction in nutrient losses of at least 50%, which implies a reduction in fertiliser use of at least 20%. In addition, the EU Common Agricultural Policy (CAP) provides direct green payments of up to 30% of the budget to farmers to support sustainable farming. For more details regarding the target of reducing the use of fertilisers, see *Farm to fork strategy. For a fair, healthy and environmentally-friendly food system.* European Commission, May 2020. https://ec.europa.eu/food/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf. For more details regarding organic fertilisers, see Altman, Marina. *Biofertilizers* 2021. S&P Global, April 2021, https://www.spglobal.com/commodityinsights/en/ci/research-analysis/biofertilizers-2021.html. For more details regarding the CAP measures to incentivise sustainable agricultural practices, see European Commission. The common agricultural policy: 2023-27, https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27_en; European Commission, Sustainable land use (greening), https://agriculture.ec.europa.eu/common-agricultural-policy/income-support/greening_en. For more information regarding the industry of organic fertilisers in the EU, see Markets and Markets. Biofertilizers Market Overview, https://www.marketsandmarkets.com/Market-Reports/compound-biofertilisers-customized-fertilisers-market-856.html.

[96] Soy production is expected to grow by an impressive 33% compared with 3% for rapeseed. In fact, in 2032, the area for protein crops is expected to grow by 34% (to 2.8 million ha), and the EU will reach 4.02% of its land devoted to vegetable proteins (it is currently 3%). For more details, see *EU agricultural outlook, for markets, income and environment 2022-2032*. European Commission, December 2022. https://agriculture.ec.europa.eu/system/files/2023-04/agricultural-outlook-2022-report_en_0.pdf.

[97] The CAP supports the cultivation of leguminous crops to reduce the EU's dependency on imports of plant proteins for feed, see *Common Agricultural Policy for 2023-2027. 28 CAP strategic plans at a glance.* European Commission, December 2022, p. 3. https://agriculture.ec.europa.eu/system/files/2022-12/csp-at-a-glance-eu-countries_en.pdf. See also, European Commission, *Report from the Commission to the Council and the European Parliament on the development of plant proteins in the European Union*, November 2018. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX-:52018DC0757.

[98] Currently, organic farming and animal production have a relatively low presence in Europe. In 2020, approximately 6% of the cattle herd and 7.2% of sheep and goat flocks were estimated to be raised organically, while for poultry and pigs, the figures were 3.6% and 1% respectively. Extensive grass-fed systems for cattle, sheep and goats can be easier and cheaper to convert into organic produce. For more details, see *Organic Farming in the EU. A decade of organic growth.* European Commission, January 2023. https://agriculture.ec.europa.eu/system/files/2023-04/agri-market-brief-20-organic-farming-eu_en.pdf.

[99] The industry has expressed concerns about potential disruptions in the future, primarily stemming from Asian suppliers due to unforeseen closures of production units, new environmental regulations and shortages of precursor materials required for API production. Following the Pharmaceutical Strategy, various efforts have been made to produce an EU-wide list of critical medicines, to allow for the identification of supply chain vulnerabilities and assess the EU's manufacturing capacities. Also in line with the recommendations provided by the EC's SWD Structured Dialogue on the Security of Medicines Supply, and with the proposal for the reform of pharmaceutical legislation, the HMA EMA Task Force on Availability of Authorised Medicines will develop a list of critical medicines to EU Health Systems. In addition, the EMA has already defined a list of the main therapeutic groups for crisis preparedness, and HERA is working on a list of medical countermeasures for stockpiling. For more details on the *Pharmaceutical Strategy, see Pharmaceutical Strategy for Europe*. European Commission, November 2020, https://health.ec.europa.eu/system/files/2022-10/mp_vulnerabilities_global-supply_swd_en.pdf. For more details on the Structured Dialogue, see *European Commission. Commission Staff Working Document. Vulnerabilities of the Global Supply Chains of Medicines. Structured Dialogue on the Security of Medicines Supply*. European Commission, October 2022, https://health.ec.europa.eu/system/files/2022-10/mp_vulnerabilities_global-supply_swd_en.pdf. For more details on the reform of pharmaceutical legislation, see Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and

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[103] For more details, see European Commission. SAMIRA Action Plan, 2021, https://energy.ec.europa.eu/topics/nuclear-energy/radiological-and-nuclear-technology-health/samira-action-plan_en.

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[105] For more details, see Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. *A New Industrial Strategy for Europe*. COM(2020) 102 final. European Commission, 10 March 2020, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0102&from=EN; Communication the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. *A New European Innovation Agenda.* COM(2022) 332 final. European Commission, 5 July 2022, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022DC0332.

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