POLICY BRIEF

Advancing Supply Chain Resilience and Competitiveness:

Recommendations for U.S.-EU Action

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The United States and the European Union (EU) have recently launched various initiatives to manage their competition and enhance their cooperation on trade and technology issues. The Transatlantic Leadership Network's Trade and Technology Working Group addresses these topics in its work, including recommendations for more effective action. This policy brief recommends ways for the two parties to enhance their supply chain resilience and competitiveness. A companion piece focuses more specifically on semiconductor supply chains. I thank Working Group colleagues for our discussions on these issues; I take responsibility for the recommendations offered here. All products from the TLN Working Group may be found at https://www.transatlantic.org/transatlantic-technology-and-trade-working-group/.

Working Group 3 on Secure Supply Chains is tasked to focus on advancing supply chain resilience and security of supply in key sectors for the green and digital transition and for securing the protection of our citizens. A priority track has been established for semiconductors, with an initial focus on short-term supply chain issues. Other top areas of focus are clean energy, pharmaceuticals, and critical materials. In each of these sectors, the working group is tasked to: increase transparency of supply and demand; map respective existing sectoral capabilities; exchange information on policy measures and research and development priorities; and cooperate on strategies to promote supply chain resilience and diversification.

- U.S.-EU Trade and Technology Council Inaugural Joint Statement, September 2021 [1]

Introduction

Extended supply chains have become central to today's global economy. They have turned trade in goods into trade in tasks. Companies fragment their production processes, and increasingly their services activities, into a host of intermediate tasks, which are undertaken in many different places to exploit the specific comparative advantage of each location. These intermediate linkages now account for 70% of all global trade flows.[2]

The term "supply chain" evokes the image of a linear pipeline, but most supply chains resemble entangled webs of entities involved in producing and delivering goods and services.[3] Components for Apple's iPod,

for instance, are produced in Japan, Korea and the United States, assembled in China and then exported to the United States. The company has suppliers in 43 countries, and its 200 top suppliers span the globe. [4] The supply chains of most other industries are just as complex. On average, an auto manufacturer has around 250 critical "tier-one" suppliers, but the number proliferates to 18,000 across the full value chain. Aerospace manufacturers average 200 tier-one suppliers and 12,000 across all tiers, and technology companies average 125 tier-one suppliers and more than 7,000 across all tiers.[5]

Supply chains are actually more regional in character than the term 'global' suggests: they are mostly clustered around Europe, North America and Asia, and largely structured around linkages within and among these regions. The United States and Germany are the most important global hubs in complex production networks; China is a key global hub in simpler production networks, although it is moving toward more complex production-sharing networks.[6]

The expansion and extension of commercial flows via global supply chains is shaping a new dynamic among power, interdependence, and innovation. Supply chains create mutual and often asymmetric interdependencies among states, as parts and components produced in one country are then exported to others for further production/and or assembly in final products. States that acquire influence over economic flows and occupy key positions as network hubs can – and do – instrumentalize economic flows to their advantage. Supply chains can be as much channels of power as of prosperity.[7]

Even before the pandemic, concerns had been growing about supply chain resiliency (ability to anticipate, recover and bounce forward from disruption) and robustness (ability to maintain operations during a crisis).[8] Attention has centered on growing frequency of disruptions due to natural disasters and cyberattacks, as well as on the asymmetric dependencies that had built up in the deeply intertwined supply chains linking the United States, Europe, and China. Before the pandemic hit, many companies were already shifting production out of China or diversifying their production. Some didn't want to become inordinately dependent on any one particular link in their supply chain. Others wanted to avoid being caught in a U.S.-China trade war. And many decided that rising labor costs in China made other locales more attractive.[9]

The pandemic amplified these concerns, as shortages – from ventilators and computer chips to construction materials – rippled through the global economy. Together with a series of disruptive events – floods in Thailand, a deep freeze in Texas, and the mayhem generated by a giant ship lodged in the Suez Canal – the pandemic has exposed the three-fold fragility of global supply chains. First, it revealed their vulnerability, especially for companies or countries dependent on only one or just a few suppliers. Second, supply chains have become so opaque and convoluted that even the companies involved can find it difficult to untangle them. Third, the just-in-time model of delivery associated with super-efficient supply chains has meant that few companies hold just-in-case inventories.[10]

Despite these disruptions, merchandise goods trade has returned to pre-pandemic levels – underscoring that while supply chains can create dependencies and amplify shocks, they can also mitigate those shocks by shifting production or drawing on distributed networks to substitute different inputs and sources of supply. Imports and increased domestic production helped to overcome initial shortages and supply-chain disruptions for personal protective equipment (PPE), food products and other goods. As Marianne Schneider-Petsinger has noted, the challenge is finding the right balance between efficiency and resilience

– and that will differ among individual firms, specific sectors of the economy, and according to the type of emergency being confronted.

Box 1. Semiconductors

The United States and the EU have identified semiconductor supply chains as their top priority for joint work in the TTC Supply Chains Working Group. U.S. Secretary of Commerce Gina Raimondo has called semiconductors "the water of the new economy, you can't do anything without them."[11] They are the spark to innovation and productivity across practically all economic sectors, and the backbone of military might and geopolitical influence.[12] In recent years semiconductor supply chains, which are perhaps most complex of any in the world, have been subjected to a series of disruptions that have unsettled the global economy. U.S. enterprises are global leaders in production of semiconductor manufacturing equipment and in semiconductor design and associated design tools. European firms also show strength in design and manufacturing equipment production, and in some materials and sub-segments key to the semiconductor manufacturing process. However, each party relies heavily on others for highest-end chip manufacture, critical materials, and assembly, packaging and testing. The TTC offers a mechanism through which the two parties could harness their respective strengths and mitigate their respective dependencies within semiconductor supply chains. To seize the moment, they should first be careful to sidestep potential dangers, such as pursuing illusions of autonomy, harmful subsidy races or duplicative or conflicting efforts. The best way for the two parties to enhance security of semiconductor supply is not to "decouple" or become "autonomous" from all other semiconductor producers; it is to ensure that other semiconductor producers remain dependent on them, by doubling down on areas of strength. They should also improve transparency throughout the semiconductor supply chain; conduct a joint assessment of supply chain vulnerabilities; explore the feasibility of complementary foreign-investment investigative processes; align export controls of chip technologies, semiconductor manufacturing equipment, and critical inputs; consider a Solidarity Pledge for Semiconductor Resilience; building synergies among their respective scientific communities; support a next-generation expansion of the WTO Information Technology Agreement; and strengthen rules for state-owned enterprises and distortive industrial subsidies.

A companion policy brief, "Semiconductor Supply Chains, explores these issues and recommendations further.

EU and U.S. Dependencies

External Dependencies in Sensitive Sectors

In spring 2021 the European Commission and the United States published reviews of their respective supply chains, identifying dependences and policies that could mitigate potential vulnerabilities.[13] Each identified semiconductors, pharmaceuticals, batteries and critical materials as strategic sectors with vulnerable supply chains due to highly concentrated reliance on a small number of suppliers. The EU report identified heightened import dependencies on China (52%), Vietnam (11%), and Brazil (5%); the U.S. report

highlighted heavy reliance on China, in terms of both supply and demand. Charts 1 and 2 offer an overview of EU and U.S. dependencies in sensitive ecosystems.

Chart 1. EU and U.S. Dependencies in Sensitive Ecosystems

Ecosystem		Dependencies	
		US	**EU**
Ecosystems Included In Both Reviews	APIs	China, India, EU	China, India
	Critical Raw Materials	China, South Africa, Russia, Australia, Canada	China, South Africa, Brazil, Turkey, etc.
	Lithium-ion Battery	China, Japan, South Korea	China, Japan, South Korea
	Semiconductors	Taiwan, South Korea, China	Taiwan, South Korea, US, China
Ecosystems Included In EU Review Only	Cloud and Edge Computing		US, China
	Hydrogen		Africa, Asia

Sources: European Commission; United States Government; Ganyi Zhang, "EU-US: Public policies take up the challenges of the supply chain," Upply, July 23 2021, https://market-insights.upply.com/en/eu-us-public-policies-take-up-the-challenges-of-the-supply-chain.

The European Commission identified 137 products in sensitive ecosystems for which the EU is highly dependent. Almost three-quarters (99 products) are in energy-intensive industries, particularly raw/processed materials and chemicals. About a quarter of the total (34 products) are also highly vulnerable, given their low potential for diversification and substitution with domestic production. 22 of these highly vulnerable products are raw materials and intermediates goods, such as some ferro-alloys and such APIs as antibiotics, vitamins, hormones, and heterocyclic compounds, which are particularly important in the manufacturing of medicines. The remaining 12 are final goods (e.g. turbo-propellers, parts of protective garments, types of radio-broadcast receivers and some types of medicines). The EU is also highly dependent on foreign sources for semiconductors, micro-electronics and cloud technologies, all of which are critically important to the EU's green and digital transformations.

Of course, internal dependencies also exist within the EU, as various countries and companies rely on limited number of supply sources within the Single Market. This underlines the importance of a Single Market that is open to the global economy and functions even in times of crisis.

Similarly, the Biden administration concluded that the United States is dangerously dependent on specific countries for parts of the value chain for semiconductors, critical minerals and materials, batteries, pharmaceuticals and APIs.

Mutual Dependencies Amidst Deep Integration

The EU and the United States are also dependent on each other in sensitive areas, such as supplies of APIs, raw materials, and electric generators. Overall, the EU is less dependent on exports from the United States than vice versa, reflecting the EU's broader base of suppliers. In specific areas, however, EU dependence on the United States is greater than U.S. dependence on the EU. Charts 2 and 3 identifies U.S.-EU mutual dependencies.

Chart 2. EU and U.S. Mutual Dependencies in Sensitive Ecosystems

	Number of Dependent Products	Potential for Diversification				Share in Total Import Value
		Low	*Medium*	*Medium-High*	*High*	
U.S. Dependencies on the EU	260 products	18%	34%	28%	20%	3.1%
EU Dependencies on the U.S.	15 products	0%	7%	13%	80%	0.1%

Source: European Commission.

Chart 3. EU and U.S. Mutual Dependencies in Sensitive Ecosystems: Examples by Sector

	Health	Critical Materials	Renewables	Digital/ICT
U.S. Dependencies on the EU	APIS; medical apparatus	Types of steel, phosphates	Wind-powered electric generating sets	Lithography
EU Dependencies on the U.S.	API	Lithium oxide, beryllium, etc.	Types of electric motors and generators	Optical devices, Semiconductor design tools

Source: European Commission; author's additional estimates.

Moreover, while much of the supply chain debate is focused on how specific companies become dependent on *external* suppliers or distributors along the supply chain, the transatlantic economy is distinguished by the high degree of *internal* supply chain interconnectedness within firms whose operations straddle both sides of the Atlantic.[14] Transatlantic supply chains are as much about affiliates of individual companies trading with themselves within the ambit of the firm as they are about companies' external trade with outside businesses.

The deep interconnectedness of the transatlantic economy can itself be a source of resilience, to the extent that decision-makers understand those interlinkages. During past economic shocks, such as the 1997 Asian crisis and the 2007-2009 global financial crisis, companies' internal trade proved to be more resilient than their external trade. Corporate leaders and transatlantic policymakers can expand on this inbuilt resilience.[15]

Roughly 63% of U.S. imports from the European Union consisted of intra-firm trade in 2019, the last year of available data. That is much higher than intra-firm imports from the Asia-Pacific region (37%) and well above the global average (49%). The percentage was even higher in the case of Ireland (87%), the Netherlands (70%) and Germany (70%). Meanwhile, about 39% of U.S. exports to Europe in 2019 represented intra-firm trade, but the percentage is much higher for some nations. For instance, 56% of total U.S. exports to the Netherlands was classified as intra-firm trade.

Dependencies on China

Both the EU and the United States have important common dependencies vis-à-vis China, particularly regarding various Covid-related goods and APIs (including vitamins, antibiotics, and hormones), critical materials, and products needed for the green and digital transition, such as permanent magnets, electric accumulators, cell phones, and radio broadcast receivers. Charts 4 and 5 track common U.S./EU dependencies vis-à-vis the rest of the world and China in particular.

Chart 4. EU and U.S. Dependencies on China and the Rest of the World

	Number of Dependent Products	**Potential for Diversification**				**Share in Total Import Value**
		Low	*Medium*	*Medium-High*	*High*	
U.S./EU Dependencies on China	20 products	61%	9%	9%	21%	EU: 2.8% US: 4.1%
U.S./EU Dependencies on Rest of the World	70 products	25%	8%	22%	45%	EU: 4.6% US: 5.1%

Source: European Commission, Zhang.

Chart 5. EU and U.S. Mutual Dependencies on China and the Rest of the World: Examples by Sector

	Health	**Critical Materials**	**Renewables**	**Digital/ICT**
U.S./EU Dependencies on China	APIS; COVID-19 related goods (face masks, gloves)	Tungstates, ferro-alloys, etc.	Permanent magnets	Laptops, cell phones, radio-broadcast receivers
U.S./EU Dependencies on Rest of the World	APIs; COVID-19 related goods (face masks, gloves)	Various	Permanent magnets, Type electric accumulators	Laptops, cell phones, radio-broadcast receivers

Source: European Commission; Zhang.

Box 2. Pharmaceuticals

Pharmaceuticals supply chains have entangled countries around the world in a web of opaque and asymmetric interdependencies. The United States and Europe are each extraordinarily dependent on imports of active pharmaceutical ingredients (API), the key ingredients for antibiotics and many other common medicines. The Covid-19 pandemic exposed stunning dependencies on drugs and medical supplies. The two parties could improve transparency throughout the pharmaceuticals supply chain; encourage the industry to introduce quality management systems; facilitate advanced manufacturing techniques that promise to enhance diversification and redundancy; accelerate capacity for on-demand manufacturing capabilities for APIs and finished drug products; and establish virtual stockpiles and rapid-reaction mechanisms. A companion policy brief, "Enhancing Resilience in Pharmaceuticals Supply Chains, explores these issues further.

Using the TTC to Enhance Supply Chain Resilience and Robustness

The EU and the United States approach supply chain resiliency in similar ways. Both have identified roughly similar sectors of high dependencies, and both emphasize the need to increase domestic capacity in those areas. Each has underscored the importance of transatlantic cooperation, and the need to modernize and strengthen international trade rules.

The TTC is a potentially useful mechanism for the EU and the United States to engage with each other, and with the private sector, to enhance the resiliency and robustness of their respective supply chains, especially in highly-vulnerable ecosystems each has identified: semiconductors (Box 1), pharmaceuticals (Box 2), critical materials (Box 3), and clean tech (Box 4). The following efforts would be useful:

Conduct a joint assessment of supply chain vulnerabilities. Given that the two parties have conducted their own supply chain vulnerability assessments and arrived at similar conclusions, the next practical step would be for the United States and the EU to develop a common assessment of such vulnerabilities. A joint assessment could sharpen each party's understanding of common supply-chain risks, now and in the future, particularly in the context of strategic dependence on uncertain suppliers or unreliable sources. It could enable them to avoid overcapacity or duplicative investments to alleviate such dependencies; align on key definitions, such as what may be considered "critical minerals and materials"; and commit to common or complementary approaches to enhance supply chain resilience and robustness.[16]

Encourage companies to adopt formal supplier risk-management policies. Companies are the front-line actors when it comes to making supply chains more resilient and robust. Many are re-examining their supplier and distribution networks as they anticipate further disruptions: McKinsey estimates that the average manufacturing company can expect to see production disrupted for up to two weeks every two years, and for periods of one to two months every 3.7 years, at a cost of nearly half of one year's profits, and projects that As businesses address these challenges, McKinsey anticipates that they could shift as

much as $4.6 trillion in trade flows across geographies.[17] Given these prospects, and the realization that many private sector executives do not have full visibility of their own supply chains, particularly their reliance on second- and third-order suppliers, companies should consider adopting formal supplier risk-management policies akin to those that have been a staple for financial services firms for decades. The goal of this work is to develop not just lowest-cost supply chains, but rather optimal supply chains adjusted for risk and uncertainty.[18]

Enhance supply chain transparency. There is U.S.-EU agreement on the need for transparent engagement with the private sector and relevant stakeholders about potential, emerging, and systemic supply chains. As the two parties have noted, greater transparency in supply chains is likely to enhance awareness of risks and potential shortages, identify bottlenecks, and help to mitigate potential disruptions, including through alternative sources of critical inputs. Transparency empowers consumers to make informed purchasing decisions and businesses to effectively serve their customers. Better understanding about what goes into a product or process, and the conditions under which such intermediates are produced or harvested, can contribute to sustainable supply chain management. With this in mind, the two parties should:

- ***Improve sharing of information and good practice, and devise mechanisms to improve early warning*** of disruption, starting in the high-vulnerability sectors each has identified: semiconductors, pharmaceuticals, critical minerals and materials, and clean technologies.

- ***Work with stakeholders to establish transparent, consistent and predictable requirements and metrics*** for screening of risks and monitoring supply-chain performance.

- ***Introduce stress tests*** for companies in essential supply chains, along the lines of the stress tests which were made mandatory for banks in the wake of the 2007-2008 financial crisis. Stress-testing could require companies to quantify the cost of supply-chain disruptions under different scenarios, and to prepare mitigation plans.[19]

Promote supply chain diversification. The two parties agree that diverse supply chains and supplier networks can promote resilience and foster shared prosperity. They should:

- ***Consider ally-shoring options.*** Working with trusted democratic partners can play a role in diversification efforts. Some authors call this 'ally-shoring'.[20] The two parties could consider constraints on foreign production (taxes, tariffs, or local content requirements) or incentives (tax concessions or subsidies) to reshore, near-shore or diversify supply chains.

- ***Consider transatlantic consortia in critical sectors***, for instance to help boost the manufacture of essential medicines or processing of critical raw materials.

- ***Develop strategies for joint stockpiles or strategic reserves of essential goods***. Medical supplies are a good place to start: the EU has already suggested the stockpiling of key medical equipment as an area for increased transatlantic cooperation. There is precedent for this; a number

of countries have agreed to share stockpiles in case of emergencies. For example, under the Agreement on an International Energy Program, which established the International Energy Agency in the wake of the 1973/74 oil crisis, participating countries hold emergency oil stocks and release them as part of a collective action in the case of a severe shock. The United States and partners have made use of this arrangement occasionally through the years, most recently in late November 2021.[21]

Explore the feasibility of complementary foreign-investment investigative processes in sectors with critical supply chain dependencies. The U.S. Committee on Foreign Investment in the United States (CFIUS) scrutinizes risks to U.S. national security posed by investments of foreign entities. It could serve as a model for reviewing imports that create critical dependencies. The EU has already expressed interest in the CFIUS investigative process, which finds no parallel within the EU and may offer ways to shore up the EU's patchy investment screening process. The two parties might explore the feasibility of complementary CFIUS-style investigative processes in sectors of critical vulnerability, since both parties have already identified such sectors.[22]

Promote supply chain sustainability. The two parties have agreed to work together to promote and accelerate global sustainability goals, including implementation of the Paris Agreement on Climate Change, COP26 goals and commitments, and international labor and worker conventions where applicable. A companion policy brief covers these issues and offers recommendations. The United States and the EU should identify together harmful practices and products that go into their respective supply chains, and work with the private sector to eliminate such inputs, in line with the UN Guiding Principles for Business and Human Rights and other relevant codes, where applicable. Similarly, the two parties have committed to invest in and mainstream climate and environmental sustainability, including through clean energy supply chains. Current U.S.-EU efforts to negotiate what U.S. Trade Representative Katherine Tai says could become "the first ever carbon-based arrangement" to encourage trade in low-carbon steel and aluminum, could offer a template for further sectoral arrangements along similar lines. A push to revive and reframe WTO negotiations on an Environmental Goods Agreement would be useful, as outlined below. These issues are explored in more detail in a further policy brief.[23]

Box 3. Critical Materials

The United States and the EU have each issued reports identifying strategic dependencies on up to 35 critical materials. Those dependencies are set to increase; the clean technologies that U.S. and European companies are rolling out are particularly reliant on critical materials. The IEA projects that mineral requirements for clean energy technologies will grow four-fold by 2040 and six-fold by 2050.[24] EU demand is slated to increase 10-fold.[25] The largest reserves are found in fragile countries with poor protections for human rights, rule of law, and the environment. The issue is particularly sensitive because the United States and the EU are each inordinately dependent on China for many critical materials,

potentially opening them to economic coercion. When it comes to rare earths, for example, China accounts for 98% of EU imports and 80% of US imports.[26] Moreover, its massive state subsidies for Chinese firms in many of these areas have priced U.S. and European companies out of the market, and it has sometimes used its exports of these materials as a trade weapon.[27] Through its Belt and Road Initiative, China is locking in lower standards for carbon content in products among a wide swath of countries across Eurasia and Africa, while the United States and the EU struggle to scale up higher-standard infrastructure initiatives.

The United States and the EU have each prioritized efforts at building greater domestic mining and manufacturing capacity, but that is likely to be costly and take years. Such efforts could be quicker, more sustainable, and more cost-effective if the United States, Europe and other like-minded democratic partners harnessed their joint potential. Each has outlined similar approaches to reduce the risk of economic coercion, build greater supply chain resilience, boost domestic supply and research and development, and cooperate with like-minded partners internationally.[28] They have yet to take full advantage of these synergies. Moreover, enhanced domestic capacity will not fully alleviate critical dependencies. It is in the interest of the United States and the EU to work together, with other democratic market economies, and with key critical-materials suppliers, to forge secure and sustainable supply chains and low-carbon development of critical materials, both at home and abroad.[29]

The two parties identified critical materials as a priority area in the TTC Working Group on Supply Chains, and created a separate TTC Working Group on Climate and Clean Tech. As the two parties advance their efforts, they should consider working with industry and other stakeholders to leverage investment and ramp up research, development and deployment of low-carbon extraction, processing and delivery; developing a coordinated crisis-management framework should critical supplies be disrupted; sharing information tracking foreign investment and acquisitions of mineral rights, property, and development; and developing Strategic Partnerships with key producers of critical materials. These issues, and related suggestions for U.S.-EU action, are discussed greater detail in two companion policy briefs: “The United States and the EU in the Climate Races;” and “Winning the Climate Races: Recommendations for U.S-EU Action.”

Expand Coalitions for Supply Chain Resiliency. The United States and the EU have opportunity to use closer alignment via the TTC to extend their efforts to broader coalitions for supply chain resiliency and robustness, including through groupings such as the G7 and the OECD, as well as more informal coalitions of the willing, including with like-minded partners in the Indo-Pacific. Various efforts are already under way. One month after the two parties launched the TTC, on the margins of the Rome G-20 Summit in Rome, they were joined by Australia, Canada, Democratic Republic of the Congo, Indonesia, India, Japan, Mexico, Republic of Korea, Singapore, and the UK, and well as individual EU member states Germany, Italy, Netherlands, and Spain, in a joint initiative to work together and with stakeholders to strengthen supply chain resiliency, based on four common principles: transparency; diversity, openness and predictability; security; and sustainability. Those principles offer a foundation for expanded coalitions. The two parties might consider closer association with the Supply Chain Resilience Initiative launched by Australia, India and Japan in 2020, given that all parties share similar supply chain concerns, and that the United States and the EU are also deeply intertwined in Indo-Pacific supply chains.[30]

Use – and reform – the WTO. WTO rules are outmoded. Originally fashioned to facilitate trade in final products and commodities, they have not evolved to address contemporary trade realities, such as digital trade, trade in tasks and intermediate inputs, and the fragmentation of production across multiple countries. Updating and reforming WTO rules, while difficult, is important.[31]

· ***Push forward with ongoing e-commerce negotiations***. The pandemic has both underscored the importance of e-commerce and digital technologies to global supply chains, and the continuing challenges that face governance of digital trade flows. The United States, the EU and 84 other parties are engaged in WTO negotiations seeking an e-commerce agreement that could both facilitate such trade and give it predictability. Negotiators have reached agreement on such issues as spam, electronic signatures, e-contracts, online consumer protection, and open government data. Work on open internet access and paperless trading are close to completion. Tough issues remain e-invoicing, cybersecurity, customs duties on electronic transmissions, and transparency procedures. The two parties have interest in pushing these negotiations to completion.[32]

· ***Revive and reframe negotiations on an Environmental Goods Agreement***, which stalled in 2016 over disagreements on definitions of environmental goods and whether to include services and non-tariff barriers. William Reinsch and Emily Benson have proposed a rejiggered framework focused on removing tariffs on those goods that directly combat climate change. Those goods are largely agreed among key WTO members. This framework sidesteps the need to define an "environmental good" or to measure carbon content. They suggest starting with an offer to negotiate a multilateral agreement, but being prepared to move to a plurilateral agreement among like-minded countries if multilateral negotiations come up empty after two years.[33] More detail on this and related climate and trade initiatives is offered in the companion brief.

· ***Revisit WTO rules on export restrictions.*** WTO rules generally prohibit export restrictions, but allow flexibilities in emergencies. Widespread use of these measures has impeded worldwide access to medical supplies and vaccines during the COVID-19 pandemic. The United States, the EU and other like-minded parties should explore how existing WTO rules may need to be modified to balance the reality of deeply entangled supply chains with the need for effective response to unanticipated disruptions.

· ***Improve WTO-WHO cooperation on interrelated issues of trade and health,*** including consideration of a multilateral or plurilateral trade agreement in medical goods, and work with countries on the question of how strategic stockpiles of medical supplies should best be used in the event of a health crisis.[34]

Box 4. Clean Tech

According to the IEA, by 2030 the global clean tech market will surpass the value of the oil market, rising from $122 billion to $870 billion.[35] The race to develop, commercialize and deploy clean technologies is intensely competitive, as firms compete for advantage and as the United States and the EU each seek to enhance the competitiveness of their companies in future technologies. At the same time, there is great

potential for U.S.-EU cooperation, not least because of the deep integration of the $6.3 trillion transatlantic economy. U.S. and European firms are deeply embedded in each other's energy and clean tech markets – through trade, foreign investment, cross-border financing, and collaboration in research and development.[36] In addition, the U.S. and European clean energy industries are extraordinarily dependent on critical raw materials from fragile countries with poor protections for human rights, rule of law, and the environment, and on China in particular.

To address these shared concerns and to capitalize on this transatlantic potential, the United States and the EU identified clean tech and critical materials as priority areas in the TTC Working Group on Supply Chains, and created a separate TTC Working Group on Climate and Clean Tech. They pledged to "work towards" a Transatlantic Green Technology Alliance, which European Commission President Ursula von der Leyen said they would use to "enable breakthrough technologies and amazing innovations to be competitive on the market."[37] Issues related to critical materials are discussed in Box 3. On clean tech issues, two companion policy briefs offer greater detail, and related suggestions for U.S.-EU action. The gist of the proposals is to use the TTC to address ongoing and upcoming issues; and to work to make the Green Technology Alliance real. Ongoing and upcoming issues include challenges posed by carbon border adjustment mechanisms; bilateral negotiations on a Green Steel Deal, and potentially additional sectoral arrangements; and trade/climate issues at the WTO. The two parties could begin to make the Transatlantic Green Technology Alliance real by tapping digital technologies to generate less-carbon-intensive economic activity, scaling up clean technologies; prioritizing key innovation sectors; drive the commercialization of new clean technologies; prizing innovations that reduce reliance on critical technologies, improving cooperation on standards development; and launching a green hydrogen initiative.

Notes

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[1] White House, "U.S.-EU Trade and Technology Council Inaugural Joint Statement," September 29, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/29/u-s-eu-trade-and-technology-council-inaugural-joint-statement/.

[2] See Isabella Cingolani, Pietro Panzarasa & Lucia Tajoli, "Countries' positions in the international global value networks: Centrality and economic performance," *Applied Network Science,* 2:21 (2017), https://link.springer.com/article/10.1007/s41109-017-0041-4.

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