

June 9, 2022

Department of Defense  
OFFICE OF PREPUBLICATION AND SECURITY REVIEW

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**Testimony before the U.S.-China Economic and Security Review Commission Hearing On  
"U.S.-China Competition in Global Supply Chains"**

Commissioners Borochoff, Goodwin, and Schriver, I would like to begin by thanking you and your fellow Commissioners for the invitation to testify today regarding the national security implications of supply chain dependencies on China, as well as the roles government and the private sector can play in securing defense-critical supply chains.

It is my honor and pleasure to represent the Department of Defense today. I look forward to hearing from the Commission today and for the opportunity to answer your questions.

Supply chain resiliency is a top-of-mind issue in a way it has not been for decades, and efforts are underway across the U.S. government to understand and mitigate some of our most glaring supply chain vulnerabilities. For more than 50 years, market forces in the United States have prioritized supply chain efficiency over supply chain resiliency; events of the last few years (COVID-19, Ukraine conflict) have crystallized the need to prioritize and build supply chain resilience.

As you are aware, President Biden issued Executive Order (E.O.) 14017, America's Supply Chains, within his first 100 days in office, aimed at revitalizing, fortifying, and in some instances rebuilding our domestic supply chains. The United States government continues to take action to strengthen our supply chains through this E.O., which called for a comprehensive review of supply chains in the form of two directives to assess supply chain health and resilience.

The first directive was a 100-day assessment of four areas – semiconductors (led by the Department of Commerce), pharmaceuticals (led by the Department of Health and Human Services), high-capacity batteries (led by the Department of Energy), and critical minerals and materials (led by the Department of Defense, which also supported the other three reviews). The responses were consolidated and published on June 8, 2021. The E.O. also called for one-year assessments of supply chains in critical sectors, directing the Department of Defense to submit a report on supply chains in the defense industrial base (DIB) that was published in February of this year.

The Department of Defense's report focuses specifically on addressing challenges in high priority areas critical to operational readiness, including: kinetic capabilities; energy storage and batteries; castings and forgings; microelectronics; and strategic and critical materials. We also highlight strategic enablers that underpin overall mission success and supply chain resilience, such as workforce, cyber posture, small business, and manufacturing capabilities. Our strategy encompasses efforts to be undertaken internally within DoD, as well as those in collaboration with external stakeholders.

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The United States increasingly recognizes that supply chain resilience is both a whole-of-government and a whole-of-economy requirement, necessitating analysis and solutions emanating from interagency, industry, and international partners. Revitalizing supply chains requires that the United States make cooperative, strategic, timely decisions to build domestic capacity, collaborate with partners and allies, and safeguard our markets. This approach, when balanced across both supply and demand, will facilitate the development of robust markets.

The Department is prioritizing China as our long-term pacing challenge. Beijing has demonstrated increased military confidence and a willingness to take risks. Simultaneously, we face other advanced and persistent threats – as clearly evidenced by Russia’s invasion of Ukraine. Russia, Iran, North Korea, and other adversarial transnational and non-state actors are not forgotten in our supply chain resiliency efforts.

### **Supply Chain Vulnerabilities and Their Impact on U.S. Military Readiness.**

We at the Department find that U.S. reliance on sole-source suppliers and foreign sources poses risks to domestic capability and capacity to produce the products we require. Over time, many domestic suppliers have lost business and/or exited the market due to unpredictable DoD procurement practices and competitive pressures from foreign nations, particularly China.

The average American aerospace company relies on roughly 200 first tier suppliers. The second and third tiers have more than 12,000 companies.<sup>1</sup> With globalization of supply chains, these suppliers and their goods come from a wide array of places. Some foundational industrial supply chain sectors, like optical instruments, mechanical gears, welding equipment, and printed circuit boards, source a large part of their components from outside North America.<sup>2</sup>

For instance, in 1990, the U.S share of global semiconductor manufacturing capacity stood at 37 percent. In 2020, the U.S share had declined to 12 percent.<sup>3</sup> 88 percent of the production, and 98 percent of the assembly, packaging, and testing of microelectronics is performed overseas— primarily in Taiwan, South Korea, and China (with China aggressively pursuing a larger market share).<sup>4</sup>

The concentration of global supply chains for strategic and critical materials in China creates risk of disruption and politicized trade practices. For example, China dominates the global advanced battery supply chain, including lithium hydroxide (94 percent), cells (76 percent), electrolyte (76 percent), lithium carbonate (70 percent), anodes (65 percent), and cathodes (53 percent).<sup>5,6</sup> China’s lower production costs make importing materials more profitable than producing the same material domestically. It reduces the likelihood of U.S. private capital investment, leading to erosion of the profitability and competitiveness of U.S. manufactured materials and resources.<sup>7</sup>

China’s ability to offer low prices for goods are a challenge for U.S. manufacturers including the Defense Industrial Base. China’s competitive pricing and aggressive market capture strategy has led DoD’s suppliers to source materials from Chinese producers. For instance, China has captured more and more of the global steel market, pushing U.S. suppliers out of the market,

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making it harder to get steel for things like rocket motor cases, including for some missiles the U.S. is supplying to Ukraine. Low-volume and volatile procurement driven by U.S. Government and DoD practices compound China's price advantage by generating high startup costs and limited profits for U.S. businesses.<sup>8</sup>

U.S. supply chains currently involve significant materials and products from foreign manufacturers. For example, China produces more tonnage of cast products than the next seven highest producing countries, and over four times as much as the U.S. DoD counts on China for very large cast and forged (C&F) products used in the production of some defense systems and many machine tools and manufacturing systems on which the DoD is reliant.<sup>9</sup> DoD's one-year E.O. 14017 report noted that C&F parts are critical to the development, procurement, and sustainment of all major defense systems, including surface ships and submarines. Multiple U.S. sources report that China can often deliver a completed item for the same cost that a U.S. forge will pay for the raw materials needed to produce the parts of an item. The Department plans to make significant investments through the Industrial Base Analysis and Sustainment (IBAS) program and Navy to help de-risk naval vessel production plans. We are also extending existing IBAS and Navy partnerships with Oak Ridge National Lab to refine ways to supplement C&F capabilities, including additive and hybrid manufacturing processes, and advanced digital metrology.

The Office of the Under Secretary of Defense for Acquisition and Sustainment (A&S) is also focused on ensuring that the Department acquires and sustains the country's defense capabilities from trusted sources. A&S also represents the Department within interagency organizations, like the Committee on Foreign Investment in the United States (CFIUS) and Team Telecom, to protect industrial base interests through the national security lens. We have found that predatory capital from the People's Republic of China (PRC) erodes DoD's mission by undermining its foundation - the DIB's manufacturing and technology advantage. An estimated \$500 billion worth of intellectual property is either stolen or co-opted by the PRC annually.

### **How the Department of Defense is Addressing Weaknesses in Defense-Critical Supply Chains.**

DoD is committed to strengthening its industrial base and establishing a network of domestic and allied supply chains to meet national security needs. Given the breadth and scale of defense supply chains, DoD is initially prioritizing four areas in which critical vulnerabilities pose the most pressing threat to national security as outlined in the February 2022 E.O. report. These focus areas are:

- **Kinetic capabilities:** current missiles systems and advanced and developing missile capabilities, including hypersonic weapons technology, as well as directed energy weapons
- **Energy storage and batteries:** high-capacity batteries, particularly lithium batteries
- **Castings and forgings:** metals or composites developed into key parts and manufacturing tools through high-intensity processes
- **Microelectronics:** State-of-the-Practice (SOTP), legacy, and State-of-the-Art (SOTA) microelectronics.

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This report also provides an update on the implementation of recommendations in DoD's Review of Critical Minerals and Materials, included in the 100-day response to E.O. 14017 published on June 8, 2021,<sup>10</sup> such as the delegation of the authority to release stocks from the National Defense Stockpile to the USD(A&S) from the President in E.O. 14051. To date, DoD's investments in enhancing the U.S. rare earth supply chain resiliency have resulted in over \$140 million in commitments to address domestic rare earth element processing capabilities and capacity.

Underpinning all four key focus areas are strategic enablers that are required for mission success. Fragility or gaps in these enablers create operational and strategic risk, and addressing the challenges in each is critical to building overall supply chain resilience. The strategic enablers are:

- **Workforce:** trade skills through doctoral-level engineering skills
- **Cyber posture:** industrial security, counterintelligence, and cybersecurity
- **Manufacturing:** current manufacturing practices, as well as advanced technology like additive manufacturing
- **Small business:** the role of key members of DoD supply chains

Across all focus areas and enablers, the Department identified certain foundational recommendations that enhance and grow its industrial base, and that are critical to the Department's overall ability to make strategic informed acquisition and sustainment decisions. These recommendations are:

- **Build domestic production capacity:** For defense-critical supply chains, the U.S. is committed to ensuring that it has reliable and resilient production access within its domestic and allied DIB.
- **Engage with partners and allies:** The U.S. is collaborating with its international partners and allies to develop policies and arrangements that strengthen our DIBs and improve supply chain resilience.
- **Mitigate Foreign Ownership, Control, or Influence (FOCI) and safeguard markets:** The Department is committed to protecting its supply chains from adversarial FOCI by scaling efforts to identify and mitigate FOCI concerns.
- **Conduct data analysis:** DoD will continue to build on previous efforts to expand its supply chain visibility by collecting and organizing key data, facilitating better risk assessment.
- **Aggregate demand:** The Department will better signal to industry what the likely total demand is across multiple programs, so industry can better anticipate number of orders from year to year.
- **Develop common standards:** To leverage commercial sector innovations, and to embed modernizing technologies in weapon systems, DoD will work, where possible, to limit its use of military-unique requirements when developing performance requirements.
- **Update acquisition policies:** DoD should engage in efforts to develop a whole-of-government strategy and implementation plan to engage with industry and Congress to

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determine which policy and regulatory changes would encourage expansion of capabilities.

### **Efforts Underway to Improve Visibility into Defense Supply Chains.**

We recognize that we are addressing a problem 70 years in the making, and our current efforts are a down payment on a very large and complex set of challenges. Continuing to build supply chain resilience requires strategy, commitment, and collaboration. DoD is actively mapping the supply chains linked to the U.S. defense industrial base. This effort will begin with evaluating the data needed to inform real-time supply chain management decisions. Collecting and organizing key data will position the Department to maximize the use of analytic tools and mitigation strategies to proactively identify and address trends, vulnerabilities, and disruptions.

On August 30, 2021, the Under Secretary of Defense for Acquisition and Sustainment established a Supply Chain Resiliency Working Group to address systemic barriers currently limiting supply chain visibility, conduct resiliency assessments, and develop effective mitigation actions. Recognizing the diverse set of challenges facing different supply lines, DoD established five priority areas, aligned to the E.O. 14017 focus areas, to begin developing bespoke supply chain plans: castings and forgings; missiles and munitions; energy storage and batteries; strategic and critical materials; and microelectronics.

The U.S. government has also created a variety of entities designed to help companies coordinate more effectively across the U.S. industrial base, and improve defense supply chains. DoD will continue to support entities like the Defense Innovation Unit and DEFENSEWERX, which establish relationships with commercial suppliers and improves DoD's visibility into small and medium sized firms interested in integrating into DoD supply chains.

The Department is also leveraging and expanding all available investment authorities, to include the Defense Production Act (DPA), to maintain national defense capabilities such as the domestic production of strategic radiation-hardened electronics and the hypersonic weapon industrial base. If those capabilities are not available or viable domestically, the Department – in conjunction with other U.S. Government agencies – is working to encourage investments and funding for ally-sourced or near-shored capabilities.

DoD also works with industry to develop assurance and security standards for critical-defense industries like microelectronics. Aligning these types of standards helps ensure the mutual security and resiliency of commercial and DoD microelectronics supply chains, while also increasing industry's visibility into DoD's future technology needs.

Workers are a critical component of supply chains, and make them possible. In U.S. manufacturing, the gap between open positions and available workers is not expected to close, with an “estimated 2.1 million unfilled jobs by 2030.” DoD continues to encourage careers and education in not only STEM fields but critical manufacturing jobs, horizontally and vertically through other Federal Government agencies and through state and local governments, including school districts. Closing the 2.1 million jobs gap will go a long way towards ensuring critical defense industries have the workers necessary to mitigate weaknesses in critical supply chains.

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Through our IBAS program, the Department established the National Imperative for Industrial Skills initiative, where we work with industry and academia. Since fiscal year 2019, we have invested over \$80 million in industrial workforce development and training projects to help improve or scale workforce pipelines. The intention of this initiative is to support a variety of defense weapon system development, production, and sustainment needs, with a focus on skills such as welding, advanced machining, electronics, precision optics, metrology, digital/additive manufacturing, and other emerging Industry 4.0 skills.

### **Conclusion.**

Thank you again for the opportunity to testify. The examples I have shared today and the sector specific recommendations in our reports highlight the initial set of actions the Department is taking to renew the DIB and maintain its position as the world leader in innovation well into the 21<sup>st</sup> Century. Economic security is national security, and our policies reflect that mentality. I hope that this overview is beneficial to your efforts, and I am now happy to answer your questions.

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<sup>1</sup> McKinsey & Company, “Why Now is the Time to Stress-Test Your Industrial Supply Chain,” 27 July 2020

<sup>2</sup> DoD, Security Defense-Critical Supply Chains, pg. 5, February 2022

<sup>3</sup> Boston Consulting Group/Semiconductor Industry Association, “Government Incentives and U.S. Competitiveness in Semiconductor Manufacturing”. Presentation. 2020.

<sup>4</sup> DoD at 33

<sup>5</sup> Benchmark Mineral Intelligence. Benchmark Mineral Intelligence Report, Battery Components Manufacturing Asset Map 2019.

<sup>6</sup> National Minerals Information Center, Mineral Commodity-Specific Supply Risk Mitigation Framework, PowerPoint Presentation June 10th 2021 Minerals Resource program, USGS referencing S&P Global Market intelligence, Roskill, Bloomberg NEF, International Energy Outlook and BCC Research data.

<sup>7</sup> DoD at 14

<sup>8</sup> DoD at 27

<sup>9</sup> DoD at 32

<sup>10</sup> United States, White House, *Building Resilient Supply Chains, Revitalizing American Manufacturing, And Fostering Broad-Based Growth, 100-Day Reviews Under Executive Order 14017*. June 2021.