



Statement before the  
**Subcommittee on Commerce, Manufacturing, and Trade hearing**

***“Computing Power and Competition:  
Examining the Semiconductor Ecosystem.”***

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Chairman, Ranking Member, and distinguished Members of the Committee, my name is Charles Wessner, and I am honored to share my views with you on current challenges and needs the U.S. semiconductor industry. I serve as a Senior Advisor (Non-Resident) to the Center for Strategic and International Studies' Renewing American Innovation program. As a bipartisan, nonprofit policy research organization dedicated to advancing practical ideas to address the world's challenges, essential goals for CSIS is to address the challenges to American national security. My remarks today reflect my own views.

Thank you for the opportunity to testify on the strategic importance of semiconductors to American economic competitiveness, technological leadership, and national security. Semiconductors are not merely another industrial sector; they are foundational to the economic growth and military capabilities of the United States. While the United States remains a global leader in semiconductor design, it faces significant challenges in domestic manufacturing, packaging, and broader ecosystem support. At the same time, strategic competitors are making sustained, state-backed investments to challenge U.S. leadership in this critical sector.<sup>1</sup>

Why are semiconductors important? It is because semiconductors underpin virtually every aspect of modern national defense. They enable advanced weapons systems,

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<sup>1</sup> Sujai Shivakumar, Charles Wessner, Thomas Howell "China's Localization Drive in Semiconductors Gains Impetus from Allied Chip Export Controls", CSIS, March 24 2026, <https://www.csis.org/analysis/chinas-localization-drive-semiconductors-gains-impetus-allied-chip-export-controls>



communications platforms, intelligence and surveillance technologies, navigation systems, and targeting capabilities. The reliability and availability of advanced semiconductor supply chains are essential to maintaining U.S. military readiness and technological superiority.

Semiconductors are equally indispensable to the broader U.S. economy. Chips power banking systems, transportation networks, healthcare infrastructure, manufacturing operations, telecommunications, and consumer technologies. They also underpin American leadership in strategic sectors such as artificial intelligence, cybersecurity, quantum computing, and biotechnology.

As recent developments in artificial intelligence make clear, semiconductor leadership increasingly determines technological leadership.<sup>2</sup>

### **The China Challenge**

China has made semiconductor dominance a central pillar of its industrial and national security strategy. Chinese policymakers are not reluctant to intervene in markets or “pick winners”; rather, they intend to be the winner. Through truly massive public investment, corporate subsidies, industrial planning, and ecosystem development, China is aggressively working to establish leadership across the semiconductor value chain, combining state

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<sup>2</sup> Sujai Shivakumar, Charles Wessner, Thomas Howell, “Securing the U.S. Industrial Base in Semiconductors: Investing in a National Champion”, CSIS, August 25, 2025, <https://www.csis.org/analysis/securing-us-industrial-base-semiconductors-investing-national-champion>



guidance, firm level incentives, supply chain mastery, and long term investments in the underpinning technologies and industrial inputs.

Moreover, the United States no longer enjoys an uncontested technological advantage across all strategic sectors. China has reached parity with—or surpassed—the United States in several emerging and foundational technologies.<sup>3</sup> Equally concerning, China continues to invest heavily in the ecosystems that transform research into scalable industrial and military advantage. It is important, indeed, essential to understand that their objective is not immediate profitability but market dominance and strategic leverage.<sup>4</sup>

Export controls remain an important tool for protecting U.S. technological advantages, but they cannot serve as the sole pillar of U.S. semiconductor strategy. Export restrictions have inherent limitations, particularly when competitors possess or are rapidly developing substitute capabilities. In some cases, export controls may accelerate efforts by foreign competitors to develop domestic alternatives and reduce reliance on U.S. firms. For example, Chinese firms have made substantial progress in overcoming the effects of controls in the critical areas of semiconductor manufacturing equipment and materials, enabling them to produce higher node chips close to the leading edge. This technological

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<sup>3</sup> OECD, “OECD Science, Technology and Innovation Outlook 2025” OECD, October 28, [https://www.oecd.org/en/publications/2025/10/oecd-science-technology-and-innovation-outlook-2025\\_bae3698d.html](https://www.oecd.org/en/publications/2025/10/oecd-science-technology-and-innovation-outlook-2025_bae3698d.html)

<sup>4</sup> Charles Wessner and Shruti Sharma, “Competing with China’s Public R&D Model: Lessons and Risks for U.S. Innovation Strategy”, CSIS, September 17, 2025, <https://www.csis.org/analysis/competing-chinas-public-rd-model-lessons-and-risks-us-innovation-strategy>



capability combined with their control of rare earths and magnets potentially gives them a strategic advantage.<sup>5</sup>

### **Proactive Investments Needed**

The United States must therefore combine defensive measures with proactive investments to support competitive industries. Long-term leadership cannot be secured solely by constraining competitors; it must also be earned by strengthening U.S. capabilities in research and production.

Supporting the semiconductor industry requires reinforcing the broader domestic innovation ecosystem, including universities, research institutions, national laboratories, and private industry. Building and maintaining semiconductor leadership will require an interlocking set of policies, institutions, and incentives supported by sustained public investment, particularly in areas such as rare earths.<sup>6</sup> Above all it will require substantial resources and sustained policy attention.

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<sup>5</sup> Sujai Shivakumar and Thomas Howell, “Export Controls: National Security Tool or Industrial Policy Lever?”, CSIS, April 7 2026, <https://www.csis.org/blogs/perspectives-innovation/export-controls-national-security-tool-or-industrial-policy-lever>

<sup>6</sup> Sujai Shivakumar, Charles Wessner, and Thomas Howell " The Pillars Necessary for a Strong Domestic Semiconductor Industry, CSIS, May 20, 2022, <https://www.csis.org/analysis/pillars-necessary-strong-domestic-semiconductor-industry#:~:text=Leveraging%20federal%20laboratories:%20The%20federal,%E2%80%9Coften%20exceeded%20Sematech's%20needs.%E2%80%9D>

**Infrastructure:**

Semiconductor manufacturing is highly dependent on robust physical infrastructure, particularly reliable electricity and water availability. Expanding U.S. semiconductor manufacturing capacity will require increased power generation from both traditional and emerging energy sources, alongside substantial investment in grid modernization.<sup>7</sup>

The AI race highlights the need for more investment in power. As a recent article by Maryam Cope, a colleague at CSIS, makes clear high quality, reliable power is emerging as a key differentiator. Huge capital investments need constant, productive use—power outages have no place in this competition.

Which raises the question of regulatory obstacles. Current regulatory processes often create unnecessary barriers to industrial expansion. Lengthy permitting processes and inconsistent regulatory requirements delay semiconductor-related construction and increase costs. Modernizing regulatory frameworks to make approvals faster, cheaper, and more predictable—while preserving necessary safeguards—is essential to maintaining U.S. competitiveness.<sup>8</sup>

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<sup>7</sup> Maryam Cope, “The Rise of “Watt’s Law” and Why Power Could Put a Ceiling on American Innovation”, CSIS, February 13, 2026, <https://www.csis.org/analysis/rise-watts-law-and-why-power-could-put-ceiling-american-innovation>

<sup>8</sup> Deloitte, “Rewiring regulation: From static rulebooks to adaptive, data-driven oversight”, Deloitte, March 30, 2026, <https://www.deloitte.com/us/en/insights/industry/government-public-sector-services/government-trends/2026/future-of-regulation.html>

**Key Federal Institutions:**

Federal institutions such as the National Science Foundation and the National Institute of Standards and Technology play a critical role in sustaining U.S. innovation leadership. Continued investment in both foundational research and translational programs is necessary to ensure that scientific advances move from laboratory research into scalable commercial and strategic applications.

Programs such as NSF’s Technology, Innovation, and Partnerships Directorate represent new and effective mechanisms for connecting research institutions, startups, and industry partners to accelerate the commercialization of innovative research. These institutions should be viewed not only as scientific assets but also as national security assets.<sup>9</sup>

Successful public-private partnerships such as NY CREATES and the Texas TIE program underscore the value of shared semiconductor research and development infrastructure. As one of the nation’s most advanced nonprofit semiconductor R&D facilities, NY CREATES provides collaborative capabilities and specialized infrastructure that individual firms need

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<sup>9</sup> Sujai Shivakumar and Julie Heng, “The NSF Is a Key National Security Pillar—Now Is Not the Time to Disarm”, CSIS, May 1, 2025, <https://www.csis.org/analysis/nsf-key-national-security-pillar-now-not-time-disarm>



but cannot replicate independently. Expanding and reinforcing such institutions should be a national priority.<sup>10</sup>

### **Workforce:**

The semiconductor industry requires both highly educated engineers and technically trained workers. The United States must expand investments in technical workforce development across the full skills spectrum. Proven programs such as those supported by the National Institute for Industry and Career Advancement should be expanded. Policymakers should also use tax credits to incentivize industry-community college partnerships, apprenticeships, internships, and employer-sponsored workforce training.

### **Talent:**

We have to support institutions like Purdue and Arizona State University that are generating more domestic STEM talent while also ensuring the United States can attract and retain the world's best technical talent. Stem graduates educated here, at considerable cost, should receive a green card when they graduate. Semiconductor talent should be understood not as an immigration issue, but as a national security imperative.<sup>11</sup>

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<sup>10</sup> Charles Wessner and Thomas Howell, "Albany NanoTech's Potential to Support the National Semiconductor Technology Center", CSIS, February 14, 2025, <https://www.csis.org/analysis/albany-nanotechs-potential-support-national-semiconductor-technology-center>

<sup>11</sup> Shruti Sharma, "Innovation Lightbulb: The Workforce Dimension of Innovation Leadership", CSIS, October 2, 2025, <https://www.csis.org/blogs/innovation-lightbulb-workforce-dimension-innovation-leadership>

**Investment Tax Credit:**

Maintaining and potentially expanding the semiconductor investment tax credit is a critical means to encourage domestic manufacturing and counterbalance, at least to a degree the massive public support for Chinese manufacturers of semiconductor devices and equipment. Policymakers should also consider adopting additional mechanisms to leverage state, federal and private-sector investments.<sup>12</sup>

**Packaging:**

Importantly, the United States should continue and expand support for the reshoring of advanced semiconductor packaging capabilities. Packaging represents an increasingly strategic segment of the semiconductor value chain with substantial opportunities to deploy new technologies and increase supply chain resilience.

The United States faces an intensifying strategic competition in semiconductors that will shape the future of economic competitiveness, military power, and technological leadership. Given the unprecedented challenge from China, we must recognize semiconductors represent a strategic advantage, one that we need to exploit. Maintaining U.S. leadership and reshoring key elements of the supply chain will require more than one-time investments or isolated policy actions. It will demand sustained commitment to

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<sup>12</sup> Sujai Shivakumar and Julie Heng, “Renewing the United States’ Skilled Technical Workforce”, CSIS, July 9, 2025, <https://www.csis.org/analysis/renewing-united-states-skilled-technical-workforce>



reinforcing America’s innovation institutions, infrastructure, workforce, and regulatory competitiveness.<sup>13</sup>

In an increasingly competitive global economy, the United States must strengthen the sources of its own long-term advantage. Semiconductor leadership will be central to that effort.

Thank you, and I look forward to your questions.

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<sup>13</sup> Renewing American Innovation “Strengthening the U.S. Innovation Ecosystem” CSIS, <https://www.csis.org/programs/renewing-american-innovation/featured-initiatives/strengthening-us-innovation-ecosystem>