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National Commission on Innovation and Competitiveness Frontiers

Working Group on Developing and Deploying Disruptive Technologies at Speed and Scale

Session 4 Discussion Guide

Tuesday, June 4th, 2024
1:00 p.m. to 2:00 p.m.

Agenda

- 1:00-1:10 – Welcome & Recap

- 1:10-1:50 – Discussion

- 1:50-2:00 – Conclusion & Next Steps

Background & Recap

When this Working Group met in March 2024, discussion focused on reducing barriers in the lab-to-market pipeline, including challenges of research translation and scaling. Specifically, the group identified three key themes:

- **Reducing barriers in the research translation process**, including facilitating better engagement between the research and investment communities.

- **Creating and broadening access to early-stage testing programs and capabilities** to support development and demonstration of critical technologies.

- **Accelerating the development, commercialization, and scaling of novel technologies**, including through enhanced domestic and international coordination.

In April 2024, the Council convened its first Competitiveness Conversation at Vanderbilt University in Tennessee. Participants gathered to discuss many issues relating to developing and deploying disruptive technologies. Key themes emerging from that conversation include:

- **Creating end-to-end technology hubs.** Creating regionally co-located, integrated supply chains that include a complementary mix of technical and industry expertise helps to foster a holistic technology ecosystem that can spur further growth. For example, in Tennessee, the state has developed capacity across many different aspects of the EV ecosystem, from basic research to manufacturing capability to regulatory expertise. A combination of expertise across government, academia, and industry creates a vibrant EV ecosystem that begets more investment and activity from new entities.

- **Innovation helps solve supply chain challenges.** Both product and process innovations are needed to solve product and supply chain challenges. On the product side, designing new materials can lessen the impact of critical minerals shortages, while re-engineering existing

technologies like transmission conductors can help improve efficiency without other resource-intensive grid upgrades. On the process side, accelerating the digitization of supply chain logistics can introduce powerful new efficiencies to existing supplier networks without creating entirely new approaches. Finding new opportunities for innovation to solve supply chain challenges, and capitalizing on existing opportunities, will be key to maintaining a healthy technology ecosystem.

- **Enhancing the digital supply chain.** Some of the largest constraints beyond the traditional supply chain (i.e., manufacturing and raw materials) are now digital. Perhaps the largest challenge in the digital space is data — which is the lifeblood of innovation, from conducting applied research to understanding process efficiency to training AI. Sharing data between collaborators, vendors, and even competitors can help spur innovation across products and processes. The digital supply chain also implicates other issues, including computing resources and power availability, which should be addressed in concert with other data challenges.

Lastly, in February 2024, the Council convened its 29th Technology Leadership and Strategy Initiative (TLSI) Dialogue at Arizona State University. Leaders across industry, academia, and government met to discuss some of the most pressing issues shaping the U.S. innovation ecosystem, including research security. Key themes emerging from that conversation include:

- **Expanding access to secure facilities.** Providing access to secure research facilities helps take technologies, especially those with disruptive and dual-use potential, from basic research to impactful, often commercial, success. Accelerating the process for gaining access to these facilities will be especially important for start-ups and small businesses with limited resources and large potential.

- **Improving security clearance processes.** Acquiring and maintaining a security clearance is a particularly long and arduous process, leaving many secure research programs with a dearth of qualified, high-clearance workers. Creating a quicker, more agile process, especially for researchers who have previously held a security clearance, will expand research in critical areas and lessen talent shortages for secure research programs.

- **Universities play a key role in the secure research ecosystem.** Universities can accelerate classified research through targeted partnerships, providing the staff, resources, and expertise needed to push secure research forward. Universities can also develop basic research programs and portfolios of applied research to fill knowledge gaps, prepare students and faculty for secure research, and ultimately address security issues. However, universities can also introduce security issues, especially through its faculty and students that unknowingly allow IP theft or introduce other vulnerabilities. Additional education on research security issues will allow university communities to meaningfully and safely contribute to secure research.

Discussion: Enhancing security and reliability in critical supply chains and our research ecosystem.

GOAL: Build on past discussions and begin driving toward concrete policy recommendations.

TOPICAL FOCUS: Securing our supply chain and research ecosystem.

The questions below are intended to guide discussion and provide food for thought. Not all questions need to be directly addressed during the Working Group session. Moderators and Working Group participants will collaboratively shape discussion around priority issues.

The past several years have highlighted many of the vulnerabilities in our innovation ecosystem, from reliable supply chains to secure research. Shortages of critical minerals, semiconductors, and other innovation inputs have demonstrated the downsides of a highly distributed supply chain. Meanwhile, a shortage of highly skilled talent across secure research programs has slowed innovation in critical technology areas, even as existing research falls prey to IP theft. Reducing and removing these vulnerabilities is necessary to securing and strengthening the U.S. innovation ecosystem.

How can stakeholders across industry, government, and academia collaborate to address vulnerabilities throughout our innovation ecosystem, including (1) creating end-to-end supply chains within regions; (2) enhancing digital aspects of the supply chain; and (3) improving and expanding our secure research ecosystem?

Core Discussion Questions

- Emerging regional hubs centered around certain technology "themes" (e.g., the future of mobility in Tennessee) highlight the importance of strategically investing in and attracting businesses up and down a particular supply chain to create a dynamic, competitive hub. What should state and local governments do to build robust regional supply chains? What federal policy actions can help local efforts?

- Alongside physical supply chains, many experts are focused on securing software and other digital supply chains, including protecting against cyber threats. What kinds of policies or partnerships are needed to enhance the security of our supply chain ecosystem?

- Similar principles around the security of supply chains can be extended to our research ecosystem – secure facilities, employees, and partnerships are needed to protect and develop technologies in critical industries like hypersonics and biotechnology. How can government, academia, and industry be intentional in promoting research security?

To Discuss As Time Allows

- What are the most important technology areas where for eliminating supply chain vulnerabilities (e.g., battery manufacturing with alternative materials)?

- Given that many supply chain investments are struggling to secure federal funding (e.g., CHIPS authorizations), how can we work to expand domestic supply chains without relying on significant federal investment?

Conclusion & Next Steps

- This Working Group will meet again September 17th, from 1:00-2:00, to build on the ideas generated in this session and explore new topics. A short summary will be sent to Working Group participants in the coming weeks.