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Senate Committee on Commerce, Science, and Technology
Subcommittee on Science, Manufacturing, and Competitiveness

"Less Hype, More Help: AI That Improves Safety, Productivity, and Care"
March 3, 2026

Introduction

Chairman Cruz, Ranking Member Cantwell, Chairman Budd, Ranking Member Baldwin, and distinguished Members of the Subcommittee, thank you for the opportunity to testify today.

I lead Siemens' maritime business in the United States, where we work directly with shipyards, defense contractors, and manufacturers modernizing some of the most complex production systems in the world.

Siemens is a global technology company with deep roots in the United States, including the global headquarters of our software business in Plano, TX. Across our businesses, we help design, simulate, build, and operate the infrastructure and industrial systems that underpin the American economy. Last year alone, Siemens invested approximately $15 billion in the U.S. to deepen our leadership in Industrial AI, simulation, and digital engineering.

Through that work, we have learned a simple lesson: AI is most powerful not as a standalone capability, but when it connects data to operational decisions in the physical world.

Siemens in the USA

Siemens has been part of the American industrial landscape for over 160 years. Our presence in the United States spans manufacturing floors, shipyards, software labs, and engineering classrooms. In many ways, our technologies are embedded in nearly every chapter of the American industrial story – from designing semiconductors and building aircraft, to modernizing shipyards, powering data centers, strengthening the electric grid, and advancing next-generation manufacturing. Approximately 50,000 Siemens employees across the country are designing, building, and deploying the technologies that power American production.

In Fort Worth, Texas, one of our newest advanced manufacturing facilities illustrates what that commitment looks like in practice. Before the first piece of equipment was installed, the factory existed as a full digital twin – a physics-based virtual replica used to simulate production flows, validate line configurations, and stress-test material movement. By resolving bottlenecks in the virtual environment first, the facility ramped up faster with greater precision and flexibility. It is a clear example of how digital-first planning accelerates real-world industrial capacity.

That same approach extends beyond a single facility. Across the Midwest – from Missouri to Ohio – thousands of Siemens engineers and software developers build the digital engineering platforms that make these deployments possible. The simulation and industrial software developed by these

teams form the backbone of AI-enabled production systems used across the United States and globally. Industrial AI adoption is not just happening on factory floors – it is being coded, tested, and refined in American software hubs.

Building on this momentum, Siemens is also advancing an AI build-out in Washington state to scale AI and digital infrastructure where industrial transformation is accelerating. The goal of our Data and AI team, which will be globally headquartered in the United States, is to unify data, software, and engineering platforms to deliver AI-native solutions across the industrial lifecycle, from design through operations. Coupled with Siemens' broader U.S. investment strategy – totaling investments of over $100 billion in 20 years – this build-out reinforces our belief that scaling Industrial AI is essential to competitiveness.

Our commitment to the United States is not limited to facilities and software – it is equally a commitment to people. Siemens has pledged to help train 200,000 electricians and manufacturing experts in the United States by 2030 to close the skills gap that increasingly defines industrial competitiveness. This initiative reflects a simple reality: as production systems become more software-defined and AI-enabled, the competitive advantage of the United States will depend not just on innovation, but on whether America's workforce is prepared to lead that innovation on the factory floor, in the software suite, and at the intersection of design and execution.

That commitment comes to life through deep partnerships across the country with universities, apprenticeships, vocational schools, and other workforce institutions preparing the next generation of industrial leaders. At Purdue University, Siemens collaborates to advance digital twin research and embed simulation tools directly into engineering education – ensuring graduates are fluent in the digital environments they will encounter in modern manufacturing. In Colorado, Siemens drives microcredentialing initiatives that provide modular, industry-recognized digital skills training. And in Kansas, Siemens technologies power smart factory initiatives that demonstrate how AI-enabled automation can scale across manufacturers of all sizes.

The list can go on. But, all of our efforts reflect a consistent theme: Siemens' role in the United States is operational, not abstract. We design here. We manufacture here. We train the workforce here. And we deploy Industrial AI here – in ways that strengthen American productivity and industrial readiness.

Industrial AI in the Physical World

In modern shipbuilding, we can now create a full digital twin of a vessel before steel is ever cut. A digital twin is a high-fidelity, physics-based virtual demonstration of a physical asset or production process. In shipbuilding, that means we can simulate how the ship will be built, how systems will integrate, how materials will flow through the yard, how production constraints may emerge – all before physical construction begins.

For example, through our work with HD Hyundai, shipbuilders are deploying an AI-enabled digital shipbuilding platform that connects design, simulation, and production planning. Teams can test decisions virtually, identify bottlenecks before they occur, reduce costly rework, and compress production timelines.

By training AI in virtual environments using digital twins and synthetic data, shipyards can improve real-world planning and performance in highly complex production environments. This is what AI looks like in the physical world.

On the deck plate, it means sequencing work packages more efficiently, flagging quality issues earlier, predicting equipment downtime, and optimizing material movement across congested yards. Workers also get to spend less time waiting and correcting mistakes, and more time building.

AI also offers tangible improvements for worker safety in manufacturing, as systems can identify hazardous conditions before they escalate – whether that is equipment operating outside safe thresholds, congestion in high-traffic work zones, or potential conflicts between tasks. Digital twins allow crews to simulate complex lifts, confined-space operations, and workflow changes virtually before executing them in the physical environment. Workers spend less time navigating uncertainty and fewer hours exposed to avoidable risks. Instead of reacting to problems after they occur, teams can anticipate them — improving both safety outcomes and operational confidence.

What is true in maritime manufacturing is true across sectors. Industrial AI and software-defined automation are delivering measurable gains across aerospace, automotive, semiconductors, energy systems, food & beverage, advanced manufacturing, and more.

We're seeing machine downtime reduced by 50%, energy consumption cut by 20%, and quality control with 99.99% accuracy across industrial operations. Furthermore, Industrial AI capabilities are helping manufacturers achieve up to 40% productivity improvements through predictive maintenance, quality control optimization, and automated decision-making – transforming traditional factories into flexible, efficient digital enterprises.

For example, through our partnership with JetZero – an American aerospace innovator – we are helping bring to market a next-generation blended-wing aircraft and a digitally native "Factory of the Future" in North Carolina. Using Siemens' AI-enabled digital twin and engineering platforms, JetZero can explore thousands of design configurations, model aerodynamic performance, and simulate its production system before physical assembly begins. AI tools support both engineering and shopfloor operations – from optimizing aircraft performance to assisting technicians in diagnosing equipment issues. The result is a more efficient aircraft and a smarter manufacturing system built here in the United States.

Across all these sectors – the result of this adoption is faster time to market, reduced waste, lower cost structures, and more resilient supply chains.

AI is not an abstract capability. AI is deployed on factory floors, in shipyards, and across production systems where it generates measurable productivity gains.

Accelerating Adoption

America's competitive edge will not be determined by who builds the most AI models. It will be determined by who most effectively deploys AI in the physical world.

That requires adoption.

The United States does not have an innovation problem – we have an adoption challenge. We lead in developing breakthrough technologies. The strategic challenge is scaling them across manufacturers of all sizes and across every sector of our industrial base.

This adoption challenge is particularly acute for small and medium-sized manufacturers, which often lack the ability to experiment with emerging technologies. Through our work with Haddy – an American advanced additive manufacturing company – we are demonstrating how automation-first production can lower those barriers. Haddy operates localized micro-factories that combine large-scale robotic 3D printing with digitally coordinated workflows. AI is embedded directly into factory control and execution systems, enabling faster iteration and scalable distributed production. This model shows how smaller manufacturers can compete in advanced industrial supply chains without the footprint of traditional larger-scale facilities.

This is also true in national security contexts. In shipbuilding, small improvements in production or quality can compound across thousands of tasks and millions of labor hours. Adoption translates directly into more predictable schedules, lower costs, and stronger industrial capacity.

At Siemens, we create technology to transform the everyday, for everyone. But technology alone does not transform an industry. Deployment at scale does. The companies and nations that integrate AI into core production systems – not as isolated pilots, but as operating infrastructure – will lead in productivity and competitiveness.

AI & The Manufacturing Workforce

Technology cannot transform industry unless people trust it, understand it, and see how it improves their work. At Siemens, we view AI as a people-centric transformation designed to help the workforce make better decisions at a faster pace, rather than replace human expertise.

Manufacturing today faces more than 400,000 open jobs nationwide. The issue is a shortage of workers combined with increasing production complexity. Across the country, an aging workforce is retiring faster than it can be replaced, and many employers struggle to attract and retain the next generation of digitally native talent. Young workers expect modern tools, intuitive systems, and career mobility – not paper-driven processes and repetitive manual tasks.

Industrial AI doesn't just solve the workforce shortage. It changes the equation.

Digital twins are a force-multiplier and allow workers to train in simulated environments before stepping onto the production floor. AI-powered copilots help technicians diagnose issues faster. Software-defined systems make production more intuitive and adaptable. Across environments, from the deck plate to the factory floor, this means fewer repetitive and hazardous tasks, faster troubleshooting, and more predictable execution.

These technologies elevate the skill sets of American workers for the higher paying jobs of tomorrow, while also increasing productivity per worker. At Siemens, we've learned digital transformation works best when the worker is at the center – when welders, machinists, planners, and engineers are part of the process from day one.

Industrial AI empowers workers to operate more advanced and competitive ecosystems – thereby strengthening both productivity and opportunity.

Policy Considerations

As Congress considers AI and manufacturing policy, we offer three considerations.

1. Distinguish Industrial AI from Consumer AI

    Industrial AI operates in structured, safety-critical, business-to-business environments using validated operational data generated by machines, sensors, and engineering systems. These applications are deployed in regulated industries such as shipbuilding, aerospace, energy, and semiconductor manufacturing, where safety and quality are non-negotiable.

    Industrial AI applications often occur upstream in design and simulation environments before physical products are built. Digital twins allow manufacturers to test and optimize processes virtually, reducing risk before deployment in the real world. In these settings, AI systems operate within defined parameters and controlled data environments – very different from open-ended consumer applications.

    To foster innovation, policy frameworks should reflect these distinctions. Approaches designed for consumer-facing AI should not unintentionally slow adoption in manufacturing environments that already operate under rigorous technical and safety standards.

2. Focus on Adoption

    The United States faces adoption and scaling challenges, especially as emerging technologies are being deployed worldwide at a rapid pace. To compete in the global economy, breakthrough technologies developed in labs and leading firms must be adopted broadly across the industrial base – including small and medium-sized manufacturers – to drive economy-wide productivity gains.

    In tandem, federal policies and investments – from shipbuilding to semiconductors – must integrate digital tools from the outset to ensure advanced manufacturing initiatives include the technology necessary for AI-enabled production.

    Public-private collaboration plays a critical role in accelerating this deployment. Programs that connect advanced computing, simulation, and industrial software with real-world production environments can shorten commercialization timelines and reduce barriers to adoption. Through the Department of Energy's Genesis Mission, Siemens is excited to help translate Industrial AI, digital twins, and advanced computing into scalable, operational industrial applications.

    Innovation creates meaningful potential. Adoption converts that potential into measurable productivity, resilience, and competitiveness.

3. Send a Clear Signal for Digitally Native Production

Both industry and government should send clear and consistent signals that digital tools are core infrastructure for competitiveness.

For example, Manufacturing USA Institutes provide platforms where manufacturers, suppliers, technology providers, and workforce institutions collaborate on applied innovation. Managing these partnerships as a true network to focus on specific manufacturing challenges can help pursue the goal of bridging the gap between basic research and commercialization.

Tailored regulatory sandboxes complement this effort by proposing structured environments where AI-enabled production systems can be deployed and tested within defined guardrails. This approach allows responsible experimentation to move forward with clarity and confidence, putting technology and innovation before regulation.

Additionally, challenge-based partnerships such as the Department of Energy's Genesis Mission help translate breakthrough capability development into operational systems that can create real-world impact. By connecting advanced research infrastructure to real use cases, these programs bridge the gap between innovation and deployment.

Modernization scales fastest when expectations are clearly set in federal programs, such as procurement standards, financing mechanisms, workforce programs, and public-private partnerships. A coordinated signal from policymakers that digitally native industrial strategy is a national priority will accelerate technology adoption, strengthen domestic supply chains, and reinforce long-term industrial readiness.

Closing

In closing, consider the story about Albert Einstein riding on a train. When the conductor came by to collect tickets, Einstein began searching his pockets but couldn't find his ticket. The conductor recognized him and said, "Professor Einstein, it's okay – I know who you are."

Einstein kept searching. He looked in his briefcase, under his seat, even on the floor. The conductor said again, "Dr. Einstein, I trust you."

Einstein replied, "Young man, I know who I am. What I don't know is where I'm going."

America knows who it is: the world's great innovation leader. But if we don't focus on where we're going – on how we deploy these groundbreaking innovations across our industrial base – we risk losing direction.

If we lead in adoption, we lead in productivity.

If we lead in productivity, we lead in competitiveness.

Thank you, and I look forward to your questions.