

Written Testimony of Siemens USA CEO Barbara Humpton

House Committee on Energy and Commerce Subcommittee on Commerce, Manufacturing, and Trade

“AI in Manufacturing: Securing American Leadership in Manufacturing and the Next Generation of Technologies”

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Introduction

Chairmen Guthrie and Bilirakis, Ranking Members Pallone and Schakowsky, and all the members of this subcommittee – thank you for this invitation and the chance to speak about this pivotal moment in U.S. manufacturing.

I serve as the President and CEO of Siemens USA.

Siemens is a leading technology company focused on pioneering a new industrial tech sector. We were founded in 1847 and have been building our American business for more than 160 years.

We're proud that the U.S. is our largest market. We have more than 45,000 people and 12,000 suppliers nationwide. In recent years, we've invested more than \$650 million in new manufacturing facilities and factory expansions. We've invested \$10 billion in the U.S. market since 2007, with an additional \$10 billion announced in a planned acquisition of a Michigan-based software company – all to build out our digital technology portfolio. With customers in all 50 states and Puerto Rico, we are creating more productive factories, more resilient buildings, and more efficient power systems.

Industrial AI

As a global leader in industrial technology, we are at the forefront of industrial artificial intelligence, or Industrial AI. We have been working on Industrial AI since the 1970s, when our R&D teams first began incorporating AI into our products. Industrial AI differs significantly from AI used in commercial or consumer settings. It must meet the rigorous requirements and standards of the most demanding industrial environments. With the ability to process large amounts of machine data and recognize complex patterns, Industrial AI helps companies accelerate their digital transformation at scale.

At Siemens, we believe making AI industrial grade requires partnership. We team up with partners from various industries, the public sector and academia to advance AI and make it industry ready. With decades of experience in the discrete and process industries, our domain expertise, and our own factories, we have long been working to improve the capabilities of AI for product and production design, production operations,

and services. Siemens is committed to making Industrial AI accessible, enabling companies of all sizes to drive digital transformation effectively.

Furthermore, we've been steadily investing in Industrial AI in the U.S. for over two decades, building the AI capabilities to support digital innovation and regrowth in domestic manufacturing. We've done this because we see tremendous potential to make American industry more state-of-the-art and competitive. Industrial AI provides opportunities for reliable, secure, trustworthy applications that help manufacturers create business value from their data. Because of Industrial AI, businesses across the country are advancing towards better products, more efficient operations, and a more prepared workforce.

Industrial AI Use Cases

Siemens is using Industrial AI to advance automation and digitalization across industries, spanning power, automotive, aerospace, pharmaceutical, food and beverage, chemical, oil & gas, and more. We're proud to partner with customers across all sectors of the economy to propel them towards their digital transformation.

For example, we are leveraging Industrial AI to build a safer automotive industry. Siemens recently built a predictive maintenance model using Industrial AI for a major automotive OEM. Now, instead of manually analyzing data from 10,000 machines, the company uses AI to help workers anticipate potential machine failures six months in advance and take preventative action.

We're also driving innovation in the aerospace industry, as Industrial AI is enabling Siemens customers to bridge the real and digital worlds like never before. At CES 2025, Siemens announced our partnership with JetZero, a pioneering aviation startup working to build the future of air travel, to collaborate on the development and production of JetZero's revolutionary blended wing aircraft. With our AI-enabled software, JetZero is using real-time data and virtual simulations to safely design the next generation of ultra-efficient commercial aircraft. And when their first factory opens, Siemens' Industrial AI will optimize it, electrifying and automating the manufacturing process.

This is just the beginning of the stories we can share demonstrating Industrial AI's profound impact. Industrial AI is optimizing construction for commercial and residential buildings. It's addressing national energy challenges by managing electricity use in data centers. It's improving energy efficiency in semiconductor factories to help expand American chip production.

With a digital-first approach built on massive volumes of data, Industrial AI is positioned to play an ever-increasing role in product design, testing, and manufacturing to leverage the tremendous amount of information to the fullest extent. Thus, advancing the capabilities of Industrial AI is critical to securing domestic manufacturing, driving

American economic growth, competing in the global economy, and advancing U.S. technological leadership.

AI and the Manufacturing Workforce

Major technology developments raise questions for workers. What does AI mean for jobs? Will technology replace people?

For Siemens, the answer is no. We believe the opposite is true. Industrial AI expands what is humanly possible, creating more opportunities for workers at all stages of their careers. We believe digital transformation is elevating the roles of our workers.

This is even more true with the introduction of generative AI.

Generative AI is making technologies more intuitive, letting workers 'speak' to machines using natural language instead of code. Siemens has led the industry in this area, deploying the first Gen AI-powered assistant, or 'copilot', for industrial operations.

For experienced workers, industrial copilots help them with more repetitive tasks. That means they can spend more time innovating and making decisions. For new hires, industrial copilots introduce the possibility to help people start manufacturing jobs without specialized skills. This can crucially bring new people into the workforce, helping fill more of America's 500,000 open positions in manufacturing.

Furthermore, in order to close these gaps in the manufacturing workforce, we also believe in investing in the workforce development programs we need today and in the future. Institutions from high school STEM classrooms to university laboratories are developing curriculum to tackle real-world challenges through programs that teach both technical and career skills. This collective action is exactly what it takes to develop the strength of digital talent necessary not just for Siemens, but for our whole country.

Siemens is engaged in collaborative efforts across the country to address critical labor shortages and rapidly shifting skill demands driven by exciting advancements in technology. As an example, Siemens recently kicked off a microcredentialing program with the University of Colorado Boulder and Pennsylvania State University to credential students and recognize career readiness, thereby creating a stronger pipeline of engineering talent demanded by industry. The credentials are intended to supplement a formal degree by validating industry knowledge and skills.

Recommendations to Policymakers

With this in mind, we continue to encourage government efforts to guide AI development in a way that balances innovation and safety. We believe that all technologies should be applied securely and with purpose.

Like this committee, we recognize the advantage that Industrial AI leadership will bring to U.S. manufacturing. This technology is not only here to expand what is humanly possible; it is advancing our ability to bolster American manufacturing and build a skilled workforce.

In order to harness the full potential of Industrial AI, it is vital policymakers understand the unique role of industrial applications and separate Industrial AI from consumer-focused applications. We encourage Congress and policymakers to recognize the distinction between Industrial AI in business-to-business contexts, as opposed to the consumer-facing applications where much of the attention is directed and the center of many policy issues currently under debate.

Furthermore, as state legislatures across the country consider individual measures to regulate AI, targeted definitions matter now more than ever. Overly broad definitions of which role an AI actor plays would negatively impact our ability to develop and provide access to next-generation technologies, especially harming small- and medium-sized manufacturers. This would be detrimental to the future of economic growth and innovation in the U.S.

Additionally, it is essential for policymakers to be very specific about risk. We support safe development and secure deployment of AI technologies to mitigate risks to end users. However, many industrial AI applications are not in the operational environment, instead being utilized earlier on in the value chain at the design and test stages, where finished products can be optimized before being built.

In terms of trustworthiness of data, the core distinction of Industrial AI is that it is trained on highly monitored data from sensors and machines, providing a more reliable foundation for training AI models in this domain when compared to generally publicly available data used for many consumer-facing AI uses. Furthermore, in our industrial settings, we implement robust data quality checks and validation processes to ensure the accuracy and consistency of industrial data, critical for trustworthy AI.

We also encourage policymakers to align public sector priorities with private industry efforts to maximize these efforts. We believe the relationship between the public sector and the private sector is critical, and we can learn a lot from each other. All levels of government benefit from expanding understanding of fast-moving technology, finding creative ways to encourage broader adoption, and creating the necessary ecosystems to develop technology further.

One example of these successful ecosystems is Manufacturing USA. The network of Manufacturing USA Institutes has been effective in improving the competitiveness of U.S. manufacturing by accelerating technology commercialization and developing the manufacturing workforce. Siemens is a proud partner in several institutes supporting:

- Cybersecurity in manufacturing at MxD in Chicago
- Advanced materials, process and systems engineering at LIFT in Detroit
- The new digital twin for semiconductor manufacturing institute in North Carolina, SMART USA
- Teams applying for the newest institute focused on AI in manufacturing

Lastly, policymakers must advance Industrial AI by prioritizing strong rules for digital trade, especially to include strong protections for source code and algorithms. We encourage policymakers to build upon the success of previous U.S.-led efforts to protect intellectual property, prevent forced data localization, and oppose the use of customs duties on electronic transfers. These priorities have built the foundation of an ecosystem where American-driven technology can compete, grow and innovate in the global economy. By remaining committed to strong digital trade protections, policymakers can propel Industrial AI applications to enable all companies – startups, small and medium enterprises, industrial giants – to thrive in this new era for American manufacturing.

Conclusion

Industrial AI is poised to revolutionize the way we're managing the factory floor, making manufacturing processes more responsive, more agile, and reprogrammable in real time. As production becomes more connected and more autonomous, Industrial AI will make human-machine collaboration more innovative, enabling manufacturing operators and engineers to detect and analyze the most useful data points that no human could ever fully interpret alone. This will bolster crucial decisions that advance product customization and production resiliency.

By combining cutting-edge digital tools with improved machinery and infrastructure, we can propel domestic manufacturing and economic growth forward, helping American businesses of all sizes to maximize their potential.

I'll finish with an example of how Industrial AI is supercharging the growth of U.S. manufacturing. In three weeks, Siemens will celebrate the opening of a new manufacturing facility in Fort Worth, Texas.

To build the facility, we used Industrial AI, developing a digital representation, or digital twin, of the facility's product and production lines. To staff the facility, we created 480 new jobs, with another 320 to come next year. To train workers, we recruited former high school teachers to develop a training protocol for people with no manufacturing experience. And when the facility begins operations, it will produce the electrical components that power American data centers – the foundation of AI.

Fort Worth is a microcosm of what Industrial AI can do for domestic manufacturing. With these technologies, we can boost economic growth, create jobs, empower innovation, and secure the next generation of American industry.

To all the members of this committee, know that Siemens stands ready to work with you. Together, we will advance American manufacturing and build a skilled workforce.