



RESEARCH, INNOVATION AND TECHNOLOGY: **Powering Manufacturing 4.0**

Manufacturers in the United States have created an innovation engine that has reshaped the world around us. New technologies and processes have brought us energy independence, new lifesaving medicines and medical devices and more efficient automobiles, to name a few. Countless other products are being developed and refined constantly to make people's lives better and secure our nation's global leadership position in manufacturing. Every day, manufacturers across the country are transforming their own operations to achieve greater efficiency, productivity and competitiveness while working to create a better tomorrow.

Manufacturers in the U.S. account for about two-thirds of private-sector spending on R&D, and manufacturing has been awarded more patents than any other industry. Innovation is the lifeblood of our economy, the foundation of a globally competitive manufacturing base here

at home and the driver for U.S. leadership in manufacturing abroad. Building on this history of innovation, manufacturers are leading the charge in the digital economy of the 21st century. Machine learning and artificial intelligence, additive manufacturing, the Internet of Things, robotics, 5G, cloud computing, augmented reality, advanced materials and other innovations are attracting significant attention and investment that will propel manufacturing into the future.

To continue this progress, a whole-of-government approach to the semiconductor shortage should identify and prioritize mitigating foreign dependencies and bottlenecks in the semiconductor supply chain by adding capacity, improving quality and creating stable regulatory environments for domestic production of these critical components. Incentives should not be limited to wafer production, and the full microelectronics ecosystem, including

manufacturing equipment and related components, must be assessed so that all challenges and risks in the supply chain are addressed as the CHIPS and Science Act is implemented.

As modern manufacturing in the U.S. races toward the new economic era and pursues future technologies to lead new operational advances, federal policies must keep up with the industry's needs, prioritizing both investment and innovation. The application of advanced and digital technologies on the factory floor will contribute to a significant transformation already underway known as Manufacturing 4.0.

A Research, Innovation and Technology Agenda for the Future Must:

- Adopt policies that will attract and retain investment in R&D and other activities that drive innovation.
- Vigorously protect all forms of manufacturers' IP at home and abroad and strengthen enforcement against counterfeiting and other forms of IP theft.
- Foster the growth of connected technologies, digital infrastructure and data-driven innovation across all manufacturing industry segments.
- Include cybersecurity policies that draw on industry best practices.

ACTIONS FOR LEADERS TO TAKE:

- ✓ Deliver strong IP protections for manufacturers by advancing pro-innovation domestic policies; negotiating strong IP provisions in trade and other bilateral and regional agreements; and strengthening, not weakening, critical global IP rules.
- ✓ Implement the CHIPS and Science Act by building on U.S. leadership in producing advanced chips and improving reliable access for older and defense-specific chipsets.
- ✓ Pursue a federal approach to data privacy that provides flexibility for innovation, addresses domestic and global inconsistencies and maintains U.S. economic growth and technological leadership.
- ✓ Enact policies that curb abusive patent lawsuits while respecting IP rights for all industry segments.
- ✓ Modernize our communications laws to reduce unnecessary regulations, spur investment in our digital infrastructure and promote the deployment of next-generation wireless technology.
- ✓ Maintain a strong mechanism for the public and private sector to share real-time cyberthreat information and support reasonable reporting requirements for those under attack.