THE U.S. GOVERNMENT NEEDS TO NURTURE THE ENTIRE ELECTRONICS ECOSYSTEM

The electronics manufacturing industry is at the heart of the modern economy. It is a large, vertical industry in its own right, but it is also a crucial link in the supply chain for automobiles, aircraft, health care, retail, manufacturing, IT, telecoms, consumer technologies, and much more. In today's world, our lives depend on electronics.

However, government policy initiatives often focus on bolstering certain components of the electronics supply chain, such as semiconductors, without appreciating that electronics manufacturing is a complex ecosystem, and all parts must be strong for the entire ecosystem to thrive.

BACKGROUND

Advancements in semiconductor technology have always been intricately linked to advancements in printed circuit board (PCB) fabrication and assembly, but the interdependence is growing even greater with current trends in microelectronics.

To function, semiconductors and a variety of other components and interconnections must be placed on PCBs by assemblers, then fitted into other systems to achieve their function. Next-generation electronics are characterized by increasing power and complexity in smaller packages. The power of microelectronics to continue improving our lives depends on advancements in all the various components of electronics and in PCB fabrication and assembly.

Unfortunately, IPC estimates the United States is 20 years behind Asian nations in PCB manufacturing technologies and 30 years behind in advanced microelectronics packaging. U.S. defense and commercial original equipment manufacturers (OEMs) are urgently developing next-generation electronics systems, but they are sourcing key technologies primarily from Taiwan, South Korea, Japan, and China.

According to the U.S. Defense DoD Executive Agent for Printed Circuit Board and Interconnect Technology, PCBs and printed circuit board assemblies (PCBAs) are critical features of national defense systems. But while "the global industry for electronics is growing at a rapid pace and making huge leaps in technological advancement every year, the domestic [PCB] industrial base continues to decline."

POLICY RECOMMENDATIONS

The U.S. Government has an important role to play in cultivating an environment in which the electronics manufacturing ecosystem can thrive. For best results, policy makers must take a holistic approach.

- We encourage robust investments in Defense Production Act Title III funds to support industry modernization. Likewise, the Department of Commerce should explore funding mechanisms to support capital equipment upgrades through federal subsidies, no-interest loans, and tax credits. Commerce Department authorities have never been fully leveraged to support an ambitious U.S. manufacturing strategy.
- A robust manufacturing strategy requires a more localized ecosystem for raw materials, components, and parts. The United States has allowed much of the supply chain to go offshore, making U.S. manufacturing less nimble. We urge Congress and the Biden administration to recognize that the electronics supply chain is an ecosystem, and all segments of the industry must be strong for the entire ecosystem to thrive. Praiseworthy investments in one segment, such as semiconductors, also require investments in other segments of the industry.
- One of the most difficult challenges facing today's electronics industry is a chronic shortage of adequately skilled workers. More than two-thirds of IPC's U.S. members report that an inability to find and retain skilled workers is limiting their growth and competitiveness. Part of this challenge is due to the rapid rate at which technology evolves. To align job training with job growth, we urge support for industry-recognized credentials through:

    - Business tax credits for expenditures on training and certification offered by industry associations.

    - Tax incentives for training and certification at the individual level, focused on post-secondary education expenditures.

    - Grants for industry-based organizations to help cover costs of industry training program development and upskilling workers who may be displaced due to automation.

    - Partnering with trade associations to identify critical training and certification programs in key industries and ensure that federal contracting requirements contain language supporting these programs, which would increase workforce quality and reliability while ensuring workers are ready for the technological challenges of tomorrow.

    - Federal funding for trade associations to develop "next-gen" or "future-facing" training programs to keep U.S. electronics manufacturing competitive.

- We encourage federal support of "trusted supplier" programs in domestic and international supply chains for critical sectors of national security, as there is a need for greater supply chain visibility and transparency. We also recommend establishing metrics for defense electronics industrial base resiliency, with capacity, capabilities, security, and geographic diversity as key factors.
- We urge the administration to explore development of and access to rare earth minerals, as well as new initiatives to produce raw materials critical to electronics manufacturing.
- Industry funds for R&D are constrained by the industry's thin profit margins. Companies in Asia and Europe — with the support of national governments—are undertaking research that will enable them to lead the world in PCB fabrication and assembly. Meanwhile, in the United States, the focus is almost singularly on one or two segments of the electronics industry to the exclusion of others. The DoD should undertake a specific initiative to study and pursue research on the areas of PCB fabrication and assembly that are necessary to support advancements in microelectronics.
- The Tax Cuts and Jobs Act (TCJA) is changing the treatment of R&D tax costs. Currently, companies can fully deduct R&D costs from taxable income in the year that those costs occur, but starting in 2022, companies will be required to amortize their R&D costs over five years. We support maintaining full expensing to avoid discouraging investment and economic growth.

CLOSING

The failure of the United States to appreciate the strategic significance of electronics manufacturing has undermined the resiliency, competitiveness, and security of the U.S. electronics supply chain. Competing globally in the years ahead will require the U.S. Government to adopt a more holistic approach to measuring the health of the electronics manufacturing ecosystem and appreciating the strong connection between the semiconductor supply chain and the wider PCB and assembly industries.

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For More Information:

Chris Mitchell
Vice President, Global Government Relations
ChrisMitchell@IPC.org
Tel: + 1-202-661-8097

Ken Schramko
Senior Director, North American Government Relations
KenSchramko@IPC.org
Tel: +1 202-661-8094