

May 20, 2021

The Honorable Joseph R. Biden Jr.
President of the United States of America
The White House
1600 Pennsylvania Ave, N.W.
Washington, DC 20500

The Honorable Gina Raimondo
Secretary
U.S. Department of Commerce
1401 Constitution Ave, NW
Washington, D.C. 20230

Dear President Biden and Secretary Raimondo:

As the chief executives of leading U.S. electronics manufacturers, we are writing to express our support for your ongoing initiatives to bolster U.S. manufacturing and to make recommendations related to the much-needed, 100-day review of the semiconductor supply chain.

Specifically, we urge you to address a fundamental mistake that has characterized U.S. technology policy for more than 30 years: the idea that the United States can be a technology leader by designing electronic products that we cannot manufacture. This notion has diminished U.S. technological leadership and threatens to compromise our shared vision for the United States to reassert manufacturing leadership, including a robust semiconductor supply chain.

The electronics manufacturing industry is at the heart of the modern economy. It is a robust, vertical industry in its own right, generating more than \$700 billion a year in U.S. GDP and jobs for more than 5 million people; but it is also a critical segment of the supply chain for every other sector of the economy, including automotive, defense, aviation, financial services, health care, consumer, telecommunications and agriculture. In today's world, our lives depend on electronics, and that dependence is growing.

Despite the outsized importance of electronics in the modern economy, for decades the United States has commoditized and failed to sufficiently value the importance of electronics manufacturing. U.S. policy bolstered certain components of the electronics supply chain – especially semiconductors – without fully appreciating that electronics is a sophisticated ecosystem. Like any ecosystem, each component must be resilient for the entire ecosystem to thrive. The electronics manufacturing ecosystem is the platform upon which innovation is made possible, and supply chain security and resiliency are assured.

It is important for policymakers to have a complete understanding of electronics manufacturing as our nation grapples with the challenges to our entire supply chain. Much public and government attention is rightly being devoted to semiconductor chips manufacturing. But please bear in mind that semiconductor chips are components that, along with many other components, need to be placed onto printed circuit boards (PCBs) by assemblers to achieve functionality. Just as we seek to make advancements in semiconductor chips, so too should we make advancements in PCBs and the assembly process.

The advanced packaging of semiconductor chips is illustrative of the technical demands now placed on electronics manufacturers. Today, multiple semiconductors are placed on substrates to form advanced multichip modules, which are in turn assembled onto PCBs. Substrates are like PCBs in construction and

function. PCB companies are leading advancements in the manufacture of substrates through increased investment in additive processing technologies. Additive manufacturing is aiming to reduce the metallic traces on PCBs from the 75 microns generally available in the United States today with subtractive technology to the 30 microns available in Asia through semi-additive technology. Advanced additive technology offers a leapfrogging opportunity for U.S. PCB fabricators to manufacture PCBs with traces of only 25 to 7 microns. Gaining this technological capability will lead to electronics with higher density, reduced size, reduced weight, and increased reliability.

Despite the critical importance of substrates and additive manufacturing, federally funded research into them remains grossly insufficient, increasing the likelihood of a future in which U.S.-produced chips and bare silicon are shipped to other countries for advanced electronics packaging, after which the final packages will be shipped to third countries for testing and final assembly into products. This is not the kind of future that you or we want to see, and it would put the United States at increasing risk and disadvantage.

We wholeheartedly support efforts to shore up the semiconductor supply chain, but we believe the United States must invest in the entire domestic electronic system supply chain, rather than singling out individual segments and neglecting the rest. It would make no sense, for example, to try to reinvigorate the automotive industry by investing only in engine factories and leaving the rest of the automotive supply chain dependent on the manufacturing capabilities of other countries.

As the administration's 100-day review of the semiconductor supply chain approaches its conclusion and produces formal recommendations, we urge the U.S. Government to articulate a clear policy direction requiring a holistic, ambitious, and well-funded approach to revitalizing U.S. electronics manufacturing. Specifically, we ask that you propose concrete steps to accomplish the following:

- **Creation of a National Manufacturing Institute for Electronic Interconnection** to scale up advanced manufacturing processes intended for consumer electronics while ensuring that reliability is increased for use in the safety-critical sectors of aerospace, defense, and transportation.
- **Direct the Office of the Secretary of Defense for Industrial Policy to enact a Title III Program** focused on developing advanced circuit board manufacturing processes and techniques for advanced materials, and to modernize capital equipment to handle the new material processes.
- **Boost funding and broaden scope of the NIST Manufacturing Extension Partnership (MEP)** to include a specific focus on the electronics technologies segment (like they currently have for the food industry) and Supplier Scouting to help support small to medium-sized businesses in those areas.
- **The CHIPS for America Act** calls for a review of four supply chains – computer chips, large capacity batteries, active pharmaceutical ingredients, and critical and strategic materials, including rare-earth minerals – followed by six further sector-specific supply chain reviews, including defense, public health and biological preparedness, energy, and food production. We are calling for an expansion of the computer chips review to take a holistic approach of electronics technology and include PCB manufacturing/assembly and advanced packaging.
- **Develop trusted partnerships through international agreements** with allied nations and provide for multiyear procurements of military electronics, enabling American manufacturers to

plan and update capital improvements to manufacture tomorrow's electronics systems, and enhancing supply chain resilience.

- **Mandate a partnership between the Manufacturing Technologies (ManTech) Program and DARPA** to provide a technology maturation and application transition pathway for leap-ahead packaging solutions developed by DARPA through a multi-year series of grand challenge events. This would enable U.S. electronics manufacturers to tackle their biggest technical challenges and develop the intellectual property to remain competitive in the future.
- **Expand existing DOD- and DOE-wide bandgap compound semiconductor technology** development programs to focus on modules and packaging in order to firmly establish this new high-performance semiconductor packaging segment in the United States before it moves overseas.

Without a holistic approach to electronics manufacturing that explicitly includes support for the PCB manufacturing and assembly segments of the semiconductor supply chain, the United States will remain increasingly dependent on critical electronics components from other countries. Anything less than a holistic approach will put other nations in the driver's seat of one of the world's most critical industries.

Once again, we welcome your much-needed leadership in reviving U.S. manufacturing, and we are eager to collaborate with you and your team. We and the more than 5 million American workers who depend on our industry have a vested interest in your success.

Sincerely,

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Abaco

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Atlas Wire, LLC

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