



COMMITTEE ON

SCIENCE, SPACE, AND TECHNOLOGY

REPUBLICANS Frank Lucas, Ranking Member

Opening Statement of Ranking Member Frank Lucas

Full Committee Hearing – Ensuring American Leadership in Microelectronics

December 2, 2021

Thank you, Chairwoman Johnson, for holding this morning's hearing.

Every American who has tried to buy a car, tractor, or even a refrigerator lately, knows that we are facing severe supply chain shortages. In many cases, these shortages are being driven by global disruption to the supply chain for semiconductors or "chips".

Microelectronics, the devices made from semiconductor materials, are critical to how we live and work. They power our phones, make our cars safer, our homes smarter, and help us store and protect vital information. They are not only essential to our economic security but our national security as well.

The Chinese Communist Party (CCP) has made it clear that it wants to dominate the globe in key technology areas, and part of their strategy is to increase China's share of the semiconductor market through both investment and acquisition. U.S. technology companies obtain as much as 90 percent of their semiconductor chips from Taiwan, a huge risk given the geopolitical situation in the region.

Microelectronics are necessary for the technologies of the future. Harnessing new applications such as artificial intelligence, 5G, and quantum sciences, will require fundamental breakthroughs in microelectronics technology.

While the factors that led to today's chip shortage are worthy of their own examination, our focus today is forward-looking - how do we secure America's leadership in advanced chip design and how do we regain our leadership in semiconductor manufacturing? We must answer these questions to ensure we never face a chip shortage or disruption in the United States again.

Congress took the first steps to address this issue last year by passing the CHIPS for America Act as part of the FY21 National Defense Authorization Act. The CHIPS Act – which when introduced was referred solely to the Science Committee for jurisdiction - authorized programs to advance U.S. research and development, promote industry and government partnerships, and incentivize domestic fabrication of chips.

Today's hearing should provide critical guidance as Congress and the Administration consider how to implement and fund the CHIPS Act. I have no doubt this will be a major legislative and oversight priority for our Committee for years to come.

To lead in advanced microelectronics, the United States will need to make strategic investments along the entire innovation pipeline – from fundamental research and education, to design, to manufacturing. The federal government has a long tradition of investing in fundamental research for microelectronics, including through academic research institutions and federal laboratories that are supported by the National Science Foundation (NSF), Department of Energy (DOE), and the National Institute for Standards and Technology (NIST).

Dr. Witherell will tell us how DOE and its laboratories have worked with industry and academia to drive scientific advancements in areas such as materials science, energy efficiency, and novel devices. Access to materials, including critical minerals, chemicals, and gasses will be a key to increasing domestic technology production.

Unfortunately, the U.S. has limited quantities of many of these critical materials. So research into alternative and manufactured materials could be the answer to domestically producing advanced semiconductors.

Another challenge, which the CHIPS Act takes steps to address, is advanced packaging. Experts believe that breakthroughs in packaging will be key to improving chip efficiency beyond the regular doubling of computing capabilities predicted by Moore's law. I look forward to hearing from our witnesses today about what will make a national advanced packaging manufacturing program successful.

Developing a strong workforce in the United States to support the microelectronics industry is another challenge we need to solve. In the next five years, companies estimate that we will need at least 42,000 semiconductor engineers nationwide. That demand is even higher for the full spectrum of workers needed – from skilled technicians and operators with associate degrees to those with advanced degrees. I hope our witnesses will provide some recommendations on how we can build this workforce.

As Congress looks to strengthen U.S. chip manufacturing and advance our competitiveness in microelectronics, we must look to lessons from the past. We've been here before. In the 1980s, the federal government took strong actions to combat Japan's dominance in microelectronics. This included establishing a research consortium to support U.S competitiveness in semiconductor technology, also known as SEMATECH.

This government-industry partnership lasted until 1994. It helped the U.S. regain the lead for a time, but competing industry interests, waning government support, and other factors led to a decline that put us where we are today.

During this time, IMEC was also established and is still in operation today. IMEC has created an international ecosystem of more than 600 world-leading industry partners and a global academic network focused on developing and testing cutting-edge semiconductor innovations.

I know several of our witnesses have worked with both consortiums and I look forward to hearing what lessons can be taken from each and used to inform the establishment of the National Semiconductor Technology Center (NSTC) and the Department of Defense's "microelectronic commons."

In closing, I'd like to note that yesterday marked two weeks since the Democratic Leaders of the House and Senate announced that there will be a conference on the Senate-passed United States Innovation and Competition Act, and the innovation bills that our Committee carefully crafted and passed a bipartisan basis.

Unfortunately, we are still waiting on the details of that conference. Chairwoman Johnson and I are ready to go, we've been ready to go for months. It's time for leadership to move forward on a bipartisan conference of all of the Committees of jurisdiction.

The Senate bill included significant funding for the CHIPS Act. While I think there are still details to work out on what exactly that funding should look like, time is short to address our future domestic chip needs. We need to act now, because I can tell you that our competitors aren't waiting.

No matter what the final vehicle is for funding the CHIPS Act, I look forward to working with my colleagues to get it done as soon as possible. Thank you, Chairwoman Johnson, and I yield back the balance of my time.