ONE-YEAR PROGRESS REPORT:
CHIPS for America's Research & Development Programs

The CHIPS and Science Act is a crucial component of President Biden's Investing in America agenda, which includes investing in semiconductor innovation for the United States to secure and extend its technological leadership in the 21st century. Maintaining America's edge in science and technology is critical to our national security, which is why the CHIPS and Science Act dedicated more than $11 billion towards research, development, and workforce training programs to help unleash the next generation of innovation.

While a lot of great semiconductor innovation and design takes place in the U.S., the industry needs a robust, holistic, and inclusive research and development (R&D) ecosystem to support the growth in chip manufacturing that CHIPS for America is spurring. Entrepreneurs, large companies, startups, researchers, developers, and other stakeholders all need more access to test facilities, equipment, digital design tools, data sets and prototyping and testing capabilities. The investments we make in R&D will make our domestic manufacturers more innovative and competitive, which will drive innovation throughout the U.S. economy and strengthen every sector that relies on semiconductors. And nearly every sector relies on semiconductors.

Recognizing this, the CHIPS and Science Act funded four Department of Commerce programs focused on research and development:

- National Semiconductor Technology Center (NSTC)
- National Advanced Packaging Manufacturing Program
- CHIPS R&D Metrology Program
- CHIPS Manufacturing USA Institutes

These programs will share infrastructure, participants, and projects. They will coordinate with each other, with the CHIPS for America semiconductor incentives program, and with microelectronics R&D programs supported by other U.S. federal agencies. Each of the CHIPS R&D programs will include support for workforce development.

CHIPS R&D programs will be informed by the needs of the entire American semiconductor ecosystem, including the recipients of CHIPS manufacturing incentives. In turn, the technological and workforce advancements made by CHIPS R&D programs will benefit the U.S. semiconductor sector and supply chain—and help incentives recipients and others overcome manufacturing hurdles, compete in global markets, and meet the goals of the CHIPS and Science Act.

In just a year's time, we have made tremendous progress:

- **The Industrial Advisory Committee** (IAC) was announced in September 2022. The committee of leaders from a broad range of disciplines in the microelectronics field—including academia, the semiconductor industry, and federal laboratories—provides advice to the Secretary of Commerce on the science and technology needs of the nation's domestic microelectronics industry, the national strategy on microelectronics research, the research and development programs and other advanced microelectronics activities funded through CHIPS for America. The

IAC has met three times and the members have been working tirelessly to serve CHIPS for America.

- **A slate of CHIPS R&D leaders** was announced at the June 2023 meeting of the IAC. **Lora Weiss, Eric Lin, Neil Alderoty, and Richard-Duane Chambers** "bring exactly the depth and breadth of organizational, programmatic and technical leadership experience that CHIPS needs to stand up new, transformational R&D programs," said Secretary of Commerce Gina Raimondo.
- **The National Semiconductor Technology Center**, or NSTC, will be the centerpiece of CHIPS R&D programs, establishing America's technological leadership and reducing the time and cost of moving a great idea to commercialization. **Year-one milestones include:**
    - Publication of "A Vision and Strategy for the National Semiconductor Technology Center" in April 2023 to inform the community of the vision, mission, goals, programs, and operation of the center;
    - Establishment in June 2023 of an all-star selection committee that will choose the board of trustees for the anticipated operator of the center;
    - **Jay Lewis** was named the director of the of the CHIPS R&D NSTC program in July 2023;
    - A joint statement by the Secretaries of Commerce, Defense, and Energy and the Director of the National Science Foundation to formally establish the NSTC as a public-private consortium.
- **The National Advanced Packaging Manufacturing Program** staff has been travelling the country to learn about the needs of the microelectronics community in anticipation of publishing a vision and strategy paper later this summer. Leadership of the packaging program, which is strongly linked to the NSTC, will be announced soon.
- **The CHIPS R&D Metrology Program** is an expansion of world-class microelectronics measurement science work that has been underway at the National Institute of Standards and Technology for decades, helping the industry with the measurement capabilities that make increasing miniaturization and efficient fabrication possible.
    - **Marla Dowell** was named the director of the CHIPS R&D Metrology Program in June 2023.
    - Also in June, the program released "Metrology Gaps in the Semiconductor Ecosystem," describing the highest-priority metrology gaps affecting the U.S. microelectronics industry focus that the program will address. The gaps fall in two categories: automation, virtualization, and security, and metrology for next-generation microelectronics.
- Up to three new **Manufacturing USA** institutes focused on semiconductor manufacturing will be established with CHIPS funding to convene businesses, academia, and other stakeholders to test applications of new technology, create new products, reduce cost and risk, and enable the manufacturing workforce with the skills of the future.
    - In June 2023, CHIPS for America released a summary of public comments solicited through a Request for Information to inform the design, and requirements for, potential Manufacturing USA institute(s) that would strengthen the semiconductor and microelectronics innovation ecosystem in such areas as design, fabrication, advanced test, assembly, and packaging capabilities.
    - Most responders stressed that the new institutes should be transformational by addressing challenges that bridge the gaps from R&D to full-scale manufacturing. Commentors also agreed that the activities and scopes for any new semiconductor Manufacturing USA institutes should be carefully coordinated with those of other CHIPS programs.

The goals of CHIPS for America are being realized by two complementary efforts: The CHIPS Incentives Program will return semiconductor manufacturing to the United States, and the CHIPS Research and Development Office will keep it here by further advancing our country as a leader in semiconductor innovation, nurturing our domestic manufacturing industry with advances that keep U.S.-made products competitive here and in global markets, and helping to train a workforce in next-generation techniques in world-leading facilities.

"We will be the premier destination in the world where new leading-edge chip architectures can be invented in our research labs, designed for every end-use application, manufactured at scale and packaged with the most advanced technologies."

– Secretary Gina Raimondo

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