FACT SHEET

A Vision and Strategy for the National Semiconductor Technology Center (NSTC)

On April 25, 2023, the CHIPS for America Research and Development Office released "A Vision and Strategy for the National Semiconductor Technology Center" describing the focal point of the CHIPS Act's investment in securing our country's position as a global leader on industrial technology and innovation for decades to come.

CHIPS for America was passed with bipartisan support to meet a critical need for a stable, secure supply of semiconductors to protect U.S. national security, enhance economic competitiveness, and accelerate American innovation. CHIPS for America comprises two categories of funding: $39 billion to provide incentives for manufacturing facilities in the United States, and $11 billion to fund the research and development that will ensure continued U.S. leadership in emerging semiconductor technology that has underpinned our economic prosperity.

The CHIPS Research and Development Office was established to manage the development of the NSTC, the National Advanced Packaging Manufacturing Program, the Manufacturing USA Institute(s) focused on semiconductors, and the National Institute of Standards and Technology (NIST) Metrology Program.

Since the passage of the CHIPS Act in August 2022, the CHIPS Research and Development Office has been conducting extensive stakeholder outreach to support planning for these major initiatives, ensuring that the needs of the community are addressed.

Goals

The Department of Commerce will meet its statutory mission through three high-level goals that are described in detail in the vision and strategy document. The NSTC will be part of a whole-of-government strategy to advance and enable innovations in microelectronics R&D.

1. **Extend America's leadership in semiconductor technology** to provide the foundation for future applications and industries and to strengthen the U.S. semiconductor manufacturing ecosystem.
2. **Significantly reduce the time and cost of moving from design idea to commercialization** through access to shared facilities, digital assets and technical expertise for advancing design, prototyping, manufacturing, packaging, and scaling of semiconductors and semiconductor-related products.
3. **Build and sustain a semiconductor workforce development ecosystem**. The NSTC will serve as a coordinating body and center of excellence to scale the technical workforce, including scientists, engineers, and technicians. The NSTC workforce programs will include a focus on recruiting, training, and retraining the semiconductor workforce, including groups that are traditionally under-represented in the industry.

Participants

The NSTC will provide a platform where government agencies, national laboratories, industry and workforce representatives, customers, suppliers, educational institutions, entrepreneurs, and investors collaborate.

NSTC participants will benefit from access to research, facilities, workforce programs, convenings, shared roadmaps, standards development, and data sets. The Department anticipates that the NSTC will offer memberships with different fees by scale of institution and industry sector, so that participation is attractive and available to all parts of the community including:

- Fabless semiconductor companies
- Semiconductor customers who design their own chips
- Research institutions and community colleges
- State and local governments
- Federal agencies, national labs, and federally funded labs
- Foundries and integrated device manufacturers
- Equipment vendors and materials suppliers
- Labor unions
- Investors

The NSTC may also host visiting researchers through fellowships, residencies, and technical exchange programs.

The Department anticipates that international companies and research organizations will be able to participate in the NSTC subject to restrictions. The Department expects that most NSTC-funded work will take place at facilities and institutions located in the U.S.

Technical Programs

The NSTC will address the real-world technical challenges of the semiconductor industry and provide immediate and hands-on knowledge transfer and training to participants through three key program areas:

1. **Technology leadership** – The NSTC will conduct and fund research and collaborations with others, focusing primarily on those developments that will benefit industry approximately 5 to 15 years in the future, with the technical focus guided by advisors and in alignment with NSTC-sponsored grand challenges. Research will be conducted on design innovation as well as manufacturing process improvements, and all segments of the semiconductor industry will be considered for programs. The NSTC will lead road mapping exercises as well as facilitate the community's development of standards and protocols, including standards for the security of microelectronics devices.

2. **Managing assets that benefit the community** – The NSTC will consist of a headquarters as a place to convene events as well as conduct research, and a network of affiliated technical centers across the country with capabilities for end-to-end fabrication for small prototyping and pilot runs, experimentation with and testing of new materials and equipment, and other research-related activities.

    - The Department of Commerce may establish technical centers by building new facilities, acquiring existing facilities, or collaborating between the NSTC and existing facilities with potential expansion and upgrade funding.
    - The NSTC's affiliated technical centers will provide students with hands-on experience designing and prototyping semiconductors in a variety of technology nodes.

- The NSTC will create an open and collaborative research environment balanced with the protection of proprietary information present in the technical centers.
- The NSTC will work closely with the National Advanced Packaging Manufacturing Program to develop resources for NSTC members including advanced packaging facilities and chiplet programs.
- The NSTC's programs will generate a large amount of data. Therefore, the NSTC can play a role in collecting, aggregating, and sharing non-proprietary data sets that enable benchmarking and operational improvements, tools development, the creation of digital twins, and training artificial intelligence models.

3. **Workforce programs** – The NSTC will serve as a coordinating body and center of excellence to scale the semiconductor technical workforce, including scientists, engineers, and technicians, to meet industry's needs. The NSTC workforce programs will include a focus on recruiting, training, and retraining the semiconductor workforce, including groups that are traditionally under-represented in the industry. To meet these goals, the NSTC will create programs to meet clear industry needs in attracting, training and retaining a strong workforce.

The NSTC's technical objectives, goals, and outcomes will also be informed by the National Strategy on Microelectronics Research and recommendations from technical advisory bodies including the Industrial Advisory Committee.

Investment Fund

The NSTC will establish and capitalize an investment fund to help emerging semiconductor companies advance their technologies toward commercialization. The Department expects that the NSTC will hire an investment fund manager with substantial private sector investment and technology development experience to guide this effort, which may include:

- An investment structure to help startups reduce risk and accelerate milestones, thereby attracting significant private capital
- Collaboration with other U.S. government entities with similar objectives
- Collaboration with private sector venture, corporate, and strategic investors that bring substantial expertise to assessing and structuring financings
- A portfolio approach, with balanced risk across investments

Governance Structure

The NSTC will be structured to meet the terms in the CHIPS Act statute and the complex needs of the semiconductor industry. Extensive feedback from industry stakeholders made clear that the NSTC must be seen as neutral, trusted, and science driven. The NSTC also must address a wide variety of issues for a great diversity of stakeholders.

The Secretary of Commerce, in collaboration with the Secretary of Defense, will establish the NSTC through the creation of a public-private consortium as required by the CHIPS Act. Federal consortia may be managed by nonprofit entities. The Department will encourage the creation of a new, independent, nonprofit entity with the requisite expertise, leadership, and capacity to serve as the operator of the NSTC. This structure will ensure that the NSTC operator is visionary, dedicated to stakeholder needs, and committed to the public interest.

Next steps

- In the April 26, 2023, *Federal Register* the Department issued a call for nominations to form a selection committee that, acting independently of the Department, will select the board of trustees that will form a non-profit, which the Department anticipates will serve as the operator for the NSTC.
- As the Department proceeds with refining and finalizing plans for establishing the NSTC, it will continue to engage with participants in the broad ecosystem to ensure that the needs of the community are being addressed.
- Later this year, the Department will work to establish the NSTC consortium and encourage the establishment of a new, purpose-built, non-profit entity with world-class leadership.