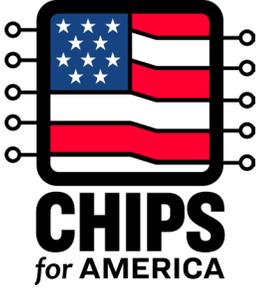
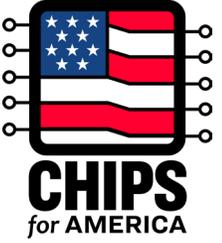


CHIPS CVDP Guidebook and Related Intellectual Property Protections

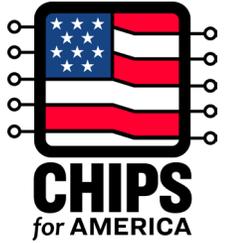


April 1, 2024



Disclaimer

- Statements and responses to questions about advanced microelectronics research and development programs in this webinar:
 - Are informational, pre-decisional, and preliminary in nature.
 - Do not constitute a commitment and are not binding on NIST or the Department of Commerce.
 - Are subject in their entirety to any final action by NIST or the Department of Commerce.
- Nothing in this presentation is intended to contradict or supersede the requirements published in any future policy documents or Notices of Funding Opportunity.



Overview of CHIPS R&D Office Goals

Vision

A vibrant and self-sustaining U.S. domestic semiconductor ecosystem that revitalizes American manufacturing, grows a skilled and diverse workforce, and leads the world in semiconductor research and innovation.

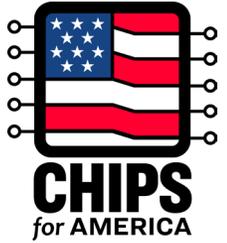
Mission

Accelerate the development and commercial deployment of foundational semiconductor technologies by establishing, connecting, and providing access to domestic tools, resources, workers, and facilities.

2030 Goals

- **U.S. Technology Leadership:** The United States establishes the capacity to invent, develop, prototype, and deploy the foundational semiconductor technologies of the future.
- **Accelerated Ideas to Market:** The best ideas achieve commercial scale as quickly and cost effectively as possible.
- **Robust Semiconductor Workforce:** Inventors, designers, researchers, developers, engineers, technicians, and staff meet evolving domestic commercial-sector and government needs.

Policy and National Security Context



Unique or Emerging Directives

CHIPS and Science Act (2022)

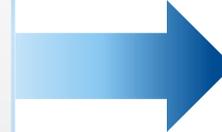
- Prohibit malign foreign talent recruitment programs
- Research security training

CHIPS Act (2021)

- Domestic production requirements
- Domestic control requirements to protect intellectual property from foreign adversaries

National Security Policy Memorandum 33 (2021)

- Research security program requirements
- Disclosure of conflicts of interest / commitment



Application Requirements

- Domestic Research and Development Requirements
- Domestic Control and Intellectual Property Rights Management Plan
- Research Security Plan
- Commercial Viability and Domestic Production (CVDP) Plan

Commercial Viability Considerations

CVDP plans address topics relevant to:

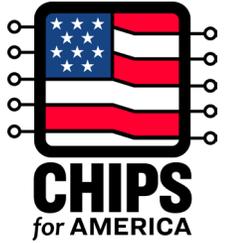


Key Components:

- **Market Analysis:** A clear description of the value proposition of the proposed technology or product and identification of competitors.
- **Customer Analysis:** An assessment of demand for the funded innovation by current and potential customers or categories of customers, at volumes necessary for commercial viability.
- **Financial Plan:** A realistic and sustainable business model that considers cost, revenue, and access to capital.



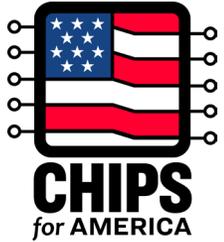
Key Point: CVDP Plans are often intended to be an “initial assessment” or an “overview”, with updates occurring across the award period. Applicants should not feel compelled to have all the answers before the research is complete!



Commercial Viability Considerations

1 Market Analysis Topics

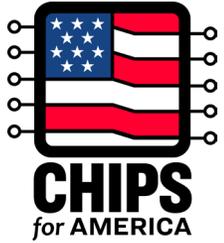
- ❑ **Current State-of-The-Art** – the most advanced technologies available on the market, relevant to the funded innovation
 - What products currently on the market, or likely to become available, serve a similar function to the funded innovation?
 - What value do those products provide?
- ❑ **Value Proposition** – the unique benefits delivered to the customer by the funded innovation
 - What does the funded innovation do, and how will it be used? Is it relevant to any defense partners?
 - How will the funded innovation benefit its potential customers, relative to other technologies that are and will become available?
- ❑ **Technical Milestones** – actions or events marking measurable progress towards the technical goals of the research award
 - Do the technical milestones for the funded work align with improving the commercial readiness and value proposition of the funded innovation?



? Does the CVDP require a comparison of the existing technology to what is currently on the market, to demonstrate commercial viability?

An initial market assessment is critical to understanding whether a funded innovation can reach commercial scale, a key CHIPS R&D objective. Individual NOFOs may give applicants options on how to address commercialization and deployment.

- Applicants should describe their business model for the funded innovation, including an initial assessment of its marketability. They should consider factors such as cost competitiveness, value proposition, and the impact of competitor products. (NAPMP M&S NOFO 4.6.1.6.d.vi)
- Applicants could also identify how they will maximize the market advantages of the funded innovation, such as by reducing manufacturing costs, improving yields, or addressing performance, availability, or conformance to technical or environmental standards. (NAPMP M&S NOFO 4.6.1.6.d.vi)



Commercial Viability Considerations

② Customer Analysis Topics

- ❑ **Market Size** – the total potential demand for the funded innovation
 - What is the total revenue opportunity for the funded innovation? Who is the target market?
 - What features of the innovation will attract these customers?
 - What key customer segments could be early adopters?

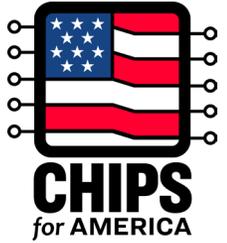
- ❑ **Customer Engagement Strategy** – a plan for raising awareness of the innovation and enabling customer adoption
 - How will you identify and engage customers for the funded innovation?
 - How will the desired customers gain access to the funded innovation?



Should applicants consider the needs of future customers in their proposal?

An identification of future customers is desired, where known. Applicants may also identify targeted customer categories, rather than specific buyers.

- Applicants should provide an overview of current or expected customer demand for the funded innovation at the volumes required for commercial viability. This includes identifying existing or potential customers, or categories of customers. (NOFO 4.6.1.6.d.vi)
- Applicants should include plans for engaging with the customer ecosystem as the project advances. (NOFO 4.6.1.6.d.vi)
- Applicants seeking to demonstrate community impact and support can also provide letters of commitment or interest from potential customers. (NOFO 4.6.1.6.d.vii, NOFO 4.6.1.11)



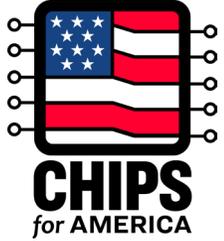
Commercial Viability Considerations

③ Financial Plan Topics

- ❑ **Cost Structure** – the fixed and variable costs to produce, market, and distribute the funded innovation
 - How much will it cost to produce the funded innovation, at commercial volumes?
 - What additional costs might exist, for example to market or distribute the funded innovation?

- ❑ **Revenue Streams** – the sources of income for the business providing access to the funded innovation
 - What are the projected sales for the funded innovation?
 - Are they sufficient to sustain your business model during development and commercialization?
 - Are there additional revenue opportunities, such as subscription services or technology licensing?

- ❑ **Access to Capital** – pathways for future investments from both Federal and non-Federal sources
 - How much private capital will the business need to attract during scale up and from what sources?
 - Is your fundraising plan or company exit-strategy consistent with CHIPS R&D domestic IP control requirements?

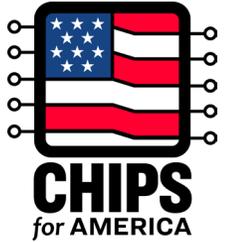


What cost and revenue considerations should applicants include in their proposal?

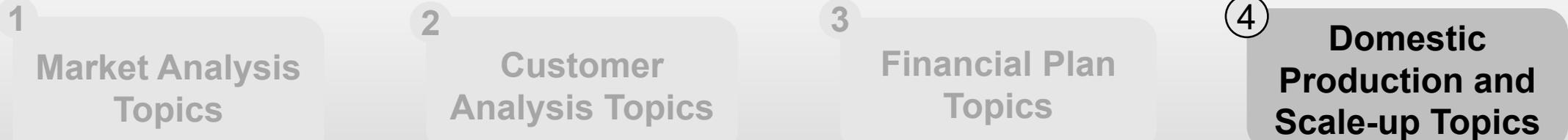
Applicants should provide sufficient information to demonstrate a realistic business model.

- Describe the business model, including an initial assessment of the funded innovation's marketability, considering factors such as cost competitiveness, value proposition, and the impact of competitor products. (NAPMP M&S NOFO 4.6.1.6.d.vi)
- CVDP milestones should complement the technical milestones. For example, technical milestones should, as appropriate, inform CVDP targets and milestones such as manufacturing time, cost, performance, and projected customer demand. (NAPMP M&S NOFO 1.6.2)
- Strong applications will demonstrate the potential to attract private capital, such as venture capital, potentially based on the economics of future revenue and commercial profitability. (NAPMP M&S NOFO 1.6.2)

Domestic Production Considerations



CVDP plans address topics relevant to:



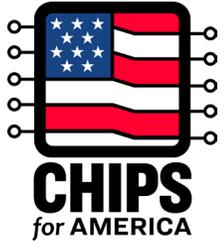
Key Component:

- **Domestic Production and Scale-up:** A pathway to transition the technology to domestic availability and to produce the technology within the United States
- **Non-Domestic Production:** Where relevant, applicants should explain what elements of production for the funded innovation are not feasible in the United States.



Key Point: CVDP plans do not require exclusive domestic production.

Applicants are invited to address potential conflicts between domestic production and commercial viability. Applicants can therefore address viability and domestic production separately and update analyses during the award period.



Domestic Production Considerations

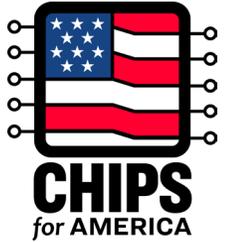
④ Domestic Production and Scale-up Topics (Part 1)

- ❑ **Scale-up – the process of transitioning the funded innovation to full-rate commercial production**
 - What capabilities are required to transition the funded innovation to full rate production?
 - What additional funding will be required to demonstrate, commercialize, and transition the funded innovation to full rate production?

- ❑ **Supply Chain – the goods, services, and processes that transform raw materials into final product**
 - Is there a plan to access the infrastructure, materials, and components required to domestically produce the funded innovation and to distribute it to customers?

- ❑ **Workforce – employees and contractors required for full-rate operations**
 - How will you access or develop the workforce needed to domestically produce the funded innovation?
 - How will you access or develop the workforce needed for ongoing R&D and commercialization activities?

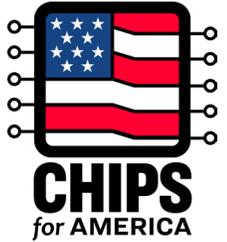
Domestic Production Considerations



4 Domestic Production and Scale-up Topics (Part 2)

- ❑ **Regional Ecosystem** – a geographic region with relevant capabilities and infrastructure, such as manufacturers, suppliers, and research or educational institutions
 - Will the production or sale of the funded innovation support a new or existing regional ecosystem, such as a domestic semiconductor cluster?

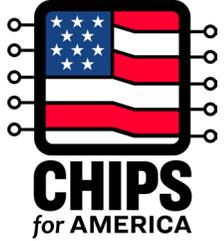
- ❑ **Standards and Regulatory Compliance** – laws, policies, standards, and industry norms that a business must adhere to when producing or selling the funded innovation
 - What standards or regulations, such as state and local environmental laws, govern the production and commercial viability of the funded innovation?
 - If applicable, are there any specific requirements for use of the funded innovation in military or critical infrastructure systems?
 - What are the plans to comply with industry norms and technical standards required to bring your product to market?



What does “production” include? Does it apply to software or to manufacturing equipment?

In accordance with 15 U.S.C. §4656(g), CHIPS R&D has developed policies for the domestic production, to the extent possible, for any IP resulting from CHIPS R&D funding.

- For the purposes of 15 USC 4656(g), CHIPS R&D defines production to include the manufacture, integration, assembly, testing, and packaging of semiconductor substrates and substrate materials. That includes semiconductors, materials used to manufacture semiconductors, or semiconductor manufacturing equipment developed or improved as a result of CHIPS-funded intellectual property. (NAPMP M&S NOFO 1.6.2)
- CHIPS R&D does not intend to impose domestic production requirements with respect to development of software.
- In the case where intellectual property relevant to the manufacture of equipment is developed with CHIPS R&D funds, domestic production requirements may apply to the production of that equipment.

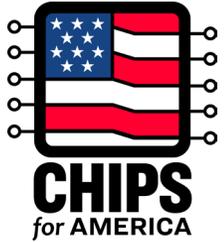


What factors might CHIPS R&D consider when evaluating applications that propose non-domestic production?

CHIPS R&D aims to improve the U.S. capacity to invent, develop, prototype, manufacture, and deploy the foundational semiconductor technologies of the future. However, consistent with 15 U.S.C. 4656(g), CHIPS R&D does not require exclusive domestic production, as this goal may be served by conducting activities overseas.

Where domestic production may not be possible, applicants should identify, as practicable at the time of application, factors driving overseas production, such as (NAPMP M&S NOFO 1.6.2):

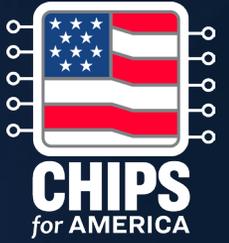
- Lack of domestic production capabilities
- Relative cost of domestic vs. foreign production, at relevant production volumes
- Potential economic or national security benefits from having distributed production among U.S. and overseas sites
- Potential risks of U.S.-based production such as market acceptance or changes to the value proposition
- Other factors the applicant deems relevant to the invention's success



? How might applicants discuss how their proposal could support a regional semiconductor ecosystem?

CHIPS R&D will favorably consider applications that demonstrate the impact of the project on regional ecosystems. Applicants can demonstrate this in a variety of ways, such as:

- Showing that the project or its results will induce larger scale investments into domestic semiconductor prototyping, manufacturing, workforce development, and the creation of good jobs within a specified region (NAPMP M&S NOFO 1.9.1 and 1.9.5)
- Partnerships with in-region entities focused on innovation, entrepreneurship, access to capital, and technology commercialization (NAPMP M&S NOFO 1.9.5)
- Partnerships, with in-region entities, that strengthen supply chains. (NAPMP M&S NOFO 1.9.5)
- Including letters of commitment or interest from entities such as community-based organizations and local officials; semiconductor and/or supply chain companies with operations or facilities in the selected or another relevant region (NAPMP M&S NOFO 1.9.5)



Thank you