Organization / PPP Working Group Update and Deliberation

DoC Industrial Advisory Committee

Deirdre Hanford and Org/PPP WG
Hosted by: Ben Davis, Designated Federal Officer

February 7, 2023

Agenda

- Recap of Organization/PPP focus and activities
- Recommendations
- Deliberation

IAC Organization / PPP Working Group

Bill Chappell
Microsoft

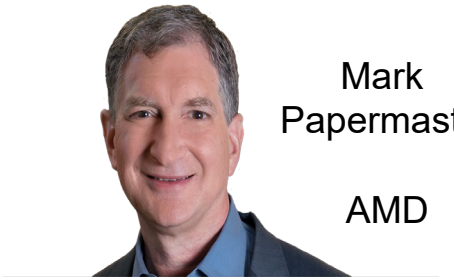
Scott DeBoer
Micron

Michael Fritze
Potomac Institute for Policy Studies

Deirdre Hanford
Synopsys

Ken Joyce
Brewer Science

Alex Oscilowski
TEL America



Mark Papermaster
AMD

Willy Shih
Harvard Business School

Anthony Yen
ASML Technology Development Center

Composition

- Hyperscaler
- Semiconductor
- Think tank
- Packaging
- SME
- Academia
- EDA & IP

Supported by DoC staff

- Ben Davis, DFO
- Tamiko Ford, DFO
- Lisa Ng

Aligning with Commerce

At present, the Department is engaged in four high-priority tasks:

1. Evaluating potential gaps in research and engineering that could be filled by the NSTC. As part of the whole-of-government effort, the NSTC will complement the many excellent centers already established by industry, academia, allies, and other governmental agencies. The Department will create a preliminary landscape analysis with the benefit of recommendations developed by the CHIPS Industrial Advisory Committee. Ultimately, the NSTC itself will finalize the focus areas, but this early work will inform further decisions.
2. Evaluating and defining a structure and governance model that fulfills the CHIPS for America goals of promoting U.S. economic and national security and protecting taxpayer investments while ensuring technical excellence and leadership.
3. Creating a preliminary operating, business, and financial model that will serve as a road map for near-term investment informed by an understanding of what will be required for long-term sustainability.
4. Identifying a slate of candidates for the NSTC chief executive.

The Department will release a white paper in the first quarter of 2023 that will summarize the results of the landscape analysis, governance structure, and preliminary operating and financial model. At that time, the Department will issue guidance on when to expect requests for proposals.

Organization / PPP Working Group Charge

01

This working group will review and examine all the various funding sources for semiconductor R&D and map out the relationships between these entities to ensure spending efficiency and eliminate any overlaps.

02

In addition, this working group will review the essential functions and governance of the NSTC and NAPMP.

03

Finally, this committee will review PPP proposals for both R&D partnerships, the value proposition for industry participation in PPPs, as well as investment funds and support of start ups

Briefings

Organization	Topic	Guest
NIST	CHIPS Overview and program mapping	Dr. Jason Boehm, Chief of Staff, NIST
Semiconductor Alliance	NSTC/NAPMP	Dr. Raj Jammy, CTO and Chief Technologist, MITRE-ENGENUITY
DoD Undersecretary of Defense for Research & Engineering	DoD Microelectronics Commons	Dr. Dev Shenoy, DoD, PD Microelectronics, OUSD (R&E) Microelectronics Modernization
NIST	Interagency perspective on R&D programs	Dr. Ronald Jones, CHIPS R&D Interagency Coordinator, NIST
Intel Corporation	NAPMP	Dr. Babak Sabi. SrVP and GM of Assembly/Test Development Dr. Tom Rucker, VP Technology and Development
Department of Commerce	NSTC Governance	Ms. Donna Dubinsky, Senior Counselor for CHIPS Implementation
IMEC	Best practices on PPP's and IMEC governance structure	Dr. Luc Van den hove, President and CEO, IMEC
American Semiconductor Innovation Coalition	NSTC / NAPMP	Dr. Mukesh Khare, Vice President Hybrid Cloud Dr. Douglas Grose, Advisor
	Lessons learned	Dr. Paolo Gargini

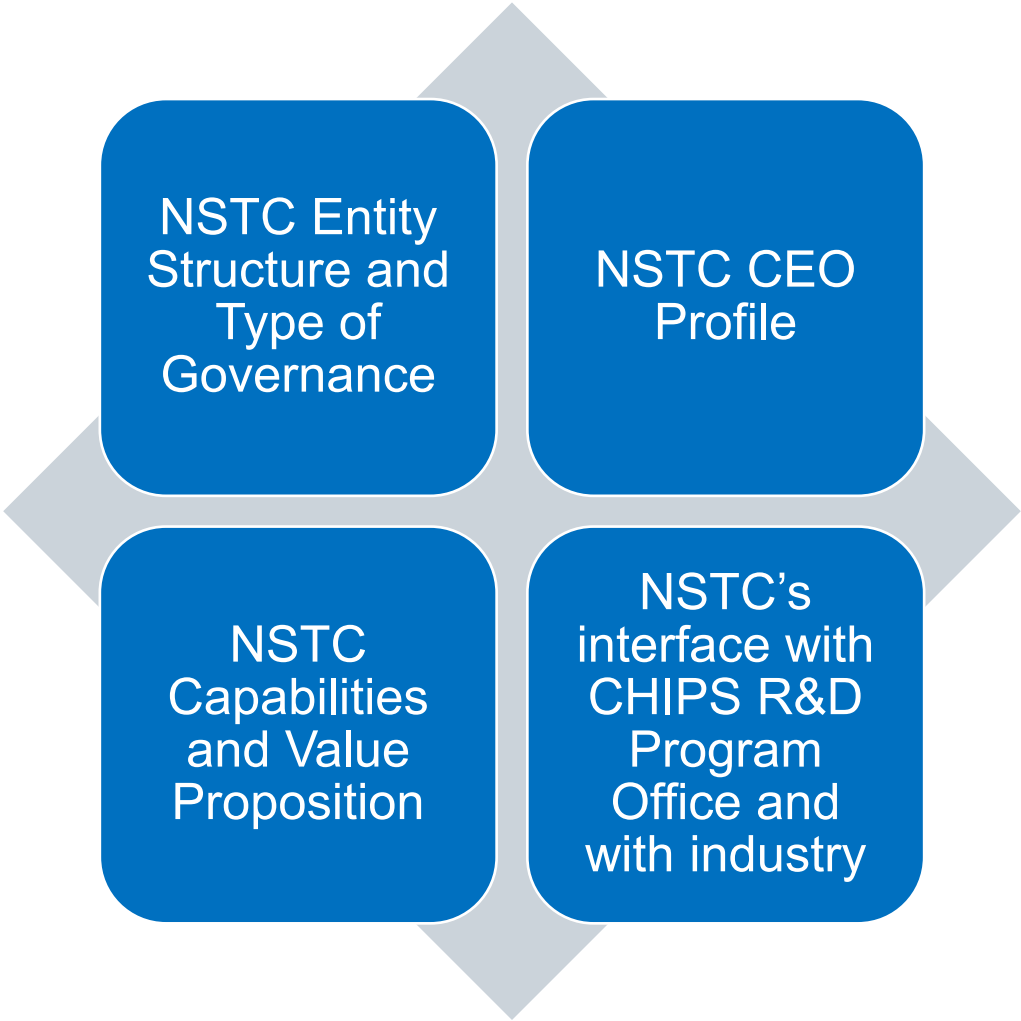
Org / PPP Working Group

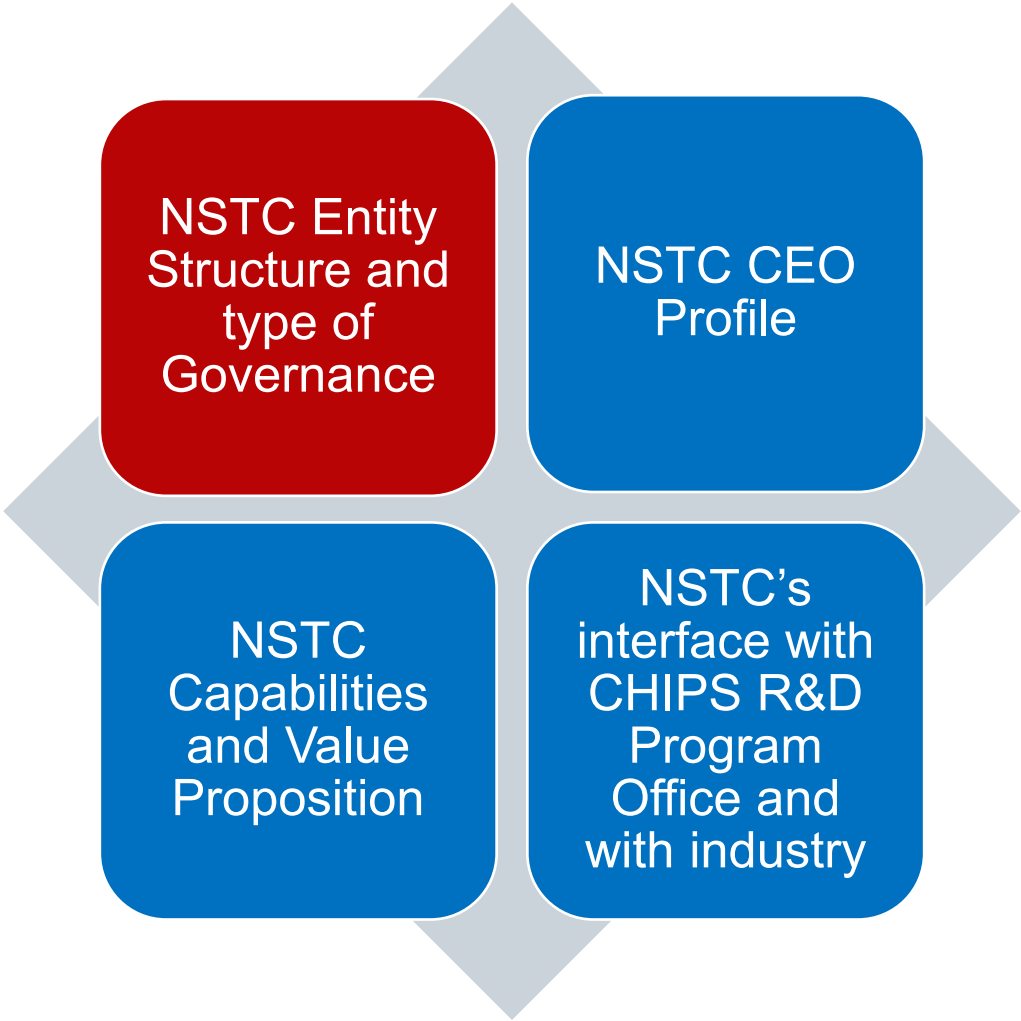
- Focus of January Sprint – Charge 2 – NSTC Governance
  - NSTC entity structure and type of governance board
  - NSTC CEO profile
  - NSTC capabilities and value proposition
  - NSTC's interface with CHIPS R&D program office and industry

- Deferred to subsequent sprints
  - NSTC/NAPMP
  - Early Wins for NSTC
  - Important role of academia
  - Composition of governance board
  - IP rights
  - Charge 1: examine all the various funding sources for semiconductor R&D and map out the relationships between these entities to ensure spending efficiency and eliminate any overlaps
  - Charge 3: review PPP proposals for both R&D partnerships, the value proposition for industry participation in PPPs, as well as investment funds and support of start ups

Agenda

- Recap of Org/PPP working group focus and activities
- ➢Recommendations
  - 1 - NSTC entity structure and type of governance board
  - 2 - NSTC CEO profile
  - 4 - NSTC capabilities and value proposition
  - 5 - NSTC's interface with CHIPS R&D program office and industry
- Deliberation


NSTC Entity Structure and Type of Governance
NSTC CEO Profile
NSTC Capabilities and Value Proposition
NSTC's interface with CHIPS R&D Program Office and with industry


NSTC Entity Structure and type of Governance
NSTC CEO Profile
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Questions

What should the structure of the NSTC be?

Principles

Independence

Nimble – speed is of the essence

Large companies should *want* to participate, small companies and organizations should be *able* to participate

Requirements

Administratively lean

Create enduring value as venue for collaboration

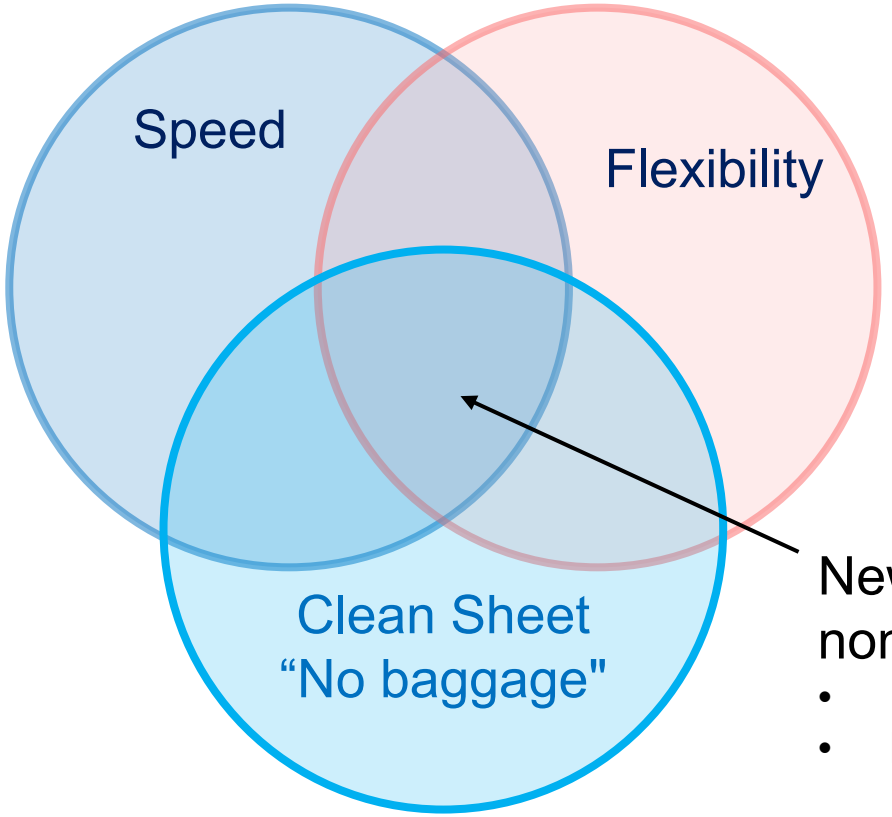
Strategy for out years

Leverage good ideas from RFI responses

Recommendations

NSTC Entity Structure

Recommendation 1-1: The subcommittee recommends that the Department of Commerce structure the NSTC as a new and independent non-profit utilizing the Department's Other Transaction Authority (OTA), leveraging many of the ideas that have been proposed in RFI responses but unencumbered by established agendas



New independent non-profit
- Use OTA
- Leverage RFI ideas

We considered:
- Government corporations
- Partnership with or independent new non-profit
  - New likely using Other Transaction Authority
  - Existing
- Speed via Other Transaction Authority (OTA)

NSTC Board Structure

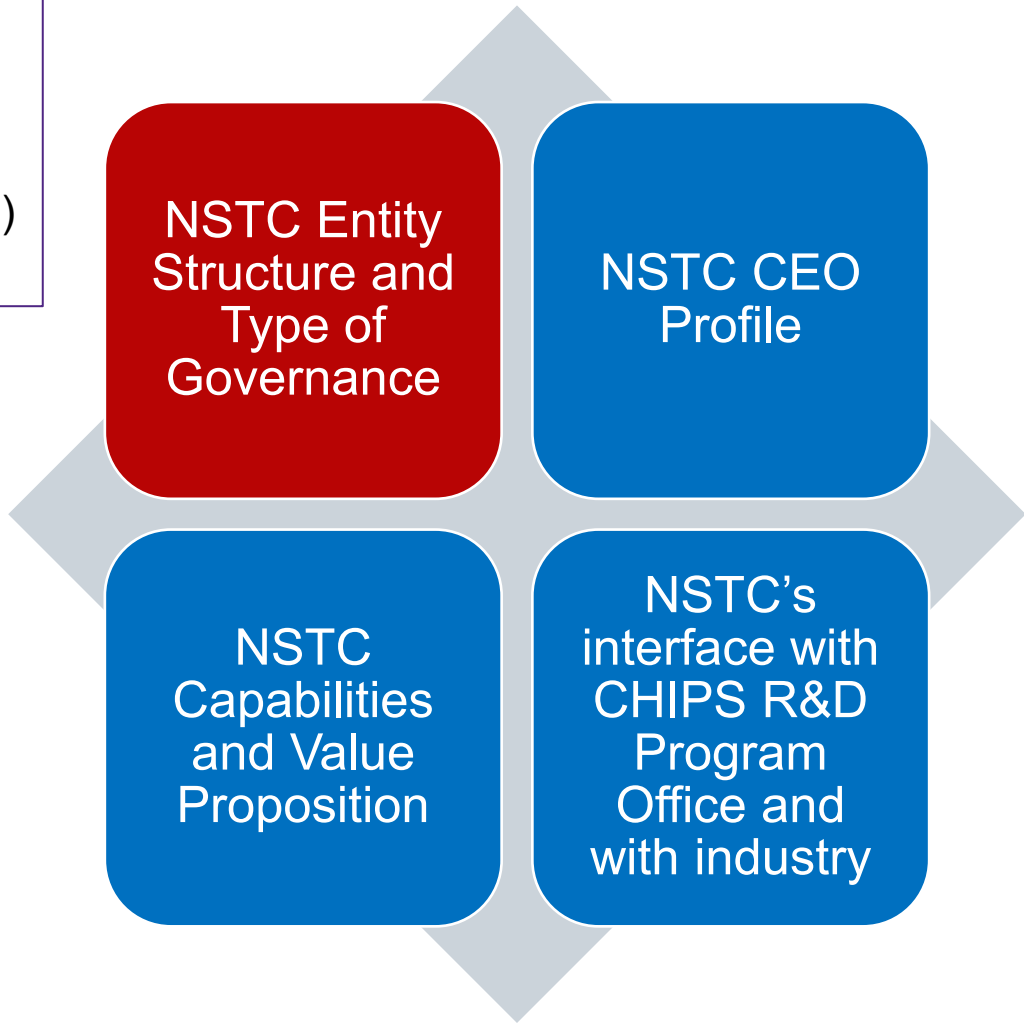
Recommendation 1-2: The subcommittee recommends a fiduciary board for oversight of the NTSC

- Fiduciary board
  - Requires members with appropriate experience/expertise to exercise due diligence and **oversight** to ensure that the organization is **well managed**
  - Does not necessarily direct the CEO and organization to make individual investments or take specific actions. Rather its roles is to **ensure a solid decision-making process** and a **financially sound strategy**
  - **Independent** and free of member company representation
  - Note: have not yet deliberated on specific fiduciary board composition
- Governance structure fosters **independence of the CEO**
  - Streamlined governance, simplicity and agility
- **Technical Advisory Board** (TAB) provides the CEO with **technical and program guidance**, bringing deep industry and technical knowledge
  - **Member companies represented** on the TAB

We considered:

- Fiduciary and Representative Boards
- Governance structures including:
  - Independent versus government entity
  - IMEC, DARPA, NSF, SRC, and SEMATECH, public company boards

- Independent, nimble and new non-profit
- Leverage input from RFI teams
- OTA (vs. solicitation)
- Fiduciary board (vs. member board)
- Members participate in TAB



NSTC CEO Profile

Recommendation 2-1: The subcommittee recommends recruiting a highly respected executive with deep technical expertise and senior level leadership experience in the semiconductor industry to serve as the CEO of NSTC

CRITICAL CAPABILITIES:

- Deep technical **expertise** and **experience** in semiconductor industry
- Visionary: willing to initiate **high-risk/high-reward** programs to enable critical technologies
- Bold thinking: **Open** to new leverageable ideas proposed by responders to Commerce RFIs
- Ability to work smoothly with USG Program Offices and Technical Advisory Board
- Skillful in designing organizational structures and business processes
- **Track record**: running global organization with significant operational scale
- **Experience** Leading Technology based organization: Technology & Product Roadmaps
- **Thinks** and **acts creatively** - non-traditional alternatives: collaborations/partnerships
- Suitable CEO **tenure** to enable establishment of a sustainable NSTC

Considerations:

- Archetypes
- Has created businesses and/or industry technical achievements during career
- Track record of transitioning technologies and bringing them to market
- Can consider an academic with strong industry experience
- Career runway
- Appointment process
- CEO authority and reporting

- Independent, nimble and new non-profit
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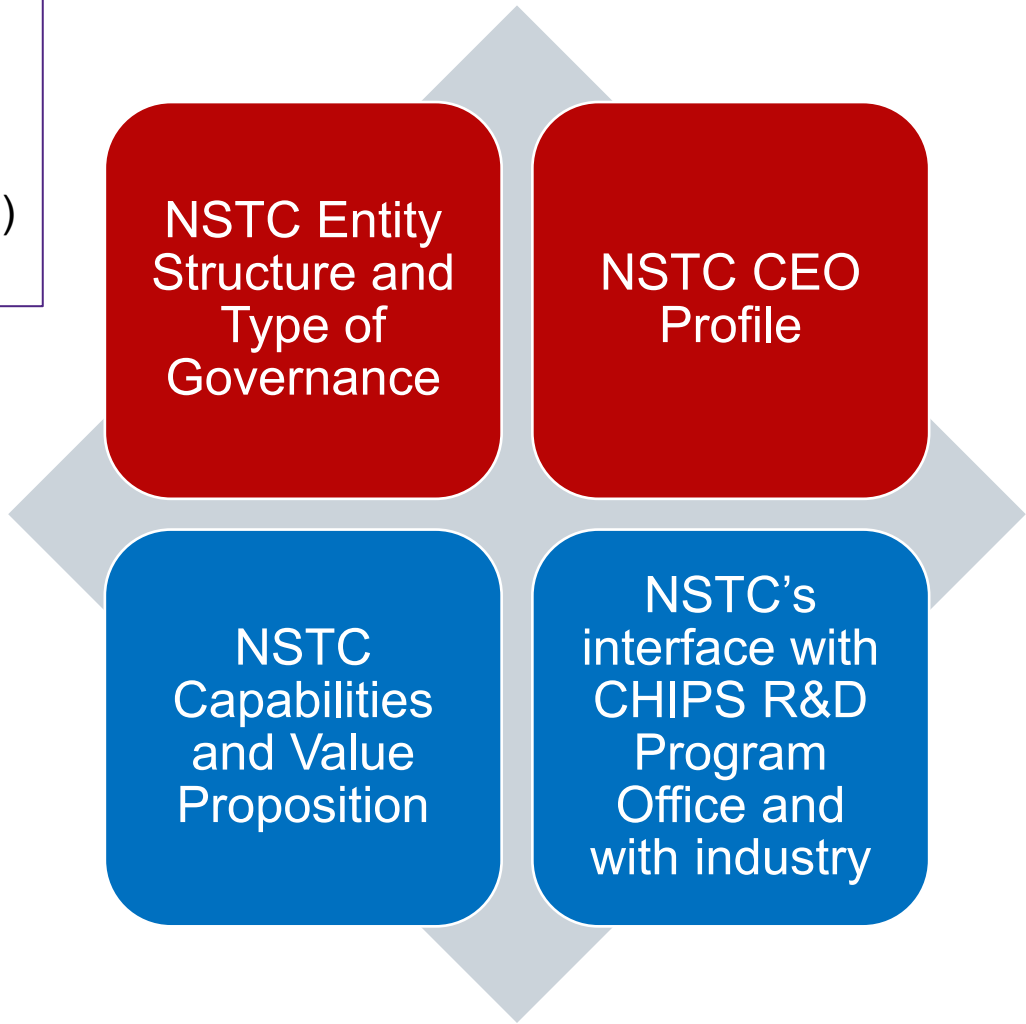


- Semiconductor industry
- Deep technical experience
- Global, Bold, Creative
- Track record of technology transition to market
- Works with partners, USG, industry and academia

NSTC Vision

- Robust U.S electronics **ecosystem** to assure economic competitiveness and microelectronics R&D leadership
- An NSTC that **brings together** industry, academia, and government
- **Attract** the most motivated students to the field, as well as the most skilled scientists, engineers and technology practitioners
- **Support small entities** so they can successfully create new value

From Eric Lin's
Earlier presentation

NSTC Mission

- Coordinating function to encourage **ecosystem growth**
- Strengthen **core domestic** semiconductor R&D, development, and manufacturing
- Attract **industry participation and private capital**
- Grow **skills pipeline**
- Guide mid- and long-term **R&D directions**
- Facilitate **transition of R&D into domestic and allied production**
- Attract aligned foreign investments

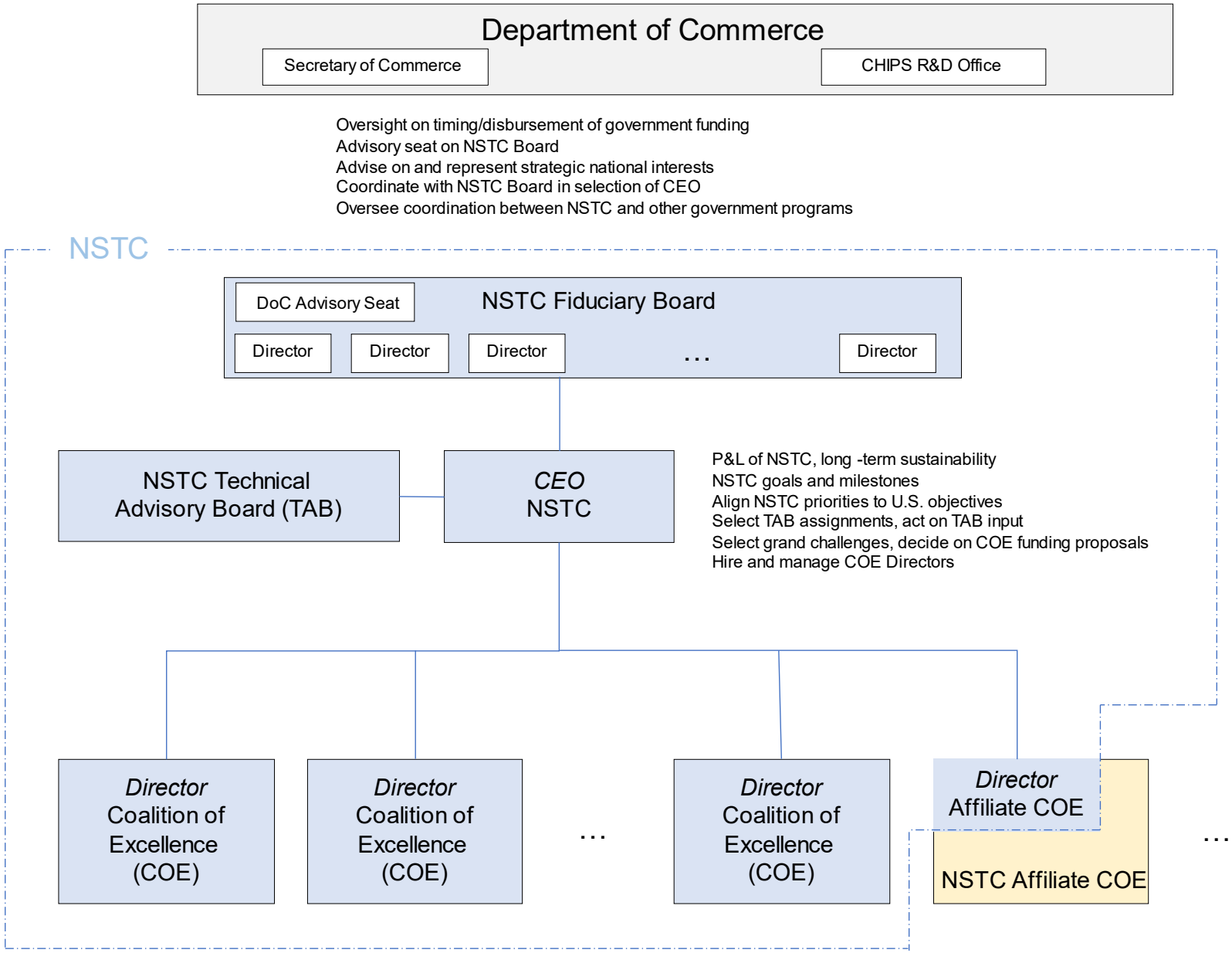
NSTC PPP Organization

Recommendation 4-1: The NSTC should be a leading and convening public private partnership, led by an independent CEO reporting to a fiduciary board, with the advice of a Technical Advisory Board (TAB).

The CEO oversees Multiple Coalitions of Excellence (COEs), each with an Executive Director who oversees specific work sectors

Considerations:

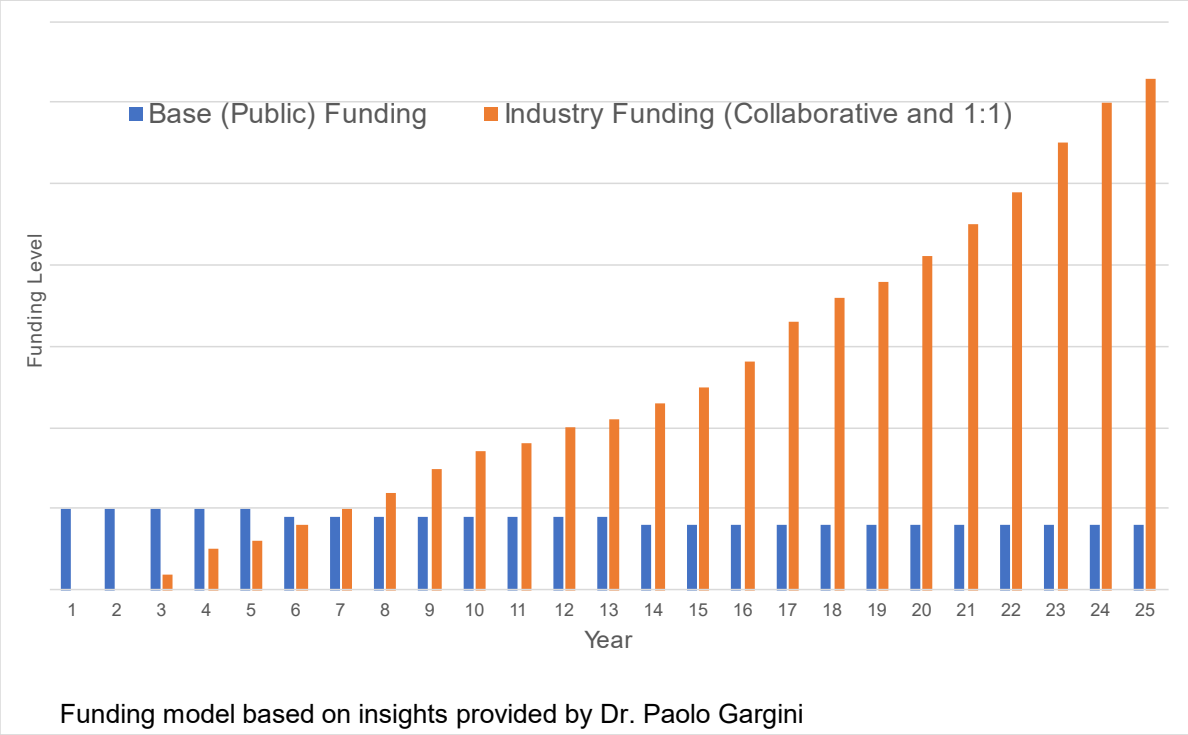
- CEO appointment process
- CEO authority & reporting structure
- COE specialization areas



NSTC Sustainable Business Model

Recommendation 4-2: The NSTC should develop a sustainable business model, with increased funding by industry over time. Government funding should provide risk capital to facilitate broad participation of firms and research institutions of all sizes and means

- Industry and Government must **co-invest for the long term** to ensure sustainability and ongoing success



Funding model based on insights provided by Dr. Paolo Gargini

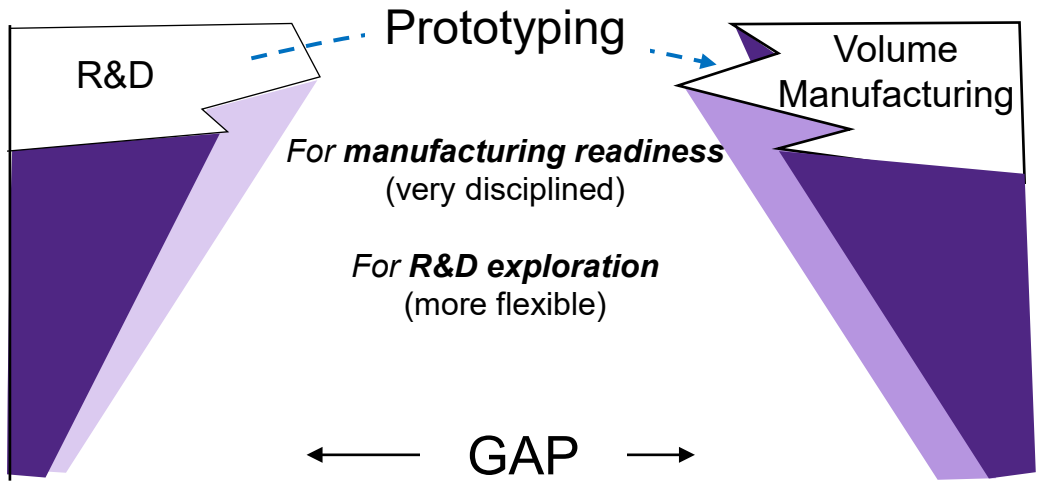
Considerations:

- Successful PPPs strike a good **balance** between Industry and Government investment
- Sustained government investment ensures **broad access** (start-ups, universities, small businesses) and increased **risk tolerance**
- Sustained Industry investment ensures **relevance and evergreen capabilities**
- Compared organizational models
- IMEC, SRC, SEMATECH, etc.

From Prototypes → Domestic Volume Manufacturing

Recommendation 4-3: The NSTC should offer prototyping enablement with a translation path to multiple domestic volume production sources, encompassing the spectrum from pre-competitive to private research program types. It should lower barriers to innovation and enable smaller entities to participate

- NSTC should leverage COE capabilities and U.S. Shared Resource Network to facilitate transition to domestic manufacturing

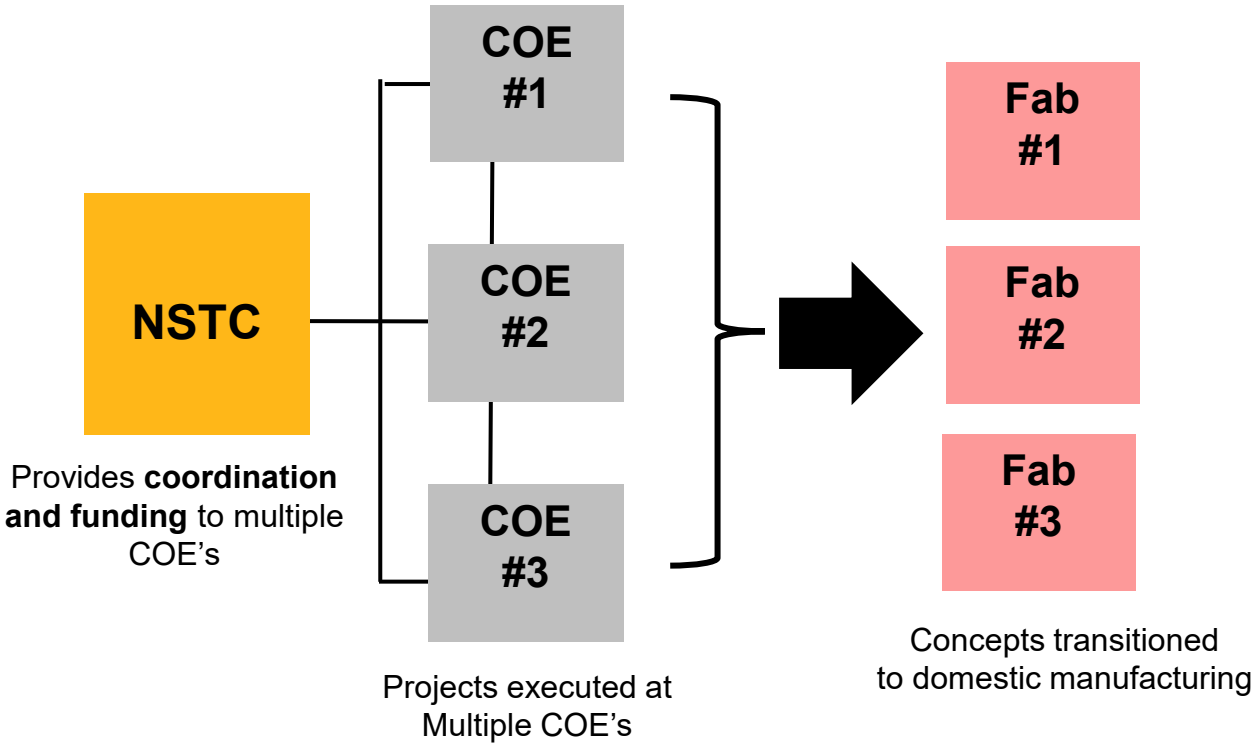


Considerations:

- Baseline flows/PDKs to enable execution
- Provides value to large entities
- Accessible to small/mid size entities, start-ups
- Provides a pathway to volume manufacturing

Vital Role of COEs

Recommendation 4-4: NSTC should be a funding mechanism for Coalitions of Excellence and for projects executed within and across COEs



Considerations:

- NSTC coordinates projects at multiple COE's
- CEO decides COE areas and leadership for each
- COEs prototype R&D concepts for domestic production

Have not yet addressed:

- How will NSTC work with other entities – ME Commons, NSF, SRC, DARPA, et al.

Partner with and complement existing centers, rather than build from scratch

Recommendation 4-5: NSTC should partner with and be complementary to existing centers, and emphasize build-out of the ecosystem and enabling infrastructure

- Building a **sustainable domestic infrastructure** that leverages existing US & global capabilities.

COE's located across the US

COE's leverage existing domestic infrastructure

Also engage with overseas organizations w/ domestic footprints

Considerations:

- Need for early "wins" with new organization
- Leverage existing US infrastructure
- Enable new domestic capabilities
- Engage global capabilities within the US
- Provide technical and financial leverage

- Independent, nimble and new non-profit
- Leverage input from RFI teams
- OTA (vs. solicitation)
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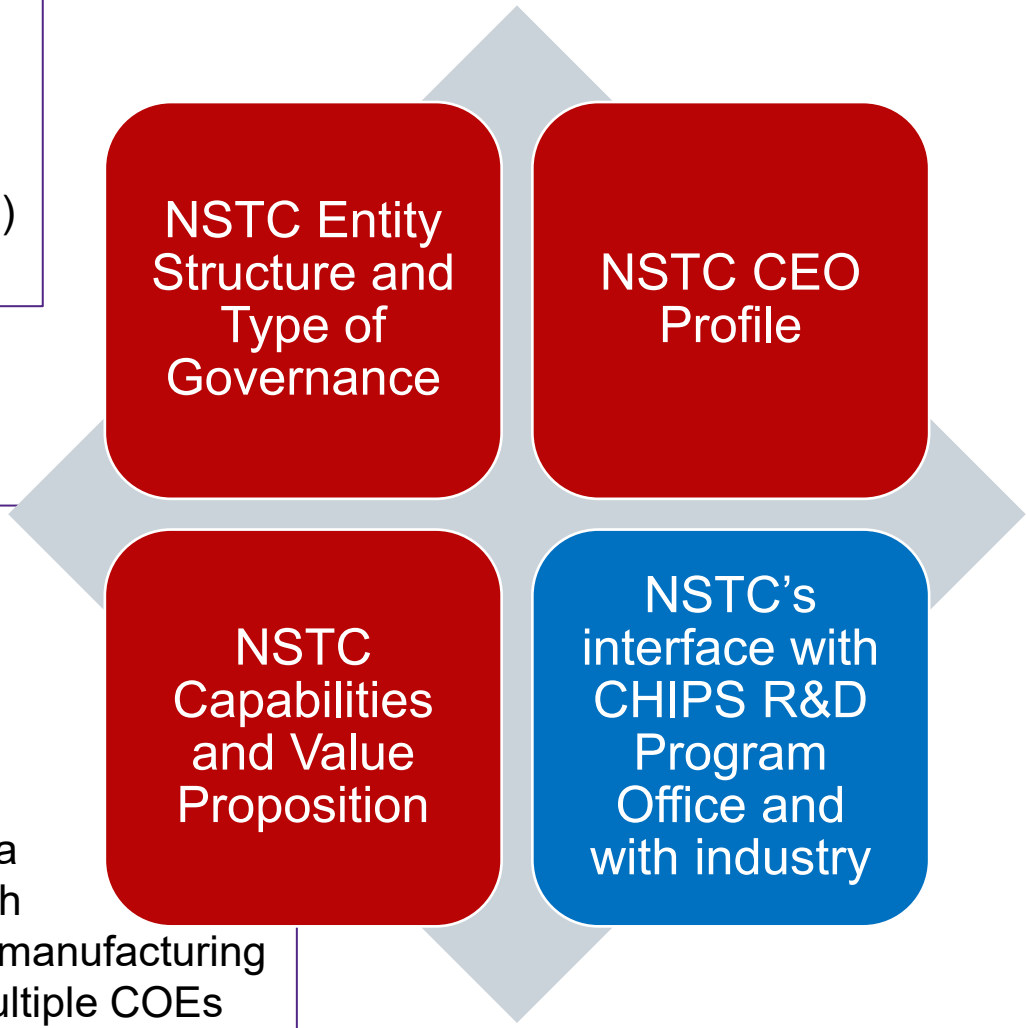
- Members participate in TAB



- Semiconductor industry
- Deep technical experience
- Global, Bold, Creative
- Track record of technology transition to market
- Works with partners, USG, industry and academia

- Leading and convening PPP
- Empowered CEO oversees multiple COEs
- Sustainable business model with increasing industry funding and ongoing USG investment in order support small entities and academia
- Offering prototyping capabilities with transition path to domestic volume manufacturing
- NSTC is funding mechanism for multiple COEs
- Leverage existing facilities

Questions

What is the interaction between the NSTC CEO and the DoC CHIPS R&D Director?

Where do the Executive Directors of the COEs reside and what are the expectations of them?

What is the role of competition?

NSTC Principles

Promote **Competition** of Ideas

Avoid conflicts of interest

Establish clear **joint goals and success metrics** aligned with NSTC mission

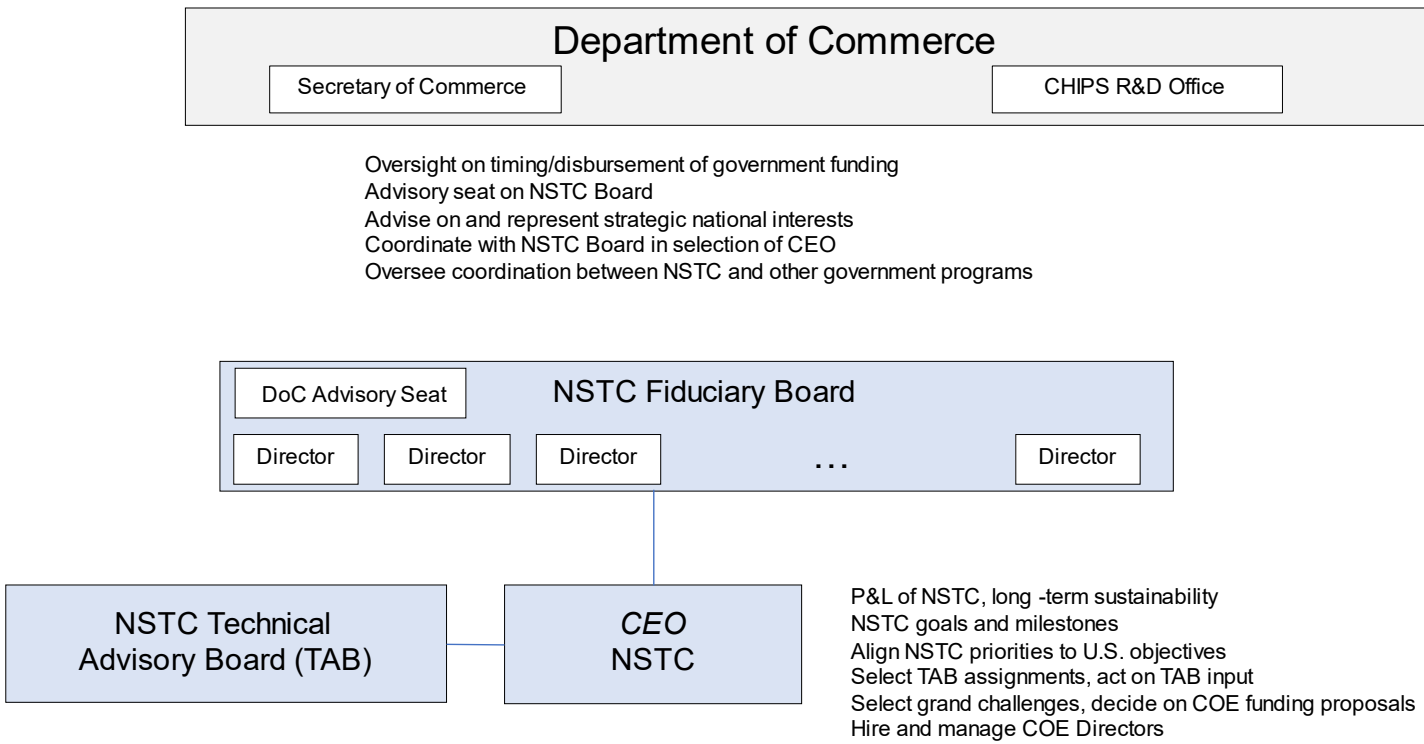
Structure of goals drives **competition of ideas**

Enable the emergence of disruptive innovations by allowing **exploration of "out-of-the-box" insights**

Ability to **accept technical risks and make hard decisions**, including cutting poor performance or stopping programs

Recommendations

Recommendation 5b-1: A strong centralized NSTC CEO office that emphasizes personal responsibility and avoids committee group think. The CEO should be given broad autonomy on how the organization's goals are executed



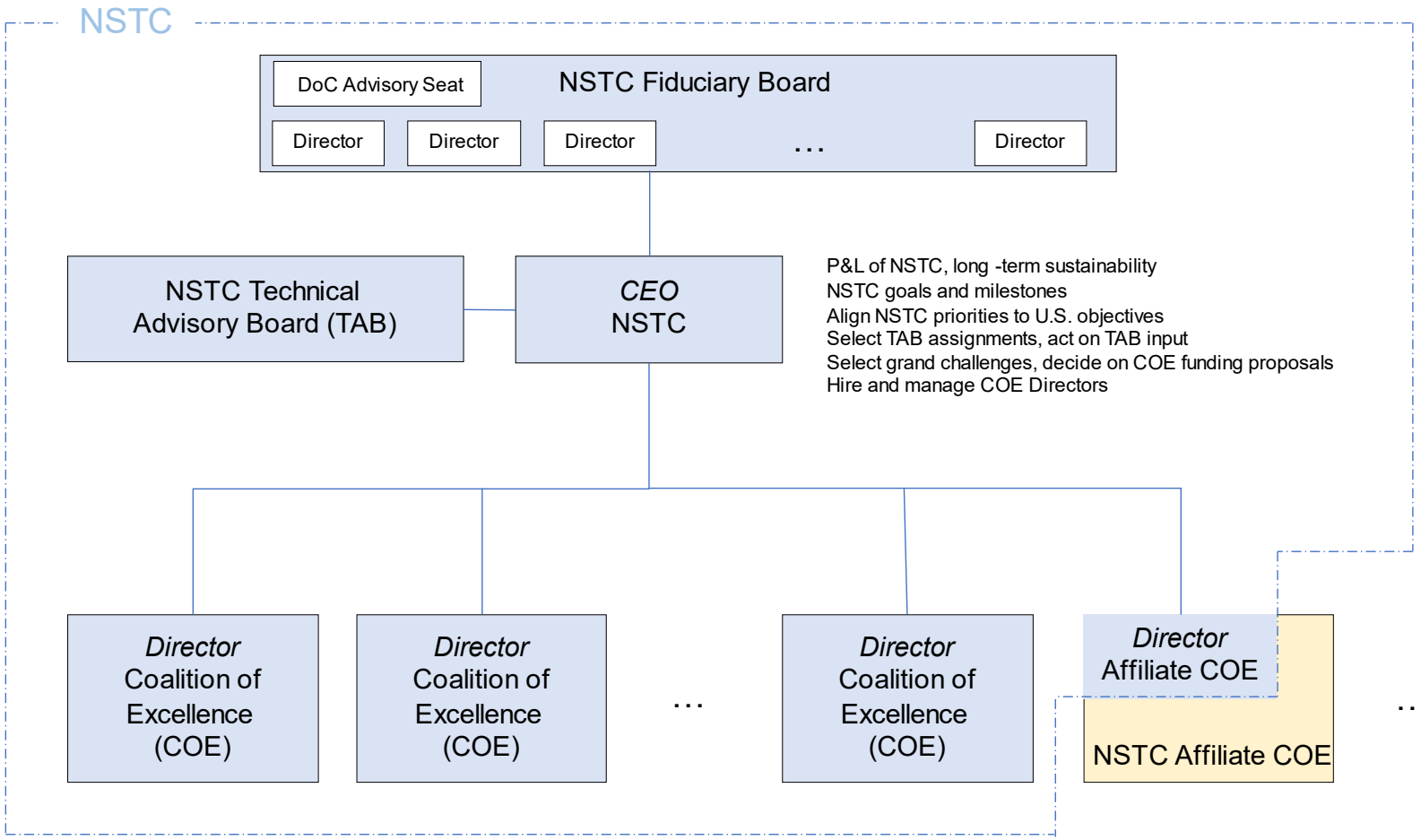
NSTC CEO

- Strong **centralized CEO office** essential
- Broad **authority** and **autonomy**
- **Politically shielded**

Department of Commerce CHIPS R&D Office

- Oversight on timing and disbursement of funding
- Represent strategic national interests
- Coordination between government entities
- Translation from PCAST

Recommendation 5b-2: The structure of the NSTC must foster healthy competition at its foundation. This competition must apply to entities who are eligible for funding and who meet publicly stated criteria



Executive Directors of the COEs

- Oversee COE operations
- Manage budgets
- Make funding and program recommendations to CEO
- Run **project solicitations** and execute with public decision criteria that will pass external review
- See proposals from **multiple industry participants** and be able to **shield IP between competing entities**
- Be hired by CEO and reside within NSTC

Recommendation 5b-3: The CEO should be responsible for items delineated below

- Clear understanding of current gaps in U.S. semiconductor technology industry leadership
- Aligning mission to enable the future technology required for U.S. leadership over the next decade
- Technical Advisory Board (TAB) assignments and process
- Meeting objectives and acting on recommendations from the TAB
- Selecting grand challenges and approving and executing the associated proposals
- Setting yearly goals and milestones
- Selection of Coalition of Excellence (COE) focus areas and expected outcomes in conjunction with the CHIPS R&D office
- Managing P&L with eye towards long term sustainability, including target mix of government and industry funding and how it evolves over time
- Hiring and managing Executive Directors of Coalitions of Excellence
- Being the *source selection authority* for Coalition of Excellence decisions and arbitrating competitions
- Coordinate with the execution of other government funded programs
- Protect Executive Directors of the COEs and the TAB from outside influence and allow for unbiased technical decisions
- Identify new revenue sources including direct U.S. industry engagement and use of facilities

This is not a complete list – other areas like workforce, investment fund, convening, etc. will also be part of CEO responsibilities

- Independent, nimble and new non-profit
- Leverage input from RFI teams
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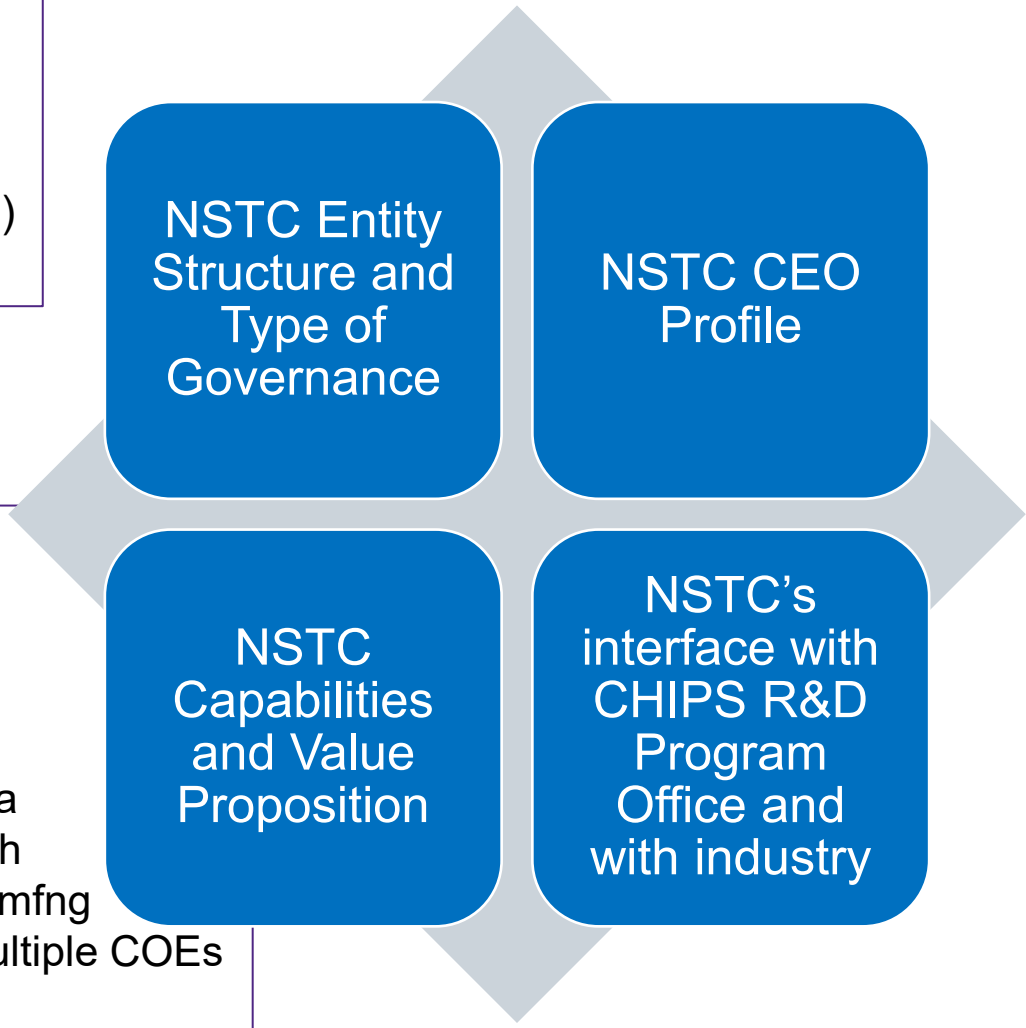

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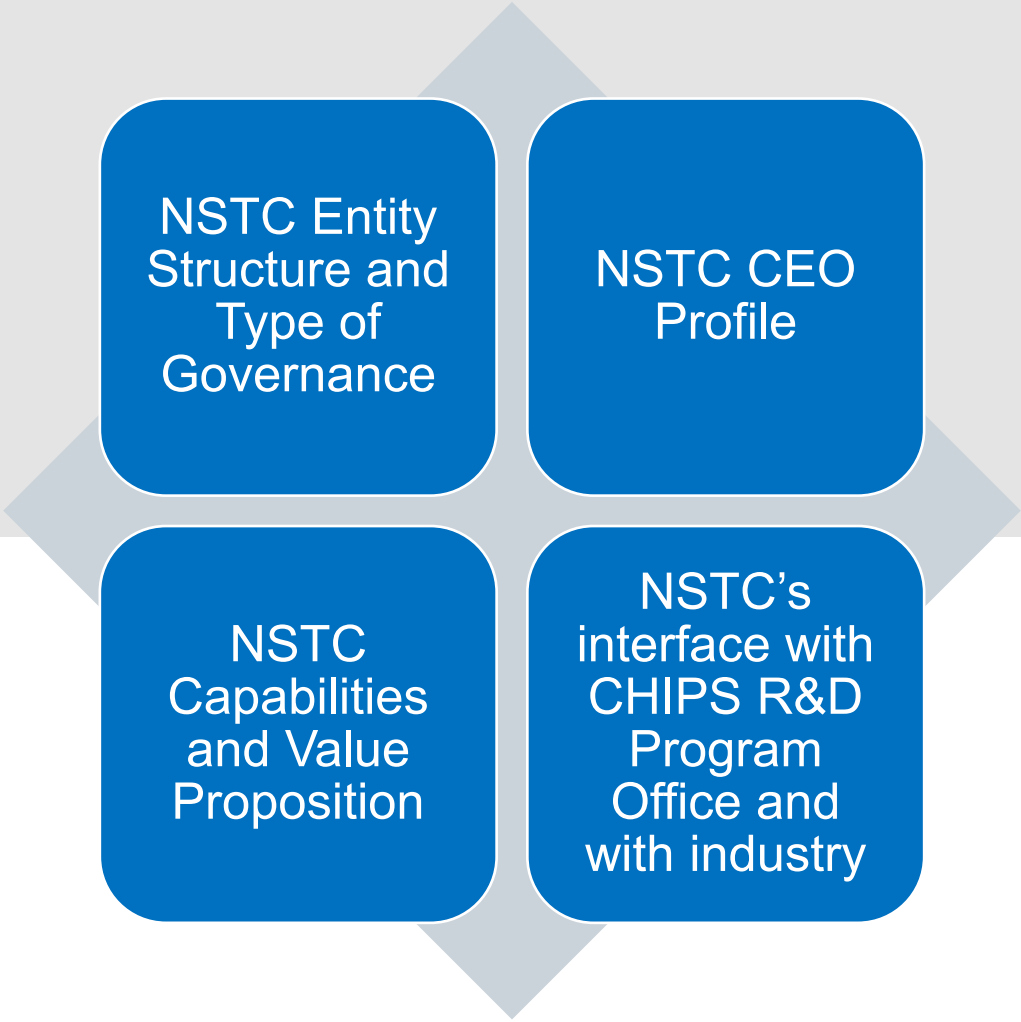
- Leading and convening PPP
- CEO oversees multiple COEs
- Sustainable business model with increasing industry funding and ongoing USG investment in order support small entities and academia
- Offering prototyping capabilities with transition path to domestic volume mfng
- NSTC is funding mechanism for multiple COEs
- Leverage existing facilities

- Strong empowered CEO with broad autonomy on setting strategy and driving execution
- CEO reports to NSTC Board
- Important relationship with Secretary of Commerce and CHIPS R&D Office
- Competition at its core – at NSTC level and at COEs
- Avoids conflicts of interest
- List of responsibilities

Questions and Deliberation



Voting

NSTC entity structure and type of governance board

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- **Recommendation 1-2:** The subcommittee recommends a fiduciary board for oversight of the NTSC

NSTC CEO profile

Recommendation 2-1: The subcommittee recommends recruiting a highly respected executive with deep technical expertise and senior level leadership experience in the semiconductor industry to serve as the CEO of NSTC

Vision and Mission of NSTC
Recommended Organizational Form

- **Recommendation 4-1:** The NSTC should be a leading and convening public private partnership, led by an independent CEO reporting to a fiduciary board, with the advice of a Technical Advisory Board (TAB). The CEO oversees Multiple Coalitions of Excellence (COEs), each with an Executive Director who oversees specific work sectors
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- **Recommendation 4-4:** NSTC should be a funding mechanism for Coalitions of Excellence and for projects executed within and across COEs
- **Recommendation 4-5:** NSTC should partner with and be complementary to existing centers, and emphasize build-out of the ecosystem and enabling infrastructure

Interface between the NSTC, the DoC CHIPS Program Office and Industry

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- **Recommendation 5b-2:** The structure of the NSTC must foster healthy competition at its foundation. This competition must apply to entities who are eligible for funding and who meet publicly stated criteria
- **Recommendation 5b-3:** The CEO should be responsible for items as described in presentation

Thank You