# LEGISLATIVE UPDATE

**Lewis-Burke Associates LLC – March 2022**

LEWIS–BURKE ASSOCIATES LLC

# The Year Ahead: Spending and Legislative Outlook

| March | April | May/June | July/Aug | Sept/Oct | November |
|---|---|---|---|---|---|
| • *FY 2022 finalized*<br>• *President's Budget Request (PBR) released Mar 28* | • *First Hill Budget hearings*<br>• *Members Submit priorities to committees* | *House & Senate begin appropriations process: Hearings, Markups* | *Sprint to August Recess & campaigning* | • *FY 2022 ends Sept 30*<br>• *Need CR past Nov election to fund government* | • *Midterms, with R's favored in House*<br>• *"Lame Duck" session*<br>• *Wrap-up or punt FY 2023* |

**Other Congressional Action/Interest**

- Russia/Ukraine
- Supreme Court
- FDA/Pandemic/CURES
- Slim majorities in both chambers
- NDAA, Competitiveness

# FY 2022 APPROPRIATIONS FINALIZED MARCH 15

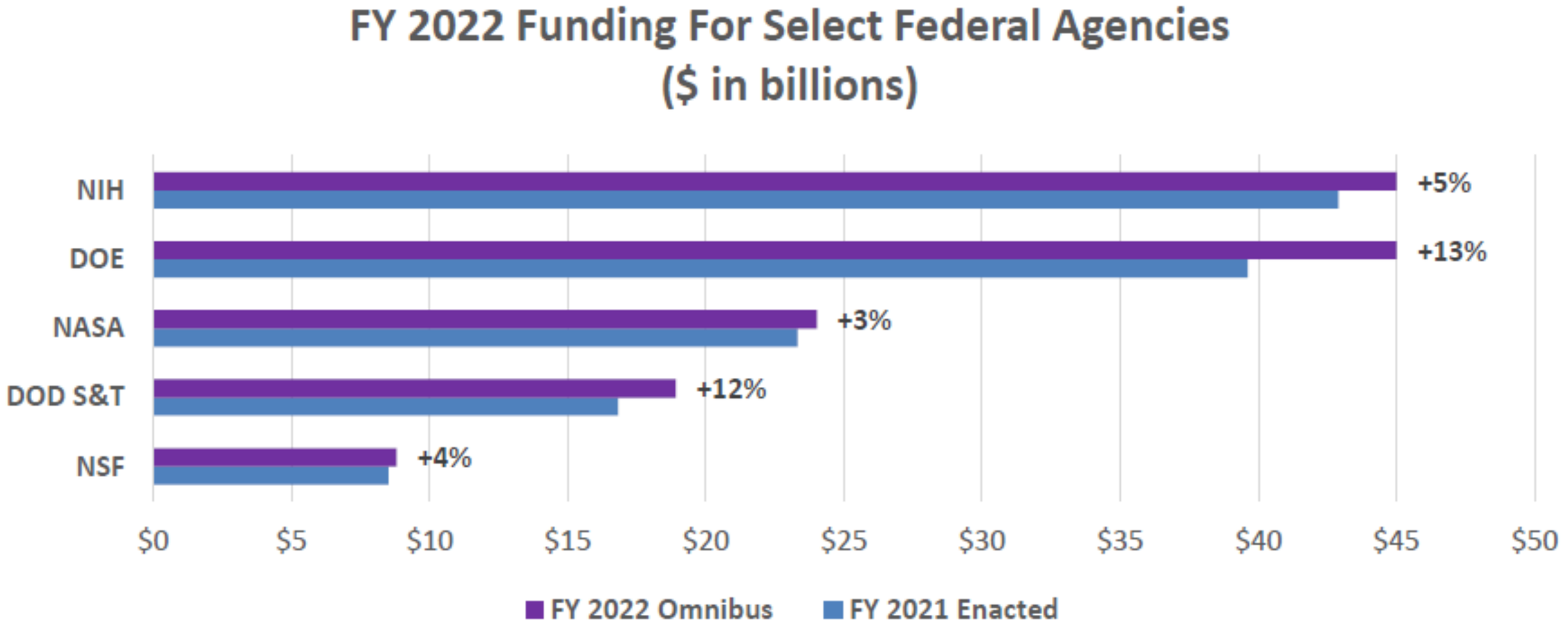
## FY 2022 Appropriations – TAKE AWAYS

- Deal meant more PARITY
  - Defense spending – 5.6 percent increase (vs. 1.7 %)
  - Non-defense spending – 6.7 percent increase (vs. 16 %)

- Defense research funding restored
- Most domestic research agencies up 3-5%
- New mechanisms/agencies – with NEW opportunities created (in addition to infrastructure)

- Lots of funding to be obligated in short time period

# FY 2022 APPROPRIATIONS



# USDA NIFA

| Program | Enacted FY 2021<br>*$Millions* | House Bill FY 2022<br>2022<br>*$ Millions* | Senate Bill FY<br>*$ Millions* | FY 2022<br>Omnibus<br>*$Millions* | |
|---|---|---|---|---|---|
| **RESEARCH** | | | | | |
| Hatch Act | 259.0 | *265.0* | ***275.0*** | 260.0 | |
| Evans-Allen | 73.0 | ***92.8*** | *73.0* | 80.0 | |
| Research Grants 1994 | 4 | *4.5* | ***5.0*** | 4.5 | |
| McIntire-Stennis | 36.0 | *38.0* | ***40.0*** | 36.0 | |
| AFRI | 435.0 | ***450.0*** | *445.0* | 445.0 | |
| **EXTENSION** | | | | | |
| Smith-Lever | 315.0 | *320.0* | ***330.0*** | 320.0 | |
| 1890 Extension | 62.0 | ***67.0*** | *62.0* | 65.0 | |
| Extension 1994 | 8.5 | *9.5* | *10.0* | 9.5 | |
| **EDUCATION** | | | | | |
| Education Grants 1994 | 4 | *5.5* | *6.0* | 5.5 | |
| Women & Minorities in STEM | 0.4 | *1* | *2* | 1.0 | |
| **INFRASTURCTURE (Research Facilities Act)** | | | | | |

# INNOVATION AND COMPETITIVENESS PACKAGE

**Sen. Schumer announces Tech Moon Shot (Endless Frontier Act) fall 2019 @ NSCAI event**

**Endless Frontier Act is merged with other agency authorizations, competitiveness, security, and trade provisions**

**Semiconductor funding is added to the overall package on the Senate floor**

**Senate passed U.S. Innovation and Competition Act (USICA) in June 2021 with 68 votes**

- Includes *Endless Frontier Act* – Focus on 10 key technology areas, $81B authorized for NSF
- $10B for Regional Technology Hubs at Department of Commerce
- Would create NSF Directorate for Technology and Innovation - centers, testbeds, fellowships, and tech transfer
- CHIPS funding would enable NIST/DARPA expanded research/workforce/fab investments for semiconductors
- Increased scrutiny on foreign gifts to universities
- Many other provisions – research security, advanced manufacturing, NASA authorization, some STEM education, new Engineering Biology National Initiative, $17B authorizations for DOE and DARPA in key technology focus areas

# INNOVATION AND COMPETITIVENESS PACKAGE

**House passes NSF for the Future and DOE Office of Science for the Future by large bipartisan majorities**

**Additional committees and bills are added to one package; it passes on the House floor on a largely partisan basis (12 vote margin – 1 R)**

**House passed America Creating Opportunities for Manufacturing, Pre-Eminence in Technology and Economic Strength Act of 2022 (COMPETES)**

- Includes *NSF for the Future* - $78B authorized for NSF – more funding for existing NSF compared to *USICA*
- NSF Directorate for Science and Engineering Solutions — societal challenges (such as environmental sustainability and cybersecurity) through Technology Research Institutes, capacity-building grants, scholarships and more
- Exemption of STEM graduates with advanced degrees from visa caps – i.e. the Startup Act
- Manufacturing Extension Partnership Pilot
- Clean energy innovation programs — Expands on authorities for Energy to operate an incubator network, university prize competition, entrepreneurial fellowships and employee leave programs at National Labs.
- Other provisions – CHIPS funding, $7B regional tech hubs, and engineering biology as well as lots of additional STEM provisions, short-term Pell, more on broadening participation, preferred research security language, NIST and DOE authorizations

# INNOVATION AND COMPETITIVENESS PACKAGE

## COMPETES & Some USICA

- DOE Office of Science directed to expand collaboration with MSIs
- DOE Office of Science directed to work with NSF on INCLUDES program
- NSF Noyce Scholarships must include more direct outreach to HBCUs
- NSF – Capacity Building program for MSIs
- NSF – DEI in technology sector
- NSF – grants to implement or expand research-based practices aimed at increasing the recruitment, retention, and advancement of minority faculty and expand STEM workforce among undergraduates from minority backgrounds
- DOE – Clean energy tech university prize competition (emphasis on MSIs)
- DOL authorized to award “Modernizing Apprenticeship Programs for the 21st Century” grants
- DOL – new $100 million telecommunications job training program with HBCUs
- ED - a new competitive grant program increasing equitable access to computer science education and computational thinking skills, with priority given to high-poverty LEAs and LEAs that partner with HBCUs
- ED - build international education capacity at MSIs

# OPPORTUNITIES FOR UNIVERSITIES AND RESEARCH ORGANIZATIONS

## R&D funding at NIST, DOD – Maybe DOE, and NSF

- Large-scale future CHIPS funding opportunities include:
  - DOC/NIST: $3 billion **National Semiconductor Technology Center (NSTC)**
  - DOC/NIST: $2.5 billion for **Advanced Packaging**
  - DOC/NIST: $150 million for a **Semiconductor Manufacturing USA Institute**
  - DOD: $2 billion for **Microelectronics R&D**
- Potential semiconductor related funding opportunities may include:
  - DOE: Funding for Microelectronics Science Research Centers
  - NSF: Funding involving MPS, ENG, CISE for R&D and workforce development

**In most cases, the CHIPS opportunities require a consortia of industry, national labs, and research universities.**

# INNOVATION AND COMPETITIVENESS PACKAGE

**What's Next**

- Procedural Conference Steps Begun
  - Early conversations have begun
  - Final decisions will be political ones (e.g., Green Climate Fund)

- More similarities than differences
  - CHIPS funding, R&D, regional economic development, science & security, etc.

- Trade Policy is where biggest differences abound
  - Senate passed their trade provisions in an amendment (91-4)

- Science Policy
  - House includes NIST and DOE policy provisions/sections
  - Senate includes NASA
  - Differences in approach at NSF & EPSCoR prioritization

# RECONCILIATION – SOCIAL INFRASTRUCTURE

## What Survives??

**Package Included Major Investments in Research, Higher Education, and Competitiveness**

- $3.5 B for NSF, including $500 M for research infrastructure, $675 M for general research/education, $500 M for climate-related research, and $1.B M for the new TIP directorate
- $3.4 B for regional technology hubs and $1.7 B for EDA
- Additional funding for climate and clean energy research at NASA, DOI, FAA, NIST, NOAA, EPA, and DOE
- $550 increase to maximum Pell award, $9 billion for ED MSI programs
- $19 B for DOL workforce development programs, including high-skill training and apprenticeships

# FY 2023 BUDGET REQUEST

**The FY 2023 budget request also doubles down on FY 2022 investments:**

- $880 million for the NSF TIP Directorate to advance use-inspired research and expedite technology development in emerging technology areas;
- $5 billion for ARPA-H;
- $700 million for ARPA-E to fund programs in climate change adaptation, mitigation, and resilience
- Increased funding to advance emerging technology areas including QIS, AI, biotechnology, next-generation computing, and 5G and advanced communications; and
- > $1 billion at NSF, DOE, and USDA for programs dedicated to increasing the participation of historically under-represented communities in science and engineering fields and building science and technology capacity in underserved institutions, including Minority Serving Institutions.

- Education: $2,175 increase for Pell Grants; increases for TRIO, GEAR UP, and Education Innovation Research programs; and increasing the number of mental health professionals in schools.
- New investments in the nation's public health infrastructure, especially for pandemic preparedness and biodefense, and would expand initiatives to address health inequities.

# BIDEN ADMINISTRATION R&D PRIORITIES

**Biden Administration Science and Technology Priorities**

The FY 2023 OMB/OSTP memo to federal agencies highlights importance of federally supported R&D to address societal grand challenges including climate change, health, prosperity, security, environmental quality, equity, and justice. The Biden Administration's focus on innovation and the translation of basic research into businesses and products is also emphasized in the memo.

## FY 2023 Multi-Agency R&D Priorities

- **Pandemic Readiness and prevention**
- ***NEW*** **Innovation for Equity**
- ***NEW*** **Tackling Climate Change**
  - ***NEW*** Climate science
  - ***NEW*** Innovation in clean-energy technologies and infrastructure
  - ***NEW*** Climate adaption and resilience
  - ***NEW*** Nature-based climate solutions for mitigation and adaption
  - Monitoring and measurement
- **Catalyze research and innovation in critical and emerging technologies**
  - AI and QIS
  - Advanced communications technologies
  - ***NEW*** Microelectronics
  - High-performance computing
  - Biotechnology
  - Robotics
  - Space technologies
- **National Security and economic resilience**
  - ***NEW*** Biosecurity and biosafety
  - Nuclear nonproliferation
  - ***NEW*** Defense against cyber-attacks and supply chain attacks

# DISCUSSION

# CHIPS OVERVIEW

## Goals for CHIPS Act

- Protect and extend U.S. semiconductor technology leadership
- Ensure a secured supply of chips for critical sectors
- "Re-shore/on-shore" semiconductor production from foreign sources
- Promote long term economic viability for semiconductor:
  - R&D
  - Manufacturing
  - Supply chain

Most of the new funding in the CHIPS Act is for industry and job creation activities.

**$52 billion over 5 years**

**Financial Incentives Programs**
$39 billion

**Research and Development**
$11 billion

# CHIPS ACT

## Funding for CHIPS would include:

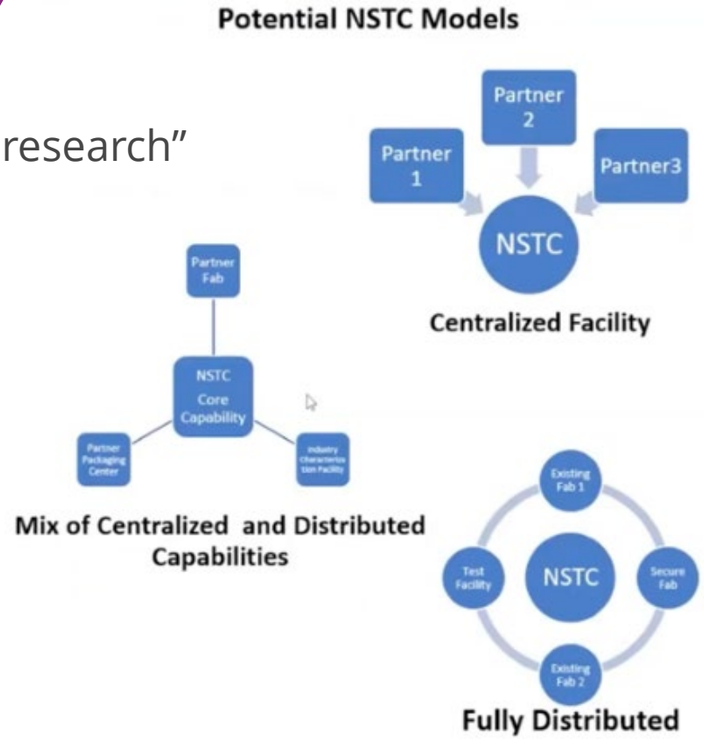
- **CHIPS for America Fund**
  - $50.2 billion over 5 years
  - National Semiconductor Technology Center (NSTC)
  - New semiconductor manufacturing institute
  - NIST Internal R&D and Advanced Packaging
- **CHIPS for America's Defense Fund**
  - $2 billion ($400 million/year for 5 years)
  - DOD and Intelligence Community R&D, testing, workforce development, and other activities
- **CHIPS for America International Technology Security and Innovation Fund**
  - $500 million ($100 million/year for 5 years)
  - Coordinate common international supply chain security and consistency in the global semiconductor industry

**CHIPS funding is spread over 5 years and will not all be available immediately once funded**

# CHIPS ACT: DOC/NSTC

## National Semiconductor Technology Center (Sec. 9906c)

- DOC funding and activities prioritize NSTC
- Mission: R&D activities requiring "manufacturing, design and packaging research"
  - Prototyping at technology readiness levels (TRL) 3-8
  - Planning elements:
    - Design infrastructure
    - Fabrication and prototyping needs
    - Advanced packaging, assembly, and test needs
    - Investment fund/incubator
    - Workforce development
- Oversight provided by the CHIPS Program Office at NIST
- Expected to be funded through a cooperative agreement
  - New or existing non-profit organization or consortium
  - Open competition
- Technical Advisory Committee will advise on long-term strategy, priorities, and collaborations




Credit: NIST

# CHIPS ACT: MANUFACTURING INSTITUTE

## National Institute of Standards and Technology (Sec. 9906f)

- Authorizes $150 million ($30 million a year) for the creation of a new **Manufacturing USA Institute**
- Research topics identified include *virtualization and automation of maintenance of **semiconductor** machinery, development of new advanced test, assembly and packaging capabilities, and development of educational skills training curricula for the talent pipeline*.
  - Common institute features:
    - Industry-led consortia
    - public-private partnerships
    - Required 1:1 cost match (2:1 is typical)
    - TRL 4-7 research funding
    - Collaboration of industry, universities, and government
      - Technology development
      - Workforce development

Credit: NIST

# CHIPS ACT: ADDITIONAL AGENCIES

## National Institute of Standards and Technology (NIST)

- Authorizes $50 million ($10 million a year) for advanced metrology
- Authorizes $50 million ($10 million a year) for metrology for security and supply chain verification
- Approx. $39 million will go towards NIST's incentive program for semiconductor production

## Department of Defense

- Authorizes $2 billion (over 5 years) to DARPA's Electronics Resurgence Initiative
- Authorizes $50 million per year for various workforce training and R&D programs
- Requires a report to Congress on a plan to use Defense Production Act authorities to establish a domestic production capability
- FY 2022 NDAA has planned allocations in 6.1-6.4 for ERI funding increases independent of DARPA's core budget

Credit: NIST