Research and Development Enhancement Act of 2022

IN THE SENATE OF THE UNITED STATES

Ms. Lambros-Kasparian introduced the following piece of legislation.

A BILL

To provide for the enhancement of the capabilities of United States Federal Research and Development Efforts as well as adopting key Research and Development initiatives

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled

SECTION I. Short Title

I. This act may be cited in public works as the “Research and Development Enhancement Act”, or the ‘RDE’ Act.

SECTION II. Findings

Congress finds that-

I. The U.S. government supports a broad range of scientific and engineering R&D. Its purposes include addressing national defense, health, safety, the environment, and energy security; advancing knowledge generally; developing the scientific and engineering workforce; and strengthening U.S. innovation and competitiveness in the global economy. Most of the R&D funded by the federal government is performed in support of the unique missions of individual funding agencies.

II. Congress plays a central role in defining the nation's R&D priorities as it makes decisions about the level and allocation of R&D funding—overall, within agencies, and for specific programs. In recent years, some Members of Congress have expressed concerns about the level of federal spending (for R&D and for other purposes) in light of the federal deficit and debt. Other Members of Congress have expressed support for increased federal spending for R&D as an investment in the nation's future competitiveness. As Congress acts to complete the FY2022 appropriations process, it faces two overarching issues: the amount of the federal budget to be spent on federal R&D and the prioritization and allocation of the available funding.

III. Current appropriations proposals show a decrease of $13.8 billion (8.8%) below the FY2021 level of $156.0 billion of Federal R&D funding. Adjusted for inflation to FY2022 dollars, the current FY2022 R&D request represents a constant-dollar decrease of 10.6% from the FY2020 actual level.

IV. Under the current appropriations, eight federal agencies would receive nearly 98% of total federal R&D funding in FY2021: the Department of Defense (DOD), 42.1%; Department of Health and Human Services (HHS), primarily the National Institutes of Health (NIH), 26.6%; Department of Energy (DOE), 11.3%; National Aeronautics and Space Administration (NASA), 9.4%; National Science Foundation (NSF), 4.5%; Department of Agriculture (USDA), 1.9%; Department of Commerce (DOC), 1.1%; and Department of Veterans Affairs (VA), 1.0%.

V. The agencies with the largest R&D funding declines (measured in dollars) in the FY2021 request compared to FY2020 enacted level are DOD (down $4.713 billion), DOE (down

$3.168 billion), HHS (down $2.943 billion), NASA (down $723 million), and DOT (down $540 million).

VI. The agencies with the largest percentage declines in R&D funding in the FY2021 request compared to FY2020 enacted level are DOT (down 47.6%), EPA (down 35.4%), DOI (down 25.5%), DOC (down 22.7%), and DOE (down 16.5%).

SECTION III. Definitions Associated with Federal Research and Development Funding

I. Two key sources of definitions associated with federal research and development funding are the White House Office of Management and Budget and the National Science Foundation.

II. Office of Management and Budget. The Office of Management and Budget provides the following definitions of R&D-related terms in OMB Circular No. A-11, "Preparation, Submission, and Execution of the Budget."1 This document provides guidance to agencies in the preparation of the President's annual budget and instructions on budget execution. In 2017, OMB adopted a refinement to the categories of R&D, replacing "development" with "experimental development," which more narrowly defines the set of activities to be included. The new definition has resulted in lower reported R&D by some agencies, including the Department of Defense and the National Aeronautics and Space Administration. This definition is used in the President's FY2022 budget.
    a. Conduct of R&D. Research and experimental development (R&D) activities are defined as creative and systematic work undertaken in order to increase the stock of knowledge—including knowledge of people, culture, and society—and to devise new applications using available knowledge.
    b. Basic Research. Basic research is defined as experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts. Basic research may include activities with broad or general applications in mind, such as the study of how plant genomes change, but excludes research directed towards a specific application or requirement, such as the optimization of the genome of a specific crop species.
    c. Applied Research. Applied research is defined as original investigation undertaken in order to acquire new knowledge. Applied research is, however, directed primarily towards a specific practical aim or objective.
    d. Experimental Development. Experimental development is defined as creative and systematic work, drawing on knowledge gained from research and practical experience, which is directed at producing new products or processes or

improving existing products or processes. Like research, experimental development will result in gaining additional knowledge.

e. R&D Equipment. R&D equipment includes amounts for major equipment for research and development. It includes acquisition, design, or production of major movable equipment, such as mass spectrometers, research vessels, DNA sequencers, and other major movable instruments for use in R&D activities. It includes programs of $1 million or more that are devoted to the purchase or construction of major R&D equipment.
f. R&D Facilities. R&D facilities include amounts for the construction of facilities that are necessary for the execution of an R&D program. This may include land, major fixed equipment, and supporting infrastructure such as a sewer line or housing at a remote location.

III. National Science Board/National Science Foundation. The National Science Board/National Science Foundation provides the following definitions of R&D-related terms in its report Science and Engineering Indicators: 2022.
    a. Research and Development (R&D): Research and experimental development comprise creative and systematic work undertaken to increase the stock of knowledge—including knowledge of humankind, culture, and society—and its use to devise new applications of available knowledge.
    b. Basic Research: Experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
    c. Applied Research: Original investigation undertaken to acquire new knowledge; directed primarily, however, toward a specific, practical aim or objective.
    d. Development (or Experimental Development): Systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.

SECTION IV. Appropriations for Research and Development programs

I. These are authorized to be appropriated to the White House Office of Management and Budget for the fiscal year 2022 for the following activities:
    a. $ 250 Million for the Environmental Protection Agency
    b. $ 590 Million for the Department of Transport
    c. $ 5 Billion for the Department of Health and Human Services
    d. $ 4 Billion for the Department of Defense

II. These are authorized to be appropriated to General Federal R&D for the fiscal year 2022 for the following activities:
    a. $3 Billion for Basic Research
    b. $7 Billion for Applied Research
    c. $5 Billion for Development
    d. $4 Billion for Facilities and Equipment

III. These are authorized to be appropriated to the National Science Foundation for the fiscal year 2022 for the following multi-agency Research and Development Initiatives:
    a. Enhanced Artificial Intelligence Research and Development Initiative
        i. A 76% increase in the AI R&D budget of the National Science Foundation to $868 million over the FY2020 level, for AI-related research and the creation of several National AI Research Institutes, in collaboration with USDA, DHS, DOT, and VA. The institutes are to support multisector, multidisciplinary research and workforce efforts among academia, industry, federal agencies, and nonprofits.
        ii. An additional $100 million for the USDA Agriculture and Food Research Initiative (AFRI) for AI and machine learning research to promote advanced manufacturing in the food and agricultural sciences, as well as to continue efforts in robotics and the application of big data to precision agriculture.
        iii. $125 million for DOE's Office of Science, a $54 million increase over the FY2020 request.
        iv. $50 million for NIH research on chronic diseases using AI and related approaches.
        v. $459 million for DARPA AI R&D, an increase of $50 million from the FY2020 request.
        vi. $290 million for DOD's Joint AI Center, up from $242 million in FY2020.

IV. These are authorized to be appropriated to the Department of Energy for the fiscal year 2022 for the following Research and Development Initiatives aimed to support our technical efforts to research new and more efficient ways of combating climate change as well as reinforcing the security of our energy infrastructure:
    a. **Science**
        i. $ 2.2 Billion for Basic Energy Sciences
        ii. $ 1.1 Billion High Energy Physics
        iii. $ 760 Biological and Environmental Research Nuclear Physics
        iv. $ 1 Billion for Advanced Scientific Computing Research Fusion Energy Sciences
        v. $ 588 Million Other Scientific Research and Development

b. **Energy**
    i. $ 2.5 Billion for Energy Efficiency and Renewable Energy
    ii. $ 735 Million for Fossil Energy R&D
    iii. $ 1 Billion for Nuclear Energy
    iv. $ 195 Million for Electricity
    v. $ 104 Million for Cybersecurity, Energy Security, and Emergency Response R&D
    vi. $ 435 Million forAdvanced Research Projects Agency–Energy
c. National Security
    i. $ 1.8 Billion for Weapons Activities Stockpile R T&E
    ii. $ 900 Million for Naval Reactors
    iii. $ 642 Million for Defense Nuclear Nonproliferation R&D
    iv. $ 30 Million Def. Environmental Cleanup Technol. Devel.

SECTION V. Enactment

The provisions of this Act shall go into effect immediately upon its signature by the President.