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**Analysis of the
President's FY 2022
Discretionary Budget Proposal**

**Implications for Research, Higher Education, and
Academic Medicine**

Prepared by Lewis-Burke Associates LLC

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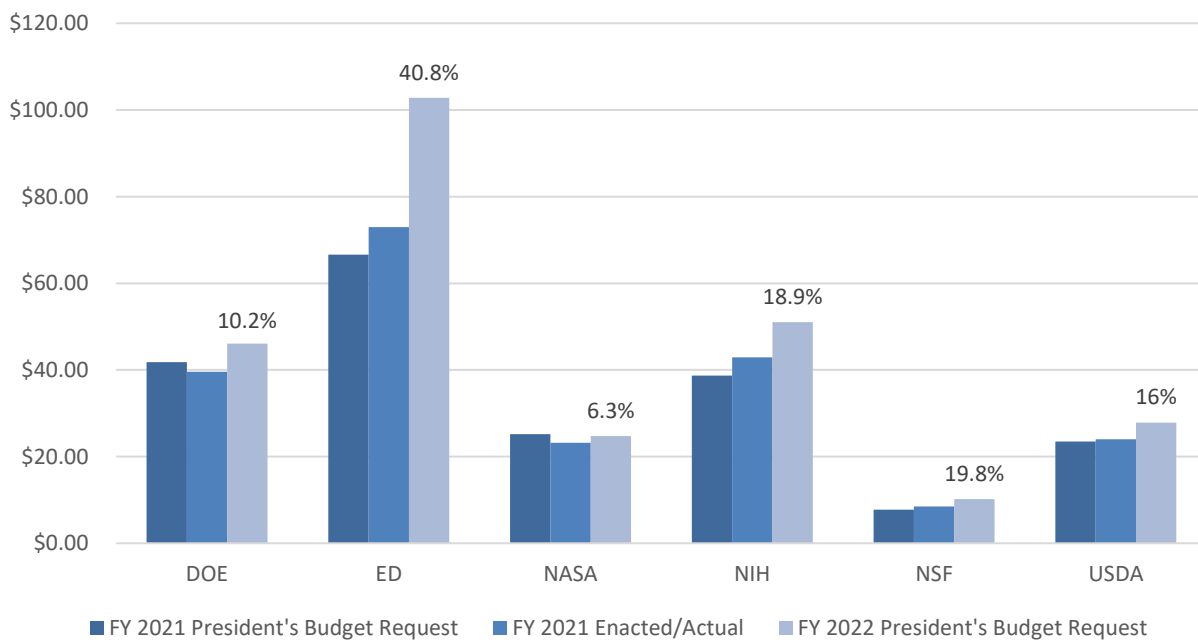
Executive Summary

On April 9, 2021, President Biden released his first budget proposal to Congress. Unrestrained by legally-imposed budget caps for the first time in a decade, President Biden proposed an 18 percent boost in discretionary spending for a total of \$1.522 trillion. While the full budget request will not be released until mid May, the Administration has been under pressure by Congress to release an initial blueprint to kick off the congressional appropriations process. A budget request is due to Congress the first week in February, but has been significantly delayed due to the transition from the Trump Administration and the need to fill key federal leadership positions. While it is ultimately up to Congress to decide which proposals to embrace, modify, or reject as part of the annual appropriations process, Congress has been waiting on the new Administration to highlight its major political priorities and new funding initiatives. While many details on specific federal programs and projects are not available, the budget proposal provides top line funding levels for major federal agencies and key initiatives.

President Biden’s top FY 2022 budget priorities are public health, climate and clean energy, and education. This is a sharp contrast from the Trump Administration, which prioritized defense spending and proposed major cuts to other domestic programs. President Biden’s proposal would provide \$769 billion in non-defense spending—a \$123 billion increase or 16 percent increase over the FY 2021 enacted level. In contrast, the proposal would provide \$753 billion for defense spending—a \$13 billion or 1.7 percent increase over the FY 2021 enacted level. This would be the first time in more than a decade that non-defense spending would exceed defense spending.

Overall, the budget proposal would significantly increase funding for research and development, manufacturing, education, and healthcare programs of interest to the research, higher education, and academic medicine communities. The graphic below shows proposed FY 2022 funding levels for major federal research and education agencies compared to the FY 2021 enacted levels.

KEY AGENCIES AT A GLANCE (IN BILLIONS)



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While the budget proposal increases funding for fundamental research at key science agencies, the primary focus is on translational research and technology development and deployment. For example, the budget proposal would establish a new NSF Directorate for technology, innovation, and partnership; provide \$6.5 billion for the creation of a new Advanced Research Projects Agency for Health (ARPA-H) within NIH; allocate \$1 billion for a new Advanced Research Projects Agency for Climate (ARPA-C); increase funding for applied energy development and demonstration projects at DOE by \$2 billion; and establish two new Manufacturing Innovation Institutes and double funding for the Manufacturing Extension Partnership through NIST.

For higher education, the most notable funding provisions include an additional \$3 billion for Pell Grants. This would increase the maximum Pell Grant by \$400 and expand the program to make Deferred Action for Childhood Arrivals recipients eligible. The budget proposal would also provide an additional \$600 million to increase institutional capacity and student support at Historically Black Colleges and Universities (HBCUs), Tribally Controlled Colleges and Universities (TCCUs) and Minority-Serving Institutions (MSIs). The proposal would also increase support for Registered Apprenticeships (RA), with \$285 million in funding proposed, a \$100 million increase above the 2021 enacted level.

While Democrats strongly favor many of the new initiatives and investments proposed by the Biden Administration, Republicans remain opposed. Republicans have two major concerns. The first are rising deficits and massive increases in government spending. This \$1.5 trillion discretionary funding proposal comes on the heels of a \$1.9 trillion COVID aid package and the recently released \$2.2 trillion infrastructure proposal. The Biden Administration also plans to release in the next few weeks another trillion-dollar package focused on health care. The second major concern is insufficient funding for the Department of Defense (DOD). Defense spending is the top priority for Republicans and the Biden Administration proposed flat funding for DOD. Republicans are concerned about China's growing military strength and the United States' ability to defend against future threats. While Republicans want to increase defense spending, progressive Democrats have called for a 10 percent cut. Finding consensus on DOD and overall defense spending will be the biggest challenge to move forward FY 2022 appropriations bills.

While the discretionary budget proposal kicks off FY 2022 congressional appropriations, the timing of marking up the 12 individual appropriations bills and passing final FY 2022 appropriations remains uncertain. Congress still needs to pass a budget resolution that sets a funding level for overall discretionary spending in FY 2022. Without that top line, the Appropriations Committees can't advance appropriations bills. Further complicating agreement on overall discretionary spending is Congress concurrently considering the Biden Administration's multi trillion-dollar proposals for infrastructure and health care. Democrats are considering using reconciliation, which would need only a simple majority in both the House and the Senate, to pass these other packages, but these would have to be included in the budget resolution and could potentially delay the annual appropriations process. The Biden Administration has also proposed increasing taxes on corporations and high-income individuals to offset some of these costs, but there is a lack of consensus among Democrats and Republicans on tax policies.

Lewis-Burke will provide a more detailed analysis of the FY 2022 President's budget request in May once the full request is released. This will include additional details on federal programs and projects as well as relevant proposed changes to mandatory programs, such as Medicare and Medicaid, that make up the remaining three fourths of the federal budget, and tax provisions.

Below are highlights of major new initiatives and funding proposals of interest to the research, higher education, and academic medicine communities.

Science and Innovation



The budget proposal would provide significant funding increases to all science agencies to support fundamental research and development, including:

- \$10.2 billion for the **National Science Foundation (NSF)**, which is a \$1.7 billion or 20 percent increase over the FY 2021 enacted level. Key elements include:
 - \$9.4 billion to support fundamental research across NSF, an increase of \$1.6 billion or 25 percent above the FY 2021 level;
 - Establish a new Directorate for technology, innovation, and partnership to strengthen U.S. leadership in emerging technology areas, including artificial intelligence, high performance computing, disaster response and resilience, quantum information systems, robotics, advanced communications technologies, biotechnology, and cybersecurity;
 - \$1.2 billion for climate and clean-energy related research, an increase of \$500 million or 71 percent above the FY 2021 level;
 - \$100 million for programs to increase participation in STEM fields, an increase of 50 percent over the FY 2021 level; and
 - Support for construction of major NSF facilities, including long-term upgrades to NSF’s Antarctic infrastructure and the construction of the Vera C. Rubin Observatory. The request would also support new smaller research facilities and equipment across the U.S.
- \$7.4 billion for the **Department of Energy (DOE) Office of Science**, an increase of \$400 million or 6 percent above the FY 2021 enacted level, with targeted investments in climate change modeling, including the use of Artificial Intelligence to enhance prediction and decisions-making; new materials for clean energy technologies; and construction of user facilities at DOE national laboratories.
- \$24.7 billion for the **National Aeronautics and Space Administration (NASA)**, an increase of \$1.5 billion or 6 percent above the FY 2021 enacted level. Some key elements include:
 - \$6.9 billion for human exploration to support continued development of the Artemis program;
 - Unspecified funding for continued development of major science missions, including Mars Sample Return and the Nancy Grace Roman Space Telescope. The latter mission was proposed for termination in recent budget requests by the Trump Administration only to have funding restored by Congress; and
 - \$20 million or 16 percent increase for the Office of STEM Engagement to expand initiatives to attract and retain underserved and underrepresented students in engineering and other STEM fields.
- \$916 million for the **National Institute of Standards and Technology (NIST)**, an increase of \$128 million over the FY 2021 enacted level, to expand research in “climate-resilient building codes, computing, cybersecurity, artificial intelligence, quantum information science, biotechnology, and advanced manufacturing and establish new prize competitions. Of this amount \$442 million is for NIST’s manufacturing programs, includes \$150 million to fully fund two new Manufacturing Innovation Institutes, with one focused on the design and manufacture of semiconductors. Another \$275 million, an increase of \$125 million over the FY 2021 enacted level, would be to expand the Manufacturing Extension Partnership “to make America’s small and medium manufacturers more competitive and strengthen domestic supply chains.”
- \$39 million for advanced communications research at the **National Telecommunications and Information Administration** to support the development and deployment of broadband and 5G technologies and find innovative approaches to spectrum sharing.

Biomedical Research and Public Health



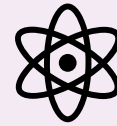
The budget proposal would provide \$133.7 billion for the Department of Health Human Services (HHS), an overall increase of \$25 billion or 23 percent above the FY 2021 enacted level. Major initiatives include:

- \$51 billion for the **National Institutes of Health (NIH)**, an increase of \$8.1 billion over the FY 2021 enacted level. Of the \$8.1 billion increase, \$6.5 billion would be for the creation of a new **Advanced Research Projects Agency for Health (ARPA-H)** to “drive transformational innovation in health research and speed application and implementation of health breakthroughs” with an initial focus on cancer, diabetes, and Alzheimer’s Disease. The funding increase would also include \$110 million, an increase of \$100 million over the FY 2021 enacted level, for **NIH’s Climate Change and Human Health program** to focus on issues related to the health impacts of climate change, with a focus on health equity.
- \$8.7 billion for the **Centers for Disease Control and Prevention (CDC)**, a \$1.6 billion increase over the FY 2021 enacted level, to improve public health capacity in states, modernizing public health data collection, training epidemiologists and other public health experts, and other activities aimed at rebuilding CDC capacity and preventing future pandemics. This includes:
 - \$153 million for CDC’s **Social Determinants of Health programs**, currently funded at \$3 million. Double funding for firearm injury prevention research at NIH and CDC, proposing \$50 million for such research split between the two agencies;
 - \$100 million for CDC and the Department of Justice to establish a **Community-Based Violence Intervention initiative**;
 - \$110 million for the **CDC Climate and Health program**, currently funded at \$10 million.
- \$10.7 billion to address the continuing **opioid crisis**. The request provides an increase of \$3.9 billion over the 2021 enacted level for medication assisted treatment, expanding the behavioral health workforce, and research.
- \$905 million for the Assistant Secretary for Preparedness and Response (ASPR) and Food and Drug Administration (FDA) to replenish critical medical supplies in the **Strategic National Stockpile** and provide the FDA with funds to increase their organizational capacity.
- \$1.6 billion for **mental health services** funding across various programs and agencies, including funding for suicide prevention activities and partnerships between mental healthcare providers and law enforcement. According to the Biden Administration, this number represents a doubling of all mental health funding at HHS.
- \$670 million to combat **HIV/AIDS**, an increase of \$267 million over FY 2021 levels, to fund various programs at the CDC, the Health Resources and Services Administration (HRSA), and other HHS agencies.
- Over \$200 million for HHS activities addressing **maternal mortality**, including racial disparities.
- \$340 million, a 19 percent increase, for **Title X Family Planning activities**.

The budget proposal also includes \$10 billion for global health programs administered through the **Department of State (DOS)** and **US Agency for International Development (USAID)**, including:

- \$1 billion to fund **global health security programs**, an increase of \$800 million above the FY 2021 enacted level. This would expand Global Health Security Agenda capacity-building programs to additional nations and increase investments in **crosscutting research and viral discovery programs** to detect and prevent future infectious disease outbreaks before they become pandemics; and
- Funds would also be provided for the U.S. contribution to the **World Health Organization**.

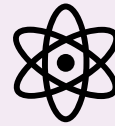
Climate and Clean Energy



The budget proposal significantly expands federal investments in climate and clean energy at every federal agency, further emphasizing the Biden Administration’s whole-of government approach. The additional \$14 billion compared to FY 2021 enacted levels is meant to put America on a path to achieve net-zero emissions economy-wide by 2050. Some key proposals include:

- \$46.1 billion for the **Department of Energy (DOE)**, a \$4.3 billion or 10 percent increase compared to the FY 2021 enacted level. Major initiatives include:
 - \$8 billion for **applied energy research, development, and demonstration projects**, an increase of 27 percent over the FY 2021 enacted level. The focus is on reducing emissions from the power, transportation, buildings, and industrial sectors with investments in new technologies such as advanced nuclear energy reactors, electric vehicles, green hydrogen, and more energy efficient air conditioning and refrigeration. The proposal would also increase investments in carbon capture, storage, and utilization, and negative emissions technologies, such as direct air capture. These investments are consistent with the Energy Act of 2020 that passed with bipartisan support in December 2020.
 - \$1 billion for a new **Advanced Research Projects Agency for Climate (ARPA-C)** and \$700 million for **Advanced Research Projects Agency-Energy (ARPA-E)**. The budget proposal does not provide information on the scope of work for ARPA-C or how it would differ from ARPA-E.
 - \$1.9 billion for a **Building Clean Energy Projects and Workforce Initiative** that would support the implementation of a new Energy Efficiency and Clean Electricity Standard to meet net-zero emission for the electricity sector by 2035; a new Build Back Better Challenge Grant competition for state, local, and tribal government to deploy clean energy technologies; and streamline transmission permitting.
 - A **new national laboratory or research center focused on climate** associated with an HBCU. The budget proposal also would expand funding opportunities and infrastructure support for facilities and information technology centers at HBCUs and MSIs. It also proposed increased funding for workforce development programs at HBCUs and MSIs in STEM fields.
- \$6.9 billion for the **National Oceanic and Atmospheric Administration (NOAA)**, an increase of \$1.4 billion or 25 percent over the FY 2021 enacted level. This increase includes \$800 million to expand investments in climate research, support regional and local decision-making with climate data and tools, and improve community resilience to climate change, such as competitive grants to build coastal resilience to help reduce the costly economic and environmental impacts of severe weather events on communities. NOAA’s National Environmental Satellite, Data, and Information Service (NESDIS) would also receive an increase of \$500 million to improve satellite observations, weather prediction, and decision-making tools.
- **National Aeronautics and Space Administration’s (NASA)** Earth Science Division would receive \$2.3 billion, an increase of \$250 million above the FY 2021 enacted level, to design the next generation of earth-observing satellites for climate change research. The Space Technology Mission Directorate would receive a \$325 million increase above the FY 2021 enacted level to develop early-stage technologies focused on clean energy.
- \$11.2 billion for the **Environmental Protection Agency (EPA)**, a \$2 billion or 21 percent increase from the FY 2021 enacted level. This includes \$1.8 billion in programs that would help reduce greenhouse gas emissions, including an additional \$100 million in air quality grants for States and Tribes to reduce greenhouse gas emissions under the Clean Air Act, an additional \$30 million to improve knowledge of the impacts of climate change on human health and the environment, and additional investments to decrease emissions of methane and hydrofluorocarbons.

Climate and Clean Energy



- Expanding power and energy-related research and development efforts at the **Department of Defense (DOD)** to improve energy efficiency, resiliency and reliability of DOD facilities and meet future operational energy demands.
- \$1.2 billion for climate and clean energy related research at the **National Science Foundation (NSF)**, an increase of \$500 million above the FY 2021 enacted level, to fund research in “atmospheric composition, water and carbon cycles, modeling climate systems, renewable energy technologies, materials sciences, and social, behavioral, and economic research on human responses to climate change.”
- \$2.5 billion for **international climate programs** at the **Department of State (DOS)** and **US Agency for International Development (USAID)**, more than four times the 2021 enacted level. This includes \$200 million for U.S. bilateral climate assistance; and \$485 million to support other multilateral climate initiatives, including \$100 million for international climate adaptation programs.
- \$17.4 billion for the **Department of the Interior**, a \$2.4 billion or 16 percent increase above the FY 2021 enacted level. This includes an additional \$200 million for climate science primarily at the **U.S. Geological Survey (USGS)** to provide information about the impacts of climate change and how best to implement mitigation, adaptation, and resilience efforts. The additional funds would “help ensure that coastal, fire-prone, and other particularly vulnerable communities have accurate and accessible information and tools to allow them to better respond to the climate crisis.”
- An additional \$540 million above the FY 2021 enacted funding level for the **Department of Homeland Security** incorporate climate impacts into pre-disaster planning and resilience efforts and expand its resilient infrastructure community grant program to prioritizes climate resilience projects for vulnerable and historically underserved communities.
- New investments to support **research to understand disparate health impacts of climate change**, especially for tribal communities, communities of color, low-income households, and disadvantaged communities. This includes:
 - establishing a new **Office of Climate Change and Health Equity** at HHS that would focus on decreasing effects of climate change on vulnerable populations;
 - \$110 million for NIH’s **Climate Change and Human Health program**, a \$100 million increase over the FY 2021 enacted level, to support research aimed at understanding the health impacts of climate change;
 - \$110 million for CDC’s **Climate and Health program**, a \$100 million increase over the FY 2021 enacted level, to identify potential health effects associated with climate change and implement health adaptation plans.

Defense

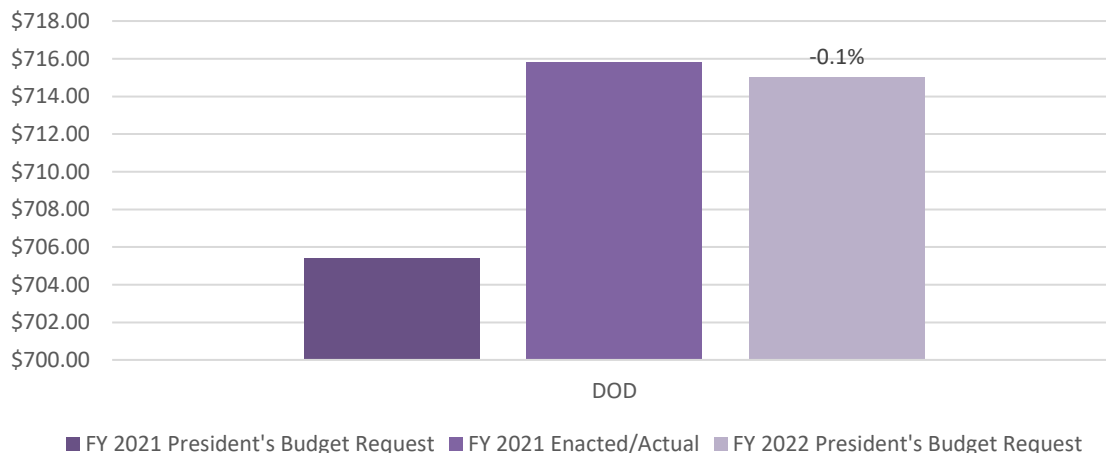


The budget proposal provide \$715 billion for the Department of Defense (DOD), which is more than the FY 2021 budget request of \$705.4 billion and level with the enacted amount of \$715.8 billion. After much speculation about the defense budget top line, the Biden Administration proposed a flat amount, not maintaining the 3 to 5 percent annual increases put forward by the Trump Administration. In addition, the President’s budget request proposes eliminating the Overseas Contingency Operations (OCO) funds for additional savings.

The DOD priorities outlined in the budget request align with the President’s campaign themes and broad goals of renewing America’s commitment to research and development, tackling the climate crisis, and countering 21st century challenges and threats. The budget request outlines support and plans for defense research and development, as well as investments to counter emerging biological threats. Responding to the climate crisis, the budget request would enable programs to promote climate resilience and energy efficiencies. To support countering 21st century challenges and threats, the budget request would enable deterring threats from China, optimize U.S. naval shipbuilding, modernize the nuclear deterrent, invest in long-range fire capabilities, ensure readiness, and divest legacy capacity and force structure. Further, the budget request would prioritize America’s commitment to military families.

Regarding science and technology investments, Lewis-Burke expects the DOD Research, Development, Test, & Evaluation (RDT&E) accounts and science and technology (S&T) sub-accounts to be funded above the FY 2021 enacted level of \$107.1 billion. While the Trump Administration increased defense spending overall, investments in long-term basic and applied research accounts were often sacrificed for legacy weapon systems. The FY 2022 full budget request may include \$125 billion for RDT&E with increased funding for basic research (6.1) and later stage development and prototyping (6.4). The increase in S&T funding would address the national security technical priorities that the Biden Administration presented in the March 2021 Interim National Security Strategic Guidance. Those technical priorities include: AI, quantum, clean and resilient energy to solve climate change, next generation telecommunications (5G) infrastructure, space, cybersecurity, and manufacturing and supply chain resilience. Further, as DOD ramps up its efforts to address climate change, the Strategic Environmental Research and Development Program (SERDP) will lead S&T efforts with increased funding and mission to address climate change adaptation, installation energy and water, energy security, and operational energy.

DOD AT A GLANCE (IN BILLIONS)



Agriculture



- \$27.8 billion for the **Department of Agriculture (USDA)**, a \$3.8 billion increase over FY 2021 enacted levels. Some key initiatives would be:
 - \$4 billion, or \$647 million above FY 2021, for the **Research, Education, and Economics (REE)** mission area. Of this funding, there would be a \$161 million increase to support a multi-agency initiative to integrate science-based tools into conservation planning;
 - \$65 million increase to the ReConnect Program which provides grants and loans for **broadband** services to rural and underserved communities;
 - \$1.7 billion, a \$476 million increase, for high-priority **hazardous fuels and forest resilience** projects;
 - \$40 million increase for **USDA climate hubs** to expand climate science tools and increase landowner awareness/engagement in combatting climate change; and
 - Establish an **Equity Commission** to review how current farm programs may have contributed to racial and geographic inequities.

Education and Workforce

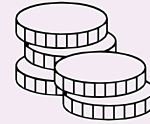


The budget proposal would provide \$102.8 billion for the **Department of Education (ED)**, which is a 41 percent increase over FY 2021 levels. The FY 2022 budget request proposes a significant \$400 increase to the maximum Pell Grant award, currently set at \$6,495. According to the proposal, this would be the largest annual increase for Pell Grants since 2009. The request also proposes to make Pell Grants available to students who are Deferred Action for Childhood Arrivals (DACA) recipients. The proposal also notes that is part of a more comprehensive proposal to double the maximum Pell Grant. This could portend a proposal to significantly increase mandatory funding for the Pell Grant program within the anticipated Biden Administration’s American Families Plan. More than \$600 million in additional funding for Historically Black Colleges and Universities (HBCUs), Tribally Controlled Colleges and Universities (TCCUs), Minority-Serving Institutions (MSIs), and Community Colleges is also proposed.

The request would nearly double funding for Title I programs under the K-12 focused *Elementary and Secondary Education Act*, to \$36.5 billion. Of the total, \$1 billion is also proposed to increase the number of counselors, nurses, and mental health professionals in schools.

The budget proposal includes \$14.2 billion for the **Department of Labor (DOL)**, a \$1.7 billion or 14 percent increase from the 2021 enacted level. The proposal would also increase support for Registered Apprenticeships (RA), with \$285 million in funding proposed, a \$100 million increase above the 2021 enacted level. Workforce Innovation and Opportunity Act State Grants would also see increased funding, in order to make training available to more dislocated workers, low-income adults, and disadvantaged youth hurt by the economic fallout from the COVID-19 pandemic. Finally, the request proposes \$100 million for DOL’s role in the new multi-agency POWER+ Initiative, aimed at reskilling and reemploying displaced workers in Appalachian communities to assist workers and transform local economies in communities transitioning away from fossil fuel production. The discretionary request also provides \$20 million for a new program, developed in collaboration with the Department of Veterans Affairs, focused on helping veterans shift to careers in clean energy.

Economic Development



Unlike the most recent coronavirus relief bill or the American Jobs Plan, which called for significant investments in economic development programs to support a wide range of projects, the budget proposal highlights more measured and targeted economic development assistance to agencies that provide support to small businesses and underserved communities. Highlights include:

- \$852 million for the **Small Business Administration (SBA)**, a 9 percent increase above the 2021 enacted level. This includes several proposed investments in programs to drive regional innovation, including:
 - \$31 million over the FY 2021 enacted level for **SBA Entrepreneurial Development Programs** to provide counseling, training, and mentoring services to underrepresented groups in entrepreneurship including people of color and women.
 - \$30 million, an \$18 million increase over the FY 2021 enacted level, for SBA programs to support innovation ecosystems, including the **Growth Accelerators, Regional Innovation Clusters, and the Federal and the State Technology Partnership Program**, which are available to universities and research institutes. This section also proposes to increase SBA's "capacity to scale the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs." The established innovation ecosystem programs mentioned above help advance this goal, but it will be interesting to see if there will be suggestions for new and/or expanded programming at SBA to this end in the full budget.
- \$70 million for **the Department of Commerce's Minority Business Development Administration (MBDA)** to elevate the agency through a new Assistant Secretary position and bolster grants and research support. This would be a \$22 million increase over the FY 2021 enacted level.
- \$84 million for the **Economic Development Administration's (EDA) Assistance to Coal Communities** program to support local revitalization for economic shifts for coal-dependent regions. The budget proposal notes that this is in addition to a request of \$300 million to support locally-driven economic development projects at EDA, including diversification, job creation, venture capital access project, and more. It is unclear what EDA account(s) would benefit from this funding. If the \$300 million is for a specific program at EDA, it would signify a large increase in support for the agency that received \$346 million in the last appropriations bill (not counting pandemic relief). There will be strong interest in this allocation when the final budget request is released.

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