



SUMMARY: *ENDLESS FRONTIER ACT*

(S. 3832 introduced 5.21.20; HR 6978 introduced 5.22.20)

Overview: Senators Charles Schumer (D-NY) and Todd Young (R-IN) introduced the bipartisan Endless Frontier Act on May 21, 2020. Representatives Ro Khanna (D-CA) and Mike Gallagher (R-WI) introduced the House companion bill, HR 6978, the following day. The primary aims of the bill are to fund research, technology transfer, and workforce in 10 “key technology areas” defined in the bill. It provides \$100 billion over 5 years to a new Technology Directorate in the renamed NSF - the National Science & Technology Foundation - and creates a new Deputy Director for Technology. The measure also creates new Regional Technology Hubs funded by the Department of Commerce that would attract new investment in the area for advancing innovation capacity through regional workforce and infrastructure development. These Regional Technology Hubs would be funded at \$10 billion over 5 years.

Section 3: National Science and Technology Foundation

- Renames the National Science Foundation as the “National Science and **Technology** Foundation (NSTF)”and provides conforming amendments (at end of bill)
- Establishes a Deputy Director for Technology so that there are two Deputy Directors for NSTF
 - Deputy Director for Technology: shall oversee and perform duties relating to the Directorate for Technology of the Foundation
 - Deputy Director for Science: shall oversee and perform duties relating to the other activities and directorates supported by the Foundation
- Establishes a new Directorate for Technology (the new Directorate parallels the reporting structure of existing directorates - under both the NSTF Director and the National Science Board).

Amending NSF Act (42 USC 1861 et seq) - Section 8A: Directorate for Technology

- Director shall establish a Directorate for Technology within the National Science and Technology Foundation within 90 days of enactment (amending 42 USC 1861 et seq).
- Goals of the Directorate: (1) Strengthening the leadership of the U.S. in critical technologies through fundamental research in the key technology focus areas (2) Enhancing the competitiveness of the U.S. in the key technology focus areas by improving education in the key technology areas and attracting more students to such areas (3) Fostering the economic and societal impact of federally-funded research and development through an accelerated translation of fundamental advances in the key technology areas into processes and products that can help achieve national goals related to economic competitiveness, domestic manufacturing, national security, shared prosperity, energy and the environment, health, education and workforce development and transportation.

- Program Managers employees of the Directorate may include Program managers who would perform a similar role to DARPA program managers; specialized hiring authorities are provided to the Directorate.
- Selection of Recipients of support may be conducted through a peer review process. (The Directorate may use DARPA procedures, peer review, both, or neither.)
- Key Technology Focus Areas: The Director shall advance innovation and goals focused on key areas: (1) artificial intelligence and machine learning (2) high performance computing, semiconductors, and advanced computer hardware (3) quantum computing and information systems (4) robotics, automation, and advanced manufacturing (5) natural or anthropogenic disaster prevention (6) advanced communications technology (7) biotechnology, genomics, and synthetic biology (8) cybersecurity, data storage and data management technologies (9) advanced energy (10) materials science, engineering, and exploration relevant to other key technology areas.
 - Key areas to be reviewed every 4 years, never to exceed more than 10 focus areas.
- Activities: Directorate activities include awarding grants (to institutions of higher education, nonprofit entities, and consortia made up of these entities; consortia may also include industry), providing funding to other divisions of the NSTF or other federal research agencies for intramural and extramural work conducted in key technology focus areas, making awards under the SBIR and STTR programs, administer prize challenges, enter into and perform cooperative research and development contracts and grants. In doing this, the Director of the Directorate for Technology and other federal research agencies will work cooperatively to further advancements in the key technology focus areas. A 5-year spending plan is required, in addition to an annual briefing to NSTF from the FBI and NCI regarding how the classified entities are preserving the advantages generated by the NSTF Technology Directorate's activities.
- Student Support: The Directorate will fund institutional undergraduate scholarships, graduate fellowships and traineeships, and postdoctoral student awards in the key technology focus areas. For NSTF student support activities within NSTF the Director would provide funds to the Directorate for Education and Human Resources. Student support may also be provided to other federal research agencies. For all student support provided the Director must ensure the funds do not displace, but rather supplement other student support.
- University Technology Centers: Through a competitive application and selection process, the Directorate will award grants to establish university technology centers to carry out fundamental research to advance innovation in key technology areas and to further the development of innovations in key technology focus areas.
- Moving Technology from Laboratory to Market: Additionally, the Directorate will establish a program to award competitive grants to higher education institutions or consortia (including industry) to build capacity at an institution and in its surrounding region to increase the likelihood new technologies in the key technology focus areas will succeed in the commercial market. For consideration, institutions can submit proposals with the steps the institution will take to reduce the risks for commercialization for new technologies and why these steps are likely to be effective.
- Test Beds: The Directorate will establish a competitive grants program to award higher education institutions or consortia (led by educational institutions, may include industry) 5-year grants (with the possibility of one 3-year extension) to create test beds and fabrication facilities

to advance new technologies in the key technology areas and transfer the technologies into the commercial market.

- Board of Advisors: A Board of Advisors will be established to advise the Deputy Director. The Board may hold public or private hearings and be provided with classified and unclassified information from a federal department or agency. **The Board does not have decision-making authority or any role in the funding decision process for any grants, awards, or agreements.** The Board will be made up of 12 members representing scientific leaders and experts from industry and academia that are appointed by Congress (8) and the NSF Director (4). The Board shall meet at least twice a year, meet once a year with the National Science Board, and may hold public or private hearings, obtain classified information, among other advisory activities.
- Areas of Funding Support: The Directorate shall use, in each of the key technology focus areas **not less than** (1) 35 percent of funds to go to University Technology Centers; (2) 15 percent of funds to student support and any remaining funds going to grants to higher education institutions to develop courses, (3) 5 percent of funds to moving technology from laboratory to market, and (4) 10 percent of funds to carry out establishment and equipping test beds and fabrication facilities (5) 15 percent to make awards to other directorates of the Foundation including SBE (not EHR, which receives funds through student support section) to advance key technology areas.
- Authorization of Appropriations: A total of \$100 billion is to be authorized and appropriated for the Technology Directorate for fiscal years 2021 through 2025 (ramped up over the duration). Additionally, there is a “Hold Harmless” provision stating that no funds shall be appropriated to the Technology Directorate for any fiscal year in which the total amount appropriated to NSTF is less than the total amount appropriated the prior fiscal year (adjusted by the rate of inflation). Prohibits appropriated funds to be transferred from any part of the Foundation to the Technology Directorate (though funding from the Directorate is permissible to support other areas of the Foundation).
- Unfunded Priorities: Following the annual budget request submission, the NSTF Director shall submit a report on the “unfunded priorities of the NSTF,” including data on award rates for each directorate and listing areas of promise that could not be funded, as well as a priority list for MREFC.

Section 4: Regional Technology Hub Program (Department of Commerce)

- Designation of Regional Technology Hubs: This section calls for designating the Regional Technology Hubs as part of the Regional Innovation program of the Department of Commerce. During the first five years, 10-15 consortia will be designated as regional technology hubs. The Hubs should be geographically distributed.
- Grants for Regional Technology Hubs: Grants will be awarded for five years and may be renewed once for an additional five years. Grants cannot exceed \$20 million per year. Additionally, there is a matching requirement in which the total federal financial assistance awarded in a given year to an eligible consortium as a regional technology hub starts at 90 percent of total and scales back to 75 percent by FY24. The allowable use of grant funds in support of the key technology focus areas is outlined here as well.

- Applications and Considerations: Several considerations for selecting an eligible consortium among applicants are outlined including the ability of the eligible consortium to sustain its activities after the end of the term of a grant awarded.
- Coordination with NIST: The activities of the regional technology hubs will be coordinated with the Hollings Manufacturing Extension Partnership and the Manufacturing USA Program.
- Interagency Collaboration: To assist regional technology hubs there will be collaboration including funding and interagency agreements with federal departments and agencies whose missions contribute to the goals of the regional technology hub.
- Authorization of Appropriations: A total of \$10 billion is to be authorized and appropriated for regional technology hubs for fiscal years 2021 through 2025.

Section 5: Strategy and Report on Economic Security, Science, Research, and Innovation to Support the National Security Strategy

- Requires the Director of OSTP (in coordination with the Director of the NSTF, the Secretary of Commerce, the National Security Council, the National Economic Council, and the heads of other relevant federal agencies) in 2021 and annually report to Congress assessing elements of national competitiveness and developing or revising a strategy to improve the country's competitiveness in science, research, and innovation to support the national security strategy.

Section 6: Conforming Amendments