

GAO@100 Highlights

Highlights of [GAO-21-104500](#), a report to the Ranking Member, Committee on Commerce, Science, and Transportation, U.S. Senate

Why GAO Did This Study

In 2015, Executive Order 13702 established the NSCI to maximize the benefits of high-performance computing for economic competitiveness and scientific discovery. The order directed 10 agencies to implement the NSCI and pursue five strategic objectives, including accelerating delivery of a capable exascale computing system, which is anticipated to be at least three times more powerful than the current top-ranked system. The NSCI Executive Council, established by the executive order and co-chaired by OSTP and the Office of Management and Budget, issued a strategic plan in 2016, which was updated in 2020.

GAO was asked to review the status of the NSCI. This report examines (1) agencies' efforts and OSTP's and agencies' reporting on progress towards meeting the objectives of the 2016 strategic plan and (2) the extent to which the 2020 strategic plan includes desirable characteristics of a national strategy. GAO analyzed key NSCI documents, administered a questionnaire to 10 NSCI agencies, and interviewed OSTP and other agency officials and nonfederal stakeholders.

What GAO Recommends

GAO is making two recommendations to OSTP, including that it annually report on progress in implementing the 2020 strategic plan and address each of the desirable characteristics of a national strategy, as practicable, in the upcoming implementation roadmap or through other means. OSTP concurred with both recommendations and stated it will annually report on progress towards the 2020 strategic plan.

View [GAO-21-104500](#). For more information, contact Candice Wright at (202) 512-6888 or wrightc@gao.gov

September 2021

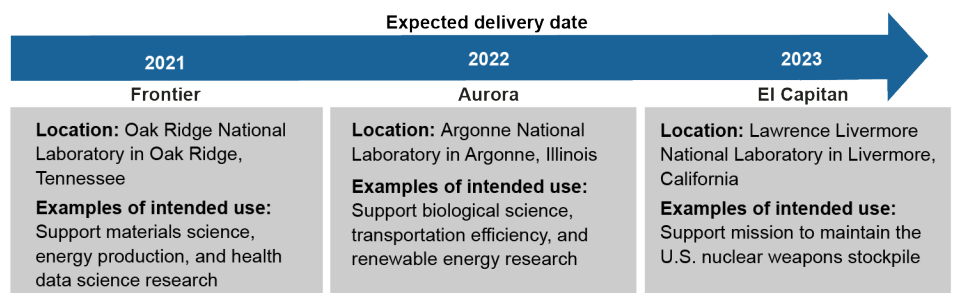
HIGH-PERFORMANCE COMPUTING

Advances Made Towards Implementing the National Strategy, but Better Reporting and a More Detailed Plan Are Needed

What GAO Found

Ten agencies took steps to implement all 71 efforts across the five objectives of the 2016 National Strategic Computing Initiative (NSCI) strategic plan and characterized most as ongoing. According to officials, agencies generally did not receive funding to implement the 2016 strategic plan and undertook efforts as part of existing programs or research that were aligned with the plan's objectives. As part of the largest NSCI investment, the Department of Energy (DOE) obligated \$2.2 billion for exascale computing from fiscal years 2016 through 2020. This includes three exascale computing systems, which are expected to be among the most powerful computers in the world when completed (see figure). DOE also collaborated with other agencies to develop exascale-ready software applications for use on those systems to address problems beyond the capability of current high-performance computers. Other agency efforts include funding workforce development and conducting research on future computing technologies.

Figure: Department of Energy's Three Expected Exascale Computing Systems



Source: GAO analysis of Department of Energy documents. | GAO-21-104500

The Office of Science and Technology Policy (OSTP) and agencies inconsistently reported on progress towards the 2016 strategic plan's objectives. OSTP reported 2016 strategic plan accomplishments in a 2018 budget report but did not do so in subsequent years. It was also not aware of the NSCI executive council reporting on progress as called for by the NSCI executive order. Academic and industry stakeholders stated that a lack of progress reports limited their visibility into accomplishments and remaining work. Having such information could help them better align their activities with agency efforts.

The 2020 strategic plan—which superseded the 2016 strategic plan—fully or substantially addressed two desirable characteristics of a national strategy identified by GAO to help ensure accountability and more effective results. For example, the plan described how agencies will partner with academia and industry but partially addressed or did not address four other characteristics, such as the resources needed to implement it or a process for monitoring and reporting on progress. OSTP and agency officials said they plan to release a more detailed implementation roadmap later in 2021 but have not described what details this plan will include. By more fully addressing the desirable characteristics of a national strategy through the implementation plan or other means, including reporting on progress, OSTP and agencies could improve efforts to sustain and enhance U.S. leadership in high-performance computing.