



CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

July 1, 2004

H.R. 4218 **High-Performance Computing Revitalization Act of 2004**

As ordered reported by the House Committee on Science on June 16, 2004

SUMMARY

H.R. 4218 would amend existing statutory guidelines for interagency research and development (R&D) related to high-performance computing. Approximately \$1.6 billion was appropriated for 2004 for nondefense R&D on high-performance computing at six agencies: the National Science Foundation (NSF), Department of Energy (DOE), National Institutes of Health, National Aeronautics and Space Administration, Department of Commerce, and Environmental Protection Agency. This bill would realign program objectives with current R&D priorities, repeal authorizations for activities that are technologically outdated and emphasize newer issues, such as providing researchers sustained access to the most advanced computing systems in the world. In addition, the bill would direct the program's Advisory Committee to evaluate program funding, management, and effectiveness on a periodic basis.

CBO estimates that implementing H.R. 4218 would cost a total of \$200 million over the 2005-2009 period, assuming appropriation of necessary funds for the new directives in the bill. CBO estimates enacting H.R. 4218 would have no effect on direct spending or revenues.

H.R. 4218 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, and tribal governments.

ESTIMATED COST TO THE FEDERAL GOVERNMENT

The estimated budgetary impact of H.R. 4218 is shown in the following table. For this estimate, CBO assumes that the bill will be enacted near the end of 2004 and that outlays will follow historical patterns for R&D infrastructure programs. The cost of this legislation primarily falls within budget function 250 (general science, space, and technology).

	By Fiscal Year, In Millions of Dollars				
	2005	2006	2007	2008	2009
CHANGES IN SPENDING SUBJECT TO APPROPRIATION					
Estimated Authorization Level	35	35	35	85	85
Estimated Outlays	11	23	35	58	73

BASIS OF ESTIMATE

CBO expects that agencies would need to increase spending to meet the bill’s new goal of providing researchers with sustained access to “high-performance computing systems that are among the most advanced in the world in terms of performance in solving scientific and engineering problems.” For this estimate, CBO assumes that this provision would authorize appropriations to provide sustained access to leadership-class facilities. Under the bill, two agencies—NSF and DOE—would be required to provide such systems for researchers.

According to a May 2004 federal task force report on high-end computing, leadership-class facilities are high-end computers that will enable breakthroughs in challenging scientific and engineering computational problems. There are no such systems currently available for U.S. civilian researchers, but CBO expects that DOE will build one leadership-class facility under existing law based on the department’s current plans.

According to DOE and NSF, such systems are typically acquired over a three-year period and would need to be replaced every three or four years. Hence, it is likely that NSF and DOE would need continuous funding for facility acquisition to provide researchers with sustained access to the most advanced computers. Based on information from those agencies, CBO expects that the cost of individual facilities could range from \$60 million to \$150 million (or an average of about \$100 million), depending on the capabilities of the facilities and the software and infrastructure needed to support them. Experience with existing systems suggests that operations and maintenance costs for each facility would cost about \$15 million a year. For this estimate, CBO assumes that NSF would build one facility over the 2005-2007 period and that both NSF and DOE would begin acquiring replacement facilities in 2008.

INTERGOVERNMENTAL AND PRIVATE-SECTOR IMPACT

H.R. 4218 contains no intergovernmental or private-sector mandates as defined in UMRA and would impose no costs on state, local, and tribal governments.

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