



## CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

April 4, 2005

### **H.R. 28** **High-Performance Computing Revitalization Act of 2005**

*As ordered reported by the House Committee on Science on March 17, 2005*

#### **SUMMARY**

H.R. 28 would amend existing statutory guidelines for interagency research and development (R&D) related to high-performance computing. Nondefense R&D on high-performance computing is conducted at six agencies: the National Science Foundation (NSF), the Department of Energy (DOE), the National Institutes of Health, the National Aeronautics and Space Administration, the Department of Commerce, and the 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realign program objectives with current R&D priorities, repeal authorizations for activities that are technologically outdated and emphasize newer issues, such as providing researchers sustained access to the most advanced computing systems in the world.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. 28 would cost a total of \$220 million over the 2006-2010 period, assuming appropriation of necessary funds for the new directives in the bill. CBO estimates that enacting H.R. 28 would have no effect on direct spending or revenues.

H.R. 28 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. 28 is shown in the following table. For this estimate, CBO assumes that the bill will be enacted during 2005 and that outlays will follow historical patterns for similar 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				
	2006	2007	2008	2009	2010
<b>CHANGES IN SPENDING SUBJECT TO APPROPRIATION</b>					
Estimated Authorization Level	34	34	70	86	88
Estimated Outlays	10	22	45	62	81

## **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.” (The six agencies currently conducting nondefense R&D on high-performance computing systems received appropriations of approximately \$1.9 billion in 2005.) For this estimate, CBO assumes that this provision would authorize appropriations to provide sustained access to such 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 current law.

According to DOE and NSF, such systems are typically acquired over a three-year period and 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 in 2005), 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 for each facility would cost about \$15 million a year. For this estimate, CBO assumes that NSF would build one facility over the 2006-2008 period and would begin acquiring a replacement facility in 2009; we assume that DOE would begin acquiring its next replacement facility in 2008.

## **INTERGOVERNMENTAL AND PRIVATE-SECTOR IMPACT**

H.R. 28 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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