

## **Positioning Your Research, Infrastructure, and Education Activities to Take Advantage of the Programs in the American Recovery and Reinvestment Act**

On February 17, President Barack Obama signed into law the American Recovery and Reinvestment Act (the economic stimulus package). This legislation includes significant investment in research, infrastructure, and education programs at multiple agencies. In some cases, Congressional direction and agency preparations provide good information on how the federal government is likely to implement the bill; in other cases, the agencies are still absorbing the details or waiting on the arrival of new leadership.

Below is guidance on what campus leadership and individual researchers can do to position your activities to take advantage of planned or potential programs at agencies that are receiving stimulus funding. There are three categories of activities:

1. Research
2. Infrastructure and Instrumentation
3. Education and Training

There is also some information on the government-wide processes and reporting that will be required from recipients of funds appropriated in the stimulus legislation. Additional reporting conditions may also be imposed by individual agencies and programs.

### **RESEARCH**

#### **National Institutes of Health—Research**

The stimulus legislation provides a total of \$10.4 billion to the National Institutes of Health (NIH) of which \$8.2 billion is available for research projects. Of that amount, the Office of the Director will retain \$800 million, within which Congress directs priority to be placed on short-term grants that focus on specific scientific challenges, new research that expands the scope of ongoing projects, and research on public and international health priorities. The remaining \$7.4 billion will be distributed among the Institutes and Centers of NIH and the Common Fund (NIH Roadmap and other trans-NIH activities) in proportion to the usual appropriation allocations for Fiscal Year (FY) 2009. The funding is available through September 30, 2010.

NIH officials are concerned about the out-year ramifications associated with being asked to spend this amount of funding on research over such a short period of time. If NIH funded new four or five-year research project grants with stimulus dollars, the concern is that the agency

would not have the resources to continue these proposals beginning in the third year of the grant without adversely affecting the entire grant portfolio. As a result, NIH is considering numerous options to lessen the likelihood of out-year impacts, while ensuring that the funding is invested in ways consistent with the goals of the stimulus to create or preserve jobs. (Programs like Pathways for Independence may be a resource for distributing the funding, and NIH is thinking about targeting supplemental funding to new investigators.)

Mechanisms that NIH has stated will be used to distribute the stimulus funds include:

- “Challenge Grants” – Challenge Grants would support investigators working on new ways to attack seemingly intractable problems and/or jump-start a particular area of research. Funding would be \$500,000 per year for two years. Research areas would be identified and prioritized by the individual NIH Institutes and Centers, but are likely to focus on multi-discipline or cross-institute problems. (For example, getting medicines across the blood-brain barrier is a major impediment to effective therapy.) Due to the time constraint of the stimulus, solicitations are expected to be released before May 2009, followed by a shortened application and peer review process.
- R01s and Related Research Mechanisms to Support Scientifically Meritorious Projects – There are currently 14,000 R01 proposals that have been approved through the peer review process, but have never been funded. In general, the Institutes and Centers will be looking to fund the proposals that lend themselves well to two year goals, are in line with the Institutes and Centers’ priorities (as laid out in their strategic plans), and have been deemed scientifically meritorious by the peer review process. They may also look for some geographic distribution of the awards. As peer review is a lengthy process, the focus will be on previously reviewed proposals; grant renewals may also be eligible for stimulus funding. However, NIH has not ruled-out the possibility of accepting *some* new grant proposals with 2-year goals. Projects that cannot be completed in two years will not be considered.
- Supplemental Funding to Existing Grants – This supplemental funding will go to already funded science projects to expand research related to a project’s original goals. For example, this funding could go towards creating training positions or purchasing equipment. Though most of these awards will be administrative, some will be competitive. (Normal procedures will be followed.) The funds are not to restore cuts made in original proposals or awards.

Campus Actions: Individual researchers should use their existing relationships with NIH program officers to suggest possible research areas to highlight and specific research topics that could be supported through the Challenge Grant mechanism. For the Challenge Grant, individual researchers and campus leaders should begin identifying and assembling potential multidisciplinary collaborations. Researchers can also contact NIH to find out what processes might be used to request supplemental funding support. In all cases, researchers should keep in mind that, while follow-up funding can be applied for, the focus must be on projects that will be completed in two years.

## **National Science Foundation—Research**

The stimulus legislation provides \$2 billion for the National Science Foundation (NSF) research directorates and offices. NSF is directed to use this funding to support all research divisions, although it is not obligated to distribute the funds evenly or proportionally among divisions. While the funding is available through September 30, 2010, NSF is under Congressional pressure to obligate as much of it as possible to multi-year grants by September 30, 2009.

Mechanisms that NSF has stated could be used to distribute the stimulus funds include:

- **Increasing Success Rates:** This funding will primarily go to increasing success rates in planned fiscal year (FY) 2009 competitions. Many of those competitions are already underway, with due dates past, although some core programs have upcoming due dates. Because NSF is able to forward fund grants (unlike NIH), they can provide funding for an array of grants two, three, four, and five years in duration to spread out the proposal pressure on NSF when the grants conclude. (Whether this approach will be approved by the Office of Management and Budget is not yet clear.)
- **Focus on the Pipeline:** As part of the effort to raise success rates, NSF will be focusing particularly on early career researchers. They are also concerned about support for undergraduates, graduate students, and post-docs. This emphasis reflects Congressional concern about the pipeline for the science, technology, engineering, and mathematics workforce, as well as jobs in general.
- **No Supplements with Stimulus Funding:** NSF will not be using the stimulus money to make supplemental awards to current grants. This decision reflects the intensive tracking and reporting requirements that agencies and stimulus funding recipients will have to meet (quarterly reports on progress, spend rate, jobs created, etc.). However, the stimulus funding will take some of the pressure off of the FY 2009 funds, and program officers will be able to use those funds for supplements, if they so desire.
- **Small and Medium Infrastructure Projects:** Some of the funding in individual programs and divisions is likely to be used to support already-planned small and medium-sized infrastructure projects (such as research vessel upgrades, supercomputing hardware purchases, seismic network improvements, and upgrades to the Antarctica research stations). Funding may also be directed to ongoing discipline-specific instrumentation programs.
- **Distribution of Funds Among Programs:** The distribution of NSF's \$2 billion among NSF's research directorates, divisions, and programs is being set internally, with Program Officers hopefully getting information about their allocations this week. The additional funding may be distributed proportionally to the FY 2009 request levels, but that has not been confirmed.

**Campus Actions:** Individual researchers with existing relationships with NSF program officers should check in on which mechanisms their programs are considering using to distribute funds, whether additional information is needed on past highly-rated but not funded proposals, and what future submission opportunities may exist.

## **Department of Energy: Office of Science—Research**

The stimulus package provides \$1.6 billion for the Department of Energy (DOE) Office of Science. There is no specific directive on the expenditure of these funds for research or on laboratory or scientific infrastructure. Some reports from the agency indicate that the primary focus for these funds will be clearing out the backlog of repair and construction projects at the Department of Energy National Laboratories (e.g. work on the National Synchrotron Light Source II at Brookhaven National Laboratory). This use of funds, by supporting construction projects in various States, would be consistent with the stimulus focus on creating jobs, particularly blue-collar jobs.

One outstanding question is whether stimulus funding could go to increase the amount of funding available for the Office of Science's new Energy Frontier Research Centers (EFRC) program. The review process for the centers is moving forward, and Congress has approved \$100 million of FY 2009 funding to establish this program. The level of proposal pressure is certainly high enough to absorb additional funding from the stimulus bill; DOE received 260 applications (approximately 71 percent from universities), requesting a total of \$4.9 billion over 5 years. The awards would be \$2 to \$5 million per year over a five-year period, and DOE plans to make only between 20 and 30 awards with the existing FY 2009 funding level.

Campus Actions: In addition to the stimulus funding, the DOE Office of Science received a healthy increase in funding in the FY 2009 Omnibus Appropriations bill to support basic research across its programs. Universities, especially those which have created EFRC teams, should consider preparing white papers for DOE that outline their capabilities in basic energy research. In view of the priorities of President Obama and his Secretary of Energy, Dr. Steven Chu, the Office of Science will have a new emphasis on tackling the technical barriers to the creation of new energy sources.

## **Department of Energy: Other Programs—Research**

The stimulus package includes a significant investment to develop new, clean, renewable energy sources to reduce the nation's dependence on foreign oil. The final bill includes approximately \$30 billion for investments in applied research, loan guarantees and grants to develop new technologies in partnership with industry, and energy efficiency and conservation activities.

Universities will be interested in the applied research and development funding in the bill, including potential partnerships with industry to develop the next generation of renewable energy technologies. Specific areas of potential relevance include renewable energy technologies, carbon capture and sequestration, and the "smart" electric power grid.

Many of the programs funded in the stimulus package were previously authorized by Congress but never funded. In a number of cases, the budgets of the organizations managing the programs will have grown dramatically overnight. Therefore, DOE, while it has some Congressional direction on the programs' shape, will still need some time to develop new solicitations.

*DOE Energy Efficiency and Renewable Energy Research and Development:* The final bill includes \$2.5 billion for applied research, development, demonstration and deployment of energy efficiency and renewable energy technologies. Within this amount, \$800 million is for biomass projects and \$400 million is for geothermal activities and projects. Also within the available funds is an allocation of \$50 million for DOE for research to increase the efficiency of information and communications technology and to improve standards. With the remaining \$1.25 billion, support could also be made available by DOE for wind, solar, water power, hydrogen, and vehicles, industrial and buildings technologies activities.

*DOE Fossil Energy Research and Development:* The final bill includes \$1 billion for existing fossil energy research and development programs. An additional \$1.52 billion is directed to a competitive solicitation for a range of industrial carbon capture and energy efficiency improvement projects, including a small amount for innovative concepts for beneficial CO<sub>2</sub> reuse. To further the development of carbon capture and storage technologies, DOE will also receive \$50 million for a competitive solicitation for site characterization activities in geologic formations; and \$20 million for geologic sequestration training and research grants.

*Smart Grid:* The final bill provides \$4.5 billion for activities related to developing the smart electricity grid, of which \$100 million is for worker training. This funding is a major new investment of federal funding that is likely to be focused on collaboration with industry and utilities, but which may also provide new opportunities for academic researchers.

*ARPA-E:* A longer term potential opportunity is the \$400 million in the final bill to establish the Advanced Research Projects Agency – Energy (ARPA-E), as authorized in the America COMPETES Act (P.L. 110-069). This organization, within DOE but outside both the Office of Science and the applied research programs, is legislatively directed to support novel early-stage energy research, development of technologies, research and development of manufacturing processes, and coordination for technology demonstration and facilitation of technology transfer. Currently ARPA-E does not exist, so a director and staff will have to be put in place to determine and execute programs with the stimulus funding.

Campus Actions: Individual researchers and groups of researchers should review current or potential industry collaborations, as DOE applied research program awards often go to industry-led partnerships. (In addition to the focus on technology transition in these programs, there is a statutory requirement for 20 percent non-federal matching funds, usually supplied by industry.) Researchers with programs and plans in the above targeted areas can also reach out to program staff in the DOE applied research offices to provide ideas on the new solicitations and raise awareness of ongoing campus programs.

### **Healthcare Comparative Effectiveness—Research**

Comparative effectiveness research compares clinical outcomes, or the “clinical effectiveness,” of alternative therapies for the same condition. The stimulus legislation provides \$1.1 billion for comparative effectiveness research and recommends that the money be spread among three entities: the Agency for Healthcare Research and Quality (AHRQ) would receive \$700 million, of which \$400 million would be transferred to the National Institutes of Health (NIH); and the

Office of the Secretary at the Department of Health and Human Services (HHS) would receive \$400 million, which is made available for the Secretary to allocate at his discretion. It is highly likely that much of this HHS money will be transferred to NIH to perform additional comparative effectiveness studies. The mechanism for distributing these monies has not yet been determined.

Campus Actions: In light of the planned healthcare reform efforts, comparative effectiveness research is likely to be a long-term and growing area of emphasis for the new Administration and Congress. Campus leadership and individual researchers should begin to assess the institution's strengths and past experiences and relevant relationships with AHRQ and NIH (the National Institute of Mental Health has ongoing work in this area). It is important to start building the teams and partnerships with other organizations needed to conduct projects in this area.

### **Department of Education—Research**

The stimulus package provides \$250 million for the Institute of Education Sciences (IES) within the Department of Education. Language directs that the funds be used for competitive grants to State educational agencies to enable them to design and develop State-wide, longitudinal data systems to track individual student progress based on a unique student identifier. Out of the \$250 million, \$5 million may be used for awards to public or private organizations to improve data coordination.

Campus Actions: Individual researchers who are interested in longitudinal data systems should contact the State education agencies regarding possible partnerships to apply for this funding.

## **INFRASTRUCTURE AND INSTRUMENTATION**

### **National Institutes of Health—Infrastructure and Instrumentation**

The stimulus bill includes \$1 billion for competitive awards for the construction, renovation, or repair of existing extramural research facilities. NIH does not have an ongoing program in this area and a new solicitation will have to be issued. However, it is already known that applicants do not have to provide assurances that sufficient funds will be available to meet the non-Federal share of the cost of constructing the facility. In addition, a past statutory limit that the grant cannot exceed 50 percent of the cost of construction has been eliminated. NIH is likely to use the existing C06 Construction Grant mechanism for this program, and may raise the maximum grant size to \$8 or \$10 million. The new Request for Applications may be out as early as the last week in February.

The legislation also provides \$300 million for shared instrumentation and other capital equipment. These funds are to be distributed by the NIH National Center for Research Resources, which has an ongoing program in this area and for which the funds will most likely be used. The agency currently has an active solicitation for the Shared Instrumentation Grant Program, with a due date of March 23.

Campus Actions: Campus leadership should gather information on potential construction and renovation projects on facilities in which research relevant to the NIH mission is conducted and begin to prioritize, as institutions are likely to be limited in the number of applications they may submit to the program and the time to prepare applications is likely to be short. For the instrumentation program, researchers and campus leaders should review planned and potential applications to the existing program to see if the number of proposals or the amount of funding requested should be expanded.

### **National Science Foundation—Infrastructure and Instrumentation**

*Facilities and Infrastructure:* The stimulus package provides \$200 million to restart an old NSF program to repair and renovate science and engineering research facilities at institutions of higher education and other research institutions. To implement this provision, NSF will have to prepare and issue a new solicitation. The size and uses of the potential awards under this program are not yet known (in the 1990's, awards were capped at \$2 million and new construction was not supported). Information that is likely to be sought in the applications includes: the impact of the renovation project on future research and research training and improving the quality or effectiveness of the nation's research capabilities; the need of the facility for renovation; and the quality of project and management plans and budget and funding.

*Instrumentation:* Current indications are that NSF plans to do a new solicitation for the Major Research Instrumentation (MRI) program (the current solicitation closed in January). The new solicitation is likely to reflect increased flexibility on NSF's part to raise the maximum award (from \$4 million to \$6 million) and potentially waive some cost sharing requirements (currently 30 percent). The stimulus bill includes \$300 million for MRI; how much of this funding will go to the current competition and how much to the new one is not yet known.

Campus Actions: Campus leadership should gather information on ongoing, ready-to-start, and near-term planned renovation projects for scientific facilities in which research relevant to the NSF mission is conducted and begin to prioritize the projects, as institutions are likely to be limited in the number of applications they may submit to the program. For the instrumentation program, past unsuccessful MRI applications and potential applications should be reviewed in preparation for resubmission or expanded submission of new proposals.

### **National Institute of Standards and Technology—Infrastructure**

The stimulus package includes \$180 million at the National Institute of Standards and Technology (NIST) for the grant program established in 2008 to provide competitive awards for construction of research science buildings at colleges, universities, and other research organizations. This funding is for competitions held in FY 2008 (for which NIST received 93 proposals and made only 3 awards) and FY 2009. The timeline for the FY 2009 competition is not yet clear.

In the FY 2008 version of this program, funds were to be used for construction of new buildings or expansion of existing research science buildings, such as laboratories, test facilities, measurement facilities, and observatories. (Unlike other infrastructure programs in the stimulus

bill, this program is *not* for renovation.) Cost sharing was strongly encouraged, with a minimum of 25 percent viewed favorably and 50 percent desired.

Campus Actions: Campus leadership should gather information on ongoing, ready-to-start, and near-term planned construction and expansion projects for scientific facilities to begin preparing to apply for the FY 2009 competition. In addition, they should revisit any applications made to the FY 2008 competition and be prepared to provide NIST with updates on any changes to its status and funding, as NIST is currently reviewing the highly-rated but unfunded applications from FY 2008 to determine which might be receive funding.

### **Department of Energy—Infrastructure**

The stimulus bill provides DOE with \$3.2 billion to fund a new Energy Efficiency and Conservation Block Grant (EECBG) program. This program provides funding to State, local, and tribal governments for energy efficiency and conservation projects to implement strategies to reduce fossil fuel emissions, reduce total energy use, and improve energy efficiency in the transportation, building and other sectors. Of this amount, under the population-based formula, 68 percent of the funds will go to local governments, 28 percent to States, 2 percent to Indian tribes, and 2 percent for competitive grants. The legislation sets aside \$400 million of this funding for competitive grants.

Campus Actions: Campus leadership should coordinate with their Governor and relevant State and local programs to seek support for “green campus” building and renovation initiatives.

### **State Fiscal Stabilization Fund—Higher Education Infrastructure**

The stimulus bill provides \$53.6 billion for the State Fiscal Stabilization Fund (SFSF), which allows Governors to apply for funds to restore State support for elementary, secondary and postsecondary public education. Within the SFSF, \$48.6 billion is distributed to the States by formula (preliminary calculations of the amount per State are available on line at <http://www.ed.gov/about/overview/budget/statetables/09arrastatetables.pdf>). These funds must first be used to restore State aid to school districts for primary elementary and secondary education and State support to public institutions of higher education to the greater of the FY 2008 or 2009 levels. The bill directs public institutions of higher education to use the funds to “mitigate the need to raise tuition and fees for in-State students” and prohibits all institutions from using the funds to increase endowments. After allocating the funds to restore State education budgets, the States can use the remainder for a variety of uses, including to provide subgrants to public and private institutions of higher education for modernization, renovation, or repair of facilities. Funds cannot be used for new construction.

Also within the SFSF, \$5 billion is reserved for competitive State Incentive Grants and Innovation Grants awarded by the Secretary of Education. The State Incentive Grants are grants to States that have made significant progress in addressing key areas such as equity in teacher distribution and establishing a longitudinal study. Fifty percent of these funds can be used for subgrants for modernization projects. The Innovation Grants will be awarded to school districts and State educational agencies that have made achievement gains in the key areas. Campus

Actions: Campus leadership should coordinate with their Governor on the renovation and repair needs on the campus.

## **EDUCATION AND TRAINING**

### **National Science Foundation—Education**

The final bill provides \$100 million for three education programs at NSF. There are funds for two existing programs: the Robert Noyce Teacher Scholarship program (\$60 million) and the Math and Science Partnerships program (\$25 million). For these programs, the funding is likely to go to increase the success rate in the FY 2009 competitions and to supplements for existing awards.

Campus Actions: Individual researchers currently funded by or applying to the Robert Noyce Teacher Scholarship program or the Math and Science Partnerships program should contact the program officers for information about opportunities for supplements or expanded proposals.

The stimulus package also contains \$15 million for NSF to establish a new program to facilitate the creation or improvement of Professional Science Master's degree programs. This program was authorized in 2007 but never funded, so NSF will have to develop and issue a new solicitation in order to distribute the funds. The purpose of the grants is to facilitate universities' creation or improvement of professional science master's degree programs, with an emphasis on practical training and preparation for the workforce in high-need fields. Programs may include linkages between universities and industries that employ science-trained personnel. In making awards, NSF is directed to give preference to those applicants located in States with low percentages of citizens with graduate or professional degrees or to applicants that secure more than two-thirds of the funding for the programs from sources other than the Federal Government.

Campus Actions: Campus leadership should identify existing and planned Professional Science Master's degree programs that focus on workforce training in high-need fields and have partnerships, particularly internships, with industry or other employers in the State so that the units with relevant programs can begin preparing to apply to NSF.

### **Department of Labor—Training**

Within the Department of Labor, the stimulus bill provides \$2.95 billion for formula grants to the States for training and employment services. To facilitate increased training of individuals for high-demand occupations, the bill provides the authority for local workforce investment boards to contract with institutions of higher education and other eligible training providers.

The bill also includes \$750 million for a program of competitive grants for worker training and placement in high growth and emerging industry sectors. Within the amount provided, \$500 million is designated for projects that prepare workers for careers in energy efficiency and renewable energy. Grants are to non-profit partnerships that include industry and labor and may include educational institutions. (This is a program that was authorized in 2007 but never

funded.) Priority within the remainder of the funds is directed to training in health care; training for wireless and broadband deployment, advanced manufacturing and other high demand industry sectors identified by local workforce areas are also allowable uses of funds.

Campus Actions: Campus leadership should identify existing training programs and ongoing partnerships with local workforce investment boards, industry, and other relevant groups to prepare for potential opportunities from the Department of Labor.

## **GOVERNMENT-WIDE PROCESSES AND REPORTING**

### **Additional Reporting Requirements**

The stimulus bill has general reporting provisions to ensure transparency and accountability in how the funds are spent and that projects are consistent with the legislation's goals, including job creation and preservation. Therefore, funds received from the programs described above will have reporting requirements above and beyond the reports usually provided to these agencies and the awards will have rigorous tracking requirements. (Funding added to existing grants and projects will have to be tracked and reported on separate from the base grant).

Quarterly reports will be required from the recipients of the funds to the granting agency. These reports will require a variety of information, including data on the amount of recovery funds expended or obligated, a description and an evaluation of the completion status of all projects supported, information on any subcontracts or subgrants, and an estimate of the number of jobs created and the number of jobs retained. Additional reporting for infrastructure investments made by State and local governments is also required.

It is likely that most information provided by awardees to funding agencies will be made publicly available in some form; materials should be prepared with this in mind.

Information about the implementation of the stimulus bill will be posted at <http://www.recovery.gov>.

### **Government-Wide Timeline**

All agencies are under significant pressure to begin distributing the funding in the stimulus bill to States, organizations, and individuals as quickly as possible. The overall timeline announced by the Administration for the next few months is:

- February 19, 2009: Federal Agencies to begin reporting their formula block grant awards.
- March 3, 2009: Federal Agencies to begin reporting uses of funds.
- May 3, 2009: Federal agencies to make performance plans publically available; to begin reporting on their allocations for entitlement programs.
- May 15, 2009: Detailed agency financial reports to become available.
- May 20, 2009: Federal agencies to begin reporting their competitive grants and contracts.
- July 15, 2009: Recipients of Federal funding to begin reporting on their use of funds.

In addition, the Office of Management and Budget has set targets for implementation of programs by the agencies. Individual agencies have additional deadlines; for example, NSF, NIST, and NASA have been directed to deliver a spending plan to Congress by April 18, 2009.