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NSF roadmap urged

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WASHINGTON, DC - The National Science Foundation (NSF) should produce a 'roadmap' to establish priorities for large-scale research facility projects it wishes to construct over the next 10 to 20 years, according to a congressionally mandated [report released yesterday](#) (January 14) by the National Academy of Sciences (NAS). Such a roadmap would clarify the rationale behind major new research facilities and help assure members of Congress and the scientific community that NSF is using an established set of criteria, including potential returns to science, technology, and society.

Over the past few years, members of Congress and others have [criticized the NSF](#) for poor explanations of how large research projects - such as optical and radio telescopes, high-energy particle accelerators, and networks of sensors to monitor the environment and cosmic rays - are selected and prioritized. In 2002, a group of senators requested the NAS study the matter, complaining that funding requests for large-scale NSF facilities "appear to be ad hoc and subjective."

"NSF should have a more systematic approach to planning," said William Brinkman, a Princeton University physics professor and chair of the NAS committee that produced the report. "These facilities play a prominent role in the fields in which they are introduced," he said at a public briefing on the report yesterday.

According to the NAS report, in the first stage of the process, peer reviewers from specific fields or interdisciplinary areas would assess proposals based on scientific and technological criteria. In the second stage, the NSF would rank surviving proposals across sets of related fields using 'agency strategic criteria' and guidance from directorate-level advisory committees. In the third stage, the National Science Board and the NSF director would assess remaining proposals using broad, national goals, including whether the projects are likely to transform areas of science or engineering. Projects would then be selected and ranked, and annual budgets would include a 5-year funding outlook and rationale for decisions.

"Science and technology quality remains at the core of this process," said Linda Lee Magid, chemistry professor at the University of Tennessee, Knoxville, and one of the NAS committee members. During the evaluation process, many requests for facilities funding will be rejected and sent back for further development. The roadmap, she said, "has off-ramps; it's not a beltway."

"The staged assessment proposed by the NRC makes sense," said Adrienne Froehlich, director of public policy at the American Institute of Biological Sciences. "Of course, it's easy to say how things should be prioritized in an ideal world, but making those judgment calls on actual projects will be very difficult," she told us.

Sam Rankin, chairman of the Coalition for National Science Funding, said the roadmap approach "sounds reasonable because it tries to get input from the scientific community at various stages."

"If the scientific community and the particular disciplines and divisions [within NSF] are making a statement of what's important and they are making a commitment to a particular project, Congress should not intervene," he told us. "It should be left to the scientific community to establish priorities of when projects should get done."

The NSF created the Major Research Equipment and Facilities Construction account in 1995 to support construction of large research facilities. As a group, these projects represent only about 4% of NSF's [proposed \\$5.5 billion budget](#) for fiscal year 2004, but they are highly visible because of their multimillion-dollar costs and potential to shape future research.

Once projects are selected and receive funding, independent committees of engineering, construction, and scientific experts should periodically review how well the plans are being implemented, the NAS panel recommended. After construction is done, another independent group of experts should monitor operations as needed.

Because the NSF was given a copy of the NAS report only recently, officials there have not yet had time to comment on it. "According to the legislation, they have 3 months to reply," Brinkman said. "But the reviews we've had with NSF have been positive."

References

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