

## Program Assessment Rating Tool (PART)

**Program:** Biological and Environmental Research  
**Agency:** Department of Energy  
**Bureau:** Office of Science  
**Type(s):** Research and Development                      Competitive Grant

Section Scores				Overall Rating
1	2	3	4	Effective
100%	89%	67%	87%	

Capital Assets and Service Acquisitio

**1.1 Is the program purpose clear?** Answer: YES                      Question Weight: 20%

**Explanation:** The mission of the Biological and Environmental Research (BER) program is to advance environmental and biomedical knowledge that promotes national security through improved energy production, development, and use and contributes to international scientific leadership.

**Evidence:** FY04 Budget Request ([www.mbe.doe.gov/budget/04budget/index.htm](http://www.mbe.doe.gov/budget/04budget/index.htm)). Public Law 95-91 that established the Department of Energy (DOE). The BER Mission has been validated by the Biological and Environmental Research Advisory Committee (BERAC).

**1.2 Does the program address a specific and existing problem, interest or need?** Answer: YES                      Question Weight: 20%

**Explanation:** BER supports fundamental research across a broad range of the biological and environmental sciences including: (1) biotechnology solutions for clean energy, carbon sequestration, and environmental cleanup, (2) low dose radiation research to underpin risk protection and cleanup standards, (3) high throughput DNA sequencing for DOE and National needs, (4) understanding the response of the Earth system to different levels of greenhouse gases in the atmosphere, (5) developing and demonstrating novel solutions to DOE's most challenging environmental problems, and (6) developing innovative radiopharmaceuticals for diagnosis and treatment of human disease and novel imaging instrumentation/technologies to visualize and measure biological functions.

**Evidence:** BERAC reviews ([www.sc.doe.gov/ober/berac/Reports.html](http://www.sc.doe.gov/ober/berac/Reports.html)).

**1.3 Is the program designed so that it is not redundant or duplicative of any other Federal, state, local or private effort?** Answer: YES                      Question Weight: 20%

**Explanation:** BER supports long-term, fundamental, high risk research relevant to DOE missions. The BER program is well coordinated with similar programs across the Federal government including: the US Climate Change Science Program (CCSP), the National Institutes of Health (NIH), the Environmental Protection Agency, the National Science Foundation (NSF), and DOE Energy and Environmental Management programs.

**Evidence:** Program reviews (BERAC, National Academy, JASON). Joint program plans including: climate (USGCRP - Annual publication of Our Changing Planet); genomics/structural biology [[www.sc.doe.gov/ober/berac/final598.html](http://www.sc.doe.gov/ober/berac/final598.html)]; low dose radiation; Bioengineering [[www.becon1.nih.gov/becon.htm](http://www.becon1.nih.gov/becon.htm)].

**1.4 Is the program design free of major flaws that would limit the program's effectiveness or efficiency?** Answer: YES                      Question Weight: 20%

**Explanation:** The BER program is based on competitive merit-review, independent expert advice, and community planning. This proves efficient and effective. However, a Committee of Visitors (COV) has yet to validate the merit review system.

**Evidence:** BERAC reviews and reports. Program files.

**1.5 Is the program effectively targeted, so that resources will reach intended beneficiaries and/or otherwise address the program's purpose directly?** Answer: YES                      Question Weight: 20%

**Explanation:** BERAC ensures that research community input is regularly gathered to assess the priorities, projects, and progress of the program. Peer review is used to assess the relevance and quality of each project.

**Evidence:** BERAC reviews and reports. Program files.

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**2.1 Does the program have a limited number of specific long-term performance measures that focus on outcomes and meaningfully reflect the purpose of the program?**      Answer: YES                      Question Weight: 11%

**Explanation:** The three key long-term measures focus on key scientific research outcomes and are meaningful indicators of progress in each of the three main program areas. The program has defined specific quantitative "successful" and "minimally effective" performance milestones for each measure, and an external panel will assess interim program performance on a triennial basis, and update the measures as necessary. It is inappropriate for a basic research program such as this one to have a quantitative long-term efficiency measure.

**Evidence:** Advisory committee reports discuss the key scientific drivers for the breadth of BER's diverse research portfolio ([www.science.doe.gov/production/ober/berac/Reports.html](http://www.science.doe.gov/production/ober/berac/Reports.html)). A description of the specific "successful" and "minimally effective" milestones, and an explanation of the relevance of these measures to the field can be found on the Office of Science (SC) Web site ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)).

**2.2 Does the program have ambitious targets and timeframes for its long-term measures?**                      Answer: YES                      Question Weight: 11%

**Explanation:** BERAC has reviewed the new long-term and annual measures for this program and found them to be ambitious and meaningful indicators of progress. The external reviews described in 2.1 will update the measures, targets, and timeframes on an interim basis.

**Evidence:** Letter from BERAC chair regarding review of long-term and annual measures.

**2.3 Does the program have a limited number of specific annual performance measures that can demonstrate progress toward achieving the program's long-term goals?**                      Answer: YES                      Question Weight: 11%

**Explanation:** The facilities measure, sequencing rate measure and improvements to climate models should provide the capabilities that the scientific community needs to make discoveries directly connected to the long term measures. The measure on the scalability of field results is key to the success of the long-term measure for Environmental Remediation. The climate and environmental remediation measures are not trendable, and will have annual primary targets that continually evolve, and cannot be predicted more than one budget year in advance.

**Evidence:** FY04 Budget Request. Website with further information, including explanation of non-trendable measures and targets ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)).

**2.4 Does the program have baselines and ambitious targets for its annual measures?**                      Answer: YES                      Question Weight: 11%

**Explanation:** Half of the annual measures include quantifiable annual targets. The other half include specific annual scientific targets. Baseline data (FY01 and FY02) verify that the quantifiable annual measures are ambitious, yet realistic.

**Evidence:** FY04 Budget Request. Website with further information ([www.sc.doe.gov/measures](http://www.sc.doe.gov/measures)).

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**2.5 Do all partners (including grantees, sub-grantees, contractors, cost-sharing partners, and other government partners) commit to and work toward the annual and/or long-term goals of the program?**                      Answer: YES                      Question Weight: 11%

**Explanation:** A limited FY03 audit by the DOE Inspector General (IG) found that "performance expectations generally flowed down into the scope of work at the national laboratories." BER program targeted solicitations explicitly include program goals, however the new measures from 2.1/2.3 (once adopted) should be present in future solicitations.

**Evidence:** Memo from the DOE IG to the Director of the Office of Science. M&O contract performance evaluation provisions (WWW-accessible examples include: Oak Ridge National Lab, [www.ornl.gov/Contract/UT-BattelleContract.htm](http://www.ornl.gov/Contract/UT-BattelleContract.htm); and, Lawrence Berkeley National Lab, [www.lbl.gov/LBL-Documents/Contract-98/AppFTOC.html](http://www.lbl.gov/LBL-Documents/Contract-98/AppFTOC.html)). Solicitation examples ([www.science.doe.gov/grants/Fr03-05.html](http://www.science.doe.gov/grants/Fr03-05.html), [www.science.doe.gov/grants/Fr03-13.html](http://www.science.doe.gov/grants/Fr03-13.html))

**2.6 Are independent evaluations of sufficient scope and quality conducted on a regular basis or as needed to support program improvements and evaluate effectiveness and relevance to the problem, interest, or need?**                      Answer: YES                      Question Weight: 11%

**Explanation:** All research projects undergo Merit Review. Grants are reviewed triennially. Major facilities are reviewed annually. Construction projects are reviewed quarterly. BERAC evaluates all aspects of the BER program every 2-5 years. JASON reviews of specific programs are used. Several large pieces of the BER portfolio are also reviewed by outside panels as part of interagency programs. Even though the FY04 PART process did not require the initiation of a Committee of Visitors (COV) review process, BER is in the process of establishing a COV because the previous external reviews have not provided a process validation and detailed portfolio quality check.

**Evidence:** SC Merit Review guidelines ([www.sc.doe.gov/production/grants/merit.html](http://www.sc.doe.gov/production/grants/merit.html)). BERAC reviews of climate change research, bioremediation program units, Free Air Carbon-dioxide Enrichment (FACE), and Atmospheric Radiation Measurement Unmanned Aerial Vehicles (ARM UAV) ([www.sc.doe.gov/ober/berac/Reports.html](http://www.sc.doe.gov/ober/berac/Reports.html)). Program files, including Lehman review reports and JASON reviews. Letter to BERAC chair on creation of COV process, schedule for reviews, and conflict of interest issues.

**2.7 Are Budget requests explicitly tied to accomplishment of the annual and long-term performance goals, and are the resource needs presented in a complete and transparent manner in the program's budget?**                      Answer: NO                      Question Weight: 11%

**Explanation:** DOE has not yet provided a budget request that adequately integrates performance information.

**Evidence:**

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**2.8**      **Has the program taken meaningful steps to correct its strategic planning deficiencies?**      Answer: YES      Question Weight: 11%

**Explanation:** New performance goals and targets have been developed in coordination with OMB. BER participated in the drafting of a new SC strategic plan. BERAC has produced forward-looking reports on various aspects of the program, including most recently the Genomes to Life effort. BER participates in interagency planning groups on topics such as genomics and climate change, including the recent strategic plan for the U.S. Climate Change Science Program. BER is initiating a COV process to help in identifying research program strengths/weaknesses for strategic planning purposes.

**Evidence:** SC strategic plan has yet to be officially provided to OMB for review. BERAC reports, e.g., structural biology, Genomes to Life, and the NABIR program ([www.sc.doe.gov/ober/berac/Reports.html](http://www.sc.doe.gov/ober/berac/Reports.html)). Climate change documents; both governmental and National Academy of Sciences ([www.usgcrp.gov](http://www.usgcrp.gov), [dels.nas.edu/ccgc](http://dels.nas.edu/ccgc)).

**2.CA1**      **Has the agency/program conducted a recent, meaningful, credible analysis of alternatives that includes trade-offs between cost, schedule, risk, and performance goals and used the results to guide the resulting activity?**      Answer: NA      Question Weight: 0%

**Explanation:** The program did not have any construction or upgrade projects of sufficient scale during FY02, so no analyses were necessary.

**Evidence:**

**2.RD1**      **If applicable, does the program assess and compare the potential benefits of efforts within the program to other efforts that have similar goals?**      Answer: NA      Question Weight: 0%

**Explanation:** This is a basic R&D program, and the question is intended for industry-related R&D programs.

**Evidence:**

**2.RD2**      **Does the program use a prioritization process to guide budget requests and funding decisions?**      Answer: YES      Question Weight: 11%

**Explanation:** Although not visible outside DOE, internal SC budget formulation practices include a priority ranking process. The program occasionally solicits prioritization recommendations from BERAC, though the program has a difficult time prioritizing across its diverse portfolio. BER typically appears to make priority-based decisions during program execution.

**Evidence:** Genomes to Life ([doegenomestolife.org](http://doegenomestolife.org)) is a priority of both BERAC and BER. A recent BERAC assessment of Biosphere 2 determined that it the science capability was not a priority for the program ([www.science.doe.gov/production/ober/berac/Biosphere\\_2.pdf](http://www.science.doe.gov/production/ober/berac/Biosphere_2.pdf)). Charge letter to BERAC chair asking for recommendations on priorities for atmospheric sciences program.

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**3.1 Does the agency regularly collect timely and credible performance information, including information from key program partners, and use it to manage the program and improve performance?**      Answer: NO                      Question Weight: 8%

**Explanation:** Performance information is collected for a number of program elements, e.g., amount and quality of DNA sequence determined, spatial resolution of improved climate models, as well as retrospective analyses by BERAC on broad program impacts. Project performance information is collected via Lehman reviews. The program collects performance data from individual grantees and national labs, and uses peer review as a type of standardized quality control at the individual grant level. However, there is not yet a systematic process, such as regular COV evaluations, that conducts research portfolio quality and process validations. While DOE IG contracts with an outside auditor to check internal controls for performance reporting, and the IG periodically conducts limited reviews of performance measurement in SC, it is not clear that these audits check the credibility of performance data reported by DOE contractors.

**Evidence:** JGI data ([www.jgi.doe.gov](http://www.jgi.doe.gov)). Climate models ([www.cesm.ucar.edu](http://www.cesm.ucar.edu)). BERAC program reviews ([www.science.doe.gov/production/ober/berac/Reports.html](http://www.science.doe.gov/production/ober/berac/Reports.html)). Program files, including JASON studies, and Lehman review of "Mouse House."

**3.2 Are Federal managers and program partners (including grantees, sub-grantees, contractors, cost-sharing partners, and other government partners) held accountable for cost, schedule and performance results?**      Answer: YES                      Question Weight: 8%

**Explanation:** Senior Executive Service (SES) and Program Manager Performance Plans are directly linked to program goals. The Management and Operations contracts for the Labs and Facilities include performance measures linked to program goals. Research funding requirements ensure consideration of past performance. All renewal requests are subject to competitive peer review, including earmarked projects after the first year.

**Evidence:** Program and personnel files. For performance-based fee adjustments on M&O contracts, see evidence for question 2.5. Grant rules for renewals ([www.science.doe.gov/grants/#GrantRules](http://www.science.doe.gov/grants/#GrantRules)).

**3.3 Are funds (Federal and partners') obligated in a timely manner and spent for the intended purpose?**      Answer: YES                      Question Weight: 8%

**Explanation:** Using DOE's monthly accounting reports, SC personnel monitor progress toward obligating funds consistent with an annual plan that is prepared at the beginning of the fiscal year to ensure alignment with appropriated purposes. SC programs consistently obligate more than 99.5% of available funds.

**Evidence:** Program files. DOE-wide audit reports.

**3.4 Does the program have procedures (e.g. competitive sourcing/cost comparisons, IT improvements, appropriate incentives) to measure and achieve efficiencies and cost effectiveness in program execution?**      Answer: YES                      Question Weight: 8%

**Explanation:** SC is currently undergoing a reengineering exercise aimed at flattening organizational structure and improving program effectiveness. The program collects the data necessary to track its one "efficiency" measure for facility operation management.

**Evidence:** FY04 Budget Request/Annual Performance Plan. SC reengineering information ([www.screstruct.doe.gov](http://www.screstruct.doe.gov)).

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**3.5 Does the program collaborate and coordinate effectively with related programs?**                      Answer: YES                      Question Weight: 8%

**Explanation:** The program, by its nature as a smaller player in almost everything it funds, is well coordinated with similar programs across the Federal government including the USGCRP, NIH, EPA, NSF, and DOE Energy and Environmental programs. This coordination and cooperation includes both joint planning, priority setting, as well as joint solicitations, including recently cost-sharing a new beamline at the Stanford Sychrotron Radiation Lab with NIH.

**Evidence:** Program and expert reviews detail coordination (e.g., [www.sc.doe.gov/ober/berac/State%20of%20BER.pdf](http://www.sc.doe.gov/ober/berac/State%20of%20BER.pdf)). Joint program planning with other agencies, especially for efforts such as the Human Genome Project and the U.S. global climate change program ([www.ornl.gov/TechResources/Human\\_Genome/home.html](http://www.ornl.gov/TechResources/Human_Genome/home.html), [www.usgcrp.gov](http://www.usgcrp.gov)). Recent joint interagency solicitations ([www.sc.doe.gov/grants/Fr03-04.html](http://www.sc.doe.gov/grants/Fr03-04.html), [www.sc.doe.gov/grants/Fr03-07.html](http://www.sc.doe.gov/grants/Fr03-07.html))

**3.6 Does the program use strong financial management practices?**                      Answer: YES                      Question Weight: 8%

**Explanation:** SC staff execute the BER program consistent with established DOE budget and accounting policies and practices. These policies have been reviewed by external groups and modified as required to reflect the latest government standards.

**Evidence:** Various Departmental manuals. Program files. Audit reports.

**3.7 Has the program taken meaningful steps to address its management deficiencies?**                      Answer: YES                      Question Weight: 8%

**Explanation:** SC is currently reengineering to improve program management efficiency. BER has worked with OMB to improve performance evaluation. Even though it was not recommended during the FY04 PART process, BER is organizing a new COV process under the auspices of BERAC.

**Evidence:** SC reengineering information ([www.screstruct.doe.gov](http://www.screstruct.doe.gov)). Letter to BERAC chair on creation of COV process, schedule for reviews, and conflict of interest issues.

**3.CA1 Is the program managed by maintaining clearly defined deliverables, capability/performance characteristics, and appropriate, credible cost and schedule goals?**                      Answer: YES                      Question Weight: 8%

**Explanation:** The BER program documents the capabilities and characteristics of new facilities in conceptual design reports that are reviewed by BERAC and independent Lehman Reviews. Progress on the one construction project is tracked quarterly through program and Lehman reviews.

**Evidence:** Conceptual Design Reviews. Program files, including facility peer review on FACE, and Lehman report on the program's single construction project (Laboratory for Comparative and Functional Genomics, [bio.lsd.ornl.gov/mgd](http://bio.lsd.ornl.gov/mgd)).

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- 3.CO1    Are grants awarded based on a clear competitive process that includes a qualified assessment of merit?**                      Answer: NO                      Question Weight: 8%
- Explanation: First time grant applications are encouraged in all Request For Proposals/Applications, and BER has a much higher percentage of new awards than other SC programs. Merit review guides all funding decisions, and the targeted solicitations ensure that a larger amount of research dollars are fully competed. However, the quality of the research funded via this process has not yet been validated by a COV. Also, BER has seen an increasing amount of Congressional earmarking in recent years, and this "research"--totaling almost \$100 million in FY 2004--does not go through any type of merit-based competitive review process.
- Evidence: On average, BER funds 30% of new research applications. For calendar year 2001, BER received 495 new applications and 82 requests for renewals of currently funded projects. ([www.sc.doe.gov/ober/ober\\_top.html](http://www.sc.doe.gov/ober/ober_top.html)) Targeted solicitations (universities: [www.science.doe.gov/grants/closed03.html](http://www.science.doe.gov/grants/closed03.html); labs: [www.science.doe.gov/grants/clolab03.html](http://www.science.doe.gov/grants/clolab03.html)).
- 3.CO2    Does the program have oversight practices that provide sufficient knowledge of grantee activities?**                      Answer: YES                      Question Weight: 8%
- Explanation: In addition to grantee progress reports, program managers stay in contact with grantees through email and telephone, program reviews, and site visits.
- Evidence: Program files, including travel logs and progress reports.
- 3.CO3    Does the program collect grantee performance data on an annual basis and make it available to the public in a transparent and meaningful manner?**                      Answer: NO                      Question Weight: 8%
- Explanation: In accordance with DOE Order 241.1A, the final and annual technical reports of program grantees are made publicly available on the web through the Office of Scientific and Technical Information's "Information Bridge". However, program-level aggregate data on the impact of the grants program is not adequately communicated in the annual DOE Performance and Accountability report.
- Evidence: DOE Order 241.1A. Information Bridge ([www.osti.gov/bridge/](http://www.osti.gov/bridge/)). FY02 Performance and Accountability Report ([www.mbe.doe.gov/stratmgt/doe02rpt.pdf](http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf)).
- 3.RD1    For R&D programs other than competitive grants programs, does the program allocate funds and use management processes that maintain program quality?**                      Answer: NO                      Question Weight: 8%
- Explanation: The funds for research programs and scientific user facilities at the Federal Labs are allocated through a limited competition analogous process to the unlimited process outlined in 10 CFR 605, though BER funds very little work with this mechanism. More so than other SC programs, BER competes the lab research grants by developing a large number of targeted (rather than general) solicitations. However, the quality of the research funded via this process has not yet been validated by a COV.
- Evidence: SC Merit Review procedures. ([www.sc.doe.gov/production/grants/merit.html](http://www.sc.doe.gov/production/grants/merit.html)) 10 CFR 605. ([www.science.doe.gov/production/grants/605index.html](http://www.science.doe.gov/production/grants/605index.html)). Targeted solicitations (universities: [www.science.doe.gov/grants/closed03.html](http://www.science.doe.gov/grants/closed03.html); labs: [www.science.doe.gov/grants/clolab03.html](http://www.science.doe.gov/grants/clolab03.html)).

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**4.1 Has the program demonstrated adequate progress in achieving its long-term performance goals?**      Answer: LARGE EXTENT      Question Weight: 20%

**Explanation:** BERAC will evaluate progress toward the new long term performance measures every three years, but no external reviews that address progress toward program goals (either past ones or the new ones proposed in the "measures" tab) are available to date other than the generally positive BERAC reviews.

**Evidence:** BERAC reports, especially the 2001 assessment of the entire program ([www.er.doe.gov/production/ober/berac/Reports.html](http://www.er.doe.gov/production/ober/berac/Reports.html)).

**4.2 Does the program (including program partners) achieve its annual performance goals?**      Answer: LARGE EXTENT      Question Weight: 20%

**Explanation:** Although all but one of the annual performance measures for FY05 are new, BER hit over half of the targets for all of its former annual GPRA measures. The genome target was missed because of a programmatic decision to focus on completing DOE's piece of the human genome according to an accelerated interagency plan.

**Evidence:** FY02 Performance and Accountability Report ([www.mbe.doe.gov/stratmgt/doe02rpt.pdf](http://www.mbe.doe.gov/stratmgt/doe02rpt.pdf)). FY04 Annual Performance Plan ([www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf](http://www.mbe.doe.gov/budget/04budget/content/perfplan/perfplan.pdf)).

**4.3 Does the program demonstrate improved efficiencies or cost effectiveness in achieving program goals each year?**      Answer: YES      Question Weight: 20%

**Explanation:** The recent history of tracking the one "efficiency" measure for facility operation management shows that the program continues to meet or exceed expectations.

**Evidence:** Program files, including facilities usage data.

**4.4 Does the performance of this program compare favorably to other programs, including government, private, etc., with similar purpose and goals?**      Answer: NA      Question Weight: 0%

**Explanation:** The program is highly integrated with the activities of other agencies, and typically plays a relatively smaller--but important--leveraging role in interagency ventures: no other program with the range of activities (i.e., environmental remediation, climate change, life sciences, medical applications) and mission focus of BER exists in the world. Partly because of the highly integrated nature of BER, no expert panel comparison of performance (either with other agencies or countries) has been conducted at the program-wide level as would be appropriate for the PART.

**Evidence:** Internal government planning reviews to assess the strongest aspects of each agency. BERAC reports ([www.er.doe.gov/production/ober/berac/Reports.html](http://www.er.doe.gov/production/ober/berac/Reports.html)). BER role in human genome project, etc.

**4.5 Do independent evaluations of sufficient scope and quality indicate that the program is effective and achieving results?**      Answer: YES      Question Weight: 20%

**Explanation:** BERAC, on a rotating schedule, reviews the major elements of the BER program against plans and scientific opportunities. The entire BER program was positively reviewed by BERAC in 2001, though this review did not have great depth. Other experts groups, such as JASON, also review pieces of BER as needed. However, BER needs a COV process to fill gaps in the normal BER review process.

**Evidence:** BERAC review reports ([www.sc.doe.gov/ober/berac/Reports.html](http://www.sc.doe.gov/ober/berac/Reports.html)). Program files, including facility peer reviews and JASON reports.

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**4.CA1**      **Were program goals achieved within budgeted costs and established schedules?**

Answer: YES

Question Weight: 20%

**Explanation:** Construction of Laboratory for Comparative & Functional Genomics at Oak Ridge, to be completed in FY 2003, is on schedule and within cost.

**Evidence:** Program files, including 04/30/02 Lehman review report.

## PART Performance Measurements

**Program:** Biological and Environmental Research

**Agency:** Department of Energy

**Bureau:** Office of Science

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**Measure:** Life Sciences -- Progress in characterizing the multi-protein complexes (or the lack thereof) involving a significant fraction of a microbe's proteins, and in developing computational models to direct the use and design of microbial communities toward DOE mission needs. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a triennial basis.

**Additional Information:** An external panel will conduct triennial reviews of progress. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2006	Excellent		
2009	Excellent		
2012	Excellent		
2015	Excellent		

**Measure:** Climate Change Research -- Progress in delivering improved climate data & models for policy makers to determine safe levels of greenhouse gases, and by 2013, toward substantially reducing differences between observed temperature & model simulations at subcontinental scales using several decades of recent data. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a triennial basis.

**Additional Information:** An external panel will conduct triennial reviews of progress. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2006	Excellent		
2009	Excellent		
2012	Excellent		
2015	Met Goal		

## PART Performance Measurements

**Program:** Biological and Environmental Research

**Agency:** Department of Energy

**Bureau:** Office of Science

**Measure:** Environmental Remediation -- Progress in developing science-based solutions for cleanup and long-term monitoring of DOE contaminated sites, and by 2013, toward employing advanced biology-based clean up solutions and science-based monitors at a significant fraction of DOE's long-term stewardship sites. An independent expert panel will conduct a review and rate progress (excellent, adequate, poor) on a triennial basis.

**Additional Information:** An external panel will conduct triennial reviews of progress. See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Long-term
2006	Excellent		
2009	Excellent		
2012	Excellent		
2015	Met Goal		

**Measure:** Increase the rate of DNA sequencing -- Number (in billions) of base pairs of high quality (less than one error in 10,000 bases) DNA microbial and model organism genome sequence produced annually.

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2001		5.8	
2002		12.7	
2003	>14	18	
2004	>20		
2005	>20		

## PART Performance Measurements

**Program:** Biological and Environmental Research

**Agency:** Department of Energy

**Bureau:** Office of Science

**Measure:** Improve climate models -- Develop a coupled climate model with fully interactive carbon and sulfur cycles, as well as dynamic vegetation to enable simulations of aerosol effects, carbon chemistry and carbon sequestration by the land surface and oceans and the interactions between the carbon cycle and climate.

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information, including a meaningful expansion of the abbreviated nonnumeric targets.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2001		Consistency	
2002		Resolution	
2003		New Model	
2004	Testbed		
2005	3 parameters		

**Measure:** Determine scalability of laboratory results in field environments -- Determine actual in situ rates of metal reduction in subsurface environments and begin to develop a numerical model to describe and predict these rates.

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information, including a meaningful expansion of the abbreviated nonnumeric targets.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual
2002		Sequence	
2003		Identify	
2004	Quantify		
2005	Predict		

## PART Performance Measurements

**Program:** Biological and Environmental Research

**Agency:** Department of Energy

**Bureau:** Office of Science

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**Measure:** Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time. (Scheduled annual operating time is roughly 38,880 hours in 2004 and 2005. The ambitiousness and appropriateness of the 90% target level is currently under review in conjunction with a reevaluation of the program's suite of user facilities.)

**Additional Information:** See [www.sc.doe.gov/measures](http://www.sc.doe.gov/measures) for more information.

<u>Year</u>	<u>Target</u>	<u>Actual</u>	<b>Measure Term:</b> Annual (Efficiency Measure)
2001	>90%	98%	
2002	>90%	97%	
2003	>90%	97%	
2004	>90%		
2005	>90%		