

**Office of Management and Budget**  
**Program Assessment Rating Tool Performance Measures**

RE: <http://www.whitehouse.gov/omb/budget/fy2005/part.html>

*Basic Energy Sciences, Office of Science, U.S. Department of Energy*

Long Term Measures

- By 2015, demonstrate progress in designing, modeling, fabricating, characterizing, analyzing, assembling, and using a variety of new materials and structures, including metals, alloys, ceramics, polymers, biomaterials and more – particularly at the nanoscale – for energy-related applications.
  - Definition of “Success” – BES-supported research leads to important discoveries that impact the course of others’ research; new knowledge and techniques, both expected and unexpected, within and across traditional disciplinary boundaries; and high-potential links across these boundaries.
  - Definition of “Minimally Effective” – BES-supported research leads to a steady stream of outputs of good quality.
  - How will progress be measured? – Expert Review every three years will rate progress as “Excellent”, “Minimally Effective” or “Insufficient”.
- By 2015, demonstrate progress in understanding, modeling, and controlling chemical reactivity and energy transfer processes in the gas phase, in solutions, at interfaces, and on surfaces for energy-related applications, employing lessons from inorganic, organic, self-assembling, and biological systems.
  - Definition of “Success” - BES-supported research leads to important discoveries that impact the course of others’ research; new knowledge and techniques, both expected and unexpected, within and across traditional disciplinary boundaries; and high-potential links across these boundaries.
  - Definition of “Minimally Effective” - BES-supported research leads to a steady stream of outputs of good quality.
  - How will progress be measured? - Expert Review every three years will rate progress as “Excellent”, “Minimally Effective” or “Insufficient”.
- By 2015, develop new concepts and improving existing methods for solar energy conversion and other major energy research needs identified in the 2003 Basic Energy Sciences Advisory Committee workshop report, *Basic Research Needs to Assure a Secure Energy Future*.
  - Definition of “Success” - BES-supported research leads to important discoveries that are rapidly and readily available and feed, as appropriate, into use or projected use by the Department’s technology offices, by other federal agencies, and/or by the private sector. There is evidence of substantive interactions with the Department’s technology offices in most BES program areas.

- Definition of “Minimally effective” - BES-supported research leads to a steady stream of outputs of good quality that show the potential to impact energy research.
- How will progress be measured? - Expert Review every three years will rate progress as “Excellent”, “Minimally Effective” or “Insufficient”.
- By 2015, demonstrate progress in conceiving, designing, fabricating, and using new instruments to characterize and ultimately control materials.
  - Definition of “Success” - BES-supported research leads to new concepts and designs for next-generation instruments and detectors for x-ray, neutron, and electron-beam scattering and for research using electric and/or magnetic fields.
  - Definition of “Minimally effective” - ES-supported research leads to new instruments that are world class.
  - How will progress be measured? - Expert Review every three years will rate progress as “Excellent”, “Minimally Effective” or “Insufficient”.

### Annual Measures

RE: FY 2005 Budget Request, [http://www.sc.doe.gov/bes/budgets/BES\\_FY2005budget.pdf](http://www.sc.doe.gov/bes/budgets/BES_FY2005budget.pdf), pp. 274-275.

- Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operating time. (*Efficiency measure*)
  - How will progress be measured? - Progress will be tracked quarterly through the Department of Energy’s tracking system –Joule. Results will be reported in the Department’s Performance and Accountability report that is published soon after the end of each fiscal year.
  - Targets -
 

|               |     |
|---------------|-----|
| ● 2001 – >90% | 96% |
| ● 2002 – >90% | 96% |
| ● 2003 – >90% | 91% |
| ● 2004 – >90% |     |
| ● 2005 – >90% |     |
- Cost-weighted mean percent variance from established cost and schedule baselines for major construction, upgrade, or equipment procurement projects (Cost variance listed first). (*Efficiency measure*)
  - How will progress be measured? - Progress will be tracked quarterly through the Department of Energy’s tracking system –Joule. Results will be reported in the Department’s Performance and Accountability report that is published soon after the end of each fiscal year.
  - Targets

|                     |              |
|---------------------|--------------|
| ● 2001 – <10%, <10% | +0.4%, -6.3% |
|---------------------|--------------|

- 2002 – <10%, <10%                    -0.2%, -1.8%
  - 2003 – <10%, <10%                    -0.5%, -1.4%
  - 2004 – <10%, <10%
  - 2005 – <10%, <10%
  
- Improve Spatial Resolution: Demonstrated spatial resolutions for imaging in the hard and soft x-ray regions, and spatial information limit for an electron microscope (measured in nanometers).
  - How will progress be measured? - Progress will be tracked quarterly through the Department of Energy's tracking system –Joule. Results will be reported in the Department's Performance and Accountability report that is published soon after the end of each fiscal year.
  - Targets
    - 2002 –            -                    150, 24, 0.09
    - 2003 –            -                    130, 20, 0.09
    - 2004 –  $\leq 115, \leq 19, \leq 0.08$
    - 2005 –  $\leq 100, \leq 18, \leq 0.08$
  
- Improve temporal resolution: Demonstrated duration (measured in femtoseconds) and intensity (measured in millions photons per pulse) of an x-ray pulse.
  - How will progress be measured? - Progress will be tracked quarterly through the Department of Energy's tracking system –Joule. Results will be reported in the Department's Performance and Accountability report that is published soon after the end of each fiscal year.
  - Targets
    - 2002 –            -                    100, 0.0003
    - 2003 –            -                    500, 1.0
    - 2004 –  $\leq 200, \geq 0.005$  (at greatly increased average brightness)
    - 2005 –  $\leq 100, \geq 100$
  
- Number of reacting species and billions of grid points in a three-dimensional combustion reacting flow computer simulation, as a part of the Scientific Discovery through Advanced Computing (SciDAC) effort.
  - How will progress be measured? - Progress will be tracked quarterly through the Department of Energy's tracking system –Joule. Results will be reported in the Department's Performance and Accountability report that is published soon after the end of each fiscal year.
  - Targets
    - 2002 –            -                    8, 0.0005
    - 2003 –            -                    8, 0.001
    - 2004 –  $\geq 44, \geq 0.0005$
    - 2005 –  $\geq 44, \geq 7$