Performance Metrics from the Stakeholder Perspective (DOE)

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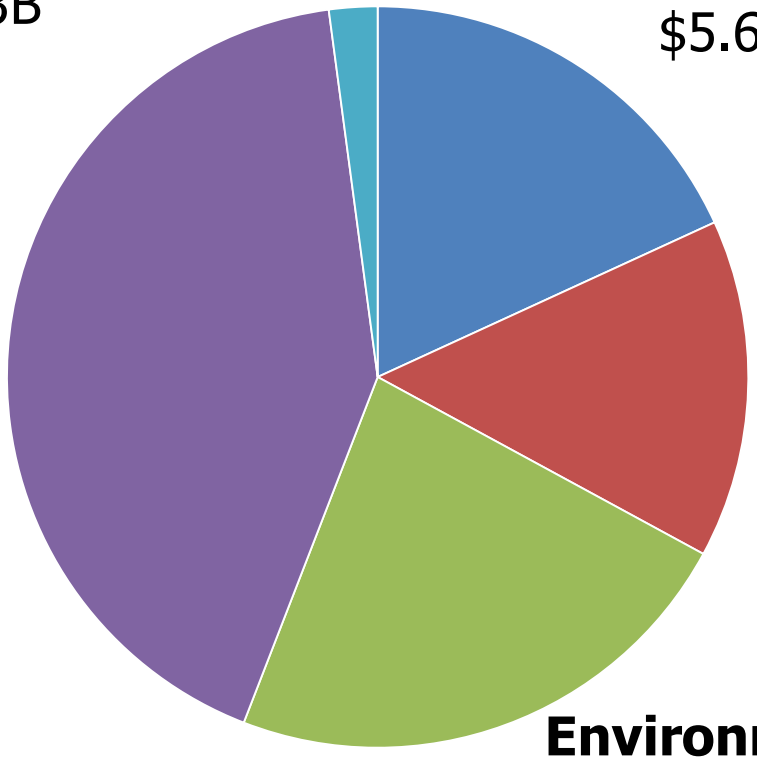
Outline

- Who We Are
- Performance Management
- Goals and Measures
- Facility Operations, Metrics and Reliability
- Questions and Discussion

The Department of Energy Portfolio



FY 2017 Budget Request = $32.5B

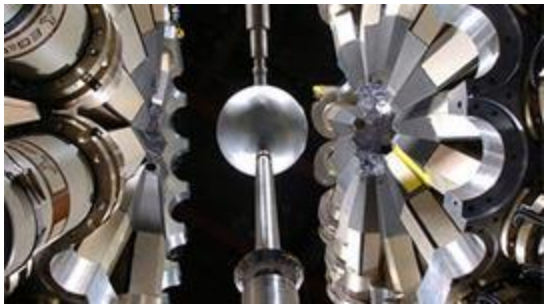
Office of Science Program Offices

Basic Energy Sciences	• Understanding, predicting, and ultimately controlling matter and energy flow at the electronic, atomic, and molecular levels
Advanced Scientific Computing Research	• Delivering world leading computational and networking capabilities to extend the frontiers of science and technology
Biological and Environmental Research	• Understanding complex biological, climatic, and environmental systems
Fusion Energy Sciences	• Building the scientific foundations for a fusion energy source
High Energy Physics	• Understanding how the universe works at its most fundamental level
Nuclear Physics	• Discovering, exploring, and understanding all forms of nuclear matter

Office of Nuclear Physics

- The Nuclear Physics program supports the following national scientific user facilities:

Argonne Tandem Linac Accelerator System (ATLAS)



Continuous Electron Beam Accelerator Facility (CEBAF)

Relativistic Heavy Ion Collider (RHIC)

Government Performance and Results Act

Federal Law Enacted in 1993

- Improve government performance management
- GPRA Modernization Act of 2010

Requires federal agencies to engage in performance management tasks such as setting goals, measuring results, and reporting progress.

The Office of Management and Budget (OMB) is tasked with producing an annual report on agency performance. This is produced with the President's annual budget proposal and provided to congress.

Three GPRA Elements

Agencies are required to

- Develop five-year strategic plans that must contain a mission statement and long-term, results-oriented goals covering each of its major functions.

- Prepare annual performance plans that establish the performance goals for the applicable fiscal year with a description of how these goals are to be met, and verified. Performance goals must cover each program activity in the agency budget.

- Prepare annual performance reports that review the agency's success or failure in meeting its targeted performance goals.

GPRA and the Federal Budget

"In accordance with the GPRA Modernization Act of 2010, the Department sets targets for, and tracks progress toward, achieving performance goals for each program."

Three Measures for Nuclear Physics

1. **Construction/MIE Cost & Schedule** – Cost weighted mean percentage variance from established cost & schedule baselines for major construction, upgrade, or equipment procurement projects

2. **Facility Operations** - Average achieved operation time of NP user facilities as a percentage of total scheduled annual operation time

3. **Nuclear Structure** - Conduct fundamental research to discover, explore, and understand all forms of nuclear matter.

Facility Hours / Statistics

The President's Budget contains several statistics related to beam hours at NP National User Facilities

- **Achieved Operating Hours:** Past performance
- **Planned Operating Hours:** Projected performance

Facility performance is evaluated at the end of the fiscal year by comparing Achieved Operating Hours to Planned Operating Hours.

The total Achieved Operating Hours for all NP National User Facilities must exceed **80%** of the total Planned Operating Hours in order to meet the established Performance Goal (Measure) for the year.

Optimal Hours / Facility Utilization

Optimal Hours - The amount of time a facility could be available for users if unconstrained by funding levels

- Starting point is 8,760 hours (365 days X 24 hours)
- Takes into account planned shutdown periods for machine and detector upgrades and installation, commissioning of new facilities, scheduled routine maintenance, holidays, changes in scientific priorities in a given year, redirection of funding, operating conditions such as the time of year and optimization of resources.

Planned Operating Hours / Optimal Hours = Facility Utilization %

- Scrutinized by the Administration and Congress
- Ideally, a facility would be operated near maximum utilization

Reliability

NP also tracks the reliability of its facilities. The following data are reported on a quarterly basis, and in the Lab Managers' Budget Briefing spreadsheets

+ Delivered Research Hours
+ Delivered Beam Study Hours
+ Delivered Tuning/Restore Hours
= Total Delivered Hours (Achieved or Planned Operating Hours)

+ Unscheduled Failure = Total Scheduled Hours

Total Delivered Hours / Total Scheduled Hours = % Reliability

Facility Performance

- Facility performance is reported and measured in hours.
- Weeks of operation are sometimes referenced throughout the budget development process within the Administration and with Congress.
- Weeks of Scheduled Operations are calculated as follows;

$$\frac{\text{Total Delivered Hours}}{(\text{Average Scheduled Hours per Week} * \text{Reliability})}$$

- Provided by each facility in the Lab Manager's Budget Briefing spreadsheets.
- Conversion factor varies by facility.
- Best estimate of realistic hours per week a facility can be scheduled for operations. Reflects operating mode and weekly maintenance
- Can be reduced by other factors such as shortage of operating staff, etc.

Supporting the DOE Mission

- Date is collected quarterly and reported in the Performance Measures Management (PMM) system – Formally Joules
  - JLab data is combined with data from other NP facilities
  - https://energy.gov/cfo/downloads/fy-2016-doe-annual-performance-report-fy-2018-annual-performance-plan

- JLab plays an important part in all 3 NP performance measures
  - 12 GeV Upgrade supports the Construction Goal
  - CEBAF Operations supports the Facility Ops Goal
  - 12 GeV CEBAF science supports the FY18 Scientific Goal

- Deviations of achieved from planned hours must be explained
- Metrics help steer Congressional Appropriations Committees
- Indicators that measure the outcome of performance goals

Questions and Discussion

How can DOE enable improvements in reliability?