U.S. DEPARTMENT OF ENERGY | Office of Science

BESAC Charges - 2023

For 2023, BESAC has 4 Charges from the Office of Science

- 2 Committee of Visitors Charges

- 2 Charges related to the BESAC International Benchmarking Report

2023 BESAC Charges from the Office of Science for Committees of Visitors (COVs)

Since 2002, Committees of Visitors (COVs) appointed by the SC Federal Advisory Committees have assessed (1) the efficacy and quality of the processes used to solicit, review, recommend, monitor, and document funding actions; and (2) the quality of the resulting program portfolios.

2 Charges for COVs for 2023

- Office of Workforce Development for Teachers and Scientists (WDTS) for fiscal years 2017-2022 (charged previously, delayed due to COVID and other impacts)
- Division of Materials Sciences and Engineering for fiscal years 2018-2022

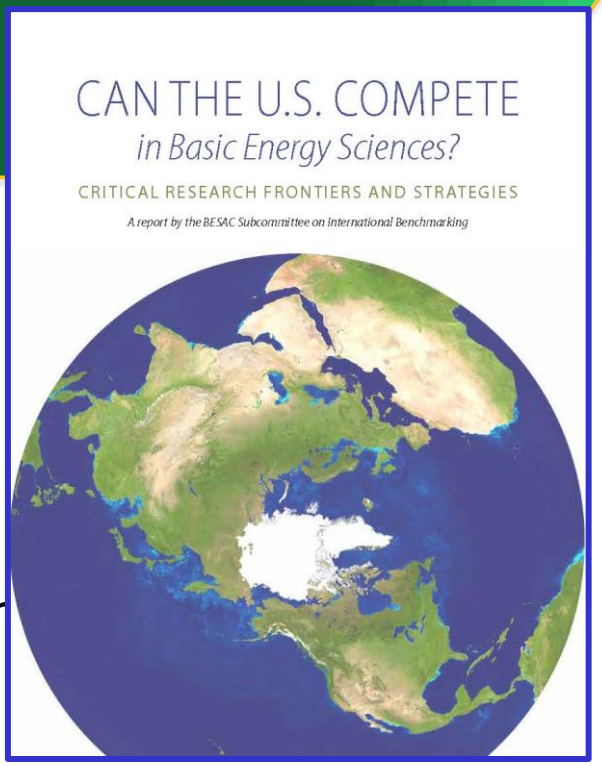
WDTS COV Report is Requested by the End of 2023

- Previous BESAC COVs examined the activities of WDTS: May 2010 and December 2016.
  - The 2016 COV confirmed the effectiveness of the WDTS programmatic structure and activities that resulted from a major re-structuring in response to the 2010 report.
- 2023 COV review, originally planned for 2022
  - postponed due to the pandemic and other constraints.
  - The revised charge supports the change in delivery date and period covered by the COV.
- In addition to the standard charge, this COV is asked to assess:
  - Effectiveness of the online technology development and evaluation activities
  - Diversity, equity, and inclusivity (DEI) of participation in WTDS programs, including outreach efforts to enhance DEI
- Scope: The Science Undergraduate Laboratory Internships (SULI); The Community College Internships (CCI); The Visiting Faculty Program (VFP);The Office of Science Graduate Student Research Program (SCGSR); The National Science Bowl® (NSB); and The Albert Einstein Distinguished Educator Fellowship (AEF)

WDTS COV Subcommittee

Name	Institution	Role	Status
Bare, Simon	SLAC	Chair	Accepted
Blackburn, Noel	BNL		Accepted
Broderick, Joan	Montana State University		Accepted
Dobbins, Tabbetha	Rowan College (NJ)	Co-Chair	Accepted
Guggilla, Padmaja (Paddy)	Alabama A&M		Accepted
McComb, David	Ohio State		Accepted
Smith, Emily	Ames		Accepted
Stack, Andrew	Oak Ridge National Laboratory		Accepted

Two BESAC Charges follow up on the 2021 BESAC International Benchmarking Report



- **Report responded to BESAC Charge:** to identify critical research areas in basic energy sciences; to examine U.S. competitiveness in these areas, in major research facilities and tools, and in funding mechanisms; and to suggest strategies that could enhance the U.S. position in comparison to its global competitors
- **Finding:** in critical areas, China is surging, Europe leads in quantum information science, and the U.S. is flattening or falling behind
- **Strategies for Success:** Increased investment in research, facilities, instrumentation; greater support for early- and mid-career scientists; improve opportunities for facility staff scientists; better integrate energy sciences research from basic to applied to industrial

Report: "Can the U.S. Compete in Basic Energy Sciences? Critical Research Frontiers and Strategies": https://science.osti.gov/-/media/bes/besac/pdf/Reports/AH_DOE2021-Benchmarking_202108.pdf

Two charges related to the 2021 BESAC International Benchmarking Report from Office of Science

1. "…to propose strategies for research investments in BES-supported domains in the medium to long term"
2. "to assess the impact of the Nanoscale Science Research Centers (NSRCs) to date and provide strategies for selection of high-impact, future directions"

Charge to Develop Strategies for Research Investments

- Advice requested on BES investment strategies for effective use of available resources.
  - Builds on Benchmarking Report "strategies for success" plus recent national focus on the strategic implications on government investment in science, including the CHIPS and Science Act (August 2022)
  - Rising costs for research, facility operations, and facility construction due to the combined effects of inflation, competition for talent, supply chains, and the pandemic. Even if increased authorization levels are realized in future appropriations, under business-as-usual scenarios, these forces will require ongoing prioritization of research topics.
- Request for proposed area-agnostic strategies that BES can apply to specific research topics as BES and the research community move forward. BESAC could consider:

Charge to Develop Strategies for Research Investments:

Request to Identify area-agnostic strategies that BES can apply to specific research topics in the future

- **Topical Priorities**:
  - How to best determine that a topical area is a high priority for increased investment?
  - How to determine that a topical area is a low priority for continued investment and could be reduced or phased out?
  - How should new topical areas for investment be identified?
  - As disciplines converge on complex problems, how should BES identify and foster cross-cutting areas for investment?
- **Investment balance**:
  - How should BES balance research and instrumentation support for National Laboratories? for academic grants?
- **Modality balance**:
  - How should BES balance research modalities for the future? single investigator, small groups, and team research (EFRCs, Energy Innovation Hubs, Quantum Information Science Research Centers, and computational science centers)
- **Discovery and Use-driven balance**:
  - How should BES weigh the potential for technological impact in defining investment priorities?
  - How can BES play a useful role in enabling innovations to cross the "valley of death"?
  - How sharp or fuzzy should the "basic-applied boundary" be?
- **International**: How should BES take account of international competition in its research domains?
- **Frequency:** How frequently should these evaluations be revisited?

Research Strategies for Prioritization Subcommittee

Name	Institution	Role	Status
Kastner, Marc	MIT Retired	Vice-Chair	Accepted
Takeuchi, Esther	BNL/Stony Brook University	Chair	Accepted

This subcommittee will include at least 10 additional BESAC members;
additional community representation will bring the membership to 15-20 individuals

Charge to assess impact and future directions for the BES Nanoscale Science Research Centers (NSRCs)

- NSRCs were established as user facilities between 2003-2008.
  - nanoscience has evolved from a new methodology to an established foundational capability for science and commercial technologies;
  - the NSRCs' have expanded to include the electron microscopy user facilities and quantum information science.
- The charge to BESAC includes a request for strategies for selection of high-impact, future directions for these facilities
- Questions that BESAC could consider in this study include:
  - What has the impact of the NSRCs been, including scientific productivity, instrumentation advances, user community, contributions to national priorities, including energy technologies, and other metrics.
  - What aspects of these facilities are "world-leading"?
  - How are the collective NSRCs synergistic and what are the unique scientific roles?
  - The initial vision for the NSRCs included synergies with the other user facilities at each of the laboratories. Has this vision been realized?
  - What future directions are most promising?
  - What are the best practices and opportunities for enhancement in the NSRC outreach activities to ensure a diverse user community?
  - **How should the NSRCs evolve to better serve the nation and user research?**

NSRC Subcommittee – to date…

Name	Institution	Status	Role
Chen, Donna	University of South Carolina	Accepted	
Datye, Abhaya	Univ. of New Mexico	Accepted	
Dosch, Helmut	DESY	Accepted	
Gibson, Murray	Florida A&M/Florida State University	Accepted	Chair
Haile, Sossina	Northwestern	Accepted	
Ourmazd, Abbas	University of Wisconsin, Milwaukee	Accepted	
Mueller, Karl	PNNL	Accepted	Co-Chair

An additional 7 members have been identified for invitations, bringing the total for this subcommittee to around 14.

Overview of NSRCs in presentation after break

Panel Lead: Murray Gibson, FAMU-FSU

Panelists from NSRCs:

Karren More, Center for Nanophase Materials Sciences (ORNL)

Jeff Nelson, Center for Integrated Nanotechnologies (LANL)

Kristin Persson, Molecular Foundry (LBNL)

Ilke Arslan, Center for Nanoscale Materials (ANL)

Chuck Black, Center for Functional Materials (BNL)

MSE COV includes the DOE EPSCoR program

- MSE COV Report is requested by the end of 2023
- Findings of the most recent MSE COV in May 2018: the processes by which MSE operates were fair, efficient, and professionally implemented. As a result, the MSE research portfolio was outstanding on a national and international scale. The committee made recommendations relating to staff travel, staffing levels, award durations, proposal pressure, and research metrics, among others.
- In addition to the standard charge, the COV is asked to comment on the diversity, equity, and inclusivity of participation in MSE programs.
- Scope: Materials Discovery, Design and Synthesis; Condensed Matter and Materials Physics; Scattering and Instrumentation Sciences; Established Program to Stimulate Competitive Research (DOE EPSCoR)
- COV Chair: Frances Hellman (UC-Berkeley/LBNL)
- ~20 Panel Leads and Panelists being recruited
- Additional details in the MSE-COV Presentation at 1:15pm today

Discussion and Questions