

Committee of Visitors Report

Directorate for Engineering
Division of Chemical, Bioengineering,
Environmental,
and Transport Systems (CBET)

Committee of Visitors
April 22-23, 2015

Co-Chairs: Dr. Linda M. Abriola and
Dr. Mary Jane Hagenson

Committee

Linda Abriola	Tufts University
Mary Jane Hagenson*	Chevron Phillips Chemical Company, Retired
Gretchen Baier	The Dow Chemical Company
Kenneth Ball	George Mason University
Sue Ann Bidstrup-Allen	University of Pennsylvania
Christopher Bowman	University of Colorado
Jennifer Curtis	University of Florida
Joseph Freeman	Rutgers University
Peggy Johnson	Pennsylvania State University
Sharon Jones	University of Portland
Kimberly Ogden	University of Arizona
Concetta LaMarca	DuPont
Martine La Berge	Clemson University
Gintaras "Rex" Reklaitis	Purdue University
William Tumas	National Renewable Energy Laboratory
<u>Kyriacos Zygouraki</u>	<u>Rice University</u>

*NSF Engineering Advisory Committee Member

Reviews

➤ 13,008: Total number of CBET actions within review period, FYs 2012-2014

➤ 1,832 Awards*

➤ 8,508 Declinations*

➤ 163 Other

*Competitive Proposal Actions

➤ 2015 COV reviewed 322 actions

➤ 135 Awards

➤ 39 Supplement Awards

➤ 134 Declinations

➤ 14 Other

Overview of COV Findings

- CBET is holding to the gold standard of review as advanced by NSF
- CBET PDs and staff are well qualified
- Clear evidence that CBET staff and reviewers are diligent and responsible in conducting proposal reviews as fairly as possible
- CBET makes use of reviewers with appropriate expertise and qualifications
- CBET recognizes and resolves COI when appropriate and all protocols were followed

Overview of COV Findings – Page 2

- CBET maintains excellent response times despite large and increasing proposal load
- Good balance of awards across disciplines, geographies, institutional type, PI experience, and other demographic considerations
- Clear alignment of portfolio with major US and NSF initiatives
- The COV commends CBET for its efforts to explore future directions through workshops and other activities

Section I: Quality and Effectiveness of Merit Review Process

- ✓ The consensus of the COV is that the review methods are appropriate
- ✓ Intellectual Merit criterion is very well addressed
- ✓ The review outcome is well documented in most cases, especially for funded project
- Broader Impact would benefit from more explanation, description and clearer guidance
- More documentation is needed for proposals that were not funded to justify the decision and help PI
- Some EAGER proposals had funding up to \$200,000, raising a question of how they should be reviewed

Section II: Selection of Reviewers

- ✓ Reviewers selected have appropriate expertise and/or qualifications
- ✓ Each panel reflected breadth of experience, occasional use of non-academic reviewers, and mix of appropriate disciplines
- ✓ All protocols regarding COI were closely followed
- The COV concludes that the NSF has made considerable efforts to ensure a diverse make-up of the panels particularly relative to ethnicity and gender. The COV urges the NSF to continue to be inclusive in review panels and strive for diversity
- The majority of reviews are done by panels. The COV recommends that CBET review panel size and effectiveness. Streamlining and/or standardization?

Section III: Management of the Program Under Review

- ✓ CBET PDs do an outstanding job of getting proposals reviewed and decisions made in a timely manner despite growing workload
- ✓ Overall quality of reviews is good and funding decisions are consistent with reviews.
- ✓ There is no indication of bias or flaws in decision making process
- ✓ The single submission window has helped to streamline the process
- The COV notes that a key component of CBET's success is the pursuit of crosscutting research. PDs should be allowed considerable latitude in determining their research portfolio while being constantly alert to emerging and frontier areas

Section III: Continued

- Roughly 50% of CBET's PDs are rotating positions. The process for recruitment and mentoring of PDs was not clearly defined. CBET would benefit from enhanced procedures and documentation of this critical staffing process
- The COV noted that CBET has the highest proposal burden relative to the number of full time staff along with the lowest proposal funding rate within the Engineering Directorate
- This COV strongly recommends that CBET continues to develop and document a detailed strategic roadmap to guide portfolio management and program development

Section IV: Resulting Portfolio of Awards

- ✓ Good balance of awards across disciplines, geographies, institutional type, PI experience, and other demographic considerations
- ✓ More than 25% of awards go to new investigators – is this an intentional component of the funding model and is it sustainable going forward?
- ✓ Grants awarded to under-represented groups was low, but reflective of demographics.
- The COV recommends that CBET provide statistical analysis of the raw data so future COVs can better interpret awards based on various considerations

Section IV- Continued

- The 2015 COV recommends a re-assessment by CBET of the size and duration of awards. \$100K/year award is lower than average ENG or NSF award and has not kept pace with rising costs of academic research. Enough for transformative research?
- Proposed work was innovative and the program portfolio is diverse and addresses novel topics
- CBET is to be commended for initiating collaborative efforts with other national agencies, including EPRI and DOE to support multidisciplinary grants in key areas
- The COV recognizes that the CBET program is extremely relevant to national priorities and the NSF mission
- The COV commends CBET for sponsoring and funding 9 workshops aligned with national priorities.

Section V: Other Topics

- General lack of statistical analysis – data presented to COV was primarily raw data; not clear that CBET routinely analyzes and reports metrics of interest
- Need to develop both better methods to capture data from grant final reports and metrics to assess project success for both review criteria (intellectual merit and broader impacts) after completion
- CBET should assess progress and impact on integration of education with research. What does CBET see as the appropriate balance of effort and funds spent on these activities versus research?

Other Topics (continued)

- What role should early career awards play in the division?
How is the success of the CAREER program (and other special programs such as REU) defined and assessed? Program goals and metrics should be aligned.
- Are there other ways new researchers can be supported, e.g. small research initiation grants?
- Portfolio assessment process under development will be crucial to support of division planning and prioritization; current strategic planning and assessment process is organized primarily around budget planning and is effective but is an *ad hoc* process and should be formalized

Other Topics (continued)

- The same fundamental review process has been used for a long time, with the most recent variation being virtual panels. Given the large proposal burden, the COV suggests that CBET pilot new ways to select and fund projects.
- Not clear is the balance of “traditional” areas to “new areas”. Both are important. CBET should fund proposals that are innovative and have the potential for high impact, whether in a “traditional” area or a “new area”.

Business Continuity Planning

- Frequent turnover of rotator and other key staff creates an even greater need for documentation of policies and procedures which are critical to the organization's functioning
- The COV recommends that CBET establishment on-boarding documents/orientation check-list to familiarize new rotators/staff with CBET policies and procedures
- The COV also recommends that CBET review the current model for filling key position. Alternatives to rotator positions? Are there new ways to manage?
- The COV process would benefit from greater documentation as many participants are "new". Best practices should be shared across ENG and a standard developed.

Thank you!

Questions?