

Office of Basic Energy Sciences
GUIDE FOR PREPARATION OF
EFRC SCIENCE REVIEW DOCUMENTS

Background Information

In August 2009, the Office of Basic Energy Sciences (BES) in the U.S. Department of Energy's (DOE) Office of Science (SC) established 46 Energy Frontier Research Centers (EFRCs). The EFRCs seek to harness fundamental science and advanced discovery research in a concerted effort to establish the scientific foundation for a vital, new U.S. energy economy. The EFRCs represent unique collaborative models in which universities, national laboratories, non-profit organizations, and/or for-profit firms, work in partnership toward common goals. These multi-investigator Centers were established to conduct fundamental research focused on grand challenges of energy research and use-inspired research, integrating the talents and expertise of leading scientists in settings designed to accelerate the pace of research beyond that which has been previously practical. The EFRCs were selected by scientific peer review and were funded at \$2-5 million per year for a five-year initial award period.

This mid-term review, in the third year of the five-year award period, is intended to provide a critical assessment of the individual EFRCs' strategic vision, scientific plans and progress, and technical accomplishments. In addition to research progress and plans, the review will particularly focus on the evaluation of EFRC management, synergy, collaborative research, and communication mechanisms – factors that distinguish the EFRC Program from typical single (or small group) investigator projects. A specific aspect to be addressed is the development of unique, collaborative approaches to the research objectives and how the EFRC effort is “greater than the sum of its parts.”

External expert panelists and DOE staff will provide critical scientific and managerial expertise to address the review criteria below. Verbatim (but anonymous) reviewer comments will be provided to all Center Directors along with a review analysis and recommendations from DOE-BES. The EFRCs will be strongly encouraged to consider this input/feedback in implementing future Center directions and actions. Note: Reviewer comments and DOE-BES analysis and recommendations may be used in future EFRC funding decisions.

Review Document

This *Guide for Preparation of EFRC Science Review Documents* provides guidance for the preparation of EFRC Review Documents (RDs) to be used by BES for conducting independent, external, peer review in FY 2012. The RD is to be prepared and submitted to SC.EFRC@science.doe.gov a minimum of eight weeks prior to the scheduled review. In addition to use by the external review panel, these RDs may be used by headquarters for a variety of purposes including budget planning and formulation, in the renewal process, and as information for a Committee of Visitors (COV), an external committee that will audit the EFRC Program.

The BES will contact the EFRCs with the review date for a regionally-sited review and the exact date that the RDs are due to BES. The eight-week lead time between RD submission and site review provides sufficient time for BES to evaluate the documents for completeness, return these to the EFRC for correction if needed, and forward the RDs to the reviewers well in advance of the review. Please follow these guidelines for the preparation of RDs; corrections will be requested for major deviations

from the guidance. The goal is to have a review document that allows the reviewers to focus on the review criteria– not focus on missing or ill-prepared information.

Relationship of the Review Document to the EFRC Proposal

The RD will typically correspond one-to-one with the initial EFRC Proposal, as amended by budget reductions and justifications at the time of the award and/or by accepted Control Changes during the award period.

Evaluation Criteria

The formal merit review with peer evaluation will assess the following criteria based on the Financial Assistance Funding Opportunity Announcement for the Energy Frontier Research Centers (Funding Opportunity Number: DE-PS02-08ER15944). Note: The Evaluation Criteria have been organized to reflect the order required in the RDs; Both DOE/BES and the reviewers will most heavily weigh the Scientific and/or technical merit of the project followed by EFRC Management and Synergy, respectively.

1. *Reasonableness and appropriateness of the budget:* This assessment will focus on the appropriateness of distribution of the resources among the partners and research activities.
2. *EFRC management* - for example, the overall management structure including advisory committees and decision-making processes. *Note:* Management reviews of each of the EFRC sites were conducted during the second year of the EFRC Program. Individualized DOE feedback was provided to each Center. The peer-reviewers for this review will not have access to prior management review documents or BES recommendations. Their review will be a “fresh look” at the management of the Center. However, BES staff will examine and evaluate the progress of each Center’s management processes relative to the prior review.
3. *Scientific and/or technical merit of the project* - for example, the influence that the results might have on the direction, progress, and thinking in relevant scientific fields of research; the likelihood of achieving valuable results; and the scientific innovation and originality indicated in the proposed research.
 - a. Does the research lie at the forefront of one or more of the challenges described in the BESAC report *Directing Matter and Energy: Five Challenges for Science and the Imagination* (http://science.energy.gov/~media/bes/pdf/reports/files/gc_rpt.pdf)?
 - b. Does the EFRC address one or more of the energy challenges described in the BES workshop reports in the Basic Research Needs series (<http://science.energy.gov/bes/news-and-resources/reports/basic-research-needs/>) in an effective and impactful manner?
 - c. Does the Center present a balanced and comprehensive program of basic research that supports experimental, theoretical, and computational efforts (as needed) and develops new approaches in these areas?
 - d. How well is the Center overcoming key scientific challenges and shifting research directions in response to promising developments?
4. Are the elements of the proposed research appropriately integrated, coordinated, and synergistic? *Appropriateness of the methods and approaches* - for example, the logic and feasibility of the research approaches and the soundness of the research plan.
 - a. Are the means for achieving an integrated EFRC appropriate?
 - b. Does the EFRC have a comprehensive scientific and technical program for world-class research that encourages high-risk, high-reward research and synergy among

- investigators? Does the EFRC demonstrate that the whole is substantially greater than the sum of the individual parts?
- c. How effectively does the EFRC research relate to existing and planned research programs at the host institution and within DOE?
 - d. Are environmental, safety and health issues responsibly properly addressed?
 - e. If appropriate, are the EFRC's education, outreach and training programs suitable for establishing the next generation energy workforce?
 - f. If appropriate, are the plans for external collaborations and partnerships reasonable and appropriate?
5. *Synergism among the PIs in a program and the programmatic focus of a multi-PI effort*
- a. How effective is communication within the EFRC in establishing a unique center identity, reinforcing a compelling research direction, and encouraging participation of all participants?
 - b. How effective is communication to external (to the EFRC) audiences in strengthening our Nation's energy workforce, promoting energy-related scientific discoveries, and/or conveying an understanding of energy technologies and mitigating the environmental impacts of energy use?
6. *Utilization of unique facilities or capabilities* – for example DOE facilities (supercomputers, large particle accelerators, high-intensity x-ray light sources, neutron scattering sources, and facilities for nanoscience, plasma science, genomic sequencing, microbiology, and atmospheric monitoring) or EFRC instrumentation, etc.

Format of the Review Documents

The RDs must be readily legible when printed and must conform to the following requirements: the height of the letters must be no smaller than 11 point with at least 2 points of spacing between lines (leading); the type density must average no more than 17 characters per inch; the margins must be at least one-inch on all sides. Figures, charts, tables, figure legends, etc., may include type smaller than these requirements as long as they are still fully legible.

Number pages consecutively at the bottom of each page throughout the review document. Start each major section at the top of a new page with the section number and title, for example, "2. Table of Contents." Do not use unnumbered pages.

The RDs are to be submitted electronically as a pdf file with the following exceptions: a) Appendix A is to be submitted as an Excel file and b) Appendix B is to be submitted in a zipped folder containing pdf files of the publications.

Summary of Review Document Contents

1. Cover Page

The Cover Page should contain the following information:

Title of EFRC and abbreviation

Award number(s) corresponding to the proposed project

Name of lead institution

Name of Center Director

Position or title of Center Director

Mailing address of Center Director

Telephone of Center Director
E-mail address of Center Director
Budget for each year; Total request

2. Table of Contents

Provide the initial page number for each of the sections of the RD.

3. Participants and Budget Summary: Likely 1-2 pages

Include a summary table listing participating institutions. For each institution show the yearly funding (all 5 years) and list all key personnel/senior investigator(s). (Note: Key personnel/senior investigators will typically be staff beyond postdoctoral associates and does not include staff in technical support roles.) The sum of the institutional budgets should total to the EFRC allocated budget for each year. Detailed budget and staffing information should be added in Appendix A of the RD.

4. EFRC Vision and Management: Total length not to exceed 2 pages

Describe vision and objectives for the EFRC and the overall management structure including advisory committees and decision-making processes.

5. Description of Research Subtasks/Subprojects: Total length not to exceed 20 pages

- a. Building on the information in Section 4, describe the overall EFRC research objectives and/or goals and the breakdown of research subtasks or subprojects (as applicable). This section should be no longer than two (2) pages.
- b. Briefly sketch the background leading to the present proposal, critically evaluate existing knowledge (including references to the literature), and specifically identify the gaps that the project is intended to fill. State concisely the importance of the research. This section should be no longer than three (3) pages.
- c. Provide a brief description for each research subtask: 1) Briefly summarize the role and intellectual contribution of each key personnel/senior investigator in the subtask, and the resources available to accomplish the research goals. [Note that supporting letters are required from unpaid key personnel/senior investigators – these are described in Appendix C.] The need for a collaborative, synergistic approach involving several investigators and the means of achieving this should be clearly established. 2) Concisely describe the research progress to date. 3) Concisely describe the research planned for the balance of the award period. The total length of this section should be no longer than 15 pages.

6. Synergism and Programmatic Focus: Total length not to exceed 3 pages

Describe how the EFRC has established a unique center identity, ensured research focus, and encouraged participation of all participants. Describe internal (and, if appropriate, external) communication in the EFRC. Illustrate, by example, the synergisms in the center.

7. Utilization of Unique Facilities or Capabilities: Total length not to exceed 3 pages

Briefly describe the utilization of unique facilities or capabilities that have been used in the EFRC project. List the most important equipment items purchases for the project and their pertinent capabilities. Include this information for each subcontracting institution, if any. Describe any

shared facilities and infrastructure to be established, including specific major instrumentation, and plans for the development of instrumentation.

8. List of Publications from EFRC Support –

Provide a list of complete citations (i.e., include titles and all co-author names) for publications that were supported by the EFRC. Publications that are not supported by this EFRC should **NOT** be included in this list. The publication list should be divided into two categories: (a) publications that were solely supported by the EFRC and (b) collaborative publications supported by the EFRC and other programs or agencies. In the case of collaborative publications, include a brief delineation of the efforts of each program/agency if this does not already appear in the acknowledgements of the publication.

Note: For this listing, the use of a multi-user facility (e.g., use of facilities funded by BES, MRI, CRIF-MU, MRSEC, IMR-MIP, etc.) should be included, with proper acknowledgement, in section 8.a. as a solely-supported EFRC publication, unless the user facility staff were research participants beyond the “normal” range of engagement of user facility staff in the research.

Provide copies of the ten (10) “best” peer-reviewed, journal publications in Appendix B of the RD. This may include publications that have the most scientific impact, best demonstrate collaboration or new facilities, etc. Up to five (5) of these ten publications may be accepted or in-press manuscripts.

9. Biographical Sketches of Key Personnel/Senior Investigators

Biographies, limited to 2 pages per investigator, are required for key personnel/senior investigators funded by the research, including those at subcontracting institutions. Provide concise vitae, listing professional and academic essentials and complete contact information. Include a list of up to ten publications that are most pertinent to the EFRC research project. Each biographical sketch should also include the following information on collaborators and other affiliations to help identify potential conflicts or bias in the selection of reviewers:

Collaborators from Other Institutions: A list of all persons in alphabetical order (including their current organizational affiliations) who are or have been active collaborators or co-authors with the individual on a project, book, article, report, abstract or paper during the *48 months* preceding the date of the review. Do NOT include collaborators at the individual’s home institution or any laboratory/institution that is funded by the EFRC. If there are no collaborators, this should be so indicated.

Graduate and Postdoctoral Advisors: A list of the names of the individual’s own graduate advisor(s) and principal postdoctoral sponsor(s), and their current organizational affiliations.

Thesis Advisor and Postgraduate-Scholar Sponsor: A list of all persons (including their organizational affiliations), over the last five years with whom the individual has had an association as thesis advisor or postgraduate-scholar sponsor. The total number of graduate students advised and postdoctoral scholars sponsored also must be identified.

10. Current and Pending Support for Key Personnel/Senior Investigators

Information on active and pending other support is required for each key personnel/senior investigator, including staff at collaborating institutions that are funded by subcontract. Include EFRC and all other support, whether Federal, non-Federal, commercial or institutional, available in direct support of an individual's research endeavors.

Please enter the EFRC senior investigator's name in the "Investigator" box for each award listed on the Current and Pending Support form. If another investigator is the lead PI on the grant, please put the lead PI's last name in parentheses after the EFRC senior investigators name in the same "Investigator" box.

For each item of other support, give the organization or agency, inclusive dates of the project or proposed project, average annual funding, level of effort devoted to the project, and a short description of the research including an explanation of synergies and overlaps between the described project and your EFRC research.

For laboratory staff, if support described does not total 1.0 FTE, an explanation should be provided. For staff employed as university faculty, explanations should be provided for support beyond normal summer-month levels.

Use the attached Current and Pending Support form (the last 2 pages of this guidance document), copying as necessary.

11. Appendices

A. Detailed Staffing and Budget Tables

Fill out the enclosed Staffing and Budget Tables using the **Instructions given on the first tab of the workbook**. There are six tabs to be completed: EFRC Sr. Investigators, Staff and Students, Graduate Degrees Earned, Advisory Group(s) members, Management & Task Budgets, and Operational & Equipment Budgets. (Submit as a separate EXCEL file)

B. Copies of Journal Publications: Provide copies of the ten (10) "best" peer-reviewed, journal publications. This may include publications that have the highest scientific impact, best demonstrate collaboration or new facilities, etc. Up to five (5) of these may be accepted or in-press manuscripts. (Submit as individual pdf files, in a zipped folder if possible)

C. Letters of Commitment from Unfunded Key Personnel/Senior Investigators or Institutions providing material support to the Center at no cost: Provide letters of commitment for investigators listed in 5.c. that are not funded through the EFRC. Also, provide letters from institutions that are providing in kind or similar support. Note: Letters of Commitment are to be kept to a minimum and must specify the role of the unfunded collaborator (e.g., to provide catalysts for testing, donated equipment, to enable microscopic analysis, etc.). Do not include non-specific letters of support or letters of general endorsement. It is not required that the letters of commitment be recently dated (i.e., they may be from the initial proposal).

D. Cost Sharing Agreements: If cost sharing is part of the support for the Center's activities, include a letter from each third party contributing support to the operation of the Center (including the host organization for the EFRC). The letter must state that the third party is committed to providing a specific dollar amount of cost sharing, what activities have been/will be supported by the cost share, and the time period for the commitment.

09/14/2011 Revision: Updating of instructions and form for current and pending support.

Current and Pending Support*

Support information is required for each key personnel / senior investigator, including persons at collaborating institutions funded through subcontracts. All financial resources (Federal, non-Federal, commercial, or institutional) should be included. A separate entry should be included for each grant, FWP, or other source of support for the PI.

Please enter the EFRC senior investigator's name in the "Investigator" box for each award listed on the Current and Pending Support form. If another investigator is the lead PI on the grant, please put the lead PI's last name in parentheses after the EFRC senior investigator's name in the same "Investigator" box.

Provide a brief paragraph on each research project including a few sentences on the synergies and/or overlaps between the project and the EFRC award.

For laboratory staff, if support does not total 12 person-months, an explanation should be provided. For university faculty, explanations should be provided for support beyond normal summer-month levels.

Copy the table below and add additional sheets as necessary. *This form has been modified from NSF 00form1239.

Investigator:	Other Agencies to which this proposal has been/will be submitted:
Support (<u>C</u> urrent, <u>P</u> ending, <u>S</u> ubmission Planned in Future or <u>T</u> ransfer of Support):	
Project/Proposal Title and grant number, if appropriate:	
Source of Support:	Location of Project:
Annual Award Amount: \$	Total Award Period:
Annual Award Amount to PI's Research: \$	
Describe Research Including Synergies and/or Overlaps with EFRC Award:	
Person-Months Per Year Committed to Project: ____ Pers. Months; Specify: <u>C</u> al., <u>A</u> cad., or <u>S</u> umr:	

Investigator:	Other Agencies to which this proposal has been/will be submitted:
Support (<u>C</u> urrent, <u>P</u> ending, <u>S</u> ubmission Planned in Future or <u>T</u> ransfer of Support):	
Project/Proposal Title and grant number, if appropriate:	
Source of Support:	Location of Project:
Annual Award Amount: \$	Total Award Period:
Annual Award Amount to PI's Research: \$	
Describe Research Including Synergies and/or Overlaps with EFRC Award:	
Person-Months Per Year Committed to Project: ____ Pers. Months; Specify: <u>C</u> al., <u>A</u> cad., or <u>S</u> umr:	

Investigator:	Other Agencies to which this proposal has been/will be submitted:
Support (<u>C</u> urrent, <u>P</u> ending, <u>S</u> ubmission Planned in Future or <u>T</u> ransfer of Support):	
Project/Proposal Title and grant number, if appropriate:	
Source of Support:	Location of Project:
Annual Award Amount: \$	Total Award Period:
Annual Award Amount to PI's Research: \$	
Describe Research Including Synergies and/or Overlaps with EFRC Award:	
Person-Months Per Year Committed to Project: ____ Pers. Months; Specify: <u>C</u> al., <u>A</u> cad., or <u>S</u> umr:	

Investigator:	Other Agencies to which this proposal has been/will be submitted:
Support (<u>C</u> urrent, <u>P</u> ending, <u>S</u> ubmission Planned in Future or <u>T</u> ransfer of Support):	
Project/Proposal Title and grant number, if appropriate:	
Source of Support:	Location of Project:
Annual Award Amount: \$	Total Award Period:
Annual Award Amount to PI's Research: \$	
Describe Research Including Synergies and/or Overlaps with EFRC Award:	
Person-Months Per Year Committed to Project: ____ Pers. Months; Specify: <u>C</u> al., <u>A</u> cad., or <u>S</u> umr:	