



Department of Energy
Office of Science
Washington, DC 20585

30 November 2018

Dr. Donald Rej
Chair, Fusion Energy Sciences Advisory Committee
Program Director, Office of Science Programs at LANL
Los Alamos National Laboratory, MS-A121
Los Alamos, NM 87545

Dear Dr. Rej:

This letter requests that the Fusion Energy Sciences Advisory Committee (FESAC) undertake a new long-range strategic planning activity for the Fusion Energy Sciences (FES) program. The strategic planning activity—to encompass the entire FES research portfolio (namely, burning plasma science and discovery plasma science)—should identify and prioritize the research required to advance both the scientific foundation needed to develop a fusion energy source, as well as the broader FES mission to steward plasma science.

In developing recommendations within this long-range strategic planning activity, FESAC should take into account the following aspects:

- Identifying specific research areas, across the entire FES portfolio, in which the U.S. should establish or enhance global leadership.
- Maintaining a healthy and flexible program, which incorporates the roles and contributions of universities, national laboratories, and industry, to deliver science results throughout the next decade.
- Maintaining, upgrading, and/or pivoting current small-, mid-, and large-scale facilities, including DIII-D and NSTX-U, and also initiating new experiments/facilities/projects.
- Identifying international collaborative opportunities or partnerships that can give U.S. scientists access to devices outside of the U.S. with unique capabilities.
- Providing support for private-public partnership ventures.
- Positioning the U.S. to obtain maximum benefits in the ITER burning plasma science era.
- Considering the future budgetary constraints described below, as well as the technical readiness and feasibility for any activity to proceed.

Your report should provide recommendations on the priorities for an optimized FES program over the next ten years (FY 2022-2031) under the following three scenarios with the FY 2019 enacted budget for the FES program as the baseline:

- Constant level of effort (defined as the published OMB inflators for FY 2022-2031)
- Modest growth (use 2% above the published OMB inflators)
- Unconstrained budget: For this scenario, please list, in priority order, specific activities (beyond those mentioned in the previous budget scenarios) that are needed to achieve and maintain a leadership position addressing the scientific opportunities identified by the community.



Within each of the three scenarios, assume that the U.S. Contributions to ITER project will continue through this entire period.

You should consider these three budget scenarios as an opportunity to identify priorities and make high-level recommendations. The activities that you recommend should be (to some significant extent) implementable under reasonable budgetary and programmatic assumptions. At the same time, the budget scenarios should not drive the prioritization to the degree that research/projects are promoted solely for their ability to fit within an assumed profile.

The FESAC report should articulate the scientific opportunities that can and cannot be pursued, as well as the approximate overall level of support needed in the FES program to pursue these opportunities within the various funding scenarios identified above.

The FESAC activity in addressing this charge should commence after the completion of community-led activities to provide broad input to this long-range planning. This two-phase approach for long-range planning is similar to that used by both the High Energy Physics program and also the Nuclear Physics program within the DOE Office of Science.

For the first phase, we have asked the American Physical Society's Division of Plasma Physics (DPP) to lead with the organization of community-led activities (such as discussions, town halls, workshops, and any other forums it chooses). We want the community to be actively involved in this long-term planning process. We are grateful that the DPP leadership is willing to provide this valuable sponsorship of the community-driven first phase.

The second phase of the process involves this charge to FESAC. Although this charge will be discussed at the December 6 and 7 FESAC meeting, no FESAC subcommittee to address the charge will be formed at that time. Toward the end of the community's process to develop its important input for planning, a FESAC subcommittee shall be formed to carry out the work of developing the long-range plan.

We would appreciate receiving the report from FESAC by December 2020, if possible. We understand that this is a challenging task; however, your considerations of these issues will be essential input to DOE planning. Please let us know if there is anything we can do to help you in this process.

Sincerely,



J. Stephen Binkley
Deputy Director for Science Programs
Office of Science