Long Range Strategic Planning
Phase 1: Community Input

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DPP

FESAC Charge from Dr. Binkley

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.

FESAC Charge from Dr. Binkley

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.

PLASMA 2020 CHARGE (DIFFERENCES FROM FESAC PROCESS)

As part of the Physics 2020 decadal assessment and outlook for physics, the National Academies of Sciences, Engineering, and Medicine will conduct a study of the past progress and future promise of plasma science and technology and provide recommendations to balance the objectives of the field in a sustainable and healthy manner over the long term. Specifically, the study committee will:

1. Engage stakeholders in government, the plasma sciences communities, and industry to collect perspectives on the major achievements and challenges of the past decade and the most exciting and promising areas of plasma research anticipated for the next 10 years, as well as how plasma research impacts and is impacted by adjacent areas of science and technology.
2. Assess the progress and achievements of plasma science over the past decade.
3. Identify and articulate the major scientific questions and new opportunities that define plasma science as a discipline, noting connections to and the influence on other disciplines.
4. Discuss the nature and importance of the U.S. role in multi-national plasma research activities.
5. Assess the scope of international research across the breadth of plasma science and discuss the relative standing of U.S. activities.
6. Discuss how plasma science has contributed and will likely contribute to U.S. national needs both in and beyond plasma science, including workforce development, economic prosperity, national defense, and other applications.
7. Assess whether the present plasma science workforce and training opportunities are commensurate with future workforce needs.
8. Assess and comment on the present role of, and future opportunities for, universities within large national programs organized around major research instruments or community assets (i.e., user facilities, satellites, telescopes, etc.).
9. Assess whether the structure, program balance, and level of the current U.S. research effort in plasma science across the federal and private efforts are best positioned to realize the science opportunities.

The study committee's recommendations should not alter recommendations from the Decadal Strategy for Solar and Space Physics, the mid-decadal assessment of that report, or the ongoing study on Strategic Plan for U.S. Burning Plasma Research. The committee may make recommendations or offer comments on organizational structure, program balance, and funding, as appropriate, with discussion of the evidentiary bases.

DPP

We are not Exactly the "P-7" Process

- Our charge is to organize the community input by selecting and working with a larger "program committee" from the community.
- FESAC has the ultimate responsibility for setting priorities within the 3 budget scenarios.
- Fundamentally, we see our charge as getting as far as possible in coordinating a transparent community response to the issue of the strategic future of the OFES portfolio (Burning Plasmas and Discovery Plasma Science). By "far as possible" we mean to identify scientific and/or programmatic objectives, prioritize them as much as feasible in an open, community-driven process, and if possible, develop budgetary values that are realistic for different objectives.

What is the Current Plan for Gathering Input

Step 1 – Review the Processes used by High Energy Physics Program at DoE (P5) and the Nuclear Physics Program at DoE

Met with **Andy Lankford** (P5 process)

A. P5 was fundamentally a 2-step process with community input widely acquired in a transparent phase-1process and the entire community had input into identification of scientific priorities and goals.
B. 2nd stage, priority setting was accomplished by a sub-committee of FPAP (the equivalent to FESAC)
C. Phase 1 culminated with a week-long “Snowmass” process in Minnesota – 300 participants.
D. Information gathering was organized into sub-areas with co-leaders and smaller working groups.
E. Process generated a hierarchy of documents: white papers -> concise reports -> summary of summaries -> final report. Facilitated by science writer.
F. Process was facilitated by an ongoing process of concept development (CD0) that is part of the HEP community culture.
G. Goal was a 10 year plan with a 20 year vision.
H. Key result was a credible, budget-realistic plan.

What is the Current Plan for Gathering Input

Step 1 – Review the Processes used by High Energy Physics Program at DoE (P5) and the Nuclear Physics Program at DoE

Met with **Don Geesaman** (Division of Nuclear Physics)

A. Extensive history of priority setting in the community with demonstrated success in getting buy-in from federal agencies.
B. Divided community into 5-6 subfields with additional cross-cutting activities workshops on high performance computing, education and workforce, etc.
C. Town hall style meetings, typically 3 days long.
D. Completed workshops in late summer and fall.
E. Key point was that existing projects that “stayed” had to appear as priorities in the strategic plan – this level of internal community consistency was critically important.
F. Major labs have a tradition of developing ongoing CD0 level project concepts.
G. For budget analyses, employed specific cost estimated committees.
H. Document development was white papers from the community -> recommendations -> NSAC panel

What is the Current Plan for Gathering Input

Step 2 – Integrate existing/ongoing strategic planning processes into the input process for this process. A key goal is that this process result in an output that is consistent/coordinated with the other similar activities underway.

1. Recent NAS Burning Plasma Study
2. Community workshop materials developed in response to the NAS Burning Plasma Study
3. Plasma 2020 Decadal Study
4. NSF Workshop on Mid and Large Scale Plasma Physics Projects (May 21-22)
5. Recent High Energy Density Physics self-studies.
6. Recent NAS Report “Opportunities in Intense Ultrafast Lasers: Reaching for the Brightest Light” that has precipated development of LaserNet within OFES.

What Questions will the P-7 Group Pose for the Various Committees that Will be Gathering Data and Making Recommendations?

1. Much too soon in our process to quantitatively address this question.

2. Look to the P5 and NSAC processes for guidance, e.g., “what are the scientific opportunities for the subfields” and “what are cross-cutting issues within the field and across to other fields?”

3. Look to the FESAC charge for specific issues to highlight.

How Will Under-Represented or Under-Emphasized Areas as Indicated by P-7 Membership (that is, areas other than fusion) be Proactively Included in the Process?

1. The OFES budget is 80% fusion. 3 of 7 members of our committee have specific strengths in non-fusion areas.

2. This committee is not “P-7,” our charge is to work with the wider program committee to develop and craft the community’s response to the request from Dr. Binkley.

3. The identification of “sub-fields” and cross-cutting activities will actively highlight non-MFE aspects of the portfolio.

How Would P-7 Like to Coordinate with Plasma 2020 for Gathering Input?

1. Extensively.
2. Transparently.
3. Synergistically.
4. From the very beginning we would like to incorporate the Plasma 2020 process into our own plans, minimize duplication and time investments of community members, and have an output that is “coherent” (a quote from the undersecretary) with Plasma 2020.

Will Your Information Gathering be Made Public in Real Time?

1. We do not, at this time, plan to provide global access to internal email exchanges.
2. We intend to live-stream any workshops, etc. that are implemented.
3. We intend to provide global access to all summary documents, white papers, and summary reports as they are developed.
4. Limited resources are available for most of these activities we will minimize costs wherever possible.

What do we Need from Plasma 2020

1. A detailed understanding of your timelines and process (are you organized around major sub-disciplines within plasma and applications, like fusion, processing, etc. How will you include/address MFE).

2. Points of contacts for individual sub-fields to coordinate information gathering.

3. A willingness to potentially combine community activities to minimize community fatigue.

4. Participation of Plasma 2020 committee members in community workshop activities

5. One (or more) Plasma 2020 members to serve on the P-7 Program Committee