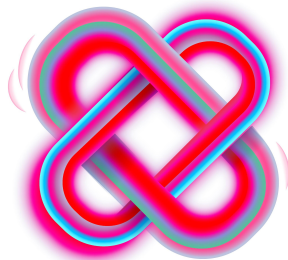


# FESAC Decadal Plan Subcommittee Update



FESAC Meeting 4/30/24

# Thank you! FESAC DP Committee members

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Troy Carter  
(UCLA)  
Chair



Tammy Ma  
(LLNL) Vice-Chair



Arianna Gleason  
(SLAC)



Brenda Garcia-Diaz  
(SRNL)



Brian Grierson  
(GA)



Carmen Menoni  
(CSU)



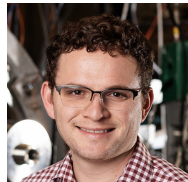
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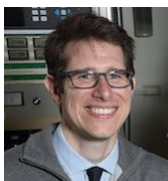
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Ex-officio:



Anne White  
(MIT)



Brian Wirth  
(UTK)



Carlos Paz-Soldan  
(Columbia)



Sam Barish  
(DOE Liason)



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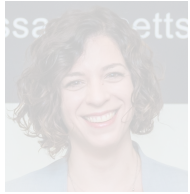
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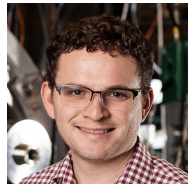
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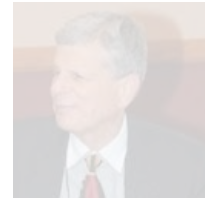
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# FESAC LRP Subcommittee, CPP Leadership, NASEM21



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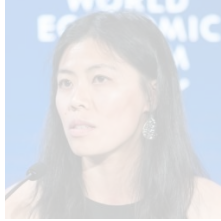
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# University Participants



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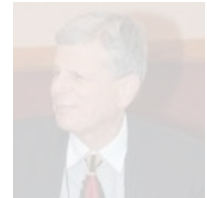
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# National Lab Participants



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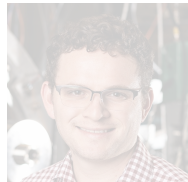
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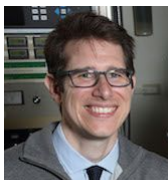
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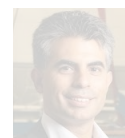
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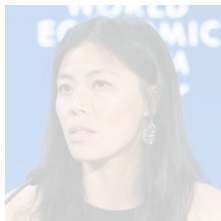
Sam Barish  
(DOE Liason)



# Industry Participants



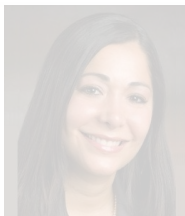
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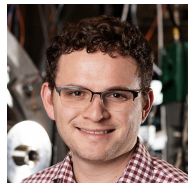
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# Charge to FESAC DP Subcommittee

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**Department of Energy**  
Office of Science  
Washington, DC 20585

**Office of the Director**

November 16, 2023

Professor Anne White  
Associate Provost and Associate Vice President for Research Administration  
School of Engineering Distinguished Professor of Engineering  
Department of Nuclear Science and Engineering  
Massachusetts Institute of Technology  
77 Massachusetts Avenue, 24-107  
Cambridge, Massachusetts 02139

Dear Professor White:

The 2020 report of the Fusion Energy Sciences Advisory Committee (FESAC) Long-Range Plan (LRP) “Powering the Future: Fusion & Plasmas” states in its Executive Summary that *“Now is the time to move aggressively toward the deployment of fusion energy which could substantially power modern society while mitigating climate*

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## Charge language I: “Alignment”

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“...**We are therefore asking FESAC to form a subcommittee to re-assess the program elements and their alignment with the FESAC LRP science drivers and the BDV**, within the four major categories of the FES budget structure...”



## Charge language I: “Alignment”

---

**“...We are therefore asking FESAC to form a subcommittee to re-assess the program elements and their alignment with the FESAC LRP science drivers and the BDV, within the four major categories of the FES budget structure...”**

- In our work in assessing alignment with the White House’s Bold Decadal Vision for Commercial Fusion, we are using the NASEM “Bringing Fusion to the US Grid” report as the embodiment of the BDV



## Charge language I: “Alignment”

---

**“...We are therefore asking FESAC to form a subcommittee to re-assess the program elements and their alignment with the FESAC LRP science drivers and the BDV, within the four major categories of the FES budget structure...**

**...identify opportunities or current plans to contribute to the FESAC LRP FM&T and fusion plasma science gaps establishing the basis of an FPP in the context of the BDV, taking into consideration the diversity in FPP concepts represented in the Milestone Program awardees. In particular, identify a scope that will address near-term scientific and technological gaps impacting the design and construction of an FPP on the pathway to commercialization within the timeframe of the BDV. For the scope within a program element that is not identified as critical to support the LRP Science Drivers or the BDV, identify specific elements that can be deferred with minimal or modest impact on the FES Program to enable redirection in support of the LRP FM&T gaps and the BDV. Identify the program elements that need to be increased to meet the goals of the LRP FM&T gaps establishing the basis of an FPP in the context of the BDV and those that can be decreased.”**



## Charge language I: “Alignment”, continued

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Some FES program elements are excluded:

“The following program elements will not be part of the requested assessment: United States (U.S) **Contributions to ITER project**, Artificial Intelligence/Machine Learning, **Material Plasma Exposure eXperiment project**, **Matter in Extreme Conditions – Upgrade project**, Quantum Information Science, Advanced Microelectronics, Advanced Manufacturing, Reaching a New Energy Science Workforce, Funding for Accelerated Inclusive Research, Accelerate Innovations in Emerging Technologies (Accelerate), Established Program to Stimulate Competitive Research, General Plant Projects/General Purpose Equipment/Infrastructure, and Other Research.”



## Charge language II: “Role of the public sector”

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**“In addition, the subcommittee should identify the role of the public sector and the FES user facilities (National Spherical Torus Experiment - Upgrade and [DIII-D]) in addressing the FM&T gaps and advancing commercial fusion applications going forward.**

**Throughout the process, please take the full FESAC LRP into account and consider sustainable support for foundational research as synergies between discovery plasma science and fusion energy development (e.g., spin-off plasma technology applications from fusion) are valued.”**



## Charge language: Overarching considerations

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**“In your deliberations, you should consider the impact of your recommendations on workforce continuity, diversity of the workforce, and continuing U.S. leadership in fusion and plasma science. Your assessment should be informed by the APS/DPP Community Planning Process report, FESAC LRP, NASEM report, objectives of the Administration’s BDV, and recent workshop reports and community reports. We would appreciate receiving a final written report from FESAC by Fall 2024.”**



## Subcommittee has already been hard at work

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- First meeting after subcommittee approval: March 7, meeting ~weekly since then
- Have already had some guests to subcommittee meetings (JP Allain, Scott Hsu)
- Focus of work so far has been:
  - ◆ Understanding the charge language (with input from DOE)
  - ◆ Developing plan to address the charge
  - ◆ Agreeing on community communications/request for input (just went out)
  - ◆ Starting work on “alignment” portion of the charge



# Our understanding of the charge/plan of attack I: Alignment

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An important part of the FESAC Decadal Plan charge is to address the alignment of the current DOE Fusion Energy Sciences program to the FESAC Long Range Plan (LRP) and the White House's Bold Decadal Vision for Commercial Fusion Energy (BDV), which is embodied by the NASEM “Bringing Fusion to the US Grid Report.

Charge language specifies that the subcommittee is to focus on existing research programs and facilities operations (and not current facilities construction or potential future facilities).





# Our understanding of the charge/plan of attack I: Alignment

The community has already put tremendous effort into developing the Community Planning Process (CPP) Report and the FESAC LRP. The DP Subcommittee feels that these reports, along with other recent community-led reports, provide ample guidance to answer the charge questions pertaining to the alignment of the current FES research program. *So we are not planning to ask for additional input at this time to address this piece of the charge.* Note that input to our process includes the FESAC Facilities Construction Projects report (and all community input to that report)





## Our understanding of the charge/plan of attack II: Role of the public sector

---

However, there is another piece of the charge that we feel calls for new input from the community, this is the “Role of the public sector” piece:

**“In addition, the subcommittee should identify the role of the public sector ... in addressing the FM&T gaps and advancing commercial fusion applications going forward ... consider sustainable support for foundational research as synergies between discovery plasma science and fusion energy development ...”**



# Our understanding of the charge/plan of attack II: Role of the public sector

---

However, there is another piece of the charge that we feel calls for new input from the community, this is the “Role of the public sector” piece:

**“In addition, the subcommittee should identify the role of the public sector ... in addressing the FM&T gaps and advancing commercial fusion applications going forward ... consider sustainable support for foundational research as synergies between discovery plasma science and fusion energy development ...”**

Since the FESAC LRP and NASEM reports were completed, there has been a significant change in the fusion energy landscape; in particular private investment in fusion has more than tripled to over \$6B. We view this part of the charge as an opportunity to provide input to DOE on the role of the public program in this context and on possible new public-private partnership mechanisms. We also recognize the chance to call out new synergies and opportunities for interactions between fusion science and technology R&D and broader plasma science and technology R&D.



# Request for Fusion R&D community input

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We are requesting two kinds of input:

1. We are planning to bring guests to talk with the subcommittee on relevant topics (e.g. Private-Public Partnership (PPP) activities in other sectors). We welcome suggestions for speakers/guests.
2. Concise (< 5 pages) white papers addressing this piece of the charge are welcome, including proposals for new PPP mechanisms, proposals for approaches for better coupling between the private and public efforts, and opportunities for synergies with fundamental and applied plasma science. We would appreciate receiving any white papers by May 31.

Please keep white paper input focused on answering the questions raised in the DP charge to FESAC, specifically the second quoted section above (as we are not seeking input at this time on the first quoted section on alignment).



<https://sites.google.com/view/fesacdpsubcommittee/home>

**FESAC DP Subcommittee...**

- Home
- Resources
- Community Input
- Members

## FESAC Decadal Plan Subcommittee

**Members**  
List of subcommittee members

**Community Input**  
Links to provide input to committee; we will also f submitted white papers f





## Next steps

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- Breaking into groups to perform “alignment” work – based on FY24 enacted FES budget
  - Will ask FES PMs to present current programs, help us answer the charge (what is aligned?)
  - Reserve the right to reach out to program performers, but not planning to do this at the moment (want to be fair/equitable if we do this; it will be hard to pick only subset of PIs to hear from)
- Continue work on Zoom, but planning in-person meeting in late June (goal is to have made good progress on alignment work, start process of generating consensus recommendations on this topic)
- Summer work: Invite speakers based on input; consider white paper input
- Want to finish report ASAP, don't want to delay work to generate S&T Roadmap, changes to FES programs that are awaiting this input