Path Forward after the White House Fusion Summit

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White House Summit announced U.S. ambition to demonstrate the feasibility of commercial fusion energy on a decadal timescale

- Game-changing innovations like fusion can help the world get to net zero, and ensure U.S. energy security and technological leadership
- Celebrated decades of progress and recent major achievements enabled by sustained bipartisan support
- Fusion can distinguish itself as an energy technology by engaging society starting right now in support of energy justice and building a diverse workforce that looks like and benefits all of America
- Heard from the ambitious fusion private sector on how they are working to deliver fusion as a globally scalable, carbon-free energy source on a timescale that matters
Bold decadal vision aims to enable...

- **2020s**
  - Net energy gain

- **2030s**
  - Pilot plant(s) & FOAK(s)
  - Materials, fuel cycle, and enabling technologies

- **2040s**
  - Aggressive commercial deployment

Clear the path to commercialization
Growth of private funding enables this opportunity

Plot credit: Sam Wurzel, Technology-to-Market Advisor, ARPA-E
Our strategy is guided by key recommendations from the NASEM report *Bringing Fusion to the U.S. Grid (2021)*

- **To ensure US leadership and impact the transition to net-zero by 2050, DOE and the private sector should demonstrate net electricity in a fusion pilot plant in the 2035–2040 timeframe**
  - White House Summit declared ambition to accelerate this to the early 2030s
- **DOE should move forward now via public-private partnerships to develop and bring fusion to commercial viability**
  - First step is a milestone-based fusion-development program to be launched as soon as possible using enacted FY22 appropriations
- **Urgent investments by DOE and private industry are needed to resolve the remaining S&T issues to realize a fusion pilot plant**
  - We are working to build support to realize at least one FPP on a decadal timescale, in partnership with the private sector
We will pursue the highest priorities from the FESAC Long-Range Plan within requested and appropriated budgets

- Fusion prototypic neutron source (FPNS)
- Design capabilities for fusion pilot plants
- New R&D opportunities aligned with the three science drivers
  - Sustaining a burning plasma (predictive capability for plasma core)
  - Engineering for extreme conditions (including materials and heat-exhaust solutions)
  - Harnessing fusion power (including tritium fuel cycle)
- Explore ways to accelerate fusion RD&D broadly via public-private partnerships
We are drawing from the experiences and models of successful public-private partnerships, and considering RFI responses.
Our plans are well aligned with enacted legislation

- **Energy Act of 2020, Sec. 2008 Fusion Energy Research**
  - The Director shall carry out a fusion energy sciences research and enabling technology development program to effectively address ... challenges to building a cost-effective fusion power plant and to support the development of a competitive fusion power industry in the U.S.
  - The Secretary shall establish ..., a milestone-based fusion development program... that will enable the construction of new full-scale fusion systems capable of demonstrating significant improvements..., as defined by the Secretary, within 10 years...

- **FY2022 Appropriations Act, Division D, Energy and Water Development and Related Agencies**
  - The Department is directed to follow and embrace the recommendations of the [FESAC long-range plan] *Powering the Future*
  - The agreement reiterates House direction on the Milestone-Based Development Program...

- **Considering/prioritizing other elements from the Energy Act of 2020**
DOE Workshop on Fusion Energy Development via Public-Private Partnerships

June 1 - 3, 2022
Capital Hilton, 1001 16th Street NW, Washington, DC

Hosted by the Office of the Under Secretary for Science and Innovation

Sponsored by the Office of Science

• Bring together technical R&D and commercialization stakeholders to provide input on next steps:
  – Broader decadal needs to “clear the path to commercialization” including possible policy/legislative actions
  – Aligning public- and private-sector fusion R&D activities
  – Milestone-based fusion-development program in partnership with the private sector
We will soon kick off a new Fusion Crosscut Team

- Led by Scott Hsu, with FES AD (James Van Dam) and ARPA-E Fusion T2M Advisor (Sam Wurzel) as co-chairs
- Other offices represented as founding members
  - NNSA (NA-113 Inertial Confinement Fusion)
  - SC BES and ASCR
  - Nuclear Energy (NE)
  - Economic Impact and Diversity (ED)
  - Savannah River Site Office/Environmental Management (EM)
- Possible additional offices to invite as fusion development progresses
  - OTT, OCED
  - NNSA NA-20 (nonproliferation)
  - CESER
Immediate priorities

- Milestone-based fusion-development program
  - Enabling use of Other Transactions (OT) authority for desired flexibilities
- Launch fusion crosscut to develop DOE-wide strategy
- FY24 budget request
- Sustainable programmatic models for labs and universities to contribute to FPP RD&D in partnership with the private sector
- DEIA and EJ initiatives
- External partnerships for “clearing the path to commercialization”
Q&A