

Congress of the United States
Washington, DC 20515

January 23, 2023

The Honorable Joseph R. Biden
President of the United States
The White House
1600 Pennsylvania Avenue, NW
Washington, D.C. 20500

Dear Mr. President,

We want to thank you again for coming to Watsonville, California, last week during the recent flooding disasters. We also appreciated our discussion about the promise of fusion power, and we were very excited to hear you agree that the Department of Energy's fusion programs should be fully funded to their authorized levels. As we stood on the tarmac in Watsonville, surrounded by catastrophic flooding, it was incredibly encouraging to hear the chief executive embrace the promise of fusion power and its potential to serve as an enduring solution to the climate crisis.

Consistent with our discussion, as you work to complete the Budget Request for Fiscal Year (FY) 2024, we strongly urge you to include \$1.044 billion for the Fusion Energy Sciences program within the Department of Energy's Office of Science. And this should be part of a request for \$9.54 billion for the DOE Office of Science overall. These levels of funding are consistent with fully funding the levels authorized in the landmark, bipartisan *CHIPS and Science Act* that you signed into law in August.

This is also consistent with the findings and recommendations conveyed in a White House Summit held on March 17th, 2022, in which the Administration announced the development of a *Bold Decadal Vision for Commercial Fusion Energy*, and expert discussions highlighted the progress and potential benefits of improved support for fusion R&D.¹ Secretary Granholm, Office of Science and Technology Policy (OSTP) Acting Director Alondra Nelson, Council on Environmental Quality (CEQ) Director Brenda Mallory, and National Climate Advisor Gina McCarthy all spoke on these benefits and substantial progress at this event.

¹ <https://www.whitehouse.gov/ostp/news-updates/2022/04/19/readout-of-the-white-house-summit-on-developing-a-bold-decadal-vision-for-commercial-fusion-energy/>

The summit agenda built off significant reports released in February 2021 by the Fusion Energy Sciences Advisory Committee² and the National Academies³ that represented a broad community consensus on the next steps necessary for fusion research to achieve the ultimate goal of a commercially viable power plant. The event was also spurred by several major breakthroughs in fusion made by government laboratories, universities, and the private sector, in the U.S. and overseas, over the previous year.

Past budgets have not fully funded the Department's fusion programs to authorized levels. Yet the recent breakthroughs in fusion research warrant increased support. In an announcement on November 18, 2022, OSTP included fusion on its list of five initial focus areas to launch the Administration's new Net-Zero Game Changers Initiative.⁴ And most recently, on December 13, 2022, DOE announced that the National Ignition Facility (NIF) achieved fusion ignition in an event in which Secretary Granholm and OSTP Director Arati Prabhakar provided thoughtful remarks on the significance of this achievement to the future of clean energy. We think that there is more than ample justification for the Administration to match its recent statements on the value of fusion research with proposed funding levels that are consistent with those in the *CHIPS and Science Act* in the FY 2024 budget request.

Beyond the importance of improving the total budget for fusion research, we would also like to emphasize that there are several key activities that DOE has yet to carry out or adequately support despite statutory direction and robust support from the research community. Much of this direction was provided in the bipartisan *Department of Energy Research and Innovation Act of 2018*, and significantly expanded upon in the bipartisan *Energy Act of 2020*. Additional guidance and extensions of current authorizations were provided in the *CHIPS and Science Act*.

These critical activities include, but are not limited to:

- **Establishment of an inertial fusion energy R&D program** – This program would build on the recent achievements of NIF and leverage capabilities and expertise at other NNSA facilities as well, while supporting energy-relevant research activities that will not be pursued by the current weapons-focused program. DOE was first directed to establish this program in statute in the *Department of Energy Research and Innovation Act of 2018*. The *Energy Act of 2020* provided significantly more guidance for this program, and an annual funding authorization level of \$25 million per year through FY 2025. The *CHIPS and Science Act* extended this authorization through FY 2027. In the FY 2023 Budget Request, the Administration proposed \$3 million to establish this program. Given the

² <https://usfusionandplasmas.org/>

³ <https://www.nationalacademies.org/news/2021/02/government-and-private-sector-should-produce-net-electricity-in-fusion-pilot-plant-by-2035-2040-to-impact-the-transition-to-a-low-carbon-emission-electrical-system-new-report-says>

⁴ <https://www.whitehouse.gov/ostp/news-updates/2022/11/18/raising-ambition-for-a-rapid-and-just-net-zero-transition-with-game-changing-innovations/>

rapid progress recently demonstrated in inertial fusion, there is strong justification to provide at least the authorized level of \$25 million for this activity going forward.

- **Establishment of an alternative and enabling concepts program** – In addition to the large-scale tokamak and laser-induced inertial fusion concepts, exemplified by the ITER international fusion project and NIF, respectively, several alternative concepts and smaller scale variations have begun to show promise toward significantly accelerating the development and deployment of commercial fusion reactors. However, there is currently no ongoing DOE program to support research and assessment of these innovative fusion energy concepts outside of public-private partnerships funded by the milestone program. So, for example, researchers of innovative concepts that are currently at the university or laboratory level do not currently have an ongoing program that would even consider their application for federal funding. DOE was first directed to establish this program in statute in the *Department of Energy Research and Innovation Act of 2018*. The *Energy Act of 2020* provided significantly more guidance for this program, and an annual funding authorization level of \$50 million per year through FY 2025. The *CHIPS and Science Act* extended this authorization through FY 2027. Thus far the Administration has provided no indication of plans to establish this program.
- **Improved support for the milestone-based public-private partnership program** – In recent years, several new small and mid-sized start-up companies have emerged proposing fusion energy device configurations which, if successful, could dramatically accelerate the development and deployment of commercial fusion reactors.⁵ However, none of these are expected to ultimately scale up to a commercial, competitive reactor without more substantial federal support in the research, development, and demonstration phases. To better support this emerging industry, a program that would provide federal funding to private companies upon confirmation of the achievement of agreed-upon technical milestones was first authorized in the *Energy Act of 2020*. This was modeled after NASA’s successful Commercial Orbital Transportation Services (COTS) program. The Administration proposed \$27 million for this program in its FY 2023 budget request, though the authorized level for FY 2023 included in the *Energy Act of 2020* is \$105 million. The final FY 2023 appropriated level for the program was \$25 million. DOE formally launched the milestone program on September 22, 2022, with \$25 million in funds appropriated for this purpose in FY 2022 in addition to expected funds for FY 2023 for a total of \$50 million. Since then, according to the Fusion Industry Association, applications to the milestone program were significantly oversubscribed.⁶ Given the breadth, growth, and the technical accomplishments of private sector fusion ventures over the last several years, this program warrants far greater support than has been provided to

⁵ <https://www.nytimes.com/2021/10/18/business/fusion-energy.html>

⁶ <https://www.fusionindustryassociation.org/post/congress-provides-record-funding-for-fusion-energy>

date. The FY 2024 authorization level for this program is \$65 million, but further noting that the final FY 2022 and FY 2023 appropriated levels were significantly lower than the authorizations, there is justification to go beyond this level in the next request.

- **Improved support for fusion materials R&D** – As highlighted in the recommendations of the Fusion Energy Sciences Advisory Committee (FESAC) Long Range Plan entitled *Powering the Future: Fusion and Plasmas*⁷ and the National Academies report entitled *Bringing Fusion to the U.S. Grid*,⁸ a critical challenge to the ultimate deployment of a commercial fusion reactor is the identification and development of materials that are able to withstand the expected heat and neutron fluxes of a fusion plasma over the long term. The FESAC report recommends the development and construction of two major facilities to address these issues: 1) the Fusion Prototypic Neutron Source (FPNS) for materials irradiation research purposes; and 2) the Exhaust and Confinement Integration Tokamak Experiment (EXCITE) to examine and address the impacts of high heat fluxes associated with commercial-scale fusion plasmas. The *CHIPS and Science Act* authorizes \$50 million per year for these activities through FY 2027. An increase to at least this level in the FY 2024 Budget Request is well-justified, and to design and build the facilities recommended by FESAC, this support may need to grow significantly over the longer term.

The activities authorized in the *CHIPS and Science Act*, once funded, will be a critical step toward boosting the research capabilities of federal agencies, meeting the nation’s climate goals, and ensuring U.S. leadership in the industries of the future. The FY 2024 Budget Request should reflect the ambition of this historic, bipartisan legislation and demonstrate to the world that the U.S. government is serious about advancing our research and technology development enterprise – and that should include significant improvements in the level and breadth of our support for fusion research. We were extremely encouraged to hear from you directly how much you also support DOE’s fusion programs, and we look forward to seeing your FY 2024 Budget Request.

Sincerely,



Zoe Lofgren
Ranking Member
Committee on Science, Space, and Technology



Alex Padilla
Senator

⁷ <https://usfusionandplasmas.org/>

⁸ <https://www.nationalacademies.org/news/2021/02/government-and-private-sector-should-produce-net-electricity-in-fusion-pilot-plant-by-2035-2040-to-impact-the-transition-to-a-low-carbon-emission-electrical-system-new-report-says>

Cc:

Jennifer Granholm, Secretary, U.S. Department of Energy
Shalanda Young, Director, U.S. Office of Management and Budget