

**Fusion Energy Sciences
Funding (\$K)**

(dollars in thousands)

	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Request	FY 2020 Request vs FY 2019 Enacted
Burning Plasma Science: Foundations				
Advanced Tokamak	121,115	130,500	88,500	-42,000
Spherical Tokamak	93,550	96,000	67,500	-28,500
Theory & Simulation	50,000	50,000	44,000	-6,000
GPE/GPP/Infrastructure	13,000	10,204	1,000	-9,204
Total, Burning Plasma Science: Foundations	277,665	286,704	201,000	-85,704
Burning Plasma Science: Long Pulse				
Long Pulse: Tokamak	15,000	14,000	9,000	-5,000
Long Pulse: Stellarators	10,069	8,500	8,500	—
Materials & Fusion Nuclear Science	27,177	38,746	32,500	-6,246
Total, Burning Plasma Science: Long Pulse	52,246	61,246	50,000	-11,246
Discovery Plasma Science				
Plasma Science Frontiers	54,000	52,050	25,000	-27,050
Measurement Innovation	7,000	8,000	4,000	-4,000
SBIR/STTR & Other	19,200	24,000	14,750	-9,250
Total, Discovery Plasma Science	80,200	84,050	43,750	-40,300
Subtotal, Fusion Energy Sciences	410,111	432,000	294,750	-137,250
Construction				
20-SC-61 Matter in Extreme Conditions Petawatt Upgrade	—	—	1,000	+1,000
14-SC-60 U.S. Contributions to ITER	122,000	132,000	107,000	-25,000
Total, Construction	122,000	132,000	108,000	-24,000
Total, Fusion Energy Sciences	532,111	564,000	402,750	-161,250

SBIR/STTR Funding:

- FY 2018 Enacted: SBIR \$11,598,000 and STTR \$1,631,000
- FY 2019 Enacted: SBIR \$12,992,000 and STTR \$1,827,000
- FY 2020 Request: SBIR \$8,899,000 and STTR \$1,252,000

**Fusion Energy Sciences
Explanation of Major Changes (\$K)**

(dollars in thousands)

FY 2020 Request vs FY 2019 Enacted

Burning Plasma Science: Foundations

The Request for DIII-D prioritizes funding to ensure scientific utilization of the significant facility enhancements implemented during the FY 2018 – FY 2019 Long Torus Opening, with 13 weeks of research operation. Funding for the NSTX-U program will support the ongoing recovery activities and maintain collaborative research at other facilities to support NSTX-U research program priorities. SciDAC continues to make progress toward whole-device modeling; this subprogram will also explore the potential of transformative approaches to fusion science, such as machine learning and QIS. Enabling R&D will focus attention on high-temperature superconductor development. Funding is provided for General Plant Projects/General Purpose Equipment (GPP/GPE), to support critical infrastructure improvements and repairs at PPPL, as well as a study of FES infrastructure needs at ORNL.

-85,704

Burning Plasma Science: Long Pulse

The Request will continue to provide support for high-priority international collaboration activities, both for tokamaks and stellarators. Materials research and fusion nuclear science research programs are focused on high priorities, such as advanced plasma-facing and structural materials. The Request supports design and R&D activities for the MPEX MIE project, expected to be baselined in FY 2020, and initiates long-lead major procurements.

-11,246

Discovery Plasma Science

For General Plasma Science, the Request emphasizes research and operations of intermediate-scale scientific user facilities and participation in the NSF-DOE Partnership. For High Energy Density Laboratory Plasmas, the focus remains on supporting research utilizing the Matter in Extreme Conditions instrument of the LCLS user facility at SLAC, supporting research on medium-scale laser facilities through the new LaserNetUS network, and exploring research opportunities of QIS.

-40,300

Construction

FES will initiate a line-item construction project for a significant upgrade to the MEC instrument. The U.S. Contributions to ITER project will continue design, fabrication, and delivery of highest-priority First Plasma hardware.

-24,000

Total, Fusion Energy Sciences

-161,250
