U.S. Department of Energy's

Office of Science

Fusion Energy Sciences Program Update

Budget Planning Meeting

Office of Fusion Energy Sciences

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Dr. Raymond Fonck
Associate Director
for Fusion Energy Sciences

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U.S. Department of Energy

Office of Science

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FY 2008 Congressional Budget Request

(B/A in thousands)

	FY 2005 Approp.	FY 2006 Approp.	FY 2007 Request to Congress	FY 2007 vs. † FY 2006		FY 2008 Request to Congress	FY 2008 vs. FY 2007	
Basic Energy Sciences	1,083,616	1,110,148	1,420,980	+310,832	+28.0%	1,498,497	+77,517	+5.5%
Advanced Scientific Computing Research	226,180	228,382	318,654	+90,272	+39.5%	340,198	+21,544	+6.8%
Biological & Environmental Research								
BER Base Program	487,474	435,476	510,263	+74,787	+17.2%	531,897	+21,634	+4.2%
Congressionally-directed projects	79,123	128,601	——	-128,601	-100.0%	——	——	——
Total, Biological & Environmental Research	566,597	564,077	510,263	-53,814	-9.5%	531,897	+21,634	+4.2%
High Energy Physics	722,906	698,238	775,099	+76,861	+11.0% ††	782,238	+7,139	+0.9% ††
Nuclear Physics	394,549	357,756	454,060	+96,304	+26.9%	471,319	+17,259	+3.8%
Fusion Energy Sciences	266,947	280,683	318,950	+38,267	+13.6%	427,850	+108,900	+34.1%
Science Laboratories Infrastructure	37,498	41,684	50,888	+9,204	+22.1%	78,956	+28,068	+55.2%
Science Program Direction	154,031	159,118	170,877	+11,759	+7.4%	184,934	+14,057	+8.2%
Workforce Development for Teachers & Scientists	7,599	7,120	10,952	+3,832	+53.8%	11,000	+48	+0.4%
S&S	67,168	68,025	70,987	+2,962	+4.4%	70,987	——	——
Use of prior year balances	-5,062	——	——	——	——	——	——	——
SBIR/STTR (from SC programs)	77,842	81,160	——	-81,160	-100.0%	——	——	——
Subtotal, Science	3,599,871	3,596,391	4,101,710	+505,319	+14.1%	4,397,876	+296,166	+7.2%
SBIR/STTR (transferred from other DOE programs)	35,779	35,653	——	-35,653	-100.0%	——	——	——
Total, Science	3,635,650	3,632,044	4,101,710	+469,666	+12.9%	4,397,876	+296,166	+7.2%

† The FY 2008 President's Budget Request and the material presented here assume the requested level for FY 2007, as the timing of FY 2007 appropriations did not allow their inclusion.

†† A portion of Stanford Linear Acceleration Center linac operations transfers from High Energy Physics to Basic Energy Sciences in FY 2007 and FY 2008. Excluding the linac operations funding, the remainder of the High Energy Physics budget increases by 12.6% in the FY 2007 request and a further 3.7% in FY 2008.

5-Year Plan Sent to Congress

	FY 2007	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
	CONG	**Mar AFP**	**CONG**				
Facility Operations	64,725	63,857	68,699	80,494*	84,126	83,674	86,653
ITER TPC	60,000	60,000	160,000	214,500	209,321	181,964	130,000
NCSX MIE	15,900	15,822	15,900	2,264			
Core Research	178,325	179,271	183,251	190,274	202,801	214,274	224,280
FES Total	**318,950**	**318,950**	**427,850**	**487,532**	**496,248**	**479,912**	**440,933**

*NCSX Starts Operations.

Beginning in FY 2010, NCSX will run only on odd years and NSTX will run only on even years.

FY 2008 Fusion Energy Sciences Congressional Budget Request

($ Millions)

	FY 2006 Actual	FY 2007 CONG	FY 2008 CONG
Science	148.7	154.2	159.6
Facility Operations	104.2	121.6	237.0
Enabling R&D	27.8	43.2	31.3
OFES Total	**280.7**	**319.0**	**427.9**
DIII-D	55.1	56.7	59.7
C-Mod	21.5	22.8	23.5
NSTX	34.2	35.1	36.1
NCSX	17.8	16.6	16.6
ITER	24.6	60.0	160.0
Non-ITER	256.1	259.0	267.9

FY 2008 Fusion Program Highlights

- Continue U.S. ITER MIE Project ($160.0M, +$100.0M)
  - $149.5M for Total Estimated Cost funding
  - $10.5M for Other Project Costs funding (R&D support)
- Increase Major Facility operations and research (+$4.6M, + 3 weeks operations)
  - 15 weeks on DIII-D, 15 weeks on C-Mod, 12 weeks on NSTX
- Most remaining program elements receive ~ 2.7% increase

ITER Funding Profile

U.S. Contributions to ITER - Annual Profile

($ in Thousands – in as spent dollars)

Fiscal Year	Total Estimated Cost (TEC)	Other Project Costs (OPC)	Total Project Cost (TPC)
2006	15,866	3,449	19,315
2007	37,000	23,000	60,000
2008	149,500	10,500	160,000
2009	208,500	6,000	214,500
2010	208,500	821	209,321
2011	181,964	—	181,964
2012	130,000	—	130,000
2013	116,900	—	116,900
2014	30,000	—	30,000
Total	**1,078,230**	**43,770**	**1,122,000**

Fusion Energy Sciences

($ in thousands)

	FY 2006 Actuals	FY 2007 CONG	FY 2008 CONG
Science			
DIII-D Research	24,274	24,300	25,264
C-MOD Research	8,490	8,890	9,133
International Collaborations	4,951	5,064	5,202
Diagnostics	3,763	3,854	3,959
Other	4,223	10,992	12,893
HBCU, Education, Outreach Reserves	(4,223)	(3,730)	(5,700)
SBIR/STTR (science)	0	(7,262)	(7,193)
Subtotal Tokamaks	45,701	53,100	56,451
NSTX Research	15,539	16,696	16,106
Experimental Plasma Research	21,389	19,990	20,638
HEDP	15,470	11,949	12,281
MST Research	6,445	6,970	6,970
NCSX Research	751	697	716
Subtotal Alternates Research	59,594	56,302	56,711
Theory	24,947	23,900	24,552
Advanced Computer/SciDAC	4,220	6,970	7,160
General Plasma Science	14,180	13,941	14,655
Science Total	148,642	154,213	159,529
Facility Operations			
DIII-D	30,780	32,362	34,405
Alcator C-Mod	13,032	13,941	14,322
NSTX	18,681	18,422	19,972
NCSX			
ITER			
Facility Ops times in weeks	7/14/11	12/15/12/0	15/15/12/
NCSX MIE	17,019	15,900	15,900
GPP/GPE/ORNL Move	3,538	3,930	2,905
ACX			
ITER Preparation	5,294		
ITER MIE TEC Costs	15,866	37,000	149,500
Facility Operations Total	104,210	121,555	237,004

	FY 2006 Actuals	FY 2007 CONG	FY 2008 CONG
Enabling R&D			
Plasma Technologies	14,787	12,945	13,452
Advanced Design	2,529	2,550	2,550
Materials Research	7,066	4,687	4,815
ITER MIE OPC	3,449	23,000	10,500
Enabling R&D Total	27,831	43,182	31,317
Total Fusion Energy Sciences	280,683	318,950	427,850
Recap			
DIII-D Res+Ops	55,054	56,662	59,669
C-Mod Res+Ops	21,522	22,831	23,455
NSTX Res+Ops	34,220	35,118	36,078
NCSX Res+Ops			716
ITER Res+Ops			
Facility Res+Ops Total	110,796	114,611	119,918
ITER TPC	19,315	60,000	160,000
Total, Core R&D Total	261,368	258,950	267,850

American Competitive Initiative and Earmarks

Funds provided in a tough federal budget must be used for relevant, peer reviewed research

Earmarks will be removed from agency budget in the next year