
HIGH ENERGY PHYSICS PROGRAM BUDGET FY2006

High Energy Physics Advisory Panel

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February 14, 2005

Office of Science

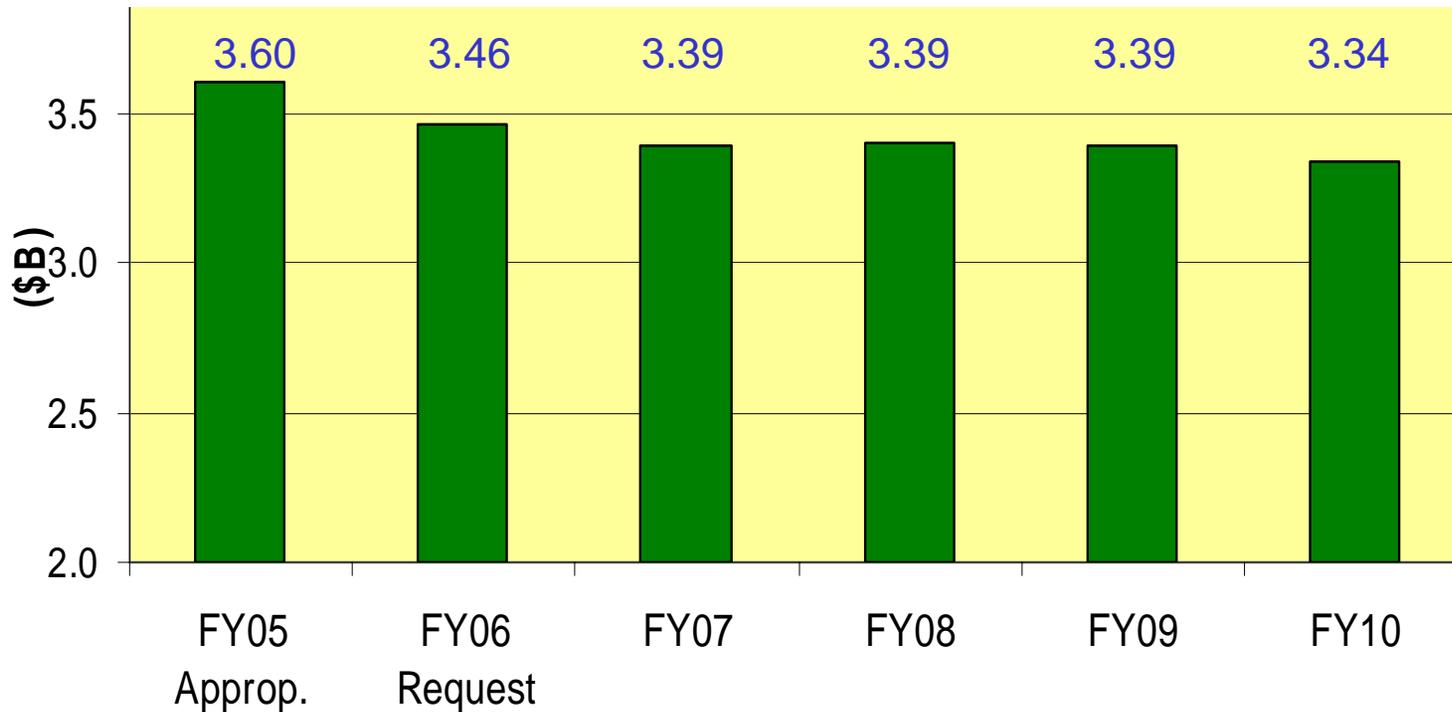
FY 2006 Congressional Budget Request

- **FY 2006 Request is 3.9% below FY 2005 Appropriation**
- **The budget forces us to make tough choices.**
 - **No new starts in FY 2006**
 - **Prioritizing ongoing programs**

(\$M)

	FY 2004 Comparable Approp.	FY 2005 Comparable Approp.	FY 2006 President's Request	FY 2006 Request vs FY 2005 Appropriation	
Basic Energy Sciences	991	1,105	1,146	+41	+3.7%
Advanced Scientific Computing Res.	197	232	207	-25	-10.9%
Biological & Environmental Research	624	582	456	-126	-21.7%
High Energy Physics	716	736	714	-23	-3.1%
Nuclear Physics	380	405	371	-34	-8.4%
Fusion Energy Sciences	256	274	291	+17	+6.1%
Other	384	270	279	+8	+3.1%
Total, Science	3,548	3,605	3,463	-142	-3.9%

Office of Science Planning Profile



\$127M (~3.7%) decrease over 5 years

The DOE HEP program in FY 2006

- Overall HEP budget and priorities in FY 2006:
 - Tevatron and B-factory will be fully supported
 - LHC preparations will be fully supported
 - Core research program at the universities and laboratories will be maintained
 - Investment for near and long term new initiatives (including neutrinos and ILC R&D) will be increased
- Any new initiatives will have to come from re-direction

High Energy Physics FY 2006 Budget

(\$M)

		FY04 Actual	FY05 Approp.	FY06 Request	FY06 - FY05	% Change
Facility ops	Tevatron	226	230	223	-7	-3.0%
	NuMI operations	0	0	8	8	
	B-factory	115	117	107	-10	-8.5%
	LHC (construction+ops)	64	62	60	-2	-2.9%
	LBNL and BNL infrastructure	6	6	6	0	
Projects	NuMI, Run2B upgrade, GLAST	33	18	2	-16	-88.8%
	planned BTeV MIE	0	7	0	-7	
Subtotal ops & projects		444	439	406	-33	-7.6%
core research	University research	101	100	101	1	
	Laboratory research	78	77	76	-1	-1.3%
	SciDAC & QCDOC	7	7	7	0	
Subtotal core research		186	184	184	0	0.0%
	Accelerator R&D	43	41	40	-1	-2.4%
	Detector R&D	12	14	13	-1	-7.1%
	BTeV R&D	4	4	0	-4	
	LC R&D	20	23	25	2	8.7%
	SNAP R&D	3	3	3	0	
	Neutrino R&D	0	0	10	10	
Subtotal R&D and new initiatives		82	85	91	6	7.1%
Others		4	28	33	5	17.9%
Total as shown in FY06 budget		716	736	714	-23	-3.1%
SBIR/STTR in FY 2004		17				
Grand Total incl SBIR/STTR		733	736	714	-23	-3.1%

GLAST

- After the rebaseline in September 2003, the GLAST-LAT project had another substantial cost increase and schedule delay
 - Risk of significant negative impact on HEP program, especially B-factory and LC R&D
 - Significant implications for our future partnerships with NASA
- SAGENAP report from 1998
 - Although proposed technology is from HEP and the science is exciting, the mission is “further removed” from HEP.
 - Concerned about possible cost growth and its associated impact on the rest of HEP program.
 - Advised DOE to make clear that expenses resulting from NASA safety and review requirements are to be borne by NASA and consider establishing a funding cap.
- Administration has acted to limit DOE’s exposure to further cost growth

Lessons learned from GLAST

- Ensure that the scale of the contribution expected from DOE-HEP matches the importance of the science to our core mission
- Listen carefully to our advisory committees and follow up on their recommendations
- Understand the cost impact of building detectors which
 - Can tolerate speed of $10g$ and temperature variation of $>150^\circ$
 - Will have 100% reliability under extreme conditions
- Clearly define responsibilities for interagency ventures
 - Especially when project rules, performance measures, and culture are very different
- Upfront planning manpower resources

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- The Department of Energy has decided not to proceed with the BTeV experiment at Fermilab
 - This decision is based on the recommendations of the P5 subpanel of HEPAP, given
 - the President's budget request for 2006,
 - expectations of funding levels in the outyears,
 - the need to support the ongoing program at the Tevatron, PEP-II and the LHC, and enhance ILC R&D.
 - The decision was not taken lightly: BTeV is an excellent experiment whose scientific merit has been reaffirmed on numerous occasions.
 - We thank and commend the members of the BTeV collaboration and Fermilab for their hard work in developing such an excellent proposal, and we ask them to understand that this is in no way a reflection on the quality of their work.

BTeV Decision: Rationale

- However, as P5 noted, the experiment needs to be completed rapidly in order to compete in physics results with LHCb:

“[...] the staging scenario stretches the BTeV schedule as far as we can support. If various constraints, budget or technical, would result in a completion date beyond the end of FY 2010, we would not support a start of the project.”

- This urgency was recognized by the BTeV collaboration, the laboratory and DOE to expedite this project, and the approval process was handled with that in mind.
- It is now clear, unfortunately, that it was not possible for the experiment to be completed on the schedule stated by P5 as being the latest tolerable.
- Given this outcome, we have decided not to start the project.
- No one would benefit from proceeding with a drawn-out schedule that would leave BTeV unable to compete effectively.

What next for Fermilab?

- In FY 2009, at the end of Tevatron Run II, Fermilab will still be operating NuMI/MINOS for at least another year, and will participate in LHC and various particle astrophysics programs. The future of Fermilab past the end of the decade will be the subject of a continuing dialogue between the Administration, Congress, the laboratory, and the broader U.S. and international particle physics communities.
- We now look forward to working with Fermilab management to develop the strongest possible future for the laboratory as well as for the overall HEP program.
- The laboratory's Long Range Plan has laid out a broad and exciting program for the next decade, centered on the International Linear Collider, significant new initiatives in neutrino physics, the LHC physics center, and particle astrophysics and underground experiments.
- We are committed to maintaining Fermilab as one of the world leading scientific facilities.

New Initiatives

- In order to inform the Department of HEP's intent to pursue several new scientific topics, we plan to prepare draft requests for approval of CD-0 "Statement of Mission Need", including
 - A generic reactor-based neutrino experiment to measure θ_{13}
 - A generic off-axis accelerator-based neutrino experiment for θ_{13} and to resolve the neutrino mass hierarchy
 - A generic high intensity neutrino beam facility for neutrino CP-violation experiments
 - A generic neutrinoless double-beta decay experiment to probe the Majorana nature of neutrinos
 - A generic underground experiment to search for direct evidence of dark matter
 - A generic ground-based dark energy experiment
- In order to be ready to move forward expeditiously, this process will be in parallel with a Scientific Advisory Group (SAG) and P5 process that I will describe tomorrow.