HFCC Monthly Meeting

Nov 6, 2025

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Introduction

- Today's Agenda:
  - Report from the just concluded PPG deliberation: Anadi Canepa
  - SuperKEKB performance and impact on FCC-ee: Frank Zimmerman

Events

- Recent Events: we will hear brief reports on them at are next meeting
  - FCC-ee vertex detector workshop, Pisa, 10/30
    - https://agenda.infn.it/event/47923/
  - FCC-ee TDAQ workshop @ CERN, Today!, 11/6
    - https://indico.cern.ch/event/1583755/
- Upcoming Events:
  - FCC-ee Heavy Flavor workshop @ CERN, 11/19-20
    - https://indico.cern.ch/event/1588013/
  - FCC-ee Physics Workshop, Munich, 1/26-30, 2026
    - https://indico.cern.ch/event/1588696/

Other news

- ESG deadline to update national inputs: Nov. 14, 2025
  - HFCC will not update its input.
  - DPF/DPB are preparing an update to their input considering recent decisions by DOE. These are in circulation for comments, but their report is consistent with the original HFCC input.
- ESG assessment of large Accelerator projects released: https://cds.cern.ch/record/2947728
- ESG Strategy Drafting session: Dec. 1 – 5, 2025
  - Mike Tuts is the U.S. representative to ESG.
  - Anadi Canepa, as the U.S. PPG representative will also be present.
- Submission of draft ESG document to Council: ~end of January.
- CEPC: Not included in the current Chinese 5-year plan.
  - There is always the possibility that it can be included 5 years later, but Yifang has made it clear that this will not happen if CERN approves FCC.

HFCC-PED organization

- Discussions on the organization are ongoing and expect to conclude by year end (unless derailed by external factors).
- An Advisory board was stipulated by DOE in their reformulation of the HFCC organization: “Advises the PED chair on a number of issues including scope, prioritization, requirements and other community needs. Members appointed by respective PED chair”.
  - An explicit charge is being formulated, but they will provide input on the HFCC-PED organization,
- The members are:
  - Anadi Canepa (Fermilab)
  - John Hobbs (Stony Brook)
  - Andy Lankford (Irvine)
  - Joe Lykken (Fermilab)
  - Jason Nielsen (Santa Cruz)
  - Maria Spiropulu (CalTech)
  - Abid Patwa (DOE, ex-officio).
- Advisory Board was agreed with DOE and endorsed by LCG.

HFCC-ACC organization

- First round of FY26 funding selections competed
- Organization unchanged from previous model

- HFCC-ACC Steering Committee: Tor Raubenheimer, Steve Gourlay, Mattias Liepe, Jean-Luc Vay

L2 Topic Coordinators		
Beam Physics	Ji Qiang (LBNL)	Vadim Sajaev (ANL)
Diagnostics and Instrumentation	Sasha Aleksandrov (ORNL)	Michiko Minty (BNL)
RF Systems	Sergey Belomestnykh (FNAL)	TBD
Magnet Systems	Giorgio Ambrosio (FNAL)	Gianluca Sabbi (LBNL)
Machine Detector Interface (MDI)	Andrei Seryi (JLAB)	Spencer Gessner (SLAC)
Infrastructure & Engineering	Damien Dockery (FNAL)	Vasiliy Morozov (ORNL)
Integration & Sustainability	Roger Ruber (JLAB)	Mei Bei (SLAC)

ESG WG2a Report

Assessment of large-scale accelerator projects at CERN
Report of ESG WG2a

31 October 2025

G. Arduini[1,a] (convener), F. Bordry[1] (co-opted accelerator expert), R. Brinkmann[2] (co-opted accelerator expert), P. Burrows[3,b] (convener), K. Desch[4], S. Farrington[5,6], F. Gianotti[1], K. Hanagaki[7], N. Holtkamp[8,9] (co-opted accelerator expert), J. Keintzel[1,c] (scientific secretary), B. Kilminster[10], T. Lesiak[11], L. Rivkin[12,13] (co-opted accelerator expert), F. Sabatié[14], M. Tuts[15], A. Zoccoli[16].

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ESG WG2a Report

	CLIC			FCC-ee				FCC-hh	LCF				LEP3			LHeC	MC	
									LP	FP								
Particles colliding [-]	e^+/e^-			e^+/e^-				p/p	e^+/e^-				e^+/e^-			e^-/p	μ^+/μ^-	
C.o.m. energy [GeV]	380	550	1500	91.2	160	240	365	84600	250	91.2	250	550	91.2	160	230	1180	3200	7600
Length [km]	12.1	15	29.6	90.7				90.7	33.5				27.6			9.2/27.6	11/4.8	11/8.7
#IPs [-]	2	2	1	4				4	2				2			1	2	
Peak inst. lumi/IP [$10^{34}cm^{-2}s^{-1}$]	2.2	3.2	3.7	140	20	7.5	1.4	30	1.35	0.28	2.7	3.85	40	6.2	1.6	2.3	0.9/2	7.9/10.1
Peak power consumption [MW]	166	210	287	251	276	297	381	355	143	123	182	322	200	226	250	220	117	182
Cost [BCHF][a]	7.2	+30%[b]	+7.1	15				+19[c]	8.3	+0.8		+5.5	3.9			2	12	17

[a] Total installation and construction cost quoted by the proponents of the projects in 2024 prices. The cost includes the technical components, materials, contracts, services, civil construction and conventional systems and associated implicit labour such as that provided by a company to produce components. It does not include labour provided by the host institution and the collaborating laboratories, contingency, any potential future inflation, the costs prior to project approval (construction and R&D), off-line computing, spares, maintenance, beam commissioning. The cost of the experiments is not included. The cost of land acquisition, site activation (e.g. external roads, water supplies, power lines) and spoil removal are not included for CLIC and LCF though they are expected to represent a minor contribution to the total cost (at the percent level). The additional cost of each individual upgrade is indicated.

[b] Cost of the upgrade from 380 GeV.

[c] Cost estimated if FCC-hh follows FCC-ee. The cost for standalone FCC-hh is given as 28.4 BCHF.

Table 1: Overview of the main parameters submitted to the ESPP2026 and considered for this assessment. Data compiled from Refs. [ID40, ID78, ID188, ID207, ID214, ID233, ID247,2,3,4,5]. LP=Low Power, FP=Full Power.

ESG WG2a Report

Project	Scope	TRL	R&D	Test facilities	Performance	Site preparation	Schedule	Cost	Risk
CLIC 380 GeV, 1.5 TeV		4 - 6 / 5.2							
FCC-ee 91-365 GeV		4 - 7 / 6.0							
FCC-hh 85 TeV		4 - 7 (Nb_3Sn) / 4.3 2 - 7 (HTS) / 3.2							
FCC-hh - SA 85 TeV		4 - 7 (Nb_3Sn) / 5					Nb_3Sn		
LCF 250 - 550 GeV		5 - 7 / 5.5							
LEP3 91 - 230 GeV		3 - 6 / 4.0							
LHeC: HL-LHC + 60 GeV ERL		3 - 6 / 4.5							
MC 3.2 TeV, 7.6 TeV		3.2 TeV: 3 - 5 7.6 TeV: 2 - 5							

Table 16: Summary table schematically representing the key findings of the WG according to the assessment criteria and based on the present status of the large-scale collider project proposals as submitted to the ESPP2026. Scope=Scope level-of-definition; TDR=Technical Readiness Level score - the range of values and the cost-weighted average for the baseline scenarios are listed; the colour code is selected based on on the cost-weighted average TRL score (TRL≥ 6 - green, 4≤TRL<6 - yellow, TRL<4 - red); R&D=R&D requirements, R&D plan level-of-definition, R&D funding status; Test facilities=need of test facilities or demonstrators and (if needed) level-of-definition of their scope; Performance=Performance uncertainty; Site preparation=Site preparation status; Schedule=Schedule uncertainty; Cost=Cost uncertainty; Risk=Risk level-of-definition. The cost-weighted average TRL score could not be estimated for the MC project as there is no detailed cost breakdown by sub-system. The colour code for the various criteria is defined according to the summary assessment in the Tables A.1 to A.8.