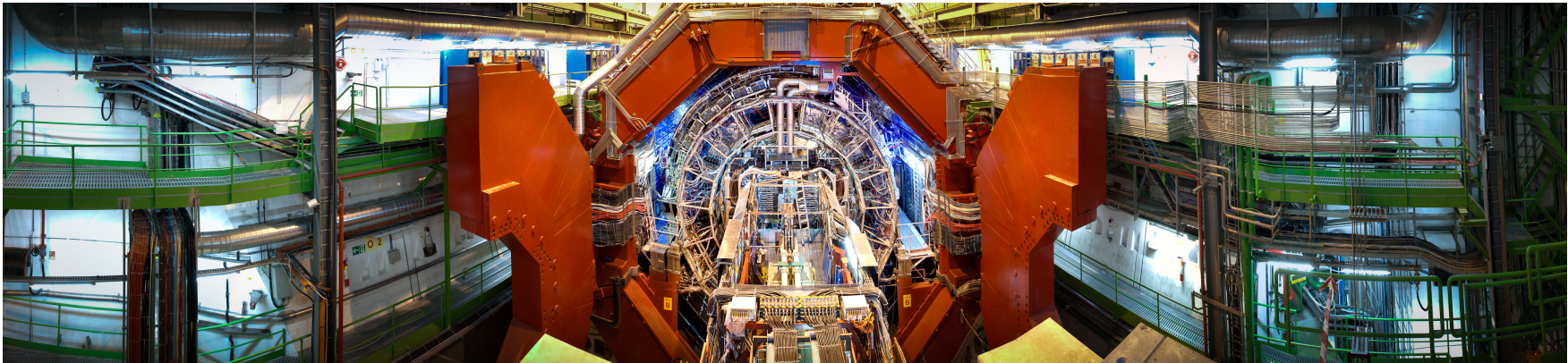


A Large Ion Collider Experiment



ALICE

47th meeting of the ALICE Resources Review Board



Adriana Telesca
30th October 2019

Overview of the presentation

Maintenance and Operation

- Category A
 - 2019 contributions and expenditure
 - 2020 preliminary budget and sharing and estimates for the period 2021-2023
- Category B
 - 2020 preliminary budget and sharing and estimates for the period 2021-2023

ALICE Upgrade

- Entry fees
- Contributions to the Common Fund for Upgrade and entry fees
- Cash balance of the Common Fund for Upgrade
- Upgrade projects estimated cost and spending profile
- 2020 Estimated expenditure on Construction for Upgrade

A Large Ion Collider Experiment



Maintenance and Operation Cat. A



M&O-A: current status

2019 M&O-A contributions in kCHF as of 28/10/2019

Outstanding contributions:

- MS:
 - Greece
 - India
 - Pakistan
 - Romania ISS (partial)
 - Romania NIPNE
 - Ukraine (partial)
- NMS:
 - Armenia
 - Brazil
 - China
 - Japan (partial)
 - Rep. of Korea NRF (partial)
 - Russia
 - USA NSF (partial)

Percentage of received contributions for 2019:

MS: 88%
 NMS: 59%
 Total: 80%

Country	2019				2002-2019				Advance payments
	Invoiced	Received	In-kind	Due	Final invoice	Received	In-kind	Due	
Armenia	7'806			7'806	221'957	172'002	0	49'956	
Austria	15'504	15'504		0	114'063	114'063	0	0	
Azerbaijan	7'806	7'806		0	28'758	28'758	0	0	
Brazil	78'059	577		77'482	994'686	917'204	0	77'482	
CERN	403'115	403'115		0	6'538'900	6'538'900	0	0	
China Beijing	7'806			7'806	159'102	78'637	62'690	17'775	
China Wuhan CCNU	78'058			78'058	711'152	520'249	60'080	130'823	
Croatia	46'835	46'835		0	691'275	691'275	0	0	
Czech Republic	93'026	93'026		0	1'361'175	1'361'175	0	0	
Denmark	62'018	62'018		0	766'217	766'217	0	0	
Finland	62'018	62'018		0	699'300	699'300	0	0	
France CEA	62'018	62'018		0	767'685	767'685	0	0	
France IN2P3	302'336	302'336		0	5'303'769	5'303'769	0	0	
Germany BMBF	379'858	379'859		-1	4'387'957	4'387'957	0	0	
Germany GSI	178'301	178'301		0	2'485'180	2'485'180	0	0	
Greece	15'504			15'504	385'975	370'471	0	15'504	
Hungary	46'513	46'513		0	483'480	483'480	0	0	
India	310'088			310'088	4'860'740	4'550'652	0	310'088	
Indonesia	7'806	7'806		0	39'405	39'405	0	0	
Italy Centro Fermi	31'009	30'935		74	392'704	392'630	0	74	
Italy INFN	767'469	767'469		0	12'133'408	12'103'408	30'000	0	
Japan	93'644	54'626		39'018	1'311'876	1'272'857	0	39'019	
JINR	62'447	62'447		0	1'214'971	815'799	399'172	0	
Mexico	124'893	124'893		0	1'871'423	1'871'423	0	0	
Netherlands	108'531	108'531		0	1'271'704	1'271'704	0	0	
Norway	155'044	155'044		0	1'926'043	1'926'043	0	0	
Pakistan	38'761	2		38'759	204'334	165'575	0	38'759	
Peru	15'612	15'612		0	141'191	141'191	0	0	
Poland	170'549	170'549		0	2'101'913	2'101'913	0	0	
Republic of Korea NRF	93'670	89'267		4'403	1'333'999	1'329'596	0	4'403	
Republic of Korea KISTI	7'806	7'806		0	110'914	110'914	0	0	
Romania ISS	31'009	24'808		6'201	532'779	526'578	0	6'201	
Romania NIPNE	46'513			46'513	814'496	767'983	0	46'513	
Russia	350'608			350'608	5'776'672	5'265'384	10'100	501'188	
Slovakia	108'531	108'531		0	1'440'895	1'440'895	0	0	
South Africa	39'029	39'029		0	832'570	832'570	0	0	
Spain				0	426'110	426'110	0	0	
Sweden	38'761	38'761		0	512'526	512'526	0	0	
Thailand	7'806	7'806		0	57'823	57'824	0	-1	
Turkey	7'752	7'752		0	67'333	67'333	0	0	
Ukraine	7'752	5'500		2'252	385'576	355'324	28'000	2'252	
United Kingdom	93'026	93'026		0	1'068'849	1'068'849	0	0	
USA DOE	312'224	312'224		0	4'524'042	4'524'042	0	0	
USA NSF	39'021	15'859		23'162	677'680	654'518	0	23'162	15'651
Grand Total	4'915'942	3'908'209	0	1'007'733	72'132'609	70'279'368	590'042	1'263'199	15'651

Rules on outstanding contributions

- If on 1st of September the outstanding amount is less than, or equal to, the current year's contribution -> CERN finance department sends a standard reminder to the Funding Agency requesting the payment within one month.
- If on 1st of September the outstanding amount is larger than the current year's contribution -> The ALICE Management sends a letter to the Funding Agency announcing that, unless payment is made before the end of the year, the right to sign papers will be withdrawn as of December 31st.

2019 M&O-A current expenditure as of 28/10/2019 in kCHF

Category	2019 Budget	Payments	Open commitments	Total expenditure	Balance Budget - Payments	Balance Budget - total expenditure
Detector related costs	1'502	1'247	220	1'467	255	35
Secretariat	193	154	31	185	39	8
Communications	0	0	0	0	0	0
Offline computing	537	440	72	512	97	25
Online computing (Op&Licenses)	646	517	99	616	129	30
Online computing (Hardware)	1'034	1'034		1'034	0	0
Test beams & calibration facilities	20	20	0	20	0	0
Laboratory operations	255	200	74	274	55	-19
General services	727	510	150	660	217	67
sub-total	4'915	4'123	647	4'770	792	145
Power (NMS only)	9	7		7	2	2
Total	4'924	4'130	647	4'777	794	147

2019 Budget = 4'924 kCHF

Balance (budget – payments) = 794 kCHF (16%)

Balance (budget – (payments + open commitments)) = 147 kCHF (3%)

M&O-A cash balance as of 28/10/2019

Contributions (kCHF)

Contributions																				
Income and in-kind	Budget year																			
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Grand Total
2002	330	12																		342
2003	68	565																		632
2004	5	73	936	13																1'027
2005	9	24	68	1'213	64															1'377
2006	9	15	112	123	2'242	274														2'776
2007	4	6	13	153	323	3'562	692													4'755
2008					25	503	4'040	111												4'678
2009						8	182	4'951	124											5'265
2010					4	6	85	395	4'936	303										5'729
2011								37	111	4'198										4'346
2012									63	152	5'443	72								5'730
2013						1		1	17	22	219	4'450	255							4'966
2014							0	12	1	5	17	153	4'200	353						4'741
2015													424	4'609	692					5'725
2016													39	321	4'042	242				4'643
2017														112	710	4'062	294			5'179
2018														23	86	444	4'427	396		5'376
2019																1	81	3'512	16	3'609
Total Income per year	424	696	1'129	1'503	2'657	4'355	4'999	5'507	5'251	4'681	5'679	4'675	4'919	5'417	5'529	4'749	4'802	3'908	16	70'897

M&O-A cash balance as of 28/10/2019

Payments and cash balance (kCHF)

Expenditure		Budget year																				Grand Total
Year	Payments only	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
2002	202																				202	
2003	46	502																			548	
2004		75	855																		931	
2005		20	240	1'134																	1'394	
2006					274	2'347															2'621	
2007						291	3'422														3'714	
2008							453	4'053	4												4'510	
2009								261	4'134												4'395	
2010									513	4'639											5'152	
2011										436	6'565										7'001	
2012											317	5'534									5'851	
2013											10	50	4'682								4'741	
2014													331	4'476							4'806	
2015														26	5'060						5'086	
2016													86	2	85	5'075					5'248	
2017																50	5'327				5'377	
2018																	102	5'154			5'256	
2019																		2	67	4'060	4'130	
Total Expenditure per year		248	598	1'095	1'408	2'639	3'875	4'314	4'651	5'075	6'892	5'583	5'098	4'503	5'145	5'125	5'432	5'221	4'060		70'963	
Cash flow (Current Year)		177	98	34	95	18	479	684	856	176	-2'211	96	-423	415	272	404	-683	-419	-152	16	-67	
Cash Flow		177	275	309	404	422	901	1'586	2'442	2'618	407	503	80	495	768	1'172	489	70	-82	-67	-67	

Online Computing		Replacement Funds																				Grand Total
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019			
Actual Accruals											1'000	1'372	393	759	1'172	1'258	1'239	1'385	1'034		9'612	
Cost/Commitments												233	398	3'426	280	34	36	19	13		4'439	
Cash Balance (Current Year)											1'000	1'139	-5	-2'667	892	1'224	1'203	1'366	1'021		5'173	
Cash Flow											1'000	2'139	2'134	-533	359	1'583	2'786	4'152	5'173		5'173	



M&O-A: 2020 preliminary budget and 2021-2023 estimates

For your approval: M&O-A budget for 2020 and estimates for 2021-2023 in kCHF

PRELIMINARY budget (flattened using the online special account)

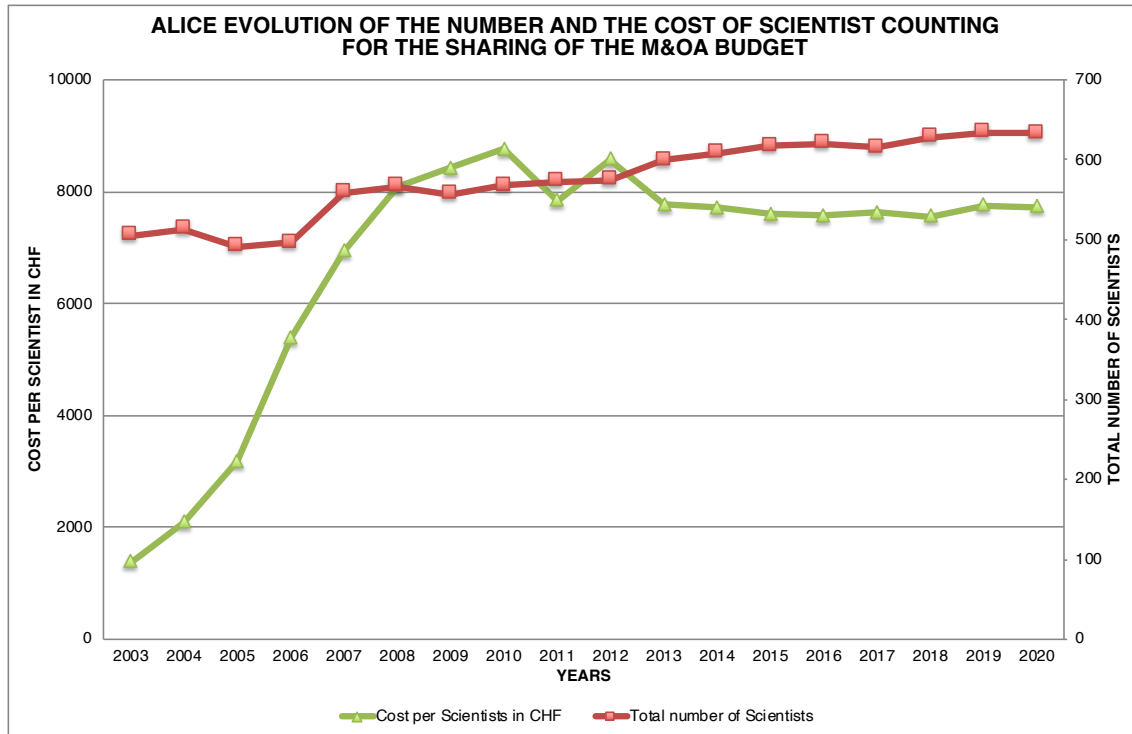
Category	2012	2013	2014	2015	2016	2017	2018	2019	Prelim. 2020	2021	2022	2023	Total 2020 to 2023
Detector related costs	1'253.1	1'733.4	1'512.4	1'167.0	1'177.0	1'142.0	1'179.0	1'502.0	1'588.0	1'174.0	1'174.0	1'174.0	5'110.0
Secretariat	207.5	207.5	207.5	208.0	193.0	193.0	193.0	193.0	193.0	193.0	193.0	193.0	772.0
Communications	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CORE computing	537.0	537.0	537.0	625.0	625.0	537.0	537.0	537.0	537.0	739.4	739.4	739.4	2'755.2
Online computing	2'012.0	1'033.0	1'403.8	1'824.6	1'894.1	1'884.8	2'031.0	1'680.4	1'556.3	1'977.9	2'026.5	1'977.9	7'538.4
Test beams & calibration facilities	85.0	30.0	85.0	50.0	50.0	50.0	50.0	20.0	40.0	50.0	50.0	50.0	190.0
Laboratory operations	250.0	280.0	255.0	245.0	245.0	280.0	245.0	255.0	255.0	245.0	245.0	245.0	990.0
General services	549.7	828.7	689.7	567.7	507.7	604.7	507.5	727.5	717.5	507.5	458.9	507.5	2'191.3
Grand Total w/o Power	4'934.3	4'649.6	4'690.4	4'687.3	4'691.9	4'691.5	4'742.5	4'914.9	4'886.7	4'886.7	4'886.7	4'886.7	19'546.9
Power	2'386.0	721.2	613.0	2'416.0	1'909.0	1'706.0	1'883.0	34.0	34.0	1'883.0	1'883.0	1'883.0	5'683.0
Grand Total	7'320.3	5'370.8	5'303.4	7'103.3	6'600.9	6'397.5	6'625.5	4'948.9	4'920.7	6'769.7	6'769.7	6'769.7	25'229.9

The 2020 M&O-A preliminary budget request without power amounts to 4'886.7 kCHF.

These budget estimates have been made according to the LHC schedule, featuring a long period of shutdown that started in January 2019 and continues until the end of 2020, followed by a long period of runs with short technical stops during winter in 2021, 2022 and 2023.

Sharing of the 2020 M&O-A budget

2020 M&O-A Budget no power 4'886'700 CHF
 2020 Power 34'000 CHF
 ALICE DB as 01/09/2019 633 scientists
 Cost M&O per scientist 7'720 CHF
 Cost Power per scientist 54 CHF



ALICE Experiment M&O-A 2020 Preliminary Budget	Snapshot number of scientists ACDB as Sept. 2019	M&O-A	Energy in CHF	Energy billed to NMS Funding Agencies in CHF	Invoice for 2020 in CHF
Armenia	1	7'720	54	54	7'774
Austria	3	23'160	161		23'160
Azerbaijan	1	7'720	54	54	7'774
Brazil	10	77'199	537	537	77'736
CERN	49	378'275	2'632		378'275
China	13	100'359	698	698	101'057
Croatia	6	46'319	322		46'319
Czech Republic	13	100'359	698		100'359
Denmark	7	54'039	376		54'039
Finland	4	30'880	215		30'880
France CEA	9	69'479	483		69'479
France IN2P3	39	301'076	2'095		301'076
Germany BMBF	54	416'875	2'900		416'875
Germany GSI	21	162'118	1'128		162'118
Greece	2	15'440	107		15'440
Hungary	6	46'319	322		46'319
India	39	301'076	2'095		301'076
Indonesia	1	7'720	54	54	7'774
Italy Centro Fermi	6	46'319	322		46'319
Italy INFN	98	756'551	5'264		756'551
Japan	14	108'079	752	722	108'800
JINR	8	61'759	430	430	62'189
Mexico	16	123'518	859	859	124'378
Netherlands	13	100'359	698		100'359
Norway	20	154'398	1'074		154'398
Pakistan	3	23'160	161		23'160
Peru	2	15'440	107	107	15'547
Poland	22	169'838	1'182		169'838
Republic of Korea NRF	14	108'079	752	752	108'831
Republic of Korea NRF - KISTI	1	7'720	54	54	7'774
Romania ISS	5	38'600	269		38'600
Romania NIPNE	5	38'600	269		38'600
Russia	45	347'396	2'417	1'762	349'157
Slovakia	13	100'359	698		100'359
Sweden	5	38'600	269		38'600
South Africa	5	38'600	269	269	38'868
Thailand	1	7'720	54	54	7'774
Turkey	1	7'720	54		7'720
Ukraine Kiev	1	7'720	54		7'720
United Kingdom	11	84'919	591		84'919
USA DOE	42	324'236	2'256	2'190	326'426
USA NSF	4	30'880	215	209	31'088
Total	633	4'886'700	34'000	8'803	4'895'503

A Large Ion Collider Experiment



Maintenance and Operation Cat. B



M&O-B: 2020 preliminary budget and 2021-2023 estimates

For your approval: M&O-B budget for 2020 and estimates for 2021-2023 in kCHF

Project	2012	2013	2014	2015	2016	2017	2018	2019	Prelim. 2020	2021	2022	2023
ITS Common	128	88	98	128	128	128	128	60	80			
ITS-SPD	95	75	75	84	110	110	110	50	25			
ITS-SDD	237	180	130	125	115	95	70	40	20			
ITS-SSD	182.5	152.5	86.5	72.5	119.1	119.1	126.1	50	0			
TPC	145	160	160	135	135	180	185	150	150			
TRD	163.5	133.5	133.5	133.5	133.5	153.5	153.5	153	153	152	154	155
TOF	120	94	92	81	62	62	63	80	78	78	78	78
HMPID	144.5	92.5	92.5	82.5	82.5	82.5	88.5	65.5	60.5	50	50	50
PHOS	158	93	142	56	56	56	56	43	43	38	38	35
EMCAL-DCAL	77.7	49	69	67	67	96	138.28	96	84	82	76	76
FMD	25	25	25	25	25	25	25	16	10			
T0	48.35	65	53	48	48	26	20.5	6.5	0			
VOA	14	52.5	52.5	10	5	5	5	8	0			
V0C	11	55.5	55.5	7	7	7	7	7	0			
PMD	29	36	26	20	15	15	15	0	0			
ZDC	35	26	30	29	26	26	22	11	13	16	16	16
ACORDE	15	15	10	10	9	10	7	8	13	34	19	7
MUON TRACKING	87	164	164	118	145	149	151	169	165	151	151	156
MUON TRIGGER	75	81	81	76	76	69	69	64	64			
CENTRAL TRIGGER	20	20	20	20	20	11	11	11	11	11	11	11
FIT										98	49	76
ITS										360	360	360
MFT										82	82	82
MID										66	66	66
TPC Upgraded										280	280	280
Grand Total	1810.6	1657.5	1595.5	1327.5	1384.1	1425.1	1450.9	1088	969.5	1498	1430	1448

For your approval: M&O-B budget for 2020 and estimates for 2021-2023 in kCHF

Activity	2012	2013	2014	2015	2016	2017	2018	2019	Prelim. 2020	2021	2022	2023
A01 Mechanics	28.5	50	42.5	26.5	26.5	27.5	35.5	30	27	40	38	37
A02 Gas Systems	82	38	38	43	45	46	41	25	24	29	26	26
A03 Cooling Systems	110	151	133	78	73	72	67.24	19	19	61	59	59
A04 FEE spares	100.5	135	112	70	62	64	56.6	38	28	74	67	73
A05.1 Standard Electronics LV/HV PS	421	322.5	256.5	180.5	182.5	185.5	172.92	99	99	147	153	152
A05.2 Standard Electronics Crates	63.5	26.5	37.5	45.5	46.5	45.5	34	14	15	39	35	36
A05.3 Standard Electronics R/O modules	172.5	94.5	111	107	105	93	73.74	52.5	45	77	73	72
A06 Controls (DCS & DSS)	33	33.5	43.5	35.5	35.5	34.5	31.8	13.5	14.5	31	37	37
A07 Sub-Detector spares	81.5	143	125	29	19	17	14	17	21	52	22	41
A08 Areas	57	42	44	39	42	35	41	23	15	51	51	51
A09 Communications	92.5	91	97	92	94	96	107.06	86.5	81	112	113	114
A10 Store Items	83.5	97.5	87.5	82.5	82.5	99	94.3	83	67	98	85	84
A11.1 Technical Manpower @ CERN: Industrial Support	23	6	11	6	6	29	9.12	9	9	14	14	14
A11.3 Technical Manpower @ CERN from Collaborating Institutes	462.05	427	457	493	564.6	581.1	672.6	578.5	505	673	657	652
Grand Total	1810.6	1657.5	1595.5	1327.5	1384.1	1425.1	1450.9	1088	969.5	1498	1430	1448
A11.2 Technical Manpower @ CERN from Collaborating Institutes (in man-months)	180	246	185	192	192	212	224	239	225	250	249	198

For your approval: M&O-B 2020 budget by system/budget item in kCHF

2020 Activity	Project																Grand Total				
	ITS Common	ITS-SPD	ITS-SDD	ITS-SSD	TPC	TRD	TOF	HMPID	PHOS	EMCAL-DCAL	FMD	T0	V0A	V0C	PMD	ZDC		ACORDE	MUON TRACKING	MUON TRIGGER	CENTRAL TRIGGER
A01 Mechanics					10	10					2						1		4		27
A02 Gas Systems					5	10		5											4		24
A03 Cooling Systems						5	2	2	10												19
A04 FEE spares								1	5	20							2				28
A05.1 Standard Electronics LV/HV PS					3	40	15	4	5	10							2	12	8		99
A05.2 Standard Electronics Crates								1									2	10		2	15
A05.3 Standard Electronics R/O modules						10	13			8						2	3	4	5		45
A06 Controls (DCS & DSS)					1	4	3	1.5	5												15
A07 Sub-Detector spares										10							3	3	5		21
A08 Areas								15													15
A09 Communications					1	27	13	8	10	2						1		12	3	4	81
A10 Store Items					10	7	13	8	8	10						2	1	5	3		67
A11.1 Technical Manpower @ CERN: Industrial Support								5		4											9
A11.3 Technical Manpower @ CERN from Collaborating Institutes	80	25	20		120	40	19	10		20	8					10		120	33		505
Grand Total	80	25	20		150	153	78	60.5	43	84	10					13	13	165	64	11	970
A11.2 Technical Manpower @ CERN from Collaborating Institutes (in man-months)						20			96	84			1							24	225
Grand Total						20			96	84			1							24	225

Sharing of the 2020 M&O-B budget

Sharing of the M&O-B 2020 preliminary budget in kCHF	ITS Common	ITS-SPD	ITS-SDD	ITS-SSD	TPC	TRD	TOF	HMPID	PHOS	EMCAL-DCAL	FMD	TO	V0 A	V0 C	PMD	ZDC	ACORDE	MUON TRACKING	MUON TRIGGER	CENTRAL TRIGGER	Grand Total in kCHF
CERN	15.94	11.25			24.0			18.15													69.3
China										4.2											4.2
Croatia					0.8																0.8
Czech Republic	1.50		1.14																		2.6
Denmark					4.8						10										14.8
France CEA																		23.1			23.1
France IN2P3	5.69									8.4								46.2	28.8		89.1
Germany BMBF						143.3															143.3
Germany GSI					86.3																86.3
India																		23.1			23.1
Italy INFN	44.38	11.25	17.44				59.5	42.35		6.3						13		26.4	30.1		250.7
Japan										6.3											6.3
JINR						6.7															6.7
Mexico																	13				13.0
Netherlands	6.13																				6.1
Poland					4.3																4.3
Republic of Korea							18.5												5.1		23.6
Romania NIPNE						3.1															3.1
Russia	0.31		0.22						43									23.1			66.6
Slovakia	2.75	2.5			2.9																8.1
South Africa																		23.1			23.1
Sweden					26.9																26.9
Ukraine	3.25		1.14																		4.4
United Kingdom																				11	11.0
United States DOE										58.8											58.8
United States NSF	0.06		0.06																		0.1
Total	80	25	20		150	153	78	60.5	43	84	10					13	13	165	64	11	969.5

A Large Ion Collider Experiment



ALICE Upgrade

Contributions to the Common Fund for Upgrade and entry fees

Entry fees in kCHF as of 28/10/2019

Payments received in 2019:

- Baku university (AZ) 20 kCHF
- Nara Women's University (JP) 10 kCHF
- LIPI (ID) 5.8 kCHF

Entrance fees pending:

- UFRGS (BR) 11.6 kCHF
- LIPI (ID) 21 kCHF
- Nara Women's University (JP) 20 kCHF
- COMSATS (PK) 25 kCHF

Funding agency	Entry Fees paid (1998 - 2019)	Due
Austria	50.0	
Armenia	38.0	
Azerbaijan	50.0	
Brazil	83.4	11.6
CERN	30.0	
China Wuhan CCNU	23.0	
Croatia	50.0	
Czech Republic	80.0	
Denmark	40.0	
Finland	40.0	
France CEA	40.0	
France IN2P3	125.0	
Germany BMBF	310.7	
Germany GSI	40.0	
Greece	47.5	
Hungary	45.0	
India	320.0	
Indonesia	28.7	21.0
Italy Centro Fermi	45.0	
Italy INFN	495.0	
Japan	80.0	20.0
JINR	40.0	
Mexico	110.0	
Netherlands	40.0	
Norway	85.0	
Pakistan	25.0	25.0
Peru	45.0	
Poland	122.0	
Republic of Korea NRF	100.0	
Republic of Korea KISTI	13.5	
Romania ISS	40.0	
Romania NIPNE	40.0	
Russia	85.0	
Slovakia	90.0	
South Africa	40.0	
Spain		
Sweden	45.0	
Switzerland	5.0	
Thailand	50.0	
Turkey	50.0	
Ukraine	70.0	
United Kingdom	90.0	
USA DOE	225.0	
USA NSF	40.0	
Total	3'511.8	77.6





Contributions to the Common Fund for Upgrade and Entry fees as of 28/10/2019

Funding Agency	Due	2012	2013	2014	2015	2016	2017	2018	2019	Total received	Outstanding	Percentage received
Armenia	17'463										17'463	
Brazil	69'852					37'500	32'352			69'852		100
CERN	471'499			471'499						471'499		100
China	43'657						43'657			43'657		100
Croatia	52'389						26'195		26'194	52'389		100
Czech Republic	87'315			87'315						87'315		100
Denmark	69'852			69'852						69'852		100
Finland	34'926						34'926			34'926		100
France CEA	52'389			52'389						52'389		100
France IN2P3	401'647		66'119	67'108	67'108	67'108	67'102	67'102		401'647	0	100
Germany BMBF	340'527			340'367		160				340'527	0	100
Germany GSI	200'824							200'824		200'824		100
Greece	26'194										26'194	
Hungary	43'657			8'732	8'732	8'932	8'932	8'329		43'657		100
India	357'990							357'990		357'990		100
Italy Centro Fermi	61'120						61'120			61'120		100
Italy INFN	873'147					100'000	250'000	75'000	225'000	650'000	223'147	74
Japan	78'583		3'056	40'166	11'787	11'787	11'787			78'583		100
JINR	78'583				24'613		53'970			78'583		100
Mexico	104'778			104'778						104'778		100
Netherlands	122'241						61'121	61'120		122'241		100
Norway	148'435					148'435				148'435		100
Pakistan	26'194										26'194	
Peru	8'731							8'731		8'731		100
Poland	165'898							165'898		165'898		100
Republic of Korea - KISTI	26'194						26'194			26'194		100
Republic of Korea NRF	96'046				19'200		19'200	19'200	19'200	76'800	19'246	80
Romania ISS	43'657					13'000	10'000	20'657		43'657		100
Romania NIPNE	61'120		10'000	10'000	10'000	10'000	9'504	11'616		61'120		100
Russia	357'990						357'990			357'990		100
Slovakia	87'315				87'315					87'315		100
South Africa	61'120			24'448	12'224		24'448			61'120		100
Sweden	43'657					43'657				43'657		100
Thailand	8'731						8'731			8'731		100
Turkey	17'463			17'463						17'463		100
Ukraine Kiev	26'194										26'194	
United Kingdom	96'046				96'046					96'046		100
USA DOE	349'259				72'998		276'262			349'260	-1	100
USA NSF	43'657	4'429	11'242	1'806	1'821		6'896			26'194	17'463	60
Grand Total	5'256'340	4'429	90'417	1'295'924	411'843	440'579	1'390'387	996'467	270'394	4'900'440	355'900	93
From CF	500'000					500'000				500'000		
Entry fee						374'285	90'000	130'268	35'849	630'402	77'592	
Total with CF Upgrade and Entry fees		4'429	90'417	1'295'924	411'843	1'314'864	1'480'387	1'126'735	306'243	6'030'842	433'492	

Common Fund for Upgrade

Cash balance as of 28/10/2019

Common Fund for Upgrade Cash 2012-2019 (kCHF)									
Contributions per year	2012	2013	2014	2015	2016	2017	2018	2019	Total
Common Fund for Upgrade	4	90	1'296	412	941	1'390	996	270	5'400
Entry fees					374	90	130	36	630
In-kind contributions									
Total contributions	4	90	1'296	412	1'315	1'480	1'127	306	6'031
Cumulative contributions	4	95	1'391	1'803	3'117	4'598	5'725	6'031	
Expenditure per year	2012	2013	2014	2015	2016	2017	2018	2019	Total
Common Fund for Upgrade			0	42	248	701	853	1'641	3'486
Entry fee								402	402
Total spending			0	42	248	701	853	2'043	1'845
Cumulative spending			0	42	290	992	1'845	3'888	
Cash balance	4	95	1'391	1'760	2'827	3'606	3'880	2'143	



Construction for Upgrade

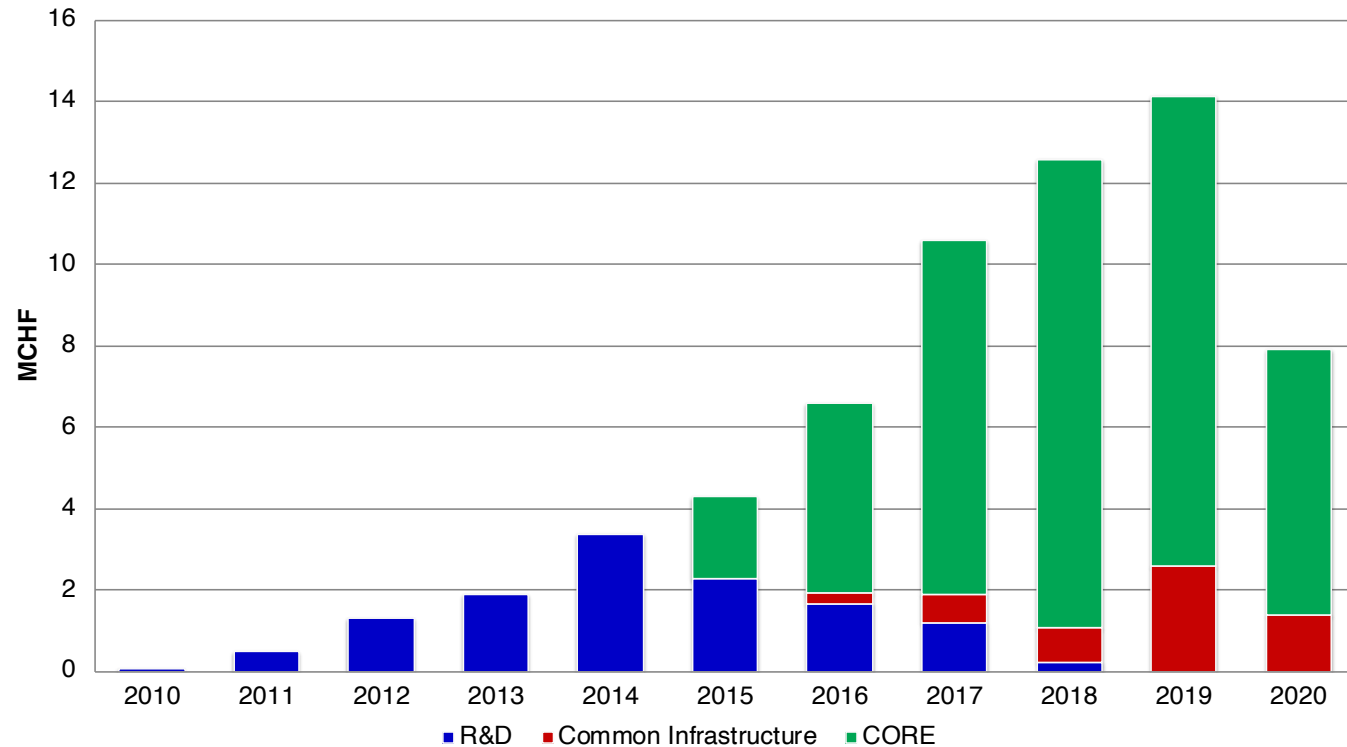


ALICE Upgrade projects

Cost estimates and spending profile

ALICE upgrade subsystem	CORE cost (MSF)
1. ITS	15.1
2. TPC	12.5
3. MFT	3.4
4. Trigger & Readout	7.1
5. O2	6.8
6. Common fund for Upgrade	5.8
Total (MSF)	50.7
R&D costs MSF	12.61
GRAND TOTAL (including R&D)	63.3

ALICE Upgrade Spending Profile



ALICE Upgrade projects

2020 Estimated expenditure on Common fund for Upgrade

The foreseen expenses on the Common Fund for Upgrade in 2020 are:

- 300 kCHF for Installation Manpower
- 380 kCHF for Services
- 700 kCHF for Access and Support structures

→ For a total of 1.38 MCHF

2020 Estimated expenditure on Construction for Upgrade

FIT: electronics, crates, sensors, scintillators and fibers for FDD, etc.

ITS: readout electronics and power distribution system.

MCH: Dual SAMPA frontend cards, electronic PCS and spare SOLAR boards.

MFT: ladder production, readout boards, data readout cables, LV power supply system.

O² EPN: EPNs and network system.

O² PDP: data storage system.

PHOS: material and equipment.

ZDC: FAN IN FAN OUT.

Funding Agency	System								Grand Total
	FIT	ITS	MCH	MFT	O2 EPN	O2 PDP	PHOS	ZDC	
CERN					439	1'358			1'797
China				33					33
Czech Republic	160			150					310
Denmark	70								70
Finland	45								45
France CEA			11	47					58
France IN2P3			302	278					580
Germany BMBF					1'044				1'044
Germany GSI					1'386				1'386
Hungary						125			125
India				264					264
Italy INFN								11	11
Norway		558							558
Pakistan		55							55
Peru				42					42
Russia	110						15		125
USA NSF	30								30
Grand Total	415	613	313	814	2'869	1'483	15	11	6'533

A Large Ion Collider Experiment



**Thank you on behalf of the
ALICE Collaboration**
