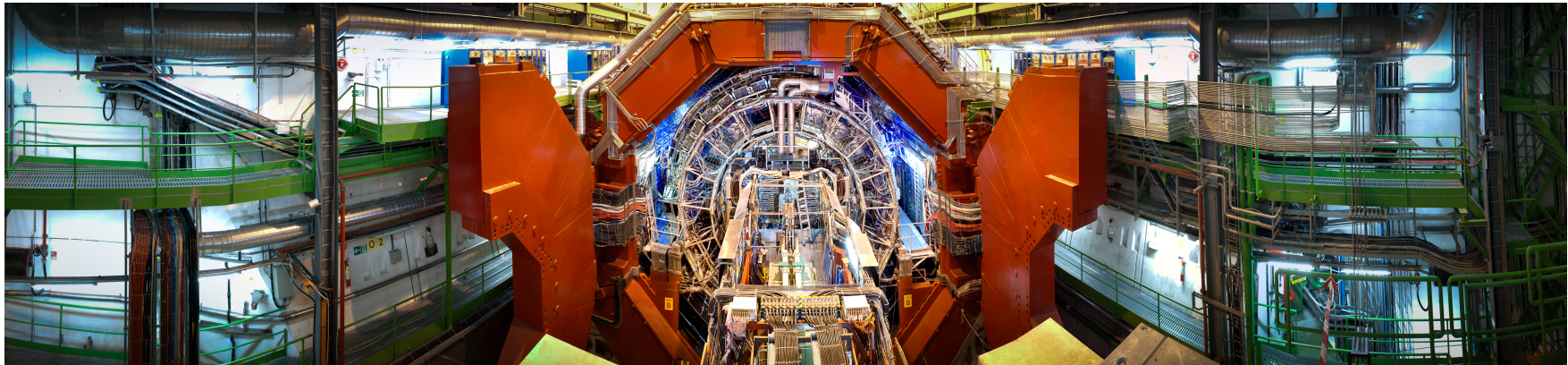


A Large Ion Collider Experiment



44th meeting of the ALICE Resources Review Board



Adriana Telesca
25 April 2018

Overview of the presentation

Maintenance and Operation budgets

- Category A
 - 2017 Book closing: contributions and expenditure
 - 2018 Current contributions and expenditure
 - 2019 Preliminary budget and sharing and estimates for the period 2020-2022
- Category B
 - 2017 Book closing: expenditure
 - 2019 Preliminary budget and sharing and estimates for the period 2020-2022

Upgrade budgets

- 2017 Contributions to Construction for Upgrade
- 2017 Common Fund for Upgrade: contributions and cash
- R&D upgrade contributions 2010-2017

A Large Ion Collider Experiment



Maintenance and Operation Cat. A

A Large Ion Collider Experiment



M&O-A 2017 book closing



M&O Cat. A contributions 2002-2017 as of 31/12/2017 in CHF

Outstanding contributions:

- Armenia
- Brazil RENAFEA
- Greece
- India
- Indonesia
- Japan
- Pakistan
- Rep. Korea NRF
- Romania ISS
- Romania NIPNE
- Ukraine

2017 advance payments:

- China CCNU
- Denmark
- France CEA
- Germany BMBF
- Germany GSI
- Russia
- USA DOE
- USA NSF

87% received for 2017

Country	2017						2002-2017				Advance payments
	Invoiced	Energy rebate	Final invoice	Received	In-kind	Due	Final invoice	Received	In-kind	Due	
Armenia	10'402	1'896	8'507			8'507	204'472	172'002	0	32'470	
Austria	30'514		30'514	30'514		0	68'352	68'352	0	0	
Azerbaijan	10'402		10'402	10'402		0	10'402	10'402	0	0	
Brazil UFRGS	31'207		31'207	31'207		0	41'854	41'854	0	0	
Brazil RENAFEA	93'622	7'583	86'039			86'039	768'299	650'147	0	118'152	
CERN	411'937		411'937	411'937		0	5'727'990	5'727'990	0	0	
China Beijing	10'402	526	9'876	9'876		0	141'327	78'637	62'690	0	
China Wuhan CCNU	83'220	4'212	79'008	79'008		0	553'336	493'256	60'080	0	9'875
Croatia	62'415	5'687	56'728	56'728		0	586'363	586'363	0	0	
Czech Republic	83'913		83'913	83'913		0	1'177'528	1'177'528	0	0	
Denmark	53'399		53'399	53'399		0	651'337	651'337	0	0	52'862
Finland	53'399		53'399	53'399		0	576'868	576'868	0	0	
France CEA	45'771		45'771	45'771		0	660'356	660'356	0	0	45'311
France IN2P3	289'881		289'881	289'881		0	4'706'915	4'706'915	0	0	
Germany BMBF	358'537		358'537	147'793		210'744	3'683'374	3'685'047	0	-1'673	
Germany GSI	175'454		175'454	175'454		0	2'133'189	2'133'189	0	0	173'690
Greece	15'257		15'257			15'257	355'367	302'184	0	53'183	
Hungary	45'771		45'771	45'771		0	391'656	391'656	0	0	
India	312'767	37'065	275'702			275'702	4'244'040	3'968'338	0	275'702	
Indonesia	10'402		10'402	5'270		5'132	21'049	15'917	0	5'132	
Italy Centro Fermi	38'142		38'142	38'142		0	339'040	339'040	0	0	
Italy INFN	701'818		701'818	701'818		0	10'663'626	10'633'626	30'000	0	
Japan	113'200	8'188	105'012	73'986		31'026	1'091'003	1'054'561	0	36'442	12'233
JINR	83'220	8'531	74'689	74'689		0	1'075'088	675'916	399'172	0	
Mexico	166'439	12'322	154'117	154'117		0	1'573'169	1'573'169	0	0	
Netherlands	91'541		91'541	91'541		0	1'057'448	1'057'448	0	0	
Norway	129'684		129'684	129'684		0	1'627'516	1'627'516	0	0	
Pakistan	30'514	2'843	27'670	27'670		0	137'978	115'276	0	22'702	
Peru	31'207	948	30'259	30'259		0	105'349	105'349	0	0	
Poland	160'198		160'198	160'198		0	1'765'225	1'765'225	0	0	
Republic of Korea NRF	124'829	10'426	114'403	110'000		4'403	1'124'175	1'119'772	0	4'403	
Republic of Korea KISTI	10'402	2'843	7'559	7'559		0	94'299	94'299	0	0	
Romania ISS	45'771		45'771	27'463		18'308	464'011	445'703	0	18'308	
Romania NIPNE	45'771		45'771	41'194		4'577	722'672	718'095	0	4'577	
Russia	414'959	28'323	386'636	410'138		-23'502	5'013'911	5'038'368	10'100	-34'557	
Slovakia	106'798		106'798	106'798		0	1'226'639	1'226'639	0	0	
South Africa	62'415	6'635	55'780	55'780		0	736'335	736'335	0	0	
Spain	7'628		7'628	7'628		0	426'110	426'110	0	0	
Sweden	30'514		30'514	30'514		0	436'006	436'006	0	0	
Thailand	10'402	948	9'455	9'455		0	40'338	40'338	0	0	
Turkey	7'628	1'895	5'733	5'733		0	53'771	53'771	0	0	
Ukraine	7'628	2'843	4'785			4'785	372'014	329'082	28'000	14'932	
United Kingdom	76'284		76'284	76'284		0	892'754	892'754	0	0	
USA DOE	392'058	36'807	355'250	357'251		-2'001	3'816'656	3'818'657	0	-2'001	
USA NSF	51'608	4'601	47'007	45'574		1'433	590'572	594'321	0	-3'749	
Grand Total	5'129'331	185'122	4'944'209	4'303'798	0	640'411	62'149'780	61'015'713	590'042	544'025	293'971

M&O-A 2017 book closing in kCHF as of 31/12/2017

Category	2017 Budget	Payments	Open commitments	Total expenditure	Balance Budget - Payments	Balance Budget - total expenditure
Detector related costs	1'142	1'236	58	1'294	-94	-152
Secretariat	193	188	2	190	5	3
Communications	0	0	0	0	0	0
Offline computing	537	626	0	626	-89	-89
Online computing (Op&Licenses)	646	646	0	646	0	0
Online computing (Hardware)	1'239	1'239		1'239	0	0
Test beams & calibration facilities	50	48		48	2	2
Laboratory operations	280	284	18	302	-4	-22
General services	605	575	36	612	30	-7
sub-total	4'692	4'842	114	4'956	-150	-264
Power (NMS only)	562	535		535	27	27
Total	5'254	5'377	114	5'492	-123	-237

End of year balance (total expenditure, no Power) = -264 kCHF End of year balance (payments only, no Power) = -150 kCHF

In 2017, the total payments amount to 5'377 kCHF, of which 50 kCHF are from commitments taken before 2017.

The open commitments at the end of 2017 amount to 114 kCHF.

The negative balance on the category of Detector Related cost is mainly due to the delayed purchase of the gas for the HMPID detector that was budgeted in 2016 and was done at the beginning of 2017.

The Power budget was completely used.

M&O-A cash balance as of 31/12/2017

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	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
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	5'395	5'444	4'304	294	61'911

M&O-A cash balance as of 31/12/2017

Payments and cash balance (kCHF)

Expenditure Payments only	Budget year																Grand Total		
	Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		2017	
	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
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	5'327	61'578	
Cash flow (Current Year)		177	98	34	95	18	479	684	856	176	-2'211	96	-423	415	249	319	-1'024	334	
Cash Flow		177	275	309	404	422	901	1'586	2'442	2'618	407	503	80	495	745	1'063	40	334	

Online Computing Replacement Funds	Budget year																Grand Total	
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
Actual Accruals										1'000	1'372	393	759	1'172	1'258	1'239		7'193
Cost/Commitments											233	398	3'426	280	34	36		4'407
Cash Balance (Current Year)										1'000	1'139	-5	-2'667	892	1'224	1'203		2'786
Cash Flow										1'000	2'139	2'134	-533	359	1'583	2'786		2'786

A Large Ion Collider Experiment



M&O-A current

2018 M&O-A contributions in kCHF as of 23/04/2018

Percentage of received contributions for 2018:
 MS: 42%
 NMS: 4%
 Total: 29%

* Not in the table: 132 kCHF received from Russia on 24/04/2018

Country	2018						2002-2018			
	Invoiced	Energy rebate	Final invoice	Received	In-kind	Due	Final invoice	Received	In-kind	Due
Armenia	10'550	871	9'680			9'680	214'151	172'002	0	42'150
Austria	30'207		30'207			30'207	98'559	68'352	0	30'207
Azerbaijan	10'550		10'550			10'550	20'952	10'402	0	10'550
Brazil RENAFEA	84'401	9'577	74'824			74'824	843'123	768'299	0	74'824
Brazil UFRGS	31'650		31'650			31'650	73'504	41'854	0	31'650
CERN	407'795		407'795	407'795		0	6'135'785	6'135'785	0	0
China Beijing	10'550	580	9'970			9'970	151'296	78'637	62'690	9'969
China Wuhan CCNU	84'401	4'643	79'758	9'875		69'883	633'094	503'131	60'080	69'883
Croatia	63'301	5'224	58'077			58'077	644'440	586'363	0	58'077
Czech Republic	90'621		90'621	60'414		30'207	1'268'149	1'237'942	0	30'207
Denmark	52'862		52'862	52'862		0	704'199	704'199	0	0
Finland	60'414		60'414			60'414	637'282	576'868	0	60'414
France CEA	45'311		45'311	45'311		0	705'667	705'667	0	0
France IN2P3	294'518		294'518	294'518		0	5'001'433	5'001'433	0	0
Germany BMBF	324'725		324'725			324'725	4'008'099	3'685'047	0	323'052
Germany GSI	173'690		173'690	173'690		0	2'306'879	2'306'879	0	0
Greece	15'104		15'104			15'104	370'471	302'184	0	68'287
Hungary	45'311		45'311	45'311		0	436'967	436'967	0	0
India	339'829	33'217	306'612			306'612	4'550'652	3'968'338	0	582'314
Indonesia	10'550		10'550			10'550	31'599	15'917	0	15'682
Italy Centro Fermi	22'655		22'655			22'655	361'695	339'040	0	22'655
Italy INFN	702'313		702'313			702'313	11'365'939	10'633'626	30'000	702'313
Japan	135'585	8'356	127'228	31'806		95'422	1'218'232	1'115'160	0	103'072
JINR	84'401	6'965	77'436			77'436	1'152'524	675'916	399'172	77'436
Mexico	189'903	16'542	173'361			173'361	1'746'530	1'573'169	0	173'361
Netherlands	105'725		105'725			105'725	1'163'173	1'057'448	0	105'725
Norway	143'483		143'483	143'483		0	1'770'999	1'770'999	0	0
Pakistan	30'207	2'612	27'595			27'595	165'573	137'980	0	27'593
Peru	21'100	871	20'230			20'230	125'579	105'349	0	20'230
Poland	166'139		166'139			166'139	1'931'364	1'765'225	0	166'139
Republic of Korea NRF	126'602	10'448	116'154			116'154	1'240'329	1'119'772	0	120'557
Republic of Korea KISTI	10'550	1'741	8'809			8'809	103'108	94'299	0	8'809
Romania ISS	37'759		37'759			37'759	501'770	464'011	0	37'759
Romania NIPNE	45'311		45'311	45'311		0	767'983	767'983	0	0
Russia	438'169	26'016	412'152			412'152	5'426'064	5'038'368	10'100	377'596
Slovakia	105'725		105'725	105'725		0	1'332'364	1'332'364	0	0
South Africa	63'301	6'094	57'206			57'206	793'541	736'335	0	57'206
Spain			0			0	426'110	426'110	0	0
Sweden	37'759		37'759	37'759		0	473'765	473'765	0	0
Thailand	10'550	871	9'680			9'680	50'017	40'338	0	9'679
Turkey	7'552	1'741	5'810			5'810	59'581	53'771	0	5'810
Ukraine	7'552	1'741	5'810			5'810	377'824	329'082	28'000	20'742
United Kingdom	83'069		83'069			83'069	975'823	892'754	0	83'069
USA DOE	428'972	33'810	395'162			395'162	4'211'818	3'818'657	0	393'161
USA NSF	52'314	4'226	48'087	20'359		27'728	638'659	614'680	0	23'979
Grand Total	5'243'035	176'148	5'066'887	1'474'219	0	3'592'668	67'216'667	62'682'466	590'042	3'944'159

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.

2018 M&O-A current expenditure as of 23/04/2018 in kCHF

Category	2018 Budget	Payments	Open commitments	Total expenditure	Balance Budget - Payments	Balance Budget - total expenditure
Detector related costs	1'179	336	148	485	843	694
Secretariat	193	45	124	169	148	24
Communications	0	0	0	0	0	0
Offline computing	537	133	221	355	404	182
Online computing (Op&Licenses)	646	180	270	450	466	196
Online computing (Hardware)	1'385			0	1'385	1'385
Test beams & calibration facilities	50	2		2	48	48
Laboratory operations	245	41	146	187	204	58
General services	508	149	55	204	359	304
sub-total	4'743	887	964	1'852	3'856	2'891
Power (NMS only)	501	79		79	422	422
Total	5'244	966	964	1'931	4'277	3'313

M&O-A cash flow as of 23/04/2018

Contributions

Contributions		Budget year																Grand Total	
Income and in-kind	Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		2018
	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															55	138	1'180	1'373
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	5'395	5'499	4'441	1'474	63'284

M&O-A cash flow as of 23/04/2018

Payments and cash balance

Expenditure Payments only	Budget year																	Grand Total	
	Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		2018
	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																46	920	966
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	5'373	920	62'544
Cash flow (Current Year)		177	98	34	95	18	479	684	856	176	-2'211	96	-423	415	249	374	-932	554	740
Cash Flow		177	275	309	404	422	901	1'586	2'442	2'618	407	503	80	495	745	1'118	186	740	740

Online Computing Replacement Funds	Budget year																	Grand Total	
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
Actual Accruals										1'000	1'372	393	759	1'172	1'258	1'239			7'193
Cost/Commitments											233	398	3'426	280	34	36	11		4'418
Cash Balance (Current Year)										1'000	1'139	-5	-2'667	892	1'224	1'203	-11		2'775
Cash Flow										1'000	2'139	2'134	-533	359	1'583	2'786	2'775		2'775

A Large Ion Collider Experiment



M&O-A 2019 preliminary budget and 2020-2022 estimates

M&O-A **preliminary** budget for 2019 and estimates for 2020-2022 in kCHF

Category	2012	2013	2014	2015	2016	2017	2018	Prelim. 2019	2020	2021	2022	Total 2019 to 2022
Detector related costs	1'253.1	1'733.4	1'512.4	1'167.0	1'177.0	1'142.0	1'179.0	1'469.0	1'559.0	1'177.0	1'177.0	5'382.0
Secretariat	207.5	207.5	207.5	208.0	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
CORE computing	537.0	537.0	537.0	625.0	625.0	537.0	537.0	537.0	537.0	713.0	713.0	2'500.0
Online computing	2'012.0	1'033.0	1'403.8	1'824.6	1'894.1	1'884.8	2'031.0	1'699.0	1'599.0	2'015.0	2'015.0	7'328.0
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	160.0
Laboratory operations	250.0	280.0	255.0	245.0	245.0	280.0	245.0	255.0	255.0	245.0	245.0	1'000.0
General services	549.7	828.7	689.7	567.7	507.7	604.7	507.5	727.5	717.5	507.5	507.5	2'459.9
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	4'900.5	4'900.5	4'900.5	4'900.5	19'601.9
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	3'834.0
Grand Total	7'320.3	5'370.8	5'303.4	7'103.3	6'600.9	6'397.5	6'625.5	4'934.5	4'934.5	6'783.5	6'783.5	23'435.9

These numbers are based on a long period of shutdown starting in January 2019 that continues until the end of 2020 and follows a long period of runs with short technical stops during winter in 2021 and 2022.

The preliminary budget will be reviewed in detail over the summer with the Scrutiny Group, and presented for final approval at the October RRB meeting.

M&O-A
preliminary
budget for 2019
and estimates
for 2020-2022
in kCHF
(detailed)

Category	Description	2012	2013	2018	2015	2016	2017	2018	2019	2020	2021	2022
Detector related costs	Beam pipe & vacuum	200	200	200	200	200	200	200	200	200	200	200
	Cooling fluids(above -50°C)											
	Cooling systems	87	87	87	87	87	87	87	87	87	87	87
	Counting & control rooms	46	47	112	47	47	25	25	25	25	25	25
	Cryogenic fluids (below -50°C)											
	Detector safety systems	77	56	49	47	47	69	59	60	79	59	59
	Electronics pool rentals	43	43	43	43	43	43	43	43	43	43	43
	External cryogenics											
	Gas consumption	290	85	135	257	267	223	270	121	172	268	268
	Gas systems	140	170	140	140	140	140	140	160	160	140	140
	General Technical support	180	180	180	180	180	180	180	180	180	180	180
	Magnet	25	40	25	25	25	25	25	35	55	25	25
	Magnet controls	23	23	23	23	23	32	32	32	32	32	32
	Magnet power supply	18	18	18	18	18	18	18	18	18	18	18
	Moving/hydraulic systems	20	60	20	20	20	20	20	30	30	20	20
	Safety	20		40	20	20	20	20	20	20	20	20
	Shutdown activities	84	724	440	60	60	60	60	458	458	60	60
	UPS maintenance											
Detector related costs Total		1253	1733	1512	1167	1177	1142	1179	1469	1559	1177	1177
Secretariat	Economat	15	15	15	15	10	10	10	10	10	10	10
	Printing and publication	30	30	30	30	20	20	20	20	20	20	20
	Secretarial assistance	163	163	163	163	163	163	163	163	163	163	163
Secretariat Total		208	208	208	208	193	193	193	193	193	193	193
Communications	Collaborative Tools	40										
	GSM phones; on-call service											
Communications Total		40										
CORE computing	Central computing environment	189	189	189	233	233	189	189	189	189	281	281
	Central production operations	26	26	26	70	70	26	26	26	26	44	44
	Hardware	98	98	98	98	98	98	98	98	98	98	98
	Software process service	158	158	158	158	158	158	158	158	158	180	180
	User support	66	66	66	66	66	66	66	66	66	110	110
CORE computing Total		537	537	537	625	625	537	537	537	537	713	713
Online computing	Common desktop infrastructure OL											
	Computers/processors/LANs	1372	393	759	1172	1258	1239	1385	1053	953	1017	1017
	Data storage (temporary on disk)											
	Detector controls											
	Software licences	65	65	65	73	56	56	56	56	56	56	56
	System management	575	575	580	580	580	590	590	590	590	942	942
Online computing Total		2012	1033	1404	1825	1894	1885	2031	1699	1599	2015	2015
Test beams & calibration facilities	General operation	20		20	15	15	15	15		20	15	15
	Common electronics											
	Electronics pool rentals TB	35	10	35	5	5	5	5			5	5
	Gas systems TB	20	20	20	20	20	20	20	20	20	20	20
	Gas consumption TB	10		10	10	10	10	10			10	10
	External cryogenics TB											
Test beams & calibration facilities Total		85	30	85	50	50	50	50	20	40	50	50
Laboratory operations	Assembly areas & clean rooms	30	30	15	15	15	50	15	15	15	15	15
	Laboratory instruments	20	20	20	20	20	20	20	20	20	20	20
	Workshops	200	230	220	210	210	210	210	220	220	210	210
Laboratory operations Total		250	280	255	245	245	280	245	255	255	245	245
General services	Cars	20	20	20	20	20	20	20	20	20	20	20
	Common desktop infrastructure GS	50	50	50	50	40	40	40	40	40	40	40
	Cooling & ventilation	83	133	83	83	83	83	83	83	83	83	83
	Cranes	190	305	285	208	208	285	208	323	323	208	208
	Heavy transport	5	20	10	5	5	5	5	20	10	5	5
	Outreach	50	100	50	90	40	40	40	40	40	40	40
	Power distribution system	41	41	41	41	41	41	41	41	41	41	41
	Storage space	10	10	10	10	10	10	10	10	10	10	10
	Survey	60	109	100	30	30	50	30	120	120	30	30
	Consultancy	40	40	40	30	30	30	30	30	30	30	30
General services Total		550	829	690	568	508	605	507	727.5	717.5	507.5	507.5
Grand Total without Power		4934	4650	4690	4687	4692	4692	4742	4900.5	4900.5	4900.5	4900.5
Power	Power	2386	721	613	2416	1909	1706	1883	34	34	1883	1883
Grand Total		7320	5371	5303	7103	6601	6398	6625	4934.5	4934.5	6783.5	6783.5

Sharing of the preliminary 2019 budget

2019 **DRAFT** M&O-A Budget no power 4'900'500 CHF
 2019 Power 34'000 CHF
 ALICE DB as 01/09/2017 628 scientists
 Cost M&O per scientist 7'803 CHF
 Cost Power per scientist 54 CHF

Final sharing is established as soon as the
 scrutiny of the preliminary budget is done and
 scientists head count is done as 01/09/2018.

ALICE Experiment M&O-A 2019 Preliminary Budget	Snapshot number of scientists ACDB as Sept. 2017	M&O-A	Energy in CHF	Energy billed to NMS Funding Agencies in CHF	Invoice for 2019 in CHF
Armenia	1	7'803	54	54	7'857
Austria	4	31'213	217		31'213
Azerbaijan	1	7'803	54	54	7'857
Brazil RENAFAE	8	62'427	433	433	62'860
Brazil UFRGS	3	23'410	162	162	23'572
CERN	54	421'381	2'924		421'381
China	9	70'230	487	487	70'717
Croatia	6	46'820	325	325	47'145
Czech Republic	12	93'640	650		93'640
Denmark	7	54'623	379		54'623
Finland	8	62'427	433		62'427
France CEA	6	46'820	325		46'820
France IN2P3	39	304'330	2'111		304'330
Germany BMBF	43	335'544	2'328		335'544
Germany GSI	23	179'477	1'245		179'477
Greece	2	15'607	108		15'607
Hungary	6	46'820	325		46'820
India	45	351'150	2'436		351'150
Indonesia	1	7'803	54	54	7'857
Italy Centro Fermi	3	23'410	162		23'410
Italy INFN	93	725'711	5'035		725'711
Japan	13	101'443	704	676	102'119
JINR	8	62'427	433	433	62'860
Mexico	18	140'460	975	975	141'435
Netherlands	14	109'247	758		109'247
Norway	19	148'264	1'029		148'264
Pakistan	4	31'213	217		31'213
Peru	2	15'607	108	108	15'715
Poland	22	171'674	1'191		171'674
Republic of Korea NRF	12	93'640	650	650	94'290
Republic of Korea NRF - KISTI	1	7'803	54	54	7'857
Romania ISS	5	39'017	271		39'017
Romania NIPNE	6	46'820	325		46'820
Russia	45	351'150	2'436	1'776	352'926
Slovakia	14	109'247	758		109'247
Sweden	5	39'017	271		39'017
South Africa	6	46'820	325	325	47'145
Thailand	1	7'803	54	54	7'857
Turkey	1	7'803	54		7'803
Ukraine Kiev	1	7'803	54		7'803
United Kingdom	11	85'837	596		85'837
USA DOE	41	319'937	2'220	2'155	322'092
USA NSF	5	39'017	271	263	39'280
Total	628	4'900'500	34'000	9'038	4'909'538



A Large Ion Collider Experiment



Maintenance and Operation cat. B

A Large Ion Collider Experiment



M&O-B 2017 book closing

Maintenance and Operation Category B (sub-systems specific) as of 31/12/2017 in kCHF

Project	2017 budget	2017 Payments	2017 Open Commitments	Balance (budget - payments)
ITS Common	128.0	128.0		
ITS-SPD	110.0	54.0		56.0
ITS-SDD	95.0	72.0		23.0
ITS-SSD	119.1	70.0		49.1
TPC	180.0	221.3		-41.3
TRD	153.5	95.9		57.6
TOF	62.0	63.0		-1.0
HMPID	82.5	73.0		9.5
PHOS	56.0	31.3		24.7
EMCAL-DCAL	96.0	83.0		13.0
FMD	25.0	23.0		2.0
T0	26.0	16.4		9.6
VOA	5.0	2.0		3.0
V0C	7.0	2.2		4.9
PMD	15.0	15.0		
ZDC	26.0	17.0		9.0
ACORDE	10.0	8.0		2.0
MUON TRACKING	149.0	136.0		13.0
MUON TRIGGER	69.0	65.3		3.7
CENTRAL TRIGGER	11.0	10.0		1.0
Grand Total	1425.1	1186.4		238.7

The in-kind contributions in man-months for Technical manpower from collaborating institutes at CERN in 2017 have been:

- 16 man-months for the ITS-SSD
- 23 man-months for TRD
- 64 man-months for PHOS
- 80 man-months for EMCAL/DCAL
- 15 man-months for PMD
- 24 man-months for Central Trigger

A Large Ion Collider Experiment



M&O-B 2019 preliminary budget and 2020-2022 estimates

M&O-B **preliminary** budget for 2019 and estimates for 2020-2022 in kCHF

Project	2012	2013	2014	2015	2016	2017	2018	Prelim. 2019	2020	2021	2022
ITS Common	128	88	98	128	128	128	128	60	0		
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	25		
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	158	158
TOF	120	94	92	81	62	62	63	80	78	78	78
HMPID	144.5	92.5	92.5	82.5	82.5	82.5	88.5	65.5	65.5	60.5	60.5
PHOS	158	93	142	56	56	56	56	43	43	38	38
EMCAL-DCAL	77.7	49	69	67	67	96	138.28	96	96	104	92
FMD	25	25	25	25	25	25	25	16	10		
T0	48.35	65	53	48	48	26	20.5	6.5	0		
V0A	14	52.5	52.5	10	5	5	5	8	1		
V0C	11	55.5	55.5	7	7	7	7	7	7		
PMD	29	36	26	20	15	15	15	0	0		
ZDC	35	26	30	29	26	26	22	11	13	16	16
ACORDE	15	15	10	10	9	10	7	8	13	34	19
MUON TRACKING	87	164	164	118	145	149	151	169	165	151	151
MUON TRIGGER	75	81	81	76	76	69	69	64	69		
CENTRAL TRIGGER	20	20	20	20	20	11	11	11	11	11	11
FIT											98
ITS											360
MFT											82
MID											66
TPC Upgraded											180
Grand Total	1810.6	1657.5	1595.5	1327.5	1384.1	1425.1	1450.9	1088	944.5	1436.5	1360.5

The projects that will go through an upgrade during LS2 and for which the M&O-B budget will be paid by a different composition of funding agencies have been added at the bottom of the table in order to distinguish them from the existing projects.

These numbers are based on a long period of shutdown starting in January 2019 that continues until the end of 2020 and follows a long period of runs with short technical stops during winter in 2021 and 2022.

The preliminary budget will be reviewed in detail over the summer with the Scrutiny Group, and presented for final approval at the October RRB meeting.

M&O-B **preliminary** budget for 2019 and estimates for 2020-2022 in kCHF

Activity	2012	2013	2014	2015	2016	2017	2018	Prelim. 2019	2020	2021	2022
A01 Mechanics	28.5	50	42.5	26.5	26.5	27.5	35.5	30	27	40	38
A02 Gas Systems	82	38	38	43	45	46	41	25	24	24	24
A03 Cooling Systems	110	151	133	78	73	72	67.24	19	19	59	63
A04 FEE spares	100.5	135	112	70	62	64	56.6	38	38	95	73
A05.1 Standard Electronics LV/HV PS	421	322.5	256.5	180.5	182.5	185.5	172.92	99	100	166	167
A05.2 Standard Electronics Crates	63.5	26.5	37.5	45.5	46.5	45.5	34	14	15	40	36
A05.3 Standard Electronics R/O modules	172.5	94.5	111	107	105	93	73.74	52.5	47.5	79	73
A06 Controls (DCS & DSS)	33	33.5	43.5	35.5	35.5	34.5	31.8	13.5	14.5	32.5	38.5
A07 Sub-Detector spares	81.5	143	125	29	19	17	14	17	21	52	22
A08 Areas	57	42	44	39	42	35	41	23	20	61	61
A09 Communications	92.5	91	97	92	94	96	107.06	86.5	83	108	108
A10 Store Items	83.5	97.5	87.5	82.5	82.5	99	94.3	83	73	96	88
A11.1 Technical Manpower @ CERN: Industrial Support	23	6	11	6	6	29	9.12	9	9	14	14
A11.3 Technical Manpower @ CERN from Collaborating Institutes	462.05	427	457	493	564.6	581.1	672.6	578.5	453.5	570	555
Grand Total	1810.6	1657.5	1595.5	1327.5	1384.1	1425.1	1450.9	1088	944.5	1436.5	1360.5
A11.2 Technical Manpower @ CERN from Collaborating Institutes (in man-months)	180	246	185	192	192	212	224	239	239	267	209

These numbers are based on a long period of shutdown starting in January 2019 that continues until the end of 2020 and follows a long period of runs with short technical stops during winter in 2021 and 2022.

The preliminary budget will be reviewed in detail over the summer with the Scrutiny Group, and presented for final approval at the October RRB meeting.



M&O-B 2019 **preliminary** budget by system in kCHF

2019	Project																			Grand Total	
Activity	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	Grand Total
A01 Mechanics					10	10					6								4		30
A02 Gas Systems					5	10		5											5		25
A03 Cooling Systems						5	2	2	10												19
A04 FEE spares								1	5	30							2				38
A05.1 Standard Electronics LV/HV PS					3	40	13	4	5	10				1				15	8		99
A05.2 Standard Electronics Crates								1									1	10		2	14
A05.3 Standard Electronics R/O modules						10	18			10				1		2	3	4	5		52.5
A06 Controls (DCS & DSS)					1	4	2	1.5	5												13.5
A07 Sub-Detector spares										10		1					1	3	2		17
A08 Areas								20				3									23
A09 Communications				1	1	27	13	8	10	2	2	0.5		1		1	1	12	3	4	86.5
A10 Store Items				4	10	7	13	8	8	10		2	8	1			1	6	5		83
A11.1 Technical Manpower @ CERN: Industrial Support								5		4											9
A11.3 Technical Manpower @ CERN from Collaborating Institutes	60	50	40	45	120	40	19	10		20	8			4		10		120	33		578.5
Grand Total	60	50	40	50	150	153	80	65.5	43	96	16	6.5	8	7		11	8	169	64	11	1088
A11.2 Technical Manpower @ CERN from Collaborating Institutes (in man-months)						20			96	98			1							24	239

Sharing of the **preliminary** 2019 M&O-B budget

Sharing of the M&O-B 2019 preliminary budget in kCHF	ITS Common	ITS-SPD	ITS-SDD	ITS-SSD	TPC	TRD	TOF	HMPID	PHOS	EMCAL-DCAL	FMD	T0	V0 A	V0 C	PMD	ZDC	ACORDE	MUON TRACKING	MUON TRIGGER	CENTRAL TRIGGER	Grand Total in kCHF	
CERN	11.95	22.5		6.5	24.0			19.65														84.6
China										4.8												4.8
Croatia					0.8																	0.8
Czech Republic	1.13		2.28																			3.4
Denmark					4.8						16											20.8
Finland												5.76										5.8
France CEA																		23.66				23.7
France IN2P3	4.27			10.8						9.6				7				47.32	31.6			110.6
Germany BMBF						143.3																143.3
Germany GSI					86.3																	86.3
India																		23.66				23.7
Italy INFN	33.28	22.5	34.88	17.3			73.6	45.85		7.2							11	27.04	27.8			300.4
Japan										7.2												7.2
JINR						6.7																6.7
Mexico													8				8					16.0
Netherlands	4.59			11.6																		16.2
Poland					4.3																	4.3
Republic of Korea							6.4													4.6		11.1
Romania NIPNE						3.1																3.1
Russia	0.23		0.44	0.5					43			0.74						23.66				68.6
Slovakia	2.06	5			2.9																	10.0
South Africa																		23.66				23.7
Sweden					26.9																	26.9
Ukraine	2.44		2.28	3.4																		8.1
United Kingdom																				11		11.0
United States DOE										67.2												67.2
United States NSF	0.05		0.12																			0.2
Total	60	50	40	50	150	153	80	65.5	43	96	16	6.5	8	7		11	8	169	64	11		1088

A Large Ion Collider Experiment



Upgrade budgets

Table 1A: 2015-2017 Construction for Upgrade Expenditure by System
(Unit = kCHF)

Sum of Payments		Year				
System	Funding Agency	2015	2016	2017	Grand Total	
CTP	United Kingdom		111	24	135	
FIT	Austria		10	80	90	
	Denmark		14	17	30	
	Finland	30	30	30	90	
	Mexico CONACYT	14	30	200	244	
	Mexico UNAM			6	6	
	Russia	5	15	15	35	
	USA NSF		6	33	39	
ITS	CERN	540	863	1'222	2'625	
	China		74	250	324	
	France IN2P3	17	480	200	697	
	Italy INFN	17	705	1'570	2'292	
	Netherlands	150	16	900	1'066	
	Republic of Korea NRF	17	100	100	217	
	Russia	40	40	40	120	
	Thailand			195	195	
	United Kingdom	17	268	200	485	
	MCH	France CEA	42	6	138	186
France IN2P3			21	30	51	
MFT	France CEA		8	327	335	
	France IN2P3		45	165	210	
	Japan		20		20	
	Russia			80	80	
MID	France IN2P3	63	14	86	163	
	Italy INFN	58	11	55	124	
	Republic of Korea NRF		5	5	10	
PHOS	Russia			30	30	
SAMPA	Brazil			40	40	
TOF	Italy Centro Fermi			47	47	
	Italy INFN		53	358	411	
	Russia		32		32	
TPC	Brazil			5	5	
	Croatia			3	3	
	Finland	77	58	246	381	
	Germany BMBF	742	255	753	1'749	
	Germany GSI	176	454	298	928	
	Hungary		56	109	165	
	India		50		50	
	Japan			6	6	
	Mexico CONACYT	75	10	10	95	
	Norway			39	39	
	Poland			3	3	
	Romania NIPNE	53	143	368	564	
	Slovakia			3	3	
	Sweden		49	51	100	
	USA DOE		760	596	1'356	
	TRD	Germany BMBF		325	135	460
	Grand Total		2'131	5'135	9'067	16'333

Table 1B: 2015-2017 Construction for Upgrade Expenditure by Funding Agency
(Unit = kCHF)

Sum of Payments		Year			
Funding Agency	System	2015	2016	2017	Grand Total
Austria	FIT		10	80	90
Brazil	TPC			5	5
	SAMPA			40	40
CERN	ITS	540	863	1'222	2'625
China	ITS		74	250	324
Croatia	TPC			3	3
Denmark	FIT		14	17	30
Finland	FIT	30	30	30	90
	TPC	77	58	246	381
France CEA	MCH	42	6	138	186
	MFT		8	327	335
France IN2P3	ITS	17	480	200	697
	MCH		21	30	51
	MFT		45	165	210
	MID	63	14	86	163
Germany BMBF	TPC	742	255	753	1'749
	TRD		325	135	460
Germany GSI	TPC	176	454	298	928
Hungary	TPC		56	109	165
India	TPC		50		50
Italy Centro Fermi	TOF			47	47
Italy INFN	ITS	17	705	1'570	2'292
	MID	58	11	55	124
	TOF		53	358	411
Japan	TPC			6	6
	MFT		20		20
Mexico CONACYT	FIT	14	30	200	244
	TPC	75	10	10	95
Mexico UNAM	FIT			6	6
Netherlands	ITS	150	16	900	1'066
Norway	TPC			39	39
Poland	TPC			3	3
Republic of Korea NRF	ITS	17	100	100	217
	MID		5	5	10
Romania NIPNE	TPC	53	143	368	564
Russia	FIT	5	15	15	35
	ITS	40	40	40	120
	MFT			80	80
	PHOS			30	30
	TOF		32		32
Slovakia	TPC			3	3
Sweden	TPC		49	51	100
Thailand	ITS			195	195
United Kingdom	CTP		111	24	135
	ITS	17	268	200	485
USA DOE	TPC		760	596	1'356
USA NSF	FIT		6	33	39
Grand Total		2'131	5'135	9'067	16'333



ALICE

**2017
Construction
for Upgrade
expenditure as
of 31/12/2017**

Common fund for upgrade contributions as of 31/12/2017 in kCHF

71% of contributions have been received at the end of 2017.

Note that we have received in 2018

- 8 kCHF from Hungary
- 75 kCHF from Italy INFN
- 19 kCHF from Rep. Korea NRF
- 11 kCHF Romania NIPNE

As of 23/04/2018

Funding Agency	Due	2012	2013	2014	2015	2016	2017	Total received	Outstanding
Armenia	17'463								17'463
Brazil	69'852					37'500	32'352	69'852	
CERN	471'499			471'499				471'499	
China	43'657						43'657	43'657	
Croatia	52'389						26'195	26'195	26'194
Czech Republic	87'315			87'315				87'315	
Denmark	69'852			69'852				69'852	
Finland	34'926						34'926	34'926	
France CEA	52'389			52'389				52'389	
France IN2P3	401'647		66'119	67'108	67'108	67'108	67'102	334'545	67'102
Germany BMBF	340'527			340'367		160		340'527	0
Germany GSI	200'824								200'824
Greece	26'194								26'194
Hungary	43'657			8'732	8'732	8'932	8'932	35'328	8'329
India	357'990								357'990
Italy Centro Fermi	61'120						61'120	61'120	
Italy INFN	873'147					100'000	250'000	350'000	523'147
Japan	78'583		3'056	40'166	11'787	11'787	11'787	78'583	
JINR	78'583				24'613		53'970	78'583	
Mexico	104'778			104'778				104'778	
Netherlands	122'241						61'121	61'121	61'120
Norway	148'435					148'435		148'435	
Pakistan	26'194								26'194
Peru	8'731								8'731
Poland	165'898								165'898
Republic of Korea - KISTI	26'194						26'194	26'194	
Republic of Korea NRF	96'046				19'200		19'200	38'400	57'646
Romania ISS	43'657					13'000	10'000	23'000	20'657
Romania NIPNE	61'120		10'000	10'000	10'000	10'000	9'504	49'504	11'616
Russia	357'990						357'990	357'990	
Slovakia	87'315				87'315			87'315	
South Africa	61'120			24'448	12'224		24'448	61'120	
Spain	43'657								43'657
Sweden	43'657					43'657		43'657	
Thailand	8'731						8'731	8'731	
Turkey	17'463			17'463				17'463	
Ukraine Kiev	26'194								26'194
United Kingdom	96'046				96'046			96'046	
USA DOE	349'259				72'998		276'262	349'260	-1
USA NSF	43'657	4'429	11'242	1'806	1'821		6'896	26'194	17'463
Grand Total	5'299'997	4'429	90'417	1'295'924	411'843	440'579	1'390'387	3'633'579	1'666'418
From CF	500'000					500'000		500'000	
Entry fee						374'285	90'000	464'285	243'711
Total with CF Upgrade and Entry fees		4'429	90'417	1'295'924	411'843	1'314'864	1'480'387	4'597'864	1'910'129

Entry fees in kCHF as of 31/12/2017

Payments received in 2017:

- Vienna (AT) 10 kCHF
- Baku (AZ) 10 kCHF
- UFRGS (BR) 10 kCHF
- Brescia and Pavia (IT) 25 kCHF
- NWU (JP) 10 kCHF
- Inha Uni (KR) 10 kCHF
- Karatay Univ (TR) 15 kCHF

Entrance fees pending:

- Vienna (AT) 20 kCHF
- Baku (AZ) 40 kCHF
- UFRGS (BR) 23.3 kCHF
- Bonn (DE) 17.3 kCHF
- LIPI (ID) 38 kCHF
- NiAS (JP) 30 kCHF
- NWU (JP) 40 kCHF
- COMSATS (PK) 25 kCHF
- Inha (KR) 10 kCHF

Note that we have received in 2018:

- NiAS (JP) 5 kCHF
- Bonn (DE) 17.3 kCHF

As of 23/04/2018

Funding agency	Entry Fees paid (1998 - 2017)	Due
Austria	30.0	20.0
Armenia	38.0	
Azerbaijan	10.0	40.0
Brazil	71.7	23.3
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	293.3	17.4
Germany GSI	40.0	
Greece	47.5	
Hungary	45.0	
India	320.0	
Indonesia	11.7	38.0
Italy Centro Fermi	45.0	
Italy INFN	495.0	
Japan	30.0	70.0
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	90.0	10.0
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	3'345.7	243.7

Common fund for Upgrade

Cash balance as of 31/12/2017

Common Fund for Upgrade Cash 2012-2017 (kCHF)

Contributions per year	2012	2013	2014	2015	2016	2017	Total
Common Fund for Upgrade	4	90	1'296	412	941	1'390	4'134
Entry fees					374	90	464
In-kind contributions							
Total contributions	4	90	1'296	412	1'315	1'480	4'598
Cumulative contributions	4	95	1'391	1'803	3'117	4'598	

Expenditure per year	2012	2013	2014	2015	2016	2017	Total
Payments			0	42	248	701	992
In-kind contributions							
Total spending			0	42	248	701	992
Cumulative spending			0	42	290	992	

Cash balance	4	95	1'391	1'760	2'827	3'606	
---------------------	----------	-----------	--------------	--------------	--------------	--------------	--

2017 Construction and Common Fund for Upgrade expenditure as of 31/12/2017

Table 2A: Construction for Upgrade including Common Fund - Cumulative Expenditure and Contributions 2012-2017 by System (Unit = kCHF)

Sum of Payments	Year						Grand Total
	2012	2013	2014	2015	2016	2017	
CTP					111	24	135
FIT				49	104	381	534
ITS				798	2'546	4'677	8'021
MCH				42	27	168	237
MFT					72	572	644
MID				121	31	146	297
PHOS						30	30
SAMPA						40	40
TOF					84	405	489
TPC				1'121	1'835	2'490	5'446
TRD					325	135	460
CF Upgrade	4	90	1'296	412	441	1'390	3'634
Grand Total	4	90	1'296	2'543	5'576	10'457	19'967

Table 2B: Construction for Upgrade including Common Fund Cumulative Expenditure and Contributions 2012-2017 by Funding Agency (Unit = kCHF)

Sum of Payments	Year						Grand Total
	2012	2013	2014	2015	2016	2017	
Austria					10	80	90
Brazil					38	76	114
CERN			471	540	863	1'222	3'097
China					74	294	368
Croatia						29	29
Czech Republic			87				87
Denmark			70		14	17	100
Finland				107	88	311	506
France CEA			52	42	14	465	573
France IN2P3		66	67	147	627	548	1'455
Germany BMBF			340	742	580	888	2'550
Germany GSI				176	454	298	928
Hungary			9	9	65	118	200
India					50		50
Italy Centro Fermi						108	108
Italy INFN				75	869	2'233	3'176
Japan		3	40	12	32	18	105
JINR				25		54	79
Mexico CONACYT			105	89	40	210	444
Mexico UNAM						6	6
Netherlands				150	16	961	1'127
Norway					148	39	187
Poland						3	3
Republic of Korea KISTI						26	26
Republic of Korea NRF				36	105	124	265
Romania ISS					13	10	23
Romania NIPNE		10	10	63	153	378	614
Russia				45	87	523	654
Slovakia				87		3	90
South Africa			24	12		24	61
Sweden					93	51	144
Thailand						204	204
Turkey			17				17
United Kingdom				113	379	224	716
USA DOE				73	760	872	1'705
USA NSF	4	11	2	2	6	40	65
Grand Total	4	90	1'296	2'543	5'576	10'457	19'967

Project	FA	2010	2011	2012	2013	2014	2015	2016	2017	Grand Total
FIT							15			15
	Russia						15			15
ITS		71	470	857	1'086	2'250	1'064	493		6'290
	CERN	60	50	180	309	960	320			1'879
	China		14	60		51	55	47		228
	Czech Republic	0	10	20	7	6	8	14		64
	France IN2P3	3	68	125	125	550	52			923
	Indonesia						7	10		17
	Italy INFN	0	166	211	285	551	257			1'470
	Netherlands					10	50	18		78
	Pakistan	0	0	20	81		12	20		133
	Republic of Korea NRF			40	201	96	102	117		556
	Russia			33	28	10	10	20		101
	Slovakia			1	5	1	5	20		32
	Thailand			2	45	15	36	35		133
	Ukraine	9	11	15			7	10		52
	United Kingdom		150	150			25	54		379
	USA DOE						117	128		245
MFT			2	94	113	198	191	133	170	902
	China						9			9
	France CEA			63	40	150	63	21	12	349
	France IN2P3		2	5	73	48	98	99	146	471
	India							6		6
	Japan						3	1		4
	Peru						13			13
	Russia			27			5	6	12	50
Muon Spectrometer		0	0	4	12	80	27	53	78	253
	France CEA						3	8	33	44
	France IN2P3			4	12	75	23	36	4	153
	Italy INFN	0	0	0		4	1	10	26	41
	South Africa								16	16
O2				20	2	77	140	181	114	534
	CERN			20	2	77	140	181	114	534
Online systems		0	30	78	178	17		6		308
	CERN		30	63	178	17		6		293
	Hungary	0	0	15						15
PHOS		5	5	191	261	65	85	93	12	717
	China	0	0	0	78					78
	Japan	0	0	0	21		3	10		34
	JINR					60			12	72
	Norway	5	5	5	38					53
	Russia	0	0	186	124		5	82	83	480
SAMPA						203	140	590	475	1'408
	Brazil					203	140	590	475	1'408
TOF		0	0	3	18		53			74
	Italy INFN	0	0	3	18		53			74
TPC		0	0	89	248	499	573	133	341	1'883
	Croatia						10	5	5	20
	Finland					38	11	8	13	70
	Hungary					8				8
	Germany			47	70	192	133	28	1	470
	India				12		50	70	75	207
	Japan			40	60	40	22	9	20	191
	Mexico						10	10		20
	Norway			3	33	18	31	3		88
	Romania NIPNE					46				73
	Slovakia	0	0	0					200	200
	Sweden				63	97	106			266
	USA DOE				10	60	200			270
ZDC							3	3	5	11
	Italy INFN						3	3	5	11
Grand Total		76	507	1'336	1'917	3'389	2'289	1'685	1'195	12'395



R&D for Upgrade

Expenditure as of 31/12/2017

A Large Ion Collider Experiment



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

A Large Ion Collider Experiment



Extra slides

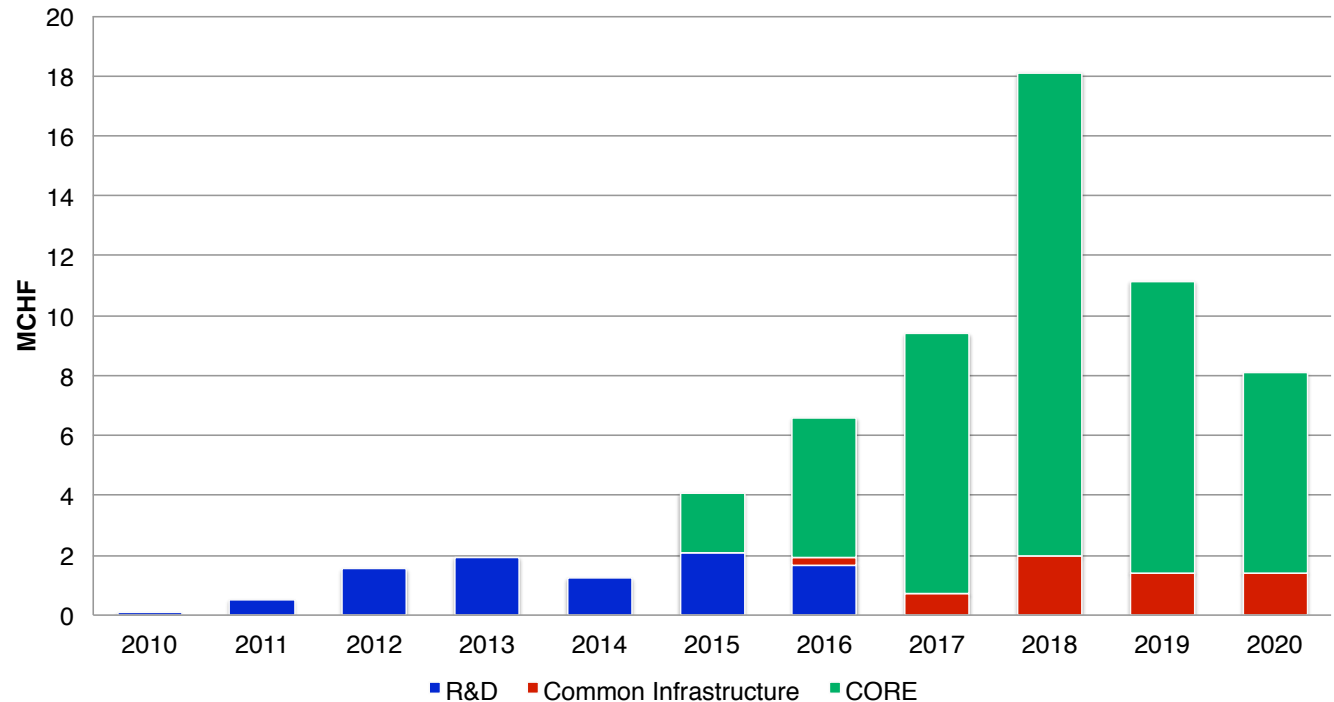


ALICE Upgrade

Total cost 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	9.8
6. Common fund for Upgrade	5.8
Total (MSF)	53.7
R&D costs MSF	9.01
GRAND TOTAL (including R&D)	62.7

ALICE Upgrade Spending Profile



ALICE Upgrade

Spending profile by project

ALICE Upgrade Construction Spending Profile

