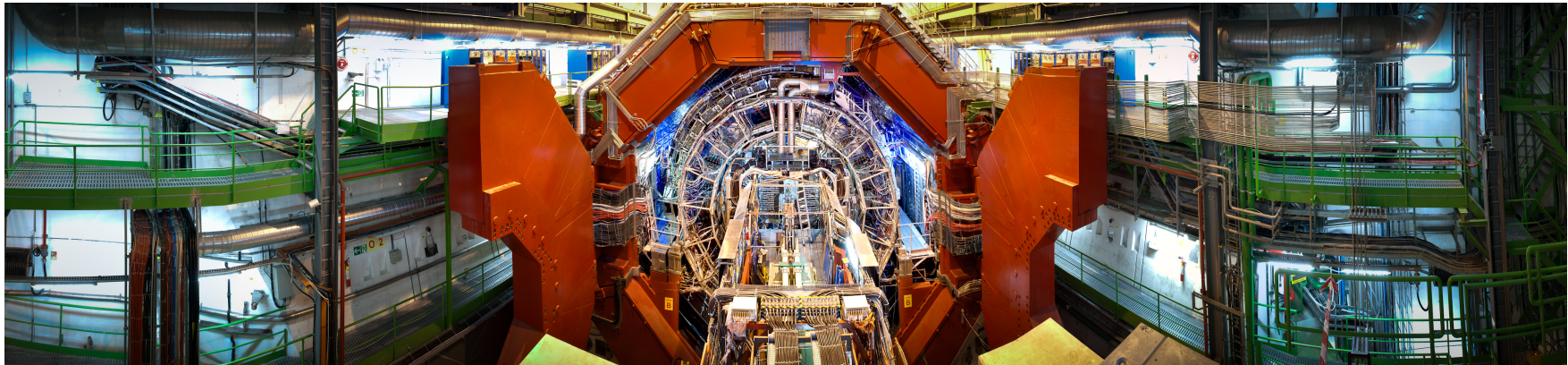


A Large Ion Collider Experiment



ALICE

42nd meeting of the ALICE Resources Review Board



Adriana Telesca
26th April 2017

Overview of the presentation

Maintenance and Operation budgets

- Category A
 - 2016 Book closing: contributions and expenditure
 - 2017 Current contributions and expenditure
 - 2018 Preliminary budget and sharing and estimates for the period 2019-2021
- Category B
 - 2016 Book closing: expenditure
 - 2018 Preliminary budget and sharing and estimates for the period 2019-2021

Upgrade budgets

- 2016 Contributions to Construction for Upgrade
- 2016 Common Fund for Upgrade: contributions and cash
- R&D upgrade contributions 2010-2016

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Maintenance and Operation Cat. A

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M&O-A 2016 book closing

M&O Cat. A contributions 2002-2016 as of 31/12/2016 in CHF

Country	2016				2002-2016						Advance payments
	Invoiced	Received	In-kind	Due	Invoiced	Energy rebate	Final invoice	Received	In-kind	Due	
Armenia	10'647			10'647	208'462	12'497	195'965	172'002	0	23'963	
Austria	37'838	37'838		0	37'838	0	37'838	37'838	0	0	
Brazil UFRGS	10'647	10'647		0	10'647	0	10'647	10'647	0	0	
Brazil RENAFAE	117'113			117'113	729'457	47'197	682'260	473'708	0	208'552	
CERN	401'082	401'082		0	5'316'053	0	5'316'053	5'316'053	0	0	
China Wuhan CCNU	74'526	73'206		1'320	517'175	42'847	474'328	414'248	60'080	0	
China Beijing	10'647			10'647	150'841	19'390	131'451	46'603	62'690	22'158	
Croatia	63'880	63'880		0	563'912	34'277	529'635	529'635	0	0	
Czech Republic	113'514	113'514		0	1'093'615	0	1'093'615	1'093'615	0	0	
Denmark	60'541	60'541		0	597'938	0	597'938	597'938	0	0	
Finland	45'405	45'405		0	523'469	0	523'469	523'469	0	0	
France CEA	52'973	52'973		0	614'585	0	614'585	614'585	0	0	45'771
France IN2P3	302'703	302'703		0	4'417'034	0	4'417'034	4'417'034	0	0	
Germany BMBF	287'568	499'985		-212'417	3'324'837	0	3'324'837	3'537'254	0	-212'417	
Germany GSI	166'487	166'487		0	1'957'735	0	1'957'735	1'957'735	0	0	175'454
Greece	15'135			15'135	340'110	0	340'110	302'184	0	37'926	
Hungary	45'405	45'405		0	345'885	0	345'885	345'885	0	0	
India	451'688	451'688		0	4'210'255	241'917	3'968'338	3'968'338	0	0	
Indonesia	10'647	3'000		7'647	10'647	0	10'647	3'000	0	7'647	
Italy Centro Fermi	37'838	37'838		0	300'898	0	300'898	300'898	0	0	
Italy INFN	771'893	670'000		101'893	9'961'808	0	9'961'808	9'829'915	30'000	101'893	
Japan	115'751	84'182		31'569	1'051'060	65'069	985'991	954'422	0	31'569	4'773
JINR	85'173	85'173		0	1'052'627	52'228	1'000'399	601'227	399'172	0	
Mexico	159'699	159'699		0	1'525'516	106'464	1'419'052	1'419'052	0	0	
Netherlands	75'676	75'676		0	965'907	0	965'907	965'907	0	0	
Norway	143'784	143'784		0	1'497'832	0	1'497'832	1'497'832	0	0	
Pakistan	22'702			22'702	110'308	0	110'308	87'606	0	22'702	
Peru	21'293			21'293	75'952	862	75'090	53'906	0	21'184	
Poland	136'216	136'216		0	1'605'027	0	1'605'027	1'605'027	0	0	
Republic of Korea NRF	127'759	127'759		0	1'072'051	62'279	1'009'772	1'009'772	0	0	
Republic of Korea KISTI	10'647	10'647		0	86'740	0	86'740	86'740	0	0	
Romania ISS	45'405	21'166		24'239	456'484	38'244	418'240	394'001	0	24'239	
Romania NIPNE	45'405	45'405		0	729'162	52'261	676'901	676'901	0	0	
Russia	412'090	418'430		-6'340	4'885'795	258'520	4'627'275	4'628'230	10'100	-11'055	
Slovakia	105'946	105'946		0	1'119'841	0	1'119'841	1'119'841	0	0	
South Africa	74'526	74'526		0	720'022	39'467	680'555	680'555	0	0	
Spain	7'568	7'568		0	418'482	0	418'482	418'482	0	0	
Sweden	30'270	30'270		0	405'492	0	405'492	405'492	0	0	
Thailand	10'647	10'647		0	30'883	0	30'883	30'883	0	0	
Turkey	7'568	7'568		0	48'038	0	48'038	48'038	0	0	
Ukraine	10'647			10'647	400'377	33'148	367'229	319'082	28'000	20'147	
United Kingdom	75'676	75'676		0	816'470	0	816'470	816'470	0	0	
USA DOE	454'124	21'294		432'830	3'669'253	207'847	3'461'406	3'028'710	0	432'696	
USA NSF	52'784	56'186		-3'402	577'645	34'080	543'565	548'747	0	-5'182	15'534
Grand Total	5'319'533	4'734'010		585'523	58'554'165	1'348'594	57'205'571	55'889'505	590'042	726'024	241'532

Outstanding contributions:

- Armenia
- Brazil RENAFAE
- China Beijing
- Greece
- Indonesia
- Italy INFN
- Japan
- Pakistan
- Peru
- Romania ISS
- Ukraine
- USA DOE

2016 advance payments:

- France CEA
- Germany BMBF
- Germany GSI
- Japan
- Russia
- USA NSF

85% received for 2016

M&O-A 2016 book closing in kCHF as of 31/12/2016

Category	2016 Budget	Payments	Open commitments	Total expenditure	Balance Budget - Payments	Balance Budget - total expenditure
Detector related costs	1'177	1'129	39	1'169	48	8
Secretariat	193	190	2	191	3	2
Communications	0	0	0	0	0	0
Offline computing	625	620	0	620	5	5
Online computing (Op&Licenses)	636	636	0	636	0	0
Online computing (Hardware)	1'258	1'258		1'258	0	0
Test beams & calibration facilities	50	48		48	2	2
Laboratory operations	245	236	15	252	9	-7
General services	508	516	15	531	-8	-23
sub-total	4'692	4'633	72	4'705	59	-13
Power (NMS only)	621	616		616	6	6
Total	5'313	5'248	72	5'321	65	-7

End of year balance (total expenditure, no Power) = -13 kCHF

End of year balance (payments only, no Power) = 59 kCHF

In 2016, the total payments amount to 5'248 kCHF, of which 173 kCHF are from commitments taken before 2016.

The open commitments at the end of 2016 amount to 72 kCHF.

The positive balance on the category of Detector Related cost is mainly due to the delayed purchase of the gas for the HMPID detector, which was done at the beginning of 2017.

The Power budget was completely used.

M&O-A cash balance as of 31/12/2016

Contributions (kCHF)

Contributions Income and in-kind	Budget year																Grand Total	
	Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		2017
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
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	5'282	4'734	242		56'733

M&O-A cash balance as of 31/12/2016

Payments and cash balance (kCHF)

Expenditure Payments only	Budget year																
	Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Grand Total
	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
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	5'075	56'200
Cash flow (Current Year)		177	98	34	95	18	479	684	856	176	-2'211	96	-423	393	137	-319	532
Cash Flow		177	275	309	404	422	901	1'586	2'442	2'618	407	503	80	473	610	291	532
Online Computing Replacement Funds		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Grand Total
Actual Accruals											1'000	1'372	393	759	1'172	1'258	5'954
Cost/Commitments												233	398	3'426	280	34	4'371
Cash Balance (Current Year)											1'000	1'139	-5	-2'667	892	1'224	1'583
Cash Flow											1'000	2'139	2'134	-533	359	1'583	1'583

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M&O-A current

2017 M&O-A contributions in kCHF as of 24/04/2017

Percentage of received contributions for 2017:
 MS: 44%
 NMS: 6%
 Total: 31%

Country	2017						2002-2017					
	Invoiced	Energy rebate	Final invoice	Received	In-kind	Due	Invoiced	Energy rebate	Final invoice	Received	In-kind	Due
Armenia	10'402	1'896	8'507			8'507	218'864	14'393	204'472	172'002	0	32'470
Austria	30'514		30'514	30'514		0	68'352	0	68'352	68'352	0	0
Azerbaijan	10'402		10'402	10'402		0	10'402	0	10'402	10'402	0	0
Brazil UFRGS	31'207		31'207			31'207	41'854	0	41'854	10'647	0	31'207
Brazil RENAFAE	93'622	7'583	86'039			86'039	823'079	54'780	768'299	650'147	0	118'152
CERN	411'937		411'937	411'937		0	5'727'990	0	5'727'990	5'727'990	0	0
China Beijing	10'402	527	9'875			9'875	161'243	19'917	141'326	68'761	62'690	9'875
China Wuhan CCNU	83'220	4'212	79'008			79'008	600'395	47'059	553'336	414'248	60'080	79'008
Croatia	62'415	5'687	56'728			56'728	626'327	39'964	586'363	529'635	0	56'728
Czech Republic	83'913		83'913	15'257		68'656	1'177'528	0	1'177'528	1'108'872	0	68'656
Denmark	53'399		53'399	53'399		0	651'337	0	651'337	651'337	0	0
Finland	53'399		53'399			53'399	576'868	0	576'868	523'469	0	53'399
France CEA	45'771		45'771	45'771		0	660'356	0	660'356	660'356	0	0
France IN2P3	289'881		289'881	289'881		0	4'706'915	0	4'706'915	4'706'915	0	0
Germany BMBF	358'537		358'537			358'537	3'683'374	0	3'683'374	3'537'254	0	146'120
Germany GSI	175'454		175'454	175'454		0	2'133'189	0	2'133'189	2'133'189	0	0
Greece	15'257		15'257			15'257	355'367	0	355'367	302'184	0	53'183
Hungary	45'771		45'771	45'771		0	391'656	0	391'656	391'656	0	0
India	312'767	37'065	275'702			275'702	4'523'022	278'982	4'244'040	3'968'338	0	275'702
Indonesia	10'402		10'402			10'402	21'049	0	21'049	3'000	0	18'049
Italy Centro Fermi	38'142		38'142			38'142	339'040	0	339'040	300'898	0	38'142
Italy INFN	701'818		701'818			701'818	10'663'626	0	10'663'626	9'931'808	30'000	701'818
Japan	113'200	8'187	105'013	11'933		93'080	1'164'260	73'256	1'091'004	987'247	0	103'757
JINR	83'220	8'530	74'690			74'690	1'135'847	60'758	1'075'089	601'227	399'172	74'690
Mexico	166'439	12'322	154'117			154'117	1'691'955	118'786	1'573'169	1'419'052	0	154'117
Netherlands	91'541		91'541	91'541		0	1'057'448	0	1'057'448	1'057'448	0	0
Norway	129'684		129'684	129'684		0	1'627'516	0	1'627'516	1'627'516	0	0
Pakistan	30'514	2'843	27'670			27'670	140'822	2'843	137'978	87'606	0	50'372
Peru	31'207	948	30'259			30'259	107'159	1'810	105'349	75'090	0	30'259
Poland	160'198		160'198	61'028		99'170	1'765'225	0	1'765'225	1'666'055	0	99'170
Republic of Korea NRF	124'829	10'426	114'403			114'403	1'196'880	72'705	1'124'175	1'009'772	0	114'403
Republic of Korea KISTI	10'402	2'843	7'559	7'559		0	97'142	2'843	94'299	94'299	0	0
Romania ISS	45'771		45'771			45'771	502'255	38'244	464'011	418'240	0	45'771
Romania NIPNE	45'771		45'771			45'771	774'933	52'261	722'672	676'901	0	45'771
Russia	414'959	28'323	386'636			386'636	5'300'754	286'843	5'013'911	4'628'230	10'100	375'581
Slovakia	106'798		106'798			106'798	1'226'639	0	1'226'639	1'119'841	0	106'798
South Africa	62'415	6'635	55'780	55'780		0	782'437	46'102	736'335	736'335	0	0
Spain	7'628		7'628			7'628	426'110	0	426'110	418'482	0	7'628
Sweden	30'514		30'514	30'514		0	436'006	0	436'006	436'006	0	0
Thailand	10'402	948	9'455			9'455	41'285	948	40'338	30'883	0	9'455
Turkey	7'628	1'896	5'732			5'732	55'666	1'896	53'770	48'038	0	5'732
Ukraine	7'628	2'843	4'785			4'785	408'005	35'991	372'014	319'082	28'000	24'932
United Kingdom	76'284		76'284	76'284		0	892'754	0	892'754	892'754	0	0
USA DOE	412'862	36'807	376'054			376'054	4'082'115	244'654	3'837'460	3'028'710	0	808'751
USA NSF	51'608	4'601	47'007	15'534		31'473	629'253	38'681	590'572	564'281	0	26'291
Grand Total	5'150'135	185'122	4'965'012	1'558'243	0	3'406'769	63'704'300	1'533'716	62'170'583	57'814'553	590'042	3'765'988

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.

2017 M&O-A current expenditure as of 24/04/2017 in kCHF

Category	2017 Budget	Payments	Open commitments	Total expenditure	Balance Budget - Payments	Balance Budget - total expenditure
Detector related costs	1'142	312	195	506	830	636
Secretariat	193	41	119	160	152	33
Communications	0	0	0	0	0	0
Offline computing	537	159	346	505	378	32
Online computing (Op&Licenses)	646	203	371	575	443	71
Online computing (Hardware)	1'239			0	1'239	1'239
Test beams & calibration facilities	50	2		2	48	48
Laboratory operations	280	38	108	147	242	133
General services	605	174	67	241	431	364
sub-total	4'692	929	1'207	2'136	3'763	2'556
Power (NMS only)	562	11		11	551	551
Total	5'254	940	1'207	2'147	4'314	3'107

M&O-A cash flow as of 24/04/2017

Contributions

Contributions Income and in-kind		Budget year															Grand Total		
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017			
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																103	264	1'317	1'684
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	5'385	4'998	1'558	58'416		

M&O-A cash flow as of 24/04/2017

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
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																45	895	940
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	5'120	895		57'140
Cash flow (Current Year)	177	98	34	95	18	479	684	856	176	-2'211	96	-423	393	240	-100	663		1'276
Cash Flow	177	275	309	404	422	901	1'586	2'442	2'618	407	503	80	473	712	613	1'276		1'276

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			5'954
Cost/Commitments											233	398	3'426	280	34			4'371
Cash Balance (Current Year)										1'000	1'139	-5	-2'667	892	1'224	13		1'583
Cash Flow										1'000	2'139	2'134	-533	359	1'583	1'596		1'596

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M&O-A 2018 preliminary budget and 2019-2021 estimates

M&O-A **preliminary** budget for 2018 and estimates for 2019-2021 in kCHF

Category	2012	2013	2014	2015	2016	2017	Prelim. 2018	2019	2020	2021	Total 2018 to 2021
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	1'589.0	1'291.0	5'528.0
Secretariat	207.5	207.5	207.5	208.0	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
CORE computing	537.0	537.0	537.0	625.0	625.0	537.0	537.0	537.0	537.0	713.0	2'324.0
On-line computing	2'012.0	1'033.0	1'403.8	1'824.6	1'894.1	1'884.8	2'142.3	1'652.3	1'522.3	1'854.3	7'171.0
Test beams & calibration facilities	85.0	30.0	85.0	50.0	50.0	50.0	50.0	20.0	40.0	50.0	160.0
Laboratory operations	250.0	280.0	255.0	245.0	245.0	280.0	245.0	255.0	255.0	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	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	4'853.7	4'853.7	4'853.7	4'853.7	19'414.9
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	3'834.0
Grand Total	7'320.3	5'370.8	5'303.4	7'103.3	6'600.9	6'397.5	6'736.7	4'887.7	4'887.7	6'736.7	23'248.9

These numbers are based on long period of runs with short technical stops during winter in 2018, followed by a long period of shutdown starting in January 2019 and continuing until the end of 2020. 2021 sees the beginning of Run 3 and has the same schedule as 2018.

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 2018
and estimates
for 2019-2021
in kCHF
(detailed)

Category	Description	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Detector related costs	Beam pipe & vacuum	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
	Counting & control rooms	46	47	112	47	47	25	25	25	25	25
	Cryogenic fluids (below -50°C)										
	Detector safety systems	77	56	49	47	47	69	59	60	79	69
	Electronics pool rentals	43	43	43	43	43	43	43	43	43	43
	External cryogenics										
	Gas consumption	290	85	135	257	267	223	270	121	202	372
	Gas systems	140	170	140	140	140	140	140	160	160	140
	General Technical support	180	180	180	180	180	180	180	180	180	180
	Magnet	25	40	25	25	25	25	25	35	55	25
	Magnet controls	23	23	23	23	23	32	32	32	32	32
	Magnet power supply	18	18	18	18	18	18	18	18	18	18
	Moving/hydraulic systems	20	60	20	20	20	20	20	30	30	20
	Safety	20		40	20	20	20	20	20	20	20
	Shutdown activities	84	724	440	60	60	60	60	458	458	60
	UPS maintenance										
Detector related costs Total		1253	1733	1512	1167	1177	1142	1179	1469	1589	1291
Secretariat	Economat	15	15	15	15	10	10	10	10	10	10
	Printing and publication	30	30	30	30	20	20	20	20	20	20
	Secretarial assistance	163	163	163	163	163	163	163	163	163	163
Secretariat Total		208	208	208	208	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	189
	Central production operations	26	26	26	70	70	26	26	26	26	158
	Hardware	98	98	98	98	98	98	98	98	98	98
	Software process service	158	158	158	158	158	158	158	158	158	158
	User support	66	66	66	66	66	66	66	66	66	110
CORE computing Total		537	537	537	625	625	537	537	537	537	713
On-line computing	Common desktop infrastructure OL										
	Computers/processors/LANs	1372	393	759	1172	1258	1239	1496	1006	876	875
	Data storage (temporary on disk)										
	Detector controls										
	Software licences	65	65	65	73	56	56	56	56	56	56
	System management	575	575	580	580	580	590	590	590	590	923
On-line computing Total		2012	1033	1404	1825	1894	1885	2142	1652	1522	1854
Test beams & calibration facilities	General operation	20		20	15	15	15	15		20	15
	Common electronics										
	Electronics pool rentals TB	35	10	35	5	5	5	5			5
	Gas systems TB	20	20	20	20	20	20	20	20	20	20
	Gas consumption TB	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
Laboratory operations	Assembly areas & clean rooms	30	30	15	15	15	50	15	15	15	15
	Laboratory instruments	20	20	20	20	20	20	20	20	20	20
	Workshops	200	230	220	210	210	210	210	220	220	210
Laboratory operations Total		250	280	255	245	245	280	245	255	255	245
General services	Academic subsistence	40	40	40	30	30	30	30	30	30	30
	Cars	20	20	20	20	20	20	20	20	20	20
	Common desktop infrastructure GS	50	50	50	50	40	40	40	40	40	40
	Cooling & ventilation	83	133	83	83	83	83	83	83	83	83
	Cranes	190	305	285	208	208	285	208	323	323	208
	Heavy transport	5	20	10	5	5	5	5	20	10	5
	Outreach	50	100	50	90	40	40	40	40	40	40
	Power distribution system	41	41	41	41	41	41	41	41	41	41
	Storage space	10	10	10	10	10	10	10	10	10	10
	Survey	60	109	100	30	30	50	30	120	120	30
General services Total		550	829	690	568	508	605	507	727	717	507
Grand Total without Power		4934	4650	4691	4687	4692	4692	4854	4854	4854	4854
Power	Power	2386	721	613	2416	1909	1706	1883	34	34	1883
Grand Total		7320	5371	5304	7103	6601	6398	6737	4888	4888	6737

Sharing of the preliminary 2018 budget

2018 **DRAFT** M&O-A Budget no power 4'853'700 CHF
 2018 Power 1'883'000 CHF
 ALICE DB as 01/09/2016 615 scientists
 Cost M&O per scientist 7'892 CHF
 Cost Power per scientist 3'062 CHF

Final sharing is established as soon as the
 scrutiny of the preliminary budget is done and
 scientists head count is done as 01/09/2017.

ALICE Experiment M&O-A 2018 Preliminary Budget	Snapshot number of scientists ACDB as Sept. 2016	M&O-A	Energy in CHF	Energy billed to NMS Funding Agencies in CHF	Invoice for 2018 in CHF
Armenia	1	7'892	3'062	3'062	10'954
Austria	4	31'569	12'247		31'569
Azerbaijan	1	7'892	3'062	3'062	10'954
Brazil RENAFAE	9	71'030	27'556	27'556	98'586
Brazil UFRGS	3	23'677	9'185	9'185	32'862
CERN	54	426'179	165'337		426'179
China	9	71'030	27'556	27'556	98'586
Croatia	6	47'353	18'371	18'371	65'724
Czech Republic	11	86'814	33'680		86'814
Denmark	7	55'245	21'433		55'245
Finland	7	55'245	21'433		55'245
France CEA	6	47'353	18'371		47'353
France IN2P3	38	299'903	116'348		299'903
Germany BMBF	47	370'933	143'904		370'933
Germany GSI	23	181'520	70'421		181'520
Greece	2	15'784	6'124		15'784
Hungary	6	47'353	18'371		47'353
India	41	323'580	125'533		323'580
Indonesia	1	7'892	3'062	3'062	10'954
Italy Centro Fermi	5	39'461	15'309		39'461
Italy INFN	92	726'082	281'685		726'082
Japan	11	86'814	33'680	32'325	119'140
JINR	8	63'138	24'494	24'494	87'632
Mexico	16	126'275	48'989	48'989	175'264
Netherlands	12	94'706	36'741		94'706
Norway	17	134'167	52'050		134'167
Pakistan	4	31'569	12'247		31'569
Peru	3	23'677	9'185	9'185	32'862
Poland	21	165'736	64'298		165'736
Republic of Korea NRF	12	94'706	36'741	36'741	131'448
Republic of Korea NRF - KISTI	1	7'892	3'062	3'062	10'954
Romania ISS	6	47'353	18'371		47'353
Romania NIPNE	6	47'353	18'371		47'353
Russia	43	339'364	131'657	95'956	435'320
Slovakia	14	110'491	42'865		110'491
Spain	1	7'892	3'062		7'892
Sweden	4	31'569	12'247		31'569
South Africa	6	47'353	18'371	18'371	65'724
Thailand	1	7'892	3'062	3'062	10'954
Turkey	1	7'892	3'062		7'892
Ukraine Kiev	1	7'892	3'062		7'892
United Kingdom	9	71'030	27'556		71'030
USA DOE	40	315'688	122'472	118'900	434'588
USA NSF	5	39'461	15'309	14'863	54'323
Total	615	4'845'808	1'879'938	494'739	5'340'547



A Large Ion Collider Experiment



Maintenance and Operation cat. B

A Large Ion Collider Experiment



M&O-B 2016 book closing

Maintenance and Operation Category B (sub-systems specific) as of 31/12/2016 in kCHF

Project	2016 budget	2016 Payments	2016 Open Commitments	Balance (budget -payments)
ACORDE	9	48		-39
CENTRAL TRIGGER	20	11		9
EMCAL-DCAL	67	108		-41
FMD	25	25		0
HMPID	82.5	76.0		6.5
ITS Common	128	128.0		0
ITS-SDD	115	47		68
ITS-SPD	110	108.3	2.1	1.7
ITS-SSD	119.1	42.4		76.7
MUON TRACKING	145	137		8
MUON TRIGGER	76	60.4		15.6
PHOS	56	106.46		-50.46
PMD	15	15.0		0.0
TOF	62	64.0		-2.0
TPC	135	108.6		26.4
TRD	133.5	112.16		21.34
T0	48	19.6		28.4
V0A	5	5		0
V0C	7	2.6		4.4
ZDC	26	18.5		7.5
Grand Total	1384.1	1243.0	2.1	141.1

The in-kind contributions in man-months for Technical manpower from collaborating institutes at CERN in 2016 have been:

- 20 man-months for ACORDE
- 24 man-months for CTP
- 98 man-months for EMCAL/DCAL
- 24 man-months for ITS Common and 24 man-months for ITS-SSD
- 70 man-months for PHOS
- 15 man-months for PMD
- 27 man-months for TRD

A Large Ion Collider Experiment



M&O-B 2018 preliminary budget and 2019-2021 estimates

M&O-B **preliminary** budget for 2018 and estimates for 2019-2021 in kCHF

Project	2012	2013	2014	2015	2016	2017	Prelim. 2018	2019	2020	2021
ACORDE	15	15	10	10	9	10	7	8	13	34
CENTRAL TRIGGER	20	20	20	20	20	11	11	20	20	20
EMCAL-DCAL	77.7	49	69	67	67	96	138.28	142.63	147.05	155.5
FMD	25	25	25	25	25	25	25	16	10	
HMPID	144.5	92.5	92.5	82.5	82.5	82.5	88.5	75.5	75.5	88.5
ITS Common	128	88	98	128	128	128	128	60	0	
ITS-SDD	237	180	130	125	115	95	70	45	20	
ITS-SPD	95	75	75	84	110	110	110	50	25	
ITS-SSD	182.5	152.5	86.5	72.5	119.1	119.1	126.1	93.1	47.7	
MUON TRACKING	87	164	164	118	145	149	151	169	163	
MUON TRIGGER	75	81	81	76	76	69	69	71	69	
PHOS	158	93	142	56	56	56	56	56	56	56
PMD	29	36	26	20	15	15	15	0	0	
TOF	120	94	92	81	62	62	63	64	59	59
TPC	145	160	160	135	135	180	185	195	156	
TRD	163.5	133.5	133.5	133.5	133.5	153.5	153.5	153	153	158
TO	48.35	65	53	48	48	26	20.5	6.5	0	
VOA	14	52.5	52.5	10	5	5	5	10	0	
VOC	11	55.5	55.5	7	7	7	7	7	0	
ZDC	35	26	30	29	26	26	22	17	17	25.5
FIT										98
ITS										400
MFT										82
MID										70
MUON CHAMBER										153
TPC Upgraded										189
Grand Total	1810.55	1657.5	1595.5	1327.5	1384.1	1425.1	1450.88	1258.73	1031.25	1589

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 long period of runs with short technical stops during winter in 2018, followed by a long period of shutdown starting in January 2019 and continuing until the end of 2020. 2021 sees the beginning of Run 3 and has the same schedule as 2018.

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 2018 and estimates for 2019-2021 in kCHF

Activity	2012	2013	2014	2015	2016	2017	Prelim. 2018	2019	2020	2021
A01 Mechanics	28.5	50	42.5	26.5	26.5	27.5	35.5	51.5	48.5	45.5
A02 Gas Systems	82	38	38	43	45	46	41	36	34	34
A03 Cooling Systems	110	151	133	78	73	72	67.24	37.49	32.74	78
A04 FEE spares	100.5	135	112	70	62	64	56.6	49.22	44.85	109
A05.1 Standard Electronics LV/HV PS	421	322.5	256.5	180.5	182.5	185.5	172.92	114.85	99.3	180.5
A05.2 Standard Electronics Crates	63.5	26.5	37.5	45.5	46.5	45.5	34	27	20	45
A05.3 Standard Electronics R/O modules	172.5	94.5	111	107	105	93	73.74	61.49	52.74	105
A06 Controls (DCS & DSS)	33	33.5	43.5	35.5	35.5	34.5	31.8	29.11	26.43	39.5
A07 Sub-Detector spares	81.5	143	125	29	19	17	14	13	11	47
A08 Areas	57	42	44	39	42	35	41	28	25	71
A09 Communications	92.5	91	97	92	94	96	107.06	91.12	84.69	110.5
A10 Store Items	83.5	97.5	87.5	82.5	82.5	99	94.3	106.61	88.43	101.5
A11.1 Technical Manpower @ CERN: Industrial Support	23	6	11	6	6	29	9.12	9.24	9.37	21
A11.3 Technical Manpower @ CERN from Collaborating Institutes	462.05	427	457	493	564.6	581.1	672.6	604.1	454.2	601
Grand Total	1810.55	1657.5	1595.5	1327.5	1384.1	1425.1	1450.88	1258.73	1031.25	1589
A11.2 Technical Manpower @ CERN from Collaborating Institutes (in man-months)	180	246	185	192	192	212	224	210	210	238

These numbers are based on long period of runs with short technical stops during winter in 2018, followed by a long period of shutdown starting in January 2019 and continuing until the end of 2020. 2021 sees the beginning of Run 3 and has the same schedule as 2018.

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 2018 **preliminary** budget by system in kCHF

2018	Project																			Grand Total	
Activity	ACORDE	CENTRAL TRIGGER	EMCAL-DCAL	FMD	HMPID	ITS Common	ITS-SDD	ITS-SPD	ITS-SSD	MUON TRACKING	MUON TRIGGER	PHOS	PMD	TOF	TPC	TRD	T0	V0A	V0C	ZDC	Grand Total
A01 Mechanics				4							4				20	6				1.5	35.5
A02 Gas Systems					15						4			2	10	10					41
A03 Cooling Systems			8.24		4	8	5	12					10	2	10	8					67.24
A04 FEE spares	2		20.6	3	1						5	20			5		0				56.6
A05.1 Standard Electronics LV/HV PS			14.4	6	10		5	15	20	15	5	5	5	15	10	40	0	2	3	2.5	172.92
A05.2 Standard Electronics Crates	2	2			1		5	4		10					10		0				34
A05.3 Standard Electronics R/O modules		5	8.24	2				11	12	3	2			13	10	4	0		1	2.5	73.74
A06 Controls (DCS & DSS)			10.3		1.5			2	1			5		3	5	4	0				31.8
A07 Sub-Detector spares	1			0				0		3	5						1	2		2	14
A08 Areas					25			0									16				41
A09 Communications	1	4	2.06	2	8		2	3	0.5	12	3	8	5	10	5	39	0.5		1	1	107.06
A10 Store Items	1		10.3		8		3	1	10	5	3	8	5	13	20	3	1		1	2.5	94.3
A11.1 Technical Manpower @ CERN: Industrial Support			4.12		5																9.12
A11.3 Technical Manpower @ CERN from Collaborating Institutes			60	8	10	120	50	62	82.6	103	38			5	80	39.5	2	1	2	10	672.6
Grand Total	7	11	138	25.0	89	128.0	70	110.0	126	151	69	56	15	63	185	154	21	5	7	22	1450.88
A11.2 Technical Manpower @ CERN from Collaborating Institutes (in man-months)		24	98									67	15			20					224
Grand Total		24	98									67	15			20					224

Sharing of the **preliminary** 2018 M&O-B budget

Sharing of the M&O-B 2018 preliminary budget in kCHF	ACORDE	CENTRAL TRIGGER	EMCAL-DCAL	FMD	HMPID	ITS Common	ITS-SDD	ITS-SPD	ITS-SSD	MUON TRACKING	MUON TRIGGER	PHOS	PMD	TOF	TPC	TRD	T0	V0 A	V0 C	ZDC	Grand Total in kCHF
CERN					26.6	25.5	31.5		16.3						29.6						129.4
Czech Republic						2.4		6.3				2.8									11.5
Denmark				25.0											5.9						30.9
Finland																	18.2				18.2
France CEA										21.1											21.1
France IN2P3			19.8			9.1			27.3	42.2	34.0								7.0		139.4
Germany BMBF																143.7					143.7
Germany GSI															106.4						106.4
Italy INFN			14.8		62.0	71.0	31.5	95.9	43.6	24.4	30.0			57.9						22.0	453.1
Netherlands						9.8			29.3												39.1
Norway												5.6									5.6
Poland												2.8			5.3						8.1
Slovakia						4.4	7.0								3.6						15.0
Sweden															33.2						33.2
United Kingdom		11.0																			11.0
China			9.8									2.8									12.6
Croatia															1.0						1.0
India										21.1			15.0								36.1
Japan			14.8									2.8									17.6
JINR												2.8				6.7					9.5
Mexico	7.0																	5.0			12.0
Republic of Korea											5.0			5.1							10.0
Romania NIPNE																3.1					3.1
Russia						0.5		1.2	1.2	21.1		36.4					2.3				62.8
South Africa										21.1											21.1
Ukraine						5.2		6.3	8.5												19.9
United States DOE			79.0																		79.0
United States NSF						0.1		0.3													0.4
Total	7	11	138.28	25	88.5	128	70	110	126.1	151	69	56	15	63	185	153.5	20.5	5	7	22	1450.9

A Large Ion Collider Experiment



Upgrade budgets

2016 Construction for Upgrade expenditure as of 31/12/2016

Table 1A: 2015-2016 Construction for Upgrade Expenditure by System
(Unit = kCHF)

Sum of Payments		Year		
System	Funding Agency	2015	2016	Grand Total
CTP	United Kingdom		111	111
FIT	Austria		10	10
	Denmark		14	14
	Finland	30	30	60
	Mexico	14	30	44
	Russia	5	15	20
	USA NSF		6	6
ITS	CERN	540	863	1'403
	China		74	74
	France IN2P3	17	480	497
	Italy INFN	17	705	722
	Netherlands	150	16	166
	Republic of Korea NRF	17	100	117
	Russia	40	40	80
	United Kingdom	17	268	285
	MCH	France CEA	42	6
France IN2P3			21	21
MFT	France CEA		8	8
	France IN2P3		45	45
	Japan		20	20
MID	France IN2P3	63	14	77
	Italy INFN	58	11	69
	Republic of Korea NRF		5	5
TOF	Italy INFN		53	53
	Russia		32	32
TPC	Finland	77	58	135
	Germany BMBF	742	255	997
	Germany GSI	176	454	630
	Hungary		56	56
	India		50	50
	Mexico	75	10	85
	Romania NIPNE	53	143	196
	Sweden		49	49
	USA DOE		760	760
	TRD	Germany BMBF		325
Grand Total		2'131	5'135	7'266

Table 1B: 2015-2016 Construction for Upgrade Expenditure by Funding Agency
(Unit = kCHF)

Sum of Payments		Year		
Funding Agency	System	2015	2016	Grand Total
Austria	FIT		10	10
CERN	ITS	540	863	1'403
China	ITS		74	74
Denmark	FIT		14	14
Finland	FIT	30	30	60
	TPC	77	58	135
France CEA	MCH	42	6	48
	MFT		8	8
France IN2P3	ITS	17	480	497
	MCH		21	21
	MFT		45	45
	MID	63	14	77
Germany BMBF	TPC	742	255	997
	TRD		325	325
Germany GSI	TPC	176	454	630
Hungary	TPC		56	56
India	TPC		50	50
Italy INFN	ITS	17	705	722
	MID	58	11	69
	TOF		53	53
Mexico	FIT	14	30	44
	TPC	75	10	85
Netherlands	ITS	150	16	166
Japan	MFT		20	20
Republic of Korea NRF	ITS	17	100	117
	MID		5	5
Romania NIPNE	TPC	53	143	196
Russia	FIT	5	15	20
	ITS	40	40	80
	TOF		32	32
Sweden	TPC		49	49
United Kingdom	CTP		111	111
	ITS	17	268	285
USA DOE	TPC		760	760
USA NSF	FIT		6	6
Grand Total		2'131	5'135	7'266

* These tables have been updated following a discussion during the RRB meeting

Common fund for upgrade contributions as of 31/12/2016 in kCHF

42% of contributions have been received at the end of 2016.

Note that we have received in 2017

- 9 kCHF from Hungary
- 54 kCHF from JINR
- 26 kCHF from Rep. of Korea KISTI
- 19 kCHF from Rep. of Korea NRF
- 10 kCHF from Romania ISS
- 8.7 kCHF from Thailand

As of 24/04/2017

Funding Agency	Due	2012	2013	2014	2015	2016	Total received	Outstanding
Armenia	17'463	0	0	0	0	0	0	17'463
Brazil	69'852	0	0	0	0	37'500	37'500	32'352
CERN	471'499	0	0	471'499	0	0	471'499	0
China	43'657	0	0	0	0	0	0	43'657
Croatia	52'389	0	0	0	0	0	0	52'389
Czech Republic	87'315	0	0	87'315	0	0	87'315	0
Denmark	69'852	0	0	69'852	0	0	69'852	0
Finland	34'926	0	0	0	0	0	0	34'926
France CEA	52'389	0	0	52'389	0	0	52'389	0
France IN2P3	401'647	0	66'119	67'108	67'108	67'108	267'443	134'204
Germany BMBF	340'527	0	0	340'367	0	160	340'527	0
Germany GSI	200'824	0	0	0	0	0	0	200'824
Greece	26'194	0	0	0	0	0	0	26'194
Hungary	43'657	0	0	8'732	8'732	8'932	26'396	17'261
India	357'990	0	0	0	0	0	0	357'990
Italy Centro Fermi	61'120	0	0	0	0	0	0	61'120
Italy INFN	873'147	0	0	0	0	100'000	100'000	773'147
Japan	78'583	0	3'056	40'166	11'787	11'787	66'796	11'787
JINR	78'583	0	0	0	24'613	0	24'613	53'970
Mexico	104'778	0	0	104'778	0	0	104'778	0
Netherlands	122'241	0	0	0	0	0	0	122'241
Norway	148'435	0	0	0	0	148'435	148'435	0
Pakistan	26'194	0	0	0	0	0	0	26'194
Peru	8'731	0	0	0	0	0	0	8'731
Poland	165'898	0	0	0	0	0	0	165'898
Republic of Korea - KISTI	26'194	0	0	0	0	0	0	26'194
Republic of Korea NRF	96'046	0	0	0	19'200	0	19'200	76'846
Romania ISS	43'657	0	0	0	0	13'000	13'000	30'657
Romania NIPNE	61'120	0	10'000	10'000	10'000	10'000	40'000	21'120
Russia	357'990	0	0	0	0	0	0	357'990
Slovakia	87'315	0	0	0	87'315	0	87'315	0
South Africa	61'120	0	0	24'448	12'224	0	36'672	24'448
Spain	43'657	0	0	0	0	0	0	43'657
Sweden	43'657	0	0	0	0	43'657	43'657	0
Thailand	8'731	0	0	0	0	0	0	8'731
Turkey	17'463	0	0	17'463	0	0	17'463	0
Ukraine Kiev	26'194	0	0	0	0	0	0	26'194
United Kingdom	96'046	0	0	0	96'046	0	96'046	0
USA DOE	349'259	0	0	0	72'998	0	72'998	276'262
USA NSF	43'657	4'429	11'242	1'806	1'821	0	19'298	24'359
Total CF Upgrade	5'299'997	4'429	90'417	1'295'924	411'843	440'579	2'243'192	3'056'805
From CF	500'000	0	0	0	0	500'000	500'000	0
Entry fee		0	0	0	0	374'285	374'285	333'671
Total with CF Upgrade and Entry fees		4'429	90'417	1'295'924	411'843	1'314'864	3'117'477	3'390'476

Entry fees in kCHF as of 31/12/2016

Payments received in 2016:

- Vienna (AT) 20 kCHF
- UFRGS (BR) 16.7 kCHF
- Bonn (DE) 32.7 kCHF
- Brescia and Pavia (IT) 25 kCHF
- NIAS (JP) 20 kCHF
- Inha Uni (KR) 10 kCHF
- Chonbuk Uni (KR) 50 kCHF

Entrance fees pending:

- Vienna (AT) 30 kCHF
- Baku (AZ) 40 kCHF
- UFRGS (BR) 33.3 kCHF
- Bonn (DE) 17.3 kCHF
- LIPI (ID) 38 kCHF
- NIAS (JP) 30 kCHF
- NWU (JP) 50 kCHF
- COMSATS (PK) 25 kCHF
- Inha (KR) 20 kCHF
- Karatay Univ (TR) 15 kCHF

Note that we have received in 2017:

- Baku (AZ) 10 kCHF
- Brescia and Pavia (IT) 25 kCHF

As of 24/04/2017

Funding agency	Entry Fees paid (1998 - 2016)	Due
Armenia	38.0	
Austria	20.0	30.0
Azerbaijan		50.0
Brazil	61.7	33.3
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	293.4	17.3
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	470.0	25.0
Japan	20.0	80.0
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	80.0	20.0
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	35.0	15.0
Ukraine	70.0	
United Kingdom	90.0	
USA DOE	225.0	
USA NSF	40.0	
Total MS + NMS	3'255.7	333.7



Common fund for Upgrade

Cash balance as of 31/12/2016

Common Fund for Upgrade Cash 2012-2016 (kCHF)

Contributions per year	2012	2013	2014	2015	2016	Total
Common Fund for Upgrade	4	90	1'296	412	941	2'743
Entry fees					374	374
In-kind contributions						
Total contributions	4	90	1'296	412	1'315	3'117
Cumulative contributions	4	95	1'391	1'803	3'117	

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

Cash balance	4	95	1'391	1'760	2'827	
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2016 Construction and Common Fund for Upgrade expenditure as of 31/12/2016

**Table 2A: Construction for Upgrade including Common Fund -
Cumulative Expenditure 2012-2016 by System (Unit = kCHF)**

Sum of Payments	Year					Grand Total
	2012	2013	2014	2015	2016	
System	2012	2013	2014	2015	2016	Grand Total
CTP					111	111
FIT				49	104	153
ITS				798	2'546	3'344
MCH				42	27	69
MFT					72	72
MID				121	31	151
TOF					84	84
TPC				1'121	1'835	2'956
TRD					325	325
CF Upgrade	4	90	1'296	412	441	2'243
Grand Total	4	90	1'296	2'543	5'576	9'509

**Table 2B: Construction for Upgrade including Common Fund Cumulative
Expenditure 2012-2016 by Funding Agency (Unit = kCHF)**

Sum of Payments	Year					Grand Total
	2012	2013	2014	2015	2016	
Funding Agency	2012	2013	2014	2015	2016	Grand Total
Austria					10	10
Brazil					38	38
CERN			471	540	863	1'874
China					74	74
Czech Republic			87			87
Denmark			70		14	84
Finland				107	88	195
France CEA			52	42	14	108
France IN2P3		66	67	147	627	907
Germany BMBF			340	742	580	1'662
Germany GSI				176	454	630
Hungary			9	9	65	82
India					50	50
Italy INFN				75	869	943
Japan		3	40	12	32	87
JINR				25		25
Mexico			105	89	40	234
Netherlands				150	16	166
Norway					148	148
Republic of Korea NRF				36	105	141
Romania ISS					13	13
Romania NIPNE		10	10	63	153	236
Russia				45	87	132
Slovakia				87		87
South Africa			24	12		37
Sweden					93	93
Turkey			17			17
United Kingdom				113	379	492
USA DOE				73	760	833
USA NSF	4	11	2	2	6	25
Grand Total	4	90	1'296	2'543	5'576	9'509

* These tables have been updated following a discussion during the RRB meeting



R&D for Upgrade

Expenditure as of 31/12/2016

Project	FA	2010	2011	2012	2013	2014	2015	2016	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	732
	China						9		9
	France CEA			63	40	150	63	21	337
	France IN2P3		2	5	73	48	98	99	325
	India							6	6
	Japan						3	1	4
	Peru						13		13
	Russia			27			5	6	38
Muon Spectrometer		0	0	4	12	80	27	53	175
	France CEA						3	8	11
	France IN2P3			4	12	75	23	36	149
	Italy INFN	0	0	0		4	1	10	15
O2				20	2	77	140	181	420
	CERN			20	2	77	140	181	420
Online systems		0	30	278	178	17		6	508
	CERN		30	63	178	17		6	293
	Hungary	0	0	215					215
PHOS		5	5	191	261	65	85	93	704
	China	0	0	0	78				78
	Japan	0	0	0	21		3	10	34
	JINR					60			60
	Norway	5	5	5	38				53
	Russia	0	0	186	124	5	82	83	480
SAMPA						203	140	590	933
	Brazil					203	140	590	933
TOF		0	0	3	18		53		74
	Italy INFN	0	0	3	18		53		74
TPC				89	248	499	573	133	1'542
	Croatia						10	5	15
	Finland					38	11	8	57
	Hungary					8			8
	Germany			47	70	192	133	28	470
	India				12		50	70	132
	Japan			40	60	40	22	9	171
	Mexico						10	10	20
	Norway			3	33	18	31	3	88
	Romania NIPNE					46			46
	Sweden				63	97	106		266
	USA DOE				10	60	200		270
ZDC							3	3	6
	Italy INFN						3	3	6
Grand Total		76	507	1'536	1'917	3'389	2'289	1'685	11'400

A Large Ion Collider Experiment



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



Extra slides

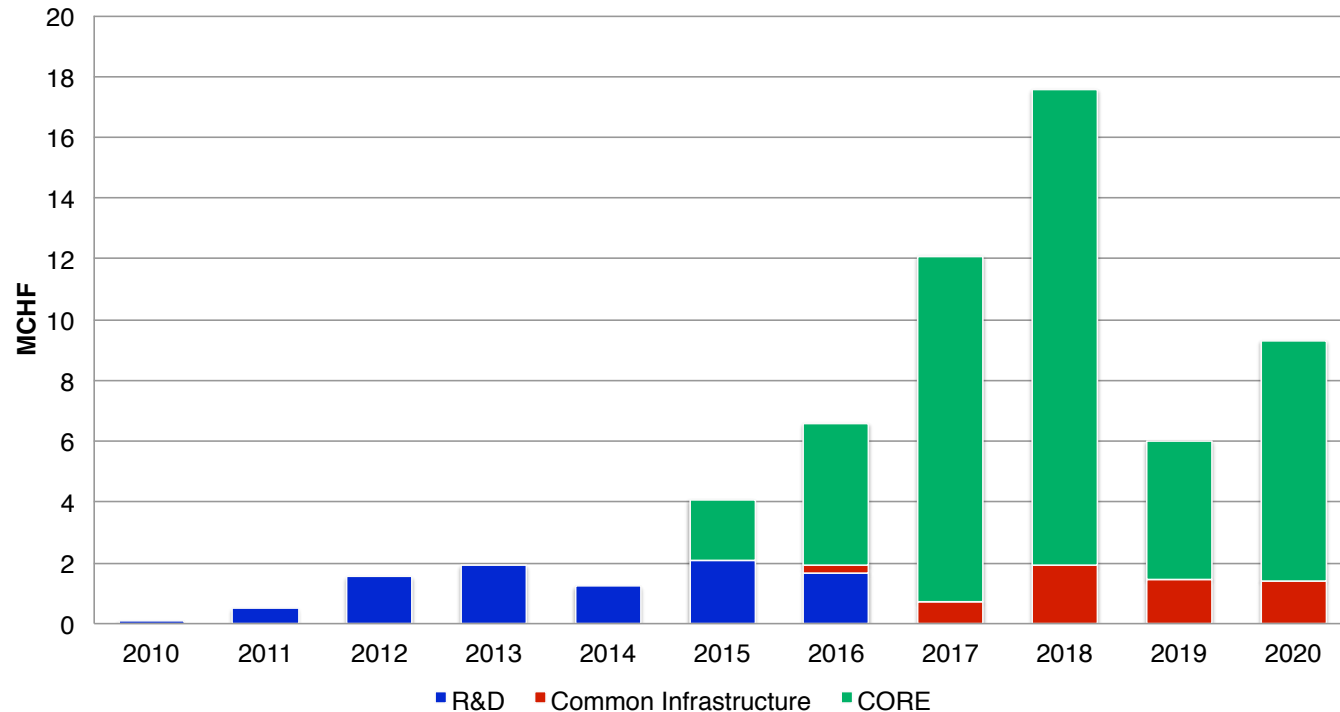


ALICE Upgrade

Total cost and spending profile

ALICE upgrade subsystem	CORE cost (MSF)
1. ITS	13.6
2. TPC	12.5
3. MFT	3.4
4. Trigger & Readout	6.9
5. O2	9.7
6. Common fund for Upgrade	5.8
Total (MSF)	51.9
R&D costs MSF	9.01
GRAND TOTAL (including R&D)	60.9

ALICE Upgrade Spending Profile



ALICE Upgrade

Spending profile by project

ALICE Upgrade Construction Spending Profile

