

ATLAS Request for the 2020 M&O Budget
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ATLAS Upgrade Financial Status Report
RRB — October 2019

- Outline

- CERN-RRB-2019-099: Request for the 2020 ATLAS M&O Budget
- CERN-RRB-2019-098: ATLAS Upgrade Status Report 2019 – 2020
 - Status of Phase-I Upgrades
 - Projected 2019 CORE Values
 - CORE Values projected to be delivered in 2020
 - Status of Phase-II Upgrades
 - Status of Phase-II Common Fund
- Status of Phase-II MoUs

Request for the 2020 ATLAS M&O Budget

- **M&O Budget Request for 2020**
 - Evolution of the M&O Budget up to 2024
- **In kind contributions (Category–A)**
- **Proposed Sharing of M&O Contributions by Funding Agency**



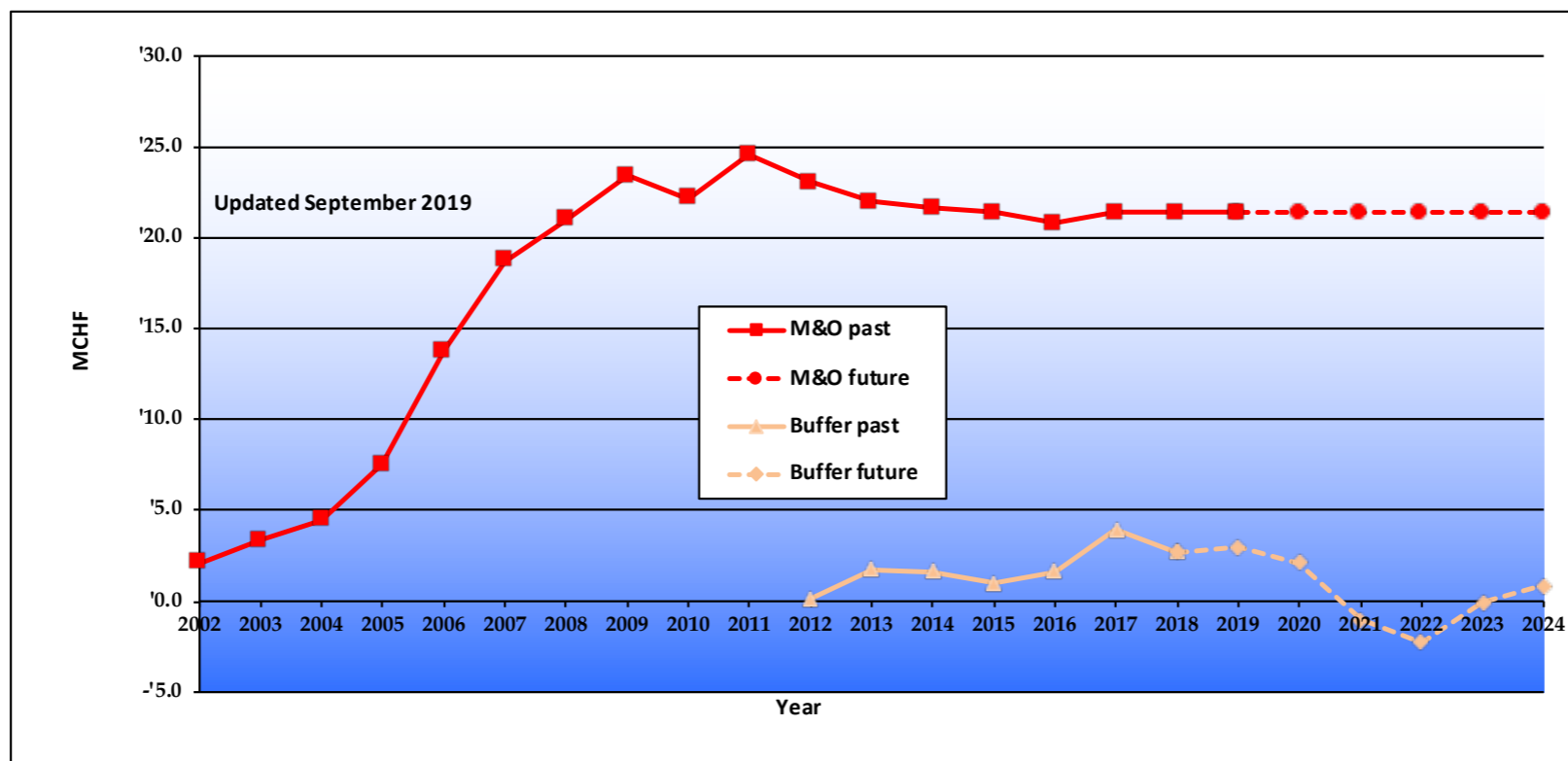
CERN-RRB-2019-099

ATLAS Resources Review Board, 28 October 2019

Request for the 2020 ATLAS M&O Budget

Request for the 2020 ATLAS M&O Budget

- Evolution of the M&O Budget up to 2024
 - Annual budget being maintained at 21.4 MCHF—using TDAQ buffer
 - TDAQ buffer projected to go -ve in 2021 and return +ve in 2024
 - Desired behaviour



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Category A	1.2	2.5	3.7	5.5	9.4	11.7	14.1	16.4	16.7	18.4	17.9	16.8	16.6	16.8	16.2	16.6	16.6	15.9	15.7	15.9	16.2	15.6	15.6	
Category B	0.9	0.9	0.8	2.0	4.4	7.0	6.9	7.0	5.5	6.1	5.2	5.1	5.0	4.6	4.6	4.8	4.8	5.5	5.7	5.5	5.2	5.8	5.8	
Total (A+B)	2.1	3.3	4.5	7.5	13.8	18.7	21.0	23.4	22.2	24.6	23.0	21.9	21.6	21.4	20.8	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4
TDAQ buffer account cumulative cash balance											0.14	1.73	1.63	0.99	1.65	3.95	2.70	2.99	2.11	-1.05	-2.28	-0.08	0.88	

- Revised projection of the TDAQ buffer balance—cf. April 2019
 - Expected networking costs in LS3 now based on actual costs incurred in LS2 —previously used costs incurred in LS1
 - RPC Gas provisioning and storage —as mitigation for anticipated cost increase during Run 3

Request for the 2020 ATLAS M&O Budget

• 2020 M&O—A Budget Request

• Requesting a budget of 15'725 kCHF

o Including full energy

• Expected costs in activities:

o Technical services

• Inclusive of energy

9.6 MCHF

2.2 MCHF

o Cryogenic systems and Magnets

1.9 MCHF

o Core computing (infrastructure)

2.4 MCHF

o TDAQ

1.8 MCHF

• Exc. withdrawal from TDAQ Buffer 0.9 MCHF

• Additional cost item (cf. 2019)

o Inclusion in the budget request of advance purchase of gas (including its storage) for the RPC detector—mitigation for expected price increase during Run 3

• +300 kCHF in 2020 and 2021

• -100 kCHF in the 2021 – 2024

	approved					requested 2020	projected			
	2015	2016	2017	2018	2019		2021	2022	2023	2024
Detector related costs	4'835	5'196	5'361	5'220	5'150	5'626	5'151	4'851	5'106	5'306
Magnet	220	220	220	220	220	220	220	220	220	220
Magnet controls	260	260	260	260	260	260	260	260	260	260
Magnet power supply	138	118	118	67	67	67	67	67	67	67
Gas systems	189	189	239	339	239	239	239	239	239	239
Gas consumption	1'150	1'150	1'150	1'150	970	1'360	1'350	1'050	1'050	870
Cooling systems	395	505	615	660	530	605	530	530	530	530
Cooling fluids(above -50°C)	80	80	110	110	80	80	80	80	80	80
External cryogenics	485	485	485	485	485	485	485	485	485	485
Cryogenic fluids (below -50°C)	0	0	0	0	0	0	0	0	0	0
Moving/hydraulic systems	90	90	90	140	90	90	90	45	45	45
Detector safety systems	210	240	240	240	240	360	240	240	240	240
Shutdown activities	510	510	640	510	810	760	510	510	610	810
General Technical support	368	359	399	359	419	400	390	390	590	650
UPS maintenance	100	100	50	50	100	100	50	50	50	100
Electronics pool rentals	20	20	20	20	20	20	20	20	20	20
Beam pipe & vacuum	60	310	165	50	60	60	60	60	60	130
Counting & control rooms	140	140	140	140	140	100	140	140	140	140
Safety	420	420	420	420	420	420	420	420	420	420
Secretariat	420	420	420	460	464	464	464	464	464	464
Secretarial assistance	300	300	300	340	344	344	344	344	344	344
Economat	20	20	20	20	20	20	20	20	20	20
Printing and publication	100	100	100	100	100	100	100	100	100	100
Collaborative tools	180	180	180	180	220	220	180	180	180	180
GSM phones; on-call service	10	10	10	10	50	50	10	10	10	10
Collaborative tools	170	170	170	170	170	170	170	170	170	170
Core computing (infrastructure)	2'354	2'309	2'354	2'354	2'354	2'354	2'354	2'354	2'354	2'354
Central computing environment	272	272	272	272	272	272	272	272	272	272
User support	363	363	363	363	363	363	363	363	363	363
Software process service	554	509	509	509	509	509	509	509	509	509
Database support	320	320	320	320	320	320	320	320	320	320
Central production operations	816	816	861	861	861	861	861	861	861	861
Hardware	30	30	30	30	30	30	30	30	30	30
On-line computing	5'287	4'371	4'485	4'191	2'569	1'923	3'802	4'574	3'706	2'942
System management	1'240	1'240	1'240	1'240	1'240	1'240	1'240	1'240	1'240	1'240
Data storage, (temporary on disk)	0	0	0	0	0	0	0	0	0	0
Detector controls	30	70	120	220	220	120	120	120	120	120
Computers/processors/LANs	3'719	2'718	2'494	2'417	693	299	1'509	2'434	2'146	1'317
Software licenses	70	70	70	70	70	70	70	70	70	70
Common desktop infrastructure	228	273	561	244	346	194	863	710	130	195
Test beams, calibration facilities	245	260	260	660	960	960	335	260	260	260
General operation	40	55	55	55	55	55	55	55	55	55
Common electronics	45	45	45	45	45	45	45	45	45	45
Electronics pool rentals	0	0	0	0	0	0	0	0	0	0
Gas systems	0	0	0	0	0	0	0	0	0	0
Gas consumption	0	0	0	0	0	0	0	0	0	0
External cryogenics	0	0	0	0	0	0	0	0	0	0
Modifications	160	160	160	560	860	860	235	160	160	160
Laboratory operations	105	90	90	90	90	90	90	90	90	90
Assembly areas, clean rooms, active storage areas	0	0	0	0	0	0	0	0	0	0
Workshops	50	50	50	50	50	50	50	50	50	50
Laboratory instruments	55	40	40	40	40	40	40	40	40	40
General services	1'219	1'219	1'267	1'249	1'908	1'888	1'307	1'249	1'249	1'808
Cooling & ventilation	344	344	344	344	344	344	344	344	344	344
Power distribution system	77	77	77	77	77	77	77	77	77	77
Heavy transport	60	60	60	60	200	200	60	60	60	200
Cranes	222	222	240	222	522	502	260	222	222	522
Cars	20	20	20	20	20	20	20	20	20	20
Survey	91	91	121	121	210	210	121	121	121	210
Storage space	0	0	0	0	0	0	0	0	0	0
Common desktop infrastructure	30	30	30	30	30	30	30	30	30	30
Technical Expertise	130	130	130	130	160	160	150	130	130	160
Outreach	245	245	245	245	345	345	245	245	245	245
TOTALS without power	14'645	14'045	14'418	14'404	13'715	13'525	13'683	14'022	13'409	13'404
Power	2'200	2'200	2'200	2'200	2'200	2'200	2'200	2'200	2'200	2'200
GRAND TOTALS	16'845	16'245	16'618	16'604	15'915	15'725	15'883	16'222	15'609	15'604

Request for the 2020 ATLAS M&O Budget

- 2020 M&O–B Budget Request
 - Requesting a budget of 5'675 kCHF

- o Compared to April 2019: +0.2 MCHF
- o Spare TGC chambers and electronics for the NSW detectors of the Muon System
- o Additional gas racks for the RPC detector
- o Electronics and technical support of the Forward Detectors

Item & Cost Driver	Pixel	SCT	TRT	IDGen	LAr	TileC	Muon	FD	TDAQ	Comp.	TOTAL
Mechanics					5	10	20	5			40
Gas systems			20			10	188				218
Cryo-systems											
Cooling system					5	3	5	20			33
FE electronics					40	60	10	49			159
Std. electronics (PS, crates, RO mod)	230	285	190	45	175	220	100	35	51		1'331
Controls (DCS, DSS)	10	20	10	5	35	16	15	14			125
Sub-detector spares						30	432	49			511
Areas (System tests, laboratory ops.)	90	20	30	120	10	20	65	20			375
Communications	1	5		8	5	5	5	5			34
Store items	24	30	30	80	10	23	20	18			235
TOTAL (excl. hired manpower at CERN)	355	360	280	258	285	397	860	215	51		3'061

Hired Manpower at CERN (kCHF)	200	277	325	365	480	250	575	262			2'734
Institute manpower, OTP class 3 (FTE)	30	24	27	30	37	32	57	21		158	416

Reduction based on surplus from prev. years (see text)											-120
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TOTAL M&O-B to be invoiced to FAs	555	637	605	623	645	647	1'435	477	51		5'675
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- Updates to 2021-2024 projection

- o Spare and maintenance of electronic modules for the LAr Phase-I system
- o Electronics and technical support of the Forward Detectors
- o TDAQ technical support for FTK

	approved					requested 2020	projected			
	2015	2016	2017	2018	2019		2021	2022	2023	2024
PIX	655	555	555	555	555	555	555	555	555	555
SCT	637	517	637	637	637	637	637	637	637	637
TRT	545	545	545	545	605	605	665	665	665	665
IDGen	623	573	573	573	723	623	573	573	573	573
LAr	700	630	610	590	615	645	670	690	730	795
TileC	604	544	604	604	647	647	604	604	604	635
Muons	570	800	830	830	1'201	1'435	1'100	765	1'355	1'450
FD	219	331	431	411	451	477	477	453	436	250
TDAQ				51	51	51	236	236	236	236
TOTALS	4'553	4'495	4'785	4'796	5'485	5'675	5'517	5'178	5'791	5'796

Request for the 2020 ATLAS M&O Budget

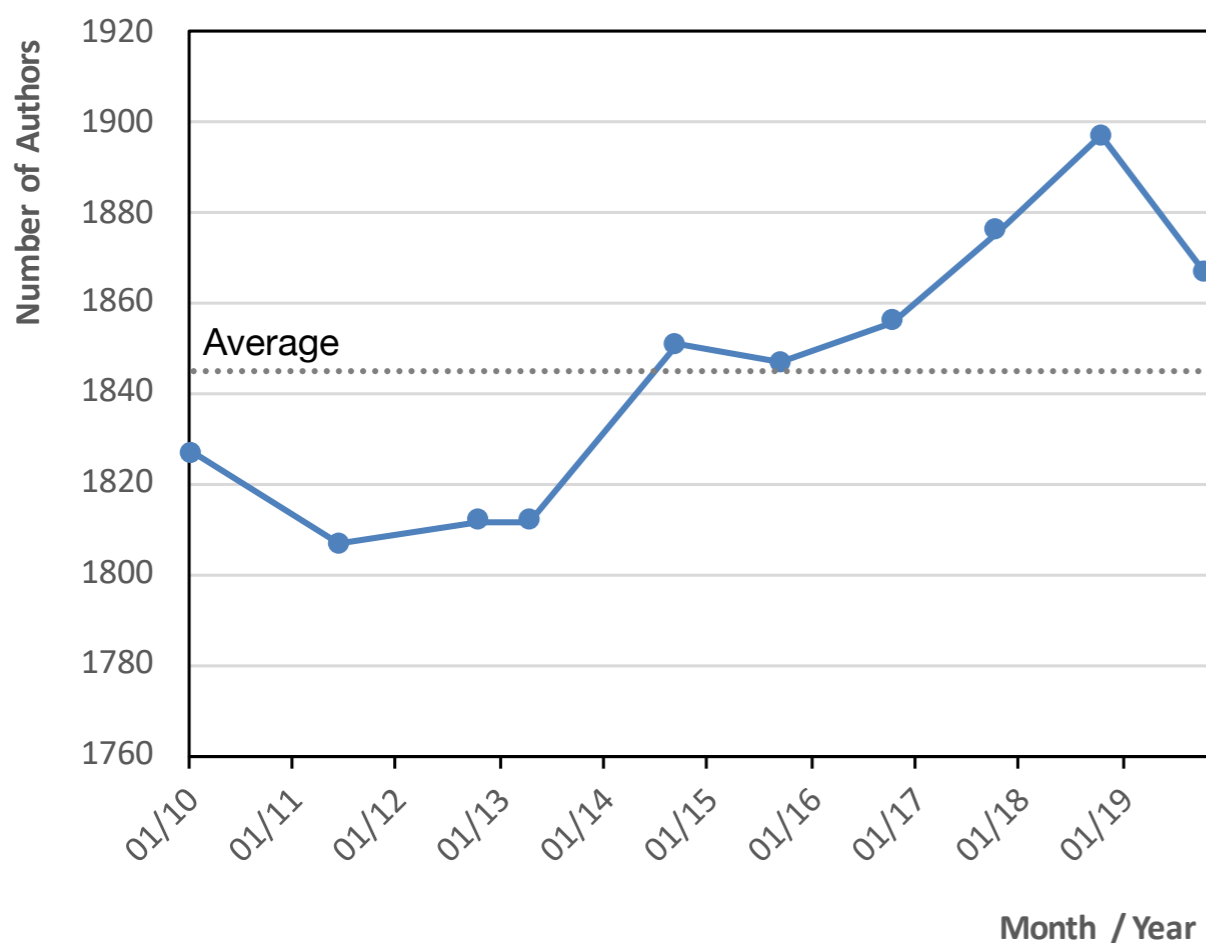
- **M&O–A in-Kind Contributions**
 - **CORE computing tasks (774 kCHF)**
 - The following Funding Agencies offer in-kind contributions for these tasks:
 - France IN2P3 (0.9 FTE), France CEA (0.2 FTE), Germany BMBF (1.4 FTE), Italy (1.2 FTE), Russia (0.7 FTE), United Kingdom K (1.2 FTE), US DOE (2.6 FTE) and US NSF (0.6 FTE)
 - The average cost is 89 kCHF/FTE
 - **General operations support (200 kCHF)**
 - Additional in-kind contributions for operations support are offered by
 - US DOE (175 kCHF) and US NSF (25 kCHF)

Request for the 2020 ATLAS M&O Budget

• Proposal for sharing of 2020 M&O

- **ATLAS Author Count as of 9 Sep. 2019**
 - o 2020: 1867—Cf. 2019 down by thirty

• Annual variation of Author Count



Funding Agency	Authors M&O-A	Category A items				Cat. B budgeted ³	Total A + B invoiced ⁴
		budgeted	adjusted ¹	in-kind	invoiced ²		
Argentina	6	51	51		51	3	54
Armenia	0	0	0		0	0	0
Australia	11	94	93		93	42	135
Austria	2	17	14		14	8	22
Azerbaijan	1	9	8		8	1	9
Belarus	2	17	17		17	1	18
Brazil	13	111	109		109	5	114
Canada	68	580	562		562	258	820
Chile	10	85	84		84	4	88
China NSFC+MSTC	56	478	472		472	24	496
Colombia	2	17	17		17	1	18
Czech Republic	45	384	326		326	19	345
Denmark	9	77	65		65	34	99
France IN2P3	99	845	717	80	637	375	1'012
France CEA	25	213	181	21	160	95	255
Georgia	6	51	51		51	2	53
Germany BMBF	135	1'152	978	125	853	512	1'365
Germany DESY	51	435	369		369	193	562
Germany MPI	22	188	159		159	83	242
Greece	17	145	123		123	7	130
Hong Kong	8	68	67		67	30	97
Israel	30	256	217		217	13	230
Italy	174	1'485	1'260	102	1'158	660	1'818
Japan	59	503	489		489	224	713
Morocco	8	68	67		67	3	70
Netherlands	24	205	174		174	91	265
Norway	18	154	130		130	68	198
Poland	30	256	217		217	13	230
Portugal	17	145	123		123	7	130
Romania	22	188	159		159	9	168
Russia	65	555	476	59	417	27	444
JINR	32	273	270		270	13	283
Serbia	4	34	29		29	2	31
Slovak Republic	12	102	87		87	5	92
Slovenia	8	68	58		58	3	61
South Africa	12	102	101		101	5	106
Spain	45	384	326		326	171	497
Sweden	31	265	225		225	117	342
Switzerland	26	222	188		188	99	287
Taipei	8	68	67		67	3	70
Turkey	11	94	80		80	5	85
United Kingdom	198	1'689	1'434	106	1'328	751	2'079
US DOE HEP	264	2'065	2'195	405	1'790	1'001	2'791
US DOE NP	11	94	93		93	42	135
US NSF	64	529	539	76	463	243	706
CERN	99	845	717		717	376	1'093
Other ⁵	7	60	59		59	27	86
Total	1'867	15'725	14'243	974	13'269	5'675	18'944

Notes:
 Based on qualified authors with PhD or equivalent from September 9, 2019 shown in the leftmost column.
¹ Includes energy cost adjustments.
² After accounting for energy cost adjustments and in-kind contributions and other adjustments.
³ See Table 2 for the detailed breakdown by System and Funding Agency.
⁴ Expected cash contributions by Funding Agencies (Sum of Cat. A invoiced + Cat. B budgeted).
⁵ Authors with M&O shares paid from different sources other than their natural Funding Agency.

ATLAS Upgrade Status Report 2019 – 2020



CERN-RRB-2019-098

ATLAS Resources Review Board, October 28, 2019

- **Status of the Phase-I Upgrades**
 - o Progress report
 - o CORE values of Phase-I deliverables expected to be realized in 2019 – 2020
- **Status of the Phase-II Upgrades**
 - o Progress report
- **Phase-II Common Fund**

For RRB information

ATLAS Upgrade Status Report 2019 – 2020

ATLAS Upgrade Status Report 2019 – 2020

Calendar year 2019

• Status of the Phase-I Upgrades

• Progress Report, details in:

o CERN-RRB-2019-098

o *Status of the experiment: Detector and Phase-I*
—L. Pontecorvo (this agenda)

o Expecting most Phase-I projects to reach completion in 2020

• In calendar year 2019

35% of the total Phase-I CORE value expected to be delivered

Funding Agency	NSW	LAr-E	TileC	FTK	TDAQ	SMALL PROJECTS	Total
Argentina							
Armenia							
Australia							
Austria							
Azerbaijan							
Belarus							
Brazil							
Canada	151	51.1					202
Chile	66						66
China NSFC+MSTC	321					6	327
Colombia							
Czech Republic			50				50
Denmark							
France IN2P3		993.8					994
France CEA	233	523.8					757
Georgia							
Germany BMBF	194	358.9					553
Germany DESY							
Germany MPI						23	23
Greece	237						237
Hong Kong							
Israel	271				27		298
Italy	327	286.0					613
Japan	55	430.2					485
Morocco							
Netherlands	19				364		383
Norway							
Poland							
Portugal							
Romania	95						95
Russia	94	128.6	50		80		353
JINR	29	52.7					82
Serbia							
Slovak Republic							
Slovenia							
South Africa	54						54
Spain			32				32
Sweden					50		50
Switzerland							
Taipei	39						39
Turkey							
United Kingdom					1'509		1'509
US DOE+NSF	1'251	1'352.2		188†	54		2'845
CERN	94	587.2	13		338		1'032
Other							
Common Fund	680						680
Total	4'210	4'764	145	188	2'422	29	11'758

Notes:

1. These numbers are the CORE values (in 2013 CORE CHF) of items expected to be delivered in 2019.

† NSF MRI Grant PHY-1126275

ATLAS Upgrade Status Report 2019 – 2020

Calendar year 2020

• Status of the Phase-I Upgrades

• Progress Report, details in:

o CERN-RRB-2019-098

o *Status of the experiment: Detector and Phase-I*
—L. Pontecorvo (this agenda)

o Expecting most Phase-I projects to reach completion in 2020

• In calendar year 2019

35% of the total Phase-I CORE value expected to be delivered

• In calendar year 2020

11% of the total Phase-I CORE value expected to be delivered

Funding Agency	nSW	LAr-E	TileC	FTK	TDAQ	SMALL PROJECTS	Total
Argentina							
Armenia							
Australia							
Austria							
Azerbaijan							
Belarus							
Brazil							
Canada	143						143
Chile	53						53
China NSFC+MSTC	163					65	228
Colombia							
Czech Republic							
Denmark							
France IN2P3							
France CEA	173						173
Georgia			32				32
Germany BMBF	45						45
Germany DESY							
Germany MPI							
Greece	19						19
Hong Kong							
Israel	43				234		277
Italy	168						168
Japan	158						158
Morocco							
Netherlands					72		72
Norway							
Poland							
Portugal			30				30
Romania	25				67		92
Russia	31				20		51
JINR	35		50				85
Serbia							
Slovak Republic			32				32
Slovenia							
South Africa			30				30
Spain							
Sweden							
Switzerland							
Taipei							
Turkey							
United Kingdom							
US DOE+NSF	725				208		933
CERN			30		192		222
Other							
Common Fund	330						330
Total	2'111	0	204	0	793	65	3'173

Notes:

1. These numbers represent CORE values (in 2013 CORE CHF) for items expected to be delivered in 2019.

ATLAS Upgrade Status Report 2019 – 2020

- Status of the Phase-I Upgrades
 - Most Phase-I projects expected to reach completion in 2020
 - Expect to report to the RRB on their completion in April 2021
 - LAr, Tile and TDAQ Phase-I upgrades are expected to stay within the scope set out in their respective TDRs and MOUs
 - CORE values earned and to be recognised will be those documented in the MOUs

ATLAS Upgrade Status Report 2019 – 2020

• Status of the Phase-I Upgrades

- o The NSW project has incurred additional costs with respect to its TDR and MOU
- o Discussions of the sharing of the incurred additional costs is ongoing
 - Many Funding Agencies have already contributed to the additional costs or have agreed to do so—primarily for their deliverables
- o Update in the April 2020 meeting of the RRB

Funding Agency	sTGC Detector	MM Detector	Alignment	FE ASIC	On-Chamber Electronics	sTGC Rim Electronics	HV/LV Power Supply Chain	DCS & Environmental Monitoring	Services: Optical Fibers	Services: Gas, Cooling, Mechanics	Integration & Commissioning
Canada	Green										
CEA Saclay		Green									
CERN		Green									
Chile	Green										
China	Green				Grey						
JINR Dubna		Yellow									
Germany BMBF		Green									
Greece		Grey									
Hong Kong					Green						
Israel	Green								Green		
Italy INFN		Yellow				Green					
Japan		Grey					Grey				
Netherlands											
Romania				Green							
Russia	Yellow	Green									
South Africa											
Taipei						Green					
United States				Green	Green				Green		

	Already paid or secured
	Currently under negotiation
	Discussion not yet started

ATLAS Upgrade Status Report 2019 – 2020

- Phase-II Common Fund
 - **Reminder:**
 - Described in its own MoU—CERN-RRB-2017-058
 - **Total cost = 24.420 MCHF**
 - Flat funding profile over 9 year period 2018-2026
 - **2.713 MCHF/year**
 - Sharing as done for M&O-A
 - **M&O author count**
 - **For detailed status up to 31 August 2019, see**
 - *Financial Matters—G. Cavallo (this agenda)*
 - CERN-RRB-2019-095
 - **To-day (22-Oct-2019)**
 - Received: 6.0 MCHF
 - Spent: 0.2 MCHF

Funding Agency	M&O author counts on 09/09/2020		Common Fund Contribution [kCHF]
Argentina	6	0.32%	8.7
Armenia	0	0.00%	-
Australia	11	0.59%	16.0
Austria	2	0.11%	2.9
Azerbaijan	1	0.05%	1.5
Belarus	2	0.11%	2.9
Brazil	13	0.70%	18.9
Canada	68	3.64%	98.8
Chile	10	0.54%	14.5
China NSFC+MSTC	56	3.00%	81.4
Colombia	2	0.11%	2.9
Czech Republic	45	2.41%	65.4
Denmark	9	0.48%	13.1
France IN2P3	99	5.30%	143.9
France CEA	25	1.34%	36.3
Georgia	6	0.32%	8.7
Germany BMBF	135	7.23%	196.2
Germany DESY	51	2.73%	74.1
Germany MPI	22	1.18%	32.0
Greece	17	0.91%	24.7
Hong Kong	8	0.43%	11.6
Israel	30	1.61%	43.6
Italy	174	9.32%	252.88
Japan	59	3.16%	85.7
Morocco	8	0.43%	11.6
Netherlands	24	1.29%	34.9
Norway	18	0.96%	26.2
Poland	30	1.61%	43.6
Portugal	17	0.91%	24.7
Romania	22	1.18%	32.0
Russia	65	3.48%	94.5
JINR	32	1.71%	46.5
Serbia	4	0.21%	5.8
Slovak Republic	12	0.64%	17.4
Slovenia	8	0.43%	11.6
South Africa	12	0.64%	17.4
Spain	45	2.41%	65.4
Sweden	31	1.66%	45.1
Switzerland	26	1.39%	37.8
Taipei	8	0.43%	11.6
Turkey	11	0.59%	16.0
United Kingdom	198	10.61%	287.8
US DOE HEP	264	14.14%	383.7
US DOE NP	11	0.59%	16.0
US NSF	64	3.43%	93.0
CERN	99	5.30%	143.9
Other	7	0.37%	10.2
Total	1867	100.00%	2'713.3

ATLAS Upgrade Status Report 2019 – 2020

● Phase-II Upgrade MoUs: Status of Signing

Funding Agency	TDAQ	ITK Strip & Common Items	LAr	Tile	Muon	Common Fund
Argentina	Signed					
Armenia						
Australia	Signed	Signed				
Austria	Unsigned					
Azerbaijan						
Belarus				Unsigned		Unsigned
Brazil						Unsigned
Canada		Signed	Signed			
Chile					Unsigned	
China NSFC+MSTC		Unsigned			Unsigned	Unsigned
Colombia	Unsigned					
Czech Republic	Signed	Signed		Signed		
Denmark	Unsigned	Unsigned				
France IN2P3	Unsigned			Unsigned		
France CEA		Signed	Signed		Signed	
Georgia				Signed		
Germany BMBF	Signed		Signed	Signed	Signed	
Germany DESY						
Germany MPI	Signed		Signed		Signed	
Greece	Unsigned				Unsigned	Unsigned
Hong Kong		Signed			Signed	
Israel	Unsigned				Unsigned	Unsigned
Italy	Unsigned		Unsigned	Unsigned		Unsigned
Japan	Unsigned				Unsigned	Signed
Morocco						Unsigned
Netherlands	Unsigned				Unsigned	Signed
Norway						Unsigned
Poland	Unsigned					Unsigned
Portugal	Signed			Signed		
Romania	Signed			Signed		
Russia		Unsigned	Unsigned	Unsigned	Unsigned	Unsigned
JINR	Signed		Signed	Signed	Signed	
Serbia						
Slovak Republic	Unsigned		Unsigned	Unsigned		
Slovenia						
South Africa		Signed		Signed		
Spain		Unsigned		Unsigned		
Sweden	Signed	Signed		Signed		
Switzerland	Signed	Signed				
Taipei					Unsigned	
Turkey	Unsigned				Unsigned	Unsigned
United Kingdom	Signed	Unsigned				Signed
USA DOE	Unsigned		Unsigned			Unsigned
USA NSF	Unsigned		Unsigned	Unsigned	Unsigned	Unsigned
CERN	Signed	Signed	Signed	Signed	Signed	Signed

o Last updated: 23-Oct-2019

- When informed by the office of the DRC

Signed
Unsigned

o Summary

Funding Agency	TDAQ	ITK Strip & Common Items	LAr	Tile	Muon	Common Fund
Signed	12	12	6	9	6	32
% signed	46%	48%	50%	56%	35%	71%
CORE value signed (kCHF)	21'898	29'277	10'036	6'447	8'639	14'662
% CORE value	49%	39%	35%	56%	30%	60%

o CORE value “signed” (kCHF, %) and initial uncertainty

Uncertainty Index	TDAQ	ITK Strip & Common Items	LAr	Tile	Muon	Common Fund
Low	19'527 (89%)	28'877 (99%)	10'036 (100%)	4'442 (69%)	8'639 (100%)	14'662 (100%)
Medium	1'735 (8%)	400 (1%)	(0%)	1'927 (30%)	(0%)	(0%)
High	636 (3%)	(0%)	(0%)	78 (1%)	(0%)	(0%)

ATLAS Upgrade Status Report 2019 – 2020

● Phase-II Upgrade MoUs

● ITk Pixel Sub-detector

- o Completed and with the office of DRC for opening for signing
- o Total CORE value of 49'364 kCHF
 - Increase of 3% compared to value in draft MoU circulated in Q1 2019
- o Contributions of Funding Agencies provide a coverage of 99%
- o Pixel MoU—Annex 5: CORE value of deliverables per Funding Agency

	Sensors	FE chip	Hybridization	On detector Services	Local Supports	Global Mechanics	Integration	Off detector services	System test, test beam, irradiation	Data transmission	Total (kCHF)
	2.1.1	2.1.2	2.1.3	2.1.4	2.1.5	2.1.6	2.1.7	2.1.8	2.1.9	2.1.10	
Czech Republic	544	301	-	-	-	-	-	556	-	-	1'401
France IN2P3	797	416	1'143	976	1'044	247	184	-	5	218	5'030
France CEA	307	-	248	40	-	124	-	73	-	173	965
Germany BMBF	486	745	1'890	163	559	124	184	1'273	5	486	5'915
Germany MPI	216	-	190	-	-	-	-	-	-	-	406
Hong Kong	343	-	-	-	-	-	-	-	-	-	343
Italy	519	-	1'299	619	761	558	381	429	14	492	5'072
Japan	1'275	580	1'798	24	-	-	-	-	19	-	3'696
Netherlands	-	147	-	-	-	-	-	-	-	-	147
Norway	420	269	435	-	-	-	-	126	-	83	1'333
Russia	-	-	547	-	-	66	-	-	-	327	940
Spain	205	-	355	-	-	-	-	335	-	-	895
Switzerland	793	329	1'195	375	1'081	371	184	29	5	725	5'087
United Kingdom	738	217	1'104	557	761	558	381	399	29	370	5'114
USA DOE	-	770	1'113	553	917	1'011	371	1'292	42	973	7'042
CERN	874	482	1'303	66	884	371	184	1'102	73	244	5'583
Total	7'517	4'256	12'620	3'373	6'007	3'430	1'869	5'614	192	4'091	48'969

● High Granularity Timing Detector—First Quarter 2021

Status of ATLAS Resources

- The ATLAS management, supported by the ATLAS Executive and Collaboration Boards, kindly invites the RRB to:
 - Approve the requested 2020 M&O-A and M&O-B budgets, and their sharing by Funding Agency;
 - Take note of the progress in the ATLAS Phase-I Upgrade projects, and the CORE deliverables projected to be realized in 2019 and 2020;
 - Approve the request and sharing by Funding Agency of the Phase-II Common Fund budget for 2020.
- Thank you for your continued support