

Budget report

ARRB meeting
April, 22 2025

B. Million

Phase 2

- 2024 status: Highlights
- Mid Term review

Phase 2

Capital Resources

2024 status: Highlights

Capital Resource: MoU

Estimates from MoU: inflation 1,5% + 7/8 capsule/year

Costs in k€ per year: **Expected** Cost purchasing 7 to 8 detectors/year (VAT Excluded)

Item	2021 64/21	2022 72/24	2023 80/26	2024 88/29	2025 96/31	2026 104/34	2027 111/37	2028 119/40	2029 127/43	2030 135/45	Total
Detector	1214,5	1357,7	1378,1	1398,7	1419,7	1441,0	1327,9	1540,4	1563,5	1587,0	14228,6
Cryostat	225,1	228,5	338,7	235,4	238,9	354,2	359,5	364,9	370,4	375,9	3091,4
Electronics	0,0	345,8	0,0	0,0	54,3	275,7	372,6	0,0	383,8	0,0	1432,2
Electronics Upgrade	340,7	0,0	438,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0	779,5
GTS/SMART	0,0	0	104,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	104,6
PSA & Data Flow	0,0	157,9	0,0	284,4	52,5	53,3	151,0	48,0	55,7	113,1	915,8
Storage	0,0	117,6	0,0	0,0	0,0	124,9	0,0	0,0	0,0	0,0	242,5
Analysis	0,0	10,5	0,0	0,0	0,0	11,1	0,0	0,0	0,0	11,8	33,3
Infrastructure	461,0	0,0	0,0	266,6	0,0	0,0	0,0	0,0	0,0	0,0	727,7
Mechanics	169,8	0,0	0,0	96,3	10,9	11,1	16,9	17,2	17,4	0,0	339,6
Total	2411,1	2218,0	2260,1	2281,5	1776,4	2271,2	2227,9	1970,5	2390,8	2087,7	21895,2

Detectors procurement represents
~80% of the AGATA Core budget

*Discount agreement with Mirion
(capsules) :*

With an inflation of 2,5%

2022: 6 capsules

215k€/caps → **183k€/caps**

2023: 7 capsules

220k€/caps → **181k€/caps**

2024: 8 capsules

226k€/caps → **178,6k€/caps**

Total estimated cost: 22 M€

→ **10,9 M€ for each 5y period**

Planning first 5 year purchases

-> Applying agreed Discounts

Critical path to apply agreed discounts with MIRION and CTT:

1- Coordination for capsule purchases at MIRION:

(discount agreement: from 2 capsules to 12 capsules apply a -3% on all capsules)

price for 2022: incr. 2,5% → 209,9 k€	- 3 capsules → 197,3 k€/caps	- 37,8 k€
price for 2022: incr. 2,5% → 215,1 k€	- 6 capsules → 182,9 k€/caps	- 193,2 k€
price for 2023: incr. 2,5% → 220,5 k€	- 7 capsules → 180,8 k€/caps	- 277,9 k€
price for 2024: incr. 2,5% → 226,5 k€	- 8 capsules → 178,6 k€/caps	- 383,2 k€
2025: No capsule planned		

→ Save on capsules **- 890 k€**

2- Coordination for cryostats purchase at CTT:

(discount agreement: 2 ATC: -5%; 3 ATC: -7,5%; 4 ATC: -10%)

2022: no ATC purchased

2023: 1 ATC in France (GANIL) : **148,5 k€ !** (as compared to 120 k€ 2 years ago)

2024: 1 ATC by GSI: full discount of 5% on 2 ATC applied as 10% on GSI ATC → **137 k€**

2025: 4 ATC: by Salamanca, IRFU, 2 INFN: 148,5 k€ full price → **133,6 k€** unit price after full discount of 10% on 4 ATC.

Capital Resource up to 2024

→ **6.83 M€** already spent vs **10.9 M€** for 2021-2025 from MoU

- 5 M€ on capsules and cryostats
- 1,1 M€ on electronics
- 0,3 M€ on DAQ
- 0,4 M€ on Infrastructure

Capital Resource up to 2024 including first plans for 2025

→ **6.83 M€** already spent vs **10.9 M€** for 2021-2025 from MoU

- 5 M€ on capsules and cryostats
- 1,1 M€ on electronics
- 0,3 M€ on DAQ
- 0,4 M€ on Infrastructure

+ **0.89 M€** presently planned for 2025

→ for a total of **7.72 M€** vs **10.9 M€** for 2021-2025 from MoU

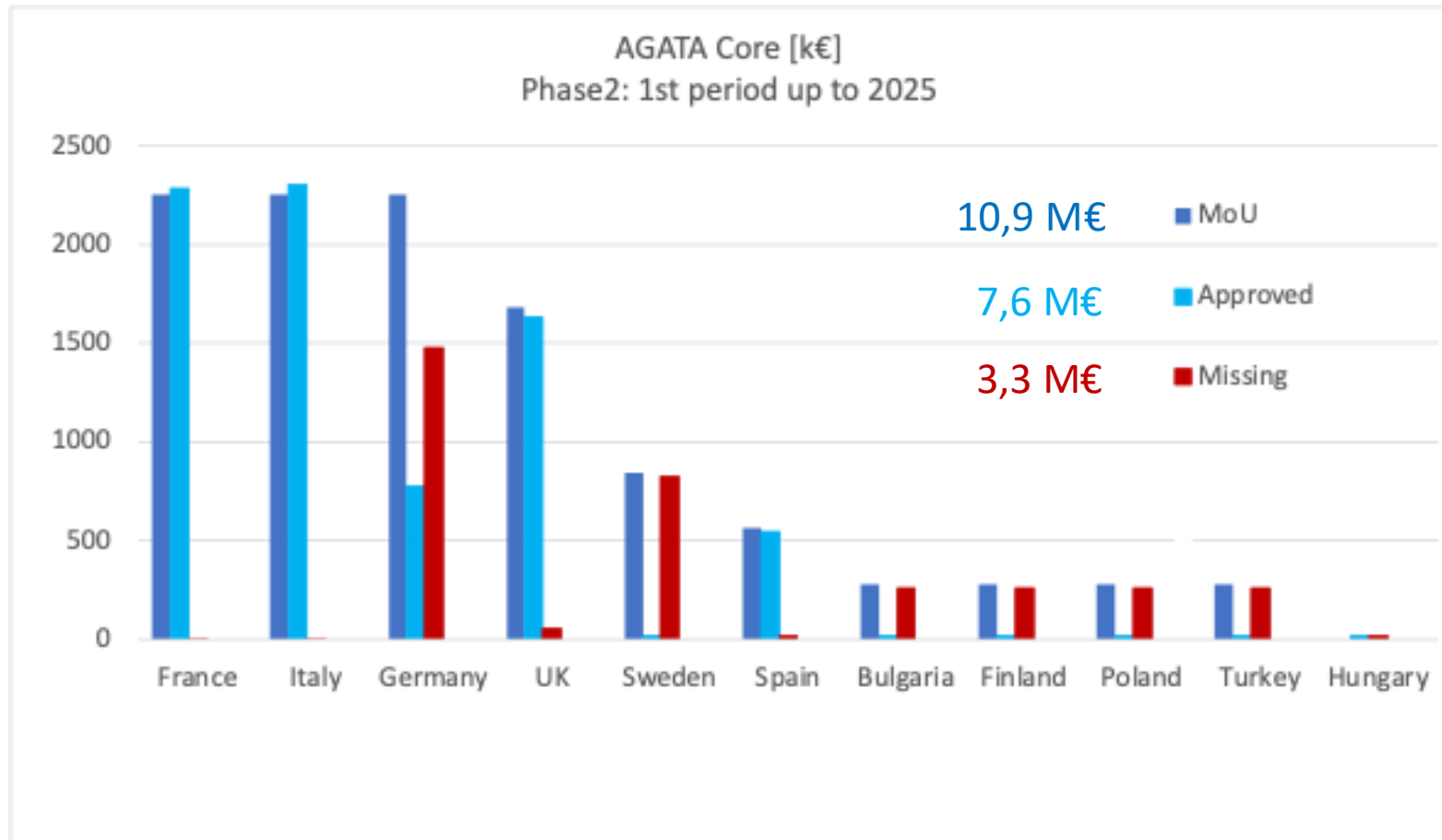
Plan for Core purchase to complete 90 capsules (2π) setup within 2025

**Planned in 2025 – to complete
the 90 capsules setup (2π)**

**Still needed – to complete
the 90 capsules setup (2π)**

• Caspules		2.900-3.300 k€ : 14 capsules
• Cryostats	536 k€ : 4 cryostats in 2025	
• FEE	354 k€ : 2025 for 89 new TRENZ boards (3pi) 34 new DIGIOPT12 boards 70 new PACE GTS (3pi)	
• DAQ		64 k€ : postponed to 2026
• Infrastructure		
• TOTAL:	890 k€	+ 2.900/3.300 + 64 k€

Capital Resources Status



Phase 2

Operation Costs

2024 status

Operation Costs

Item	2021	2022	2023	2024	2025
Capsules in setup	57	60	66	75	81
Expected Capsule failures	5	5	5	6	6
failures Under Warranty	1	1	1	2	2
Detectors in setup	19	20	22	25	27
Detectors					
LN2	20	54	59,4	67,5	72,9
Capsule maintenance/repair	224,6	228,0	231,4	234,8	238,4
Detector&Cryostat maintenance/repair	77,6	78,7	87,9	101,4	111,1
Including Preamplifier exchange...					
Other repairs (feedthrough, cabling,...)					
Detector laboratories	60	60	60	60	60
Infrastructure					
HV/LV, Autofill, infrastructure	21,8	21,8	23,9	27,2	29,4
Electronics and DAQ					
Elect. maintenance/replacement	35,1	43,8	40,5	87,7	94,4
DAQ maintenance/replacement	63	63	69,3	78,75	85,05
Other costs					
Grid costs	24	24	24	24	24
Shipping costs	25	25	25	27	27
Mechanics	8	8	8	8	8
Total operation & maintenance	559,1	606,3	629,4	716,4	750,2

Operation Costs up to 2024

MoU: **716 k€**

Allocated **571 k€** = **80% MoU**

Spent **569,5 k€ :**

508 k€ as maintenance

+

*61,5 k€ for exceptional prolongation of detector WG leader contract (IKP)
as at the time of this decision the prosecution of the activity at IKP
was critical for the project.*

Another 87 k€ should have been spent on detector repair.

GANIL-Mirion contract available since February 2025: will ease a lot future orders.

Altogether **656,5 k€** were needed in 2024

→ Using residue from precedent years.

Phase 2

Mid term Review

Phase 2

Mid term Review

Capital Investments

2021-2025: Capital investments

Country	Total capital investment MoU (2021-2025) without tax [k€]	%	Total capital investment Funds committed (2021-2025) without tax [k€]
Bulgaria	278	3	
Finland	278	3	
France	2.249		2.413
(IN2P3)	(742)	20	(748,7)
(GANIL)	(1.125)		(1.326,2)
(IRFU)	(382)		(337,2)
Germany	2.249		776
(Universities)	(1.373)	20	
(GSI - since 2024)	(876)		(776)
Hungary			
Italy	2.249	20	2.299
Poland	278	3	
Spain	561	5	603
Sweden	842	8	
Turkey	278	3	
UK	1.684	15	1.629
Total	10.946	100	7720

2021-2024: 6.83 M€

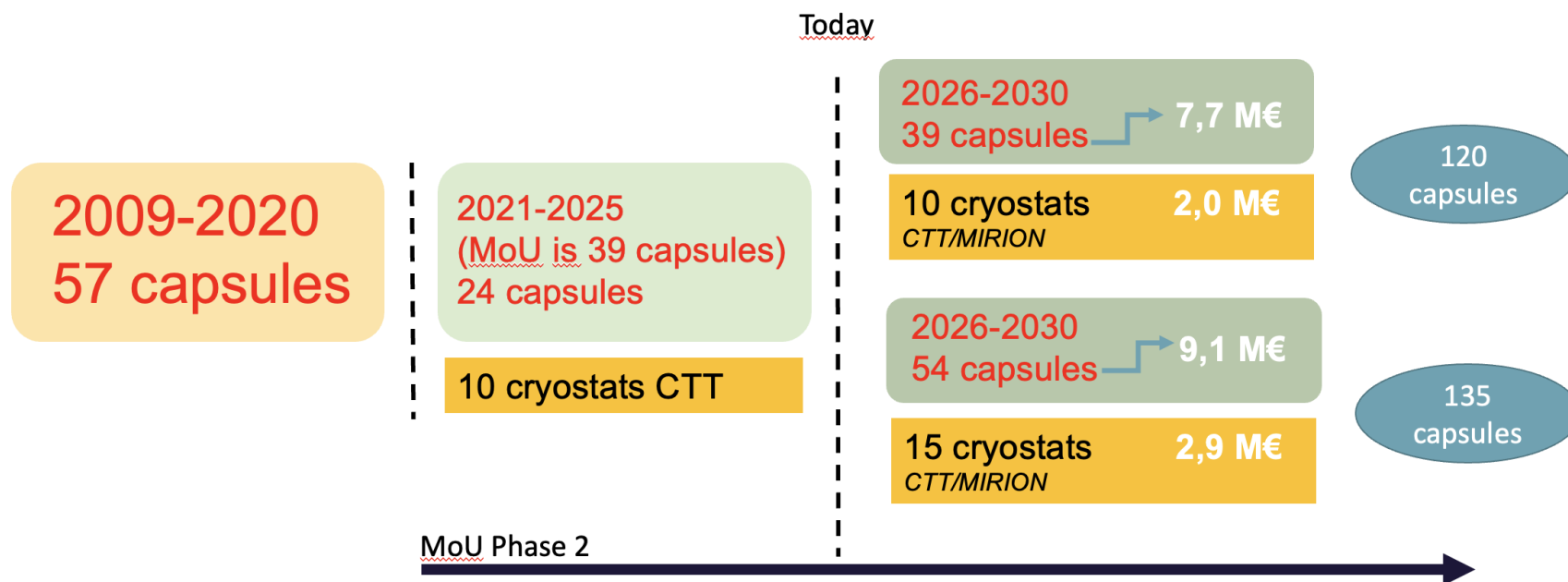
+

2025: 0,89 M€ approved

**→ 7.72 M€ already committed
(without tax)**

Production line status (from PM report)

Tables 5 and 6 : capsules and cryostats cost



2026-2030: Capital investments

Two scenarios for 2026-2030 :

1- MoU-2 2nd period (2026-2030): spending as planned in MoU

→ adding **39 caps**

	Proj Def Phase 2	Committed funds	Planned funds	Planned funds
	2021-2030	2021 - 2025	2026-2030	2021-2030
	135 caps	57 (phase 0+1) + 24 caps	57+24+39 caps	120 caps
Capsules	14,2 M€	4,256	7,753	12,009
Cryostat	3,1M€	1,261	2	3,261
PSA+DAQ	1,2 M€	0,27	0,92	1,19
Storage				
Analyse				
Mechanics	1,067 M€	0,439	0,545	0,984
Infra				
FEbEE	2,3 M€	1,494	0.626	2,12
TOTAL	21,867	7,72	11,844	19,564

→ 2026-2030: **10,9 M€** from MoU becomes **11,9 M€** due to inflation on capsules (+2,5%) and on cryostats

→ Array reaches **120 capsules** in **2030** for a Phase2 (2021-2030) total cost of **19,5 M€**

2026-2030: Capital investments

Two scenarios for 2026-2030 :

2- MoU-2 (full MoU: 2021-2030): each partner can recover delayed investments
→ adding **54 caps**

	Proj Def Phase 2	Committed funds	Planned funds	Planned funds
	2021-2030	2021 - 2025	2026-2030	2021-2030
	135 caps	57 (phase 0+1) + 24 caps	57+24 + 54 caps	135 caps
Capsules	14,2 M€	4,256	9,09	13,346
Cryostat	3,1M€	1,261	2,925	4,186
PSA+DAQ	1,2 M€	0,27	0,92	1,19
Storage				
Analyse				
Mechanics	1,067 M€	0,439	0,545	0,984
Infra				
FEbEE	2,3 M€	1,494	0,626	2,12
TOTAL	21,867	7,72	14,106	21,826

→ 2026-2030: each partner to fulfill commitment from Phase2 MoU (2021-2030), needs a total of **14,1 M€** in 2026-2030

→ Array reaches **135 capsules** (3π) in **2030** for a Phase2 (2021-2030) total cost of **21,8 M€**
equivalent to MoU as Discount compensate inflation !

2026-2030: Capital investments

Two scenarios for 2026-2030 :

→ **breakdown by countries as for MoU agreed share**

	as for 2nd period of MoU-2: 2026-2030
	39 additional capsules
	120 capsules
	[k€]
	11.844
Bulgaria	296
Finland	296
France	2.369
Germany	2.369
Hungary	296
Italy	2.369
Poland	296
Spain	592
Sweden	888
Turkey	296
UK	1.777

→ 2026-2030: **as for 2nd period of MoU-2**
(2026-2030) with updated costs,
needs a total of **11,8 M€** in 2026-2030

2026-2030: Capital investments

Two scenarios for 2026-2030 :

→ **breakdown by countries as for MoU agreed share**

	as for 2nd period of MoU-2: 2026-2030
	39 additional capsules
	120 capsules
	[k€]
	11.844
Bulgaria	296
Finland	296
France	2.369
Germany	2.369
Hungary	296
Italy	2.369
Poland	296
Spain	592
Sweden	888
Turkey	296
UK	1.777

	as to recover full MoU-2: extra effort on 2nd period for some countries
	54 additional capsules
	135 capsules
	[k€]
	14.106
Bulgaria	380
Finland	380
France	2.369
Germany	3.963
Hungary	380
Italy	2.369
Poland	380
Spain	592
Sweden	1.140
Turkey	380
UK	1.777

→ 2026-2030: **as for 2nd period of MoU-2 (2026-2030)** with updated costs,
needs a total of **11,8 M€** in 2026-2030

→ 2026-2030: **each partner to fulfill commitment from MoU-2 (2021-2030)** with updated costs,
needs a total of **14,1 M€** in 2026-2030 and
an extra effort from countries that got delayed

Phase 2

Mid term Review

Operation Costs

2021-2024: Operation Costs collected

Country	Total operation costs MoU (2021-2024) including tax [k€]	Total operation costs OC committed (2021-2024) including tax [k€]
Bulgaria	81	
Finland	95	51,0
France	457	453,9
(IN2P3)	(151)	(182,5)
(GANIL)	(228)	(195,5)
(IRFU)	(78)	(75,9)
Germany	457	376,8
(Universities)	(431)	(350,8)
(GSI-since 2024)	(26)	(26)
Hungary	125	125,0
Italy	457	453,5
Poland	81	
Spain	125	125,0
Sweden	158	128,9
Turkey	125	
UK	351	351,0
Total	2512	2065,1

2025: still to be collected

**→ 2,06 M€ collected
about 82%**

2021-2024: Operation Costs spent

Item	2021-2024		
	MoU [k€]	Collected [k€]	Total expenses [k€]
LN2	201		299
Capsule maintenance/repair	919		481
Cryostat maintenance/repair	346		374
HV/LV system, infrastructure	95		100
Detector laboratory	240		239
Electronics maintenance/repair	207		416
DAQ maintenance/repair	274		77
Grid costs + Data Analysis	96		7
Shipping costs	102		41
Mechanics etc.	32		3
Exchange rates			15
Total operation & maintenance costs (excl. personnel)	2.512	2.065	2.051

MoU: 2,5 M€

Collected: 2,065 M€
→ 82% of MoU

Spent: 2,051 M€

2021-2024: Operation Costs spent

OC expenditure : 2%/y of total investment
(from 2009 till 2024: 24.3 M€)

Need an update, as foreseen in the MoU, to take into account:

- effective number of detectors in operation at hostlab (array + detector lab)
- LN2 setup at new Hostlab
- FEE electronics, infrastructure, DAQ, Capsules and Cryostats maintenance and repair
- update actual costs of maintenance operation at MIRION and CTT

2026-2030: Updated Operation Costs

Item		2026	2027	2028	2029	2030
		(k€)	(k€)	(k€)	(k€)	(k€)
Capsules ordered		89	96	104	112	120
Capsules in Host Lab		75	81	90	96	105
Detectors						
LN2		139	142	147	150	156
Capsule maintenance/repair		243	249	254	260	268
Detector & Cryostat maintenance/repair		104	115	129	140	155
Detector laboratories		60	60	60	60	60
Infrastructure						
HV/LV, Autofill, infrastructure		27	29	33	35	38
Electronics and DAQ						
Elect. maintenance/replacement		89	94	105	112	122
DAQ maintenance/replacement		79	85	95	101	110
Other costs						
Grid costs		24	24	24	24	24
Shipping costs		19	19	19	19	19
Mechanics		8	8	8	8	8
Total operation & maintenance costs		792	825	874	909	960

2026-2030: Updated Operation Costs

→ breakdown by countries as for MoU agreed share

Country	2026 (k€)	2027 (k€)	2028 (k€)	2029 (k€)	2030 (k€)
Bulgaria	25	26	28	28	31
Finland	29	30	32	34	36
France	138	144	152	159	167
Germany	138	144	152	159	167
Hungary	38	40	42	44	46
Italy	138	144	152	159	167
Poland	25	26	28	28	31
Spain	39	40	43	44	47
Sweden	77	80	85	88	93
Turkey	38	40	42	44	46
UK	107	111	118	122	129
Total	792	825	874	909	960

Thank you for your attention

Extra slides

AVERAGE COST OF 1 FULL ATC for 2026-2030

	No discount	With discount		
			scenario 2.	scenario 1.
	average cost over 10y no discount (7/8caps/y)	average cost over 10y MoU (7/8caps/y)	average cost over 2026-2030 with 11 caps/y → 135 capsules (Cryostat Mirion) (updated in 2025)	average cost over 2026-2030 with 8 caps/y → 120 capsules (Cryostat Mirion) (updated in 2025)
Item	Cost in k€	Cost in k€	Cost in k€	Cost in k€
Detector (×3)	678,5	547,3	505	596,4
Cryostat (×1)	127,5	118,9	195,0	200,0
Electronics (×3) + GTS/SMART + Upgrade Phase 0 & Phase 1	89,9	89,1	85,7	85,7
PSA & DAQ + Storage + Analysis	45,8	45,8	47,7	47,6
Infrastructure	28	28,0	24,6	20,7
Mechanics	13,1	13,1	13,9	18,2
Total	982,8	842,1	871,9	968,6

→ Unit ATC cost reduced in scenario 2 due to higher discount

2024 Capital Resources

Already planned purchases for first 5 years

-> Applying agreed Discounts

	Planned	2021	2022	2023	2024	2025	2021-2025	proposition from MoU - Proj Def contributions 2021-2025
		64/21	72/24	80/26	88/29	96/31		
DETECTORS	Bulgaria	0	0	0	0	0	0	1
	Finland	0	0	0	0	0	0	1
	France	0	4	2	2	0	8	8
	Germany	0	0	0	3		3	8
	Hungary	0	0	0	0	0	0	0
	Italy	0	2	2	2	0	6	8
	Poland	0	0	0	0	0	0	1
	Spain	0	0	1	0	0	1	1
	Sweden	0	0	0	0	0	0	3
	Turkey	0	0	0	0	0	0	1
	UK	3	0	2	1	0	6	6
	total number	3	6	7	8	0	24	38
	<i>Increase (1.5%/year)</i>	1,62%	2,50%	2,50%	2,50%	2,50%		
	<i>Full price / Unit</i>	209,9	215,1	220,5	226,0	231,7		
	effective total price	591,9	1097,2	1265,7	1428,5	0,0	4383,2	
	effective price / Unit	197,3	182,9	180,8	178,6	#DIV/0!	182,6	
CRYOSTATS	Bulgaria	0	0	0	0	0	0	
	Finland	0	0	0	0	0	0	
	France	1	0	1	0	1	3	2
	Germany	0	0	0	1	0	1	2
	Hungary	0	0	0	0	0	0	0
	Italy	2	0	0	0	2	4	2
	Poland	0	0	0	0	0	0	
	Spain	0	0	0	0	1	1	1
	Sweden	0	0	0	0	0	0	1
	Turkey	0	0	0	0	0	0	
	UK	1	0	0	0	0	1	2
	total number	3	0	1	1	4	10	10
	<i>Increase (1.5%/year)</i>	1,50%	1,50%	25,34%	0,00%	0,00%		
	<i>Full price / Unit</i>	118,5	120,3	148,50	148,5	148,50		
	effective total price	328,8	0,0	148,5	133,6	534,6	1145,5	
	effective price / Unit	109,6	#DIV/0!	148,5	133,6	133,6	114,6	

no capsule to be bought in 2025,
as too few were planned and discount would
have been very small
Capsules postponed in 2026.

Only 24 capsules bought over 2021-25
out of 38 from MoU – Project definition
14 capsules not yet accounted for

4 Cryostats in 2025:
very high global discount applied on 4
cryostats (Salamanca, IRFU, 2-INFN) : **133,6 k€**

10 from MoU – Project definition
All + 1 cryostats accounted for

Already planned purchases for full MoU

-> Applying agreed Discounts

	Planned	2021	2022	2023	2024	2025	2021-2025	proposition from MoU - Proj Def contributions 2021-2025	2026	2027	2028	2029	2030	2026-2030	Total 2021-2030	proposition MoU - Proj Def contributions 2021-2030	da MoU - Proj Def 2021-2030
		64/21	72/24	80/26	88/29	96/31			104/34	111/37	119/40	127/43	135/45				
DETECTORS	Bulgaria	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	
	Finland	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	
	France	0	4	2	2	0	8	8	3	0	2	2	1	8	16	16	
	Germany	0	0	0	3		3	8	0	0	0	0	0	0	3	16	
	Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
	Italy	0	2	2	2	0	6	8	2	2	2	1	1	8	14	16	
	Poland	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	
	Spain	0	0	1	0	0	1	1	1	0	0	0	0	1	2	3	
	Sweden	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4	
	Turkey	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	
	UK	3	0	2	1	0	6	6	0	0	0	0	0	0	6	12	
	total number	3	6	7	8	0	24	38	6	2	4	3	2	17	41	77	78
	<i>Increase (1.5%/year)</i>	1,62%	2,50%	2,50%	2,50%	2,50%			2,50%	2,50%	2,50%	2,50%	2,50%				
	<i>Full price / Unit</i>	209,9	215,1	220,5	226,0	231,7			237,5	243,4	249,5	255,7	262,1				
	<i>effective total price</i>	591,9	1097,2	1265,7	1428,5	0,0	4383,2		1211,1	472,2	908,1	721,1	508,5	3821	8204,3		
	<i>effective price / Unit</i>	197,3	182,9	180,8	178,6	#DIV/0!	182,6		201,8	236,1	227,0	240,4	254,3	1160			
CRYOSTATS	Bulgaria	0	0	0	0	0	0		0	0	0	0	0	0	0		
	Finland	0	0	0	0	0	0		0	0	0	0	0	0	0		
	France	1	0	1	0	1	3	2	0	1	0	0	0	1	4	5	
	Germany	0	0	0	1	0	1	2	0	0	0	0	0	0	1	5	
	Hungary	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Italy	2	0	0	0	2	4	2	0	0	0	1	0	1	5	5	
	Poland	0	0	0	0	0	0		0	0	0	0	0	0	0		
	Spain	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1	
	Sweden	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
	Turkey	0	0	0	0	0	0		0	0	0	0	0	0	0		
	UK	1	0	0	0	0	1	2	0	0	0	0	0	0	1	4	
	total number	3	0	1	1	4	10	10	0	1	0	1	0	2	12	21	26
	<i>Increase (1.5%/year)</i>	1,50%	1,50%	25,34%	0,00%	0,00%			2,50%	2,50%	2,50%	2,50%	2,50%				
	<i>Full price / Unit</i>	118,5	120,3	148,50	148,5	148,50			152,2	156,0	159,9	163,9	168,0				
	<i>effective total price</i>	328,8	0,0	148,5	133,6	534,6	1145,5		0,0	156,0	0,0	163,9	0,0	320	1465,4		
	<i>effective price / Unit</i>	109,6	#DIV/0!	148,5	133,6	133,6	114,6		#DIV/0!	156,0	#DIV/0!	163,9	#DIV/0!	160			

Capital Resources up to 2024

		Bulgaria	Finland	France	Germany	Hungary	Italy	Poland	Romania	Spain	Sweden	Turkey	UK	Total
Phase 2 (5y)	Detectors	0,0	0,0	1708,1	673,0	0,0	1304,5	0,0	0,0	182,9	0,0	0,0	1115,1	4983,5
	FEE	0,0	0,0	179,6	52,1	0,0	432,2	0,0	0,0	230,8	0,0	0,0	248,4	1143,1
	DAQ	0,0	0,0	220,0	51,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	271,0
	Infra	0,0	0,0	23,4	0,0	0,0	147,7	0,0	0,0	0,0	0,0	0,0	265,4	436,5
	Ancillary	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	Data ana	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	Other	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Phase 2 - 5y	Total	0,0	0,0	2131,1	776,1	0,0	1884,4	0,0	0,0	413,6	0,0	0,0	1628,9	6834,1

→ **6.83 M€** already spent vs 10.9 M€ for 2021-2025 from MoU

- 5 M€ on capsules and cryostats
- 1,1 M€ on electronics
- 0,3 M€ on DAQ
- 0,4 M€ on Infrastructure

Capital Resources up to 2024

including first plans for 2025

		Bulgaria	Finland	France	Germany	Hungary	Italy	Poland	Romania	Spain	Sweden	Turkey	UK	Total
Phase 2	2020			0,0			79,8			0,0			721,0	800,8
	2021			163,5			503,2			66,1			237,6	970,4
	2022			739,3			378,3			38,3			68,1	1224,1
	2023			690,2	51,0		473,0			219,3			507,2	1940,7
	2024			538,0	725,1		450,0			89,9			95,0	1898,1
	2025			282,0			418,0			190,0			0,0	890,0
	Total Phase 2_1st 5y	0,0	0,0	2413,1	776,1	0,0	2302,4	0,0	0,0	603,6	0,0	0,0	1628,9	7724,1
MoU Phase 2 - 1st 5y		278	278	2249	2249		2249	278		561	842	278	1684	10946,0

→ **6.83 M€** already spent

+ **0.89 M€** presently planned for 2025

→ for a total of **7.72 M€** vs 10.9 M€ for 2021-2025 from MoU

Special detector development effort by UK

- Since very long the AGATA collaboration is trying to re-open the market of AGATA HPGe segmented capsules. Presently MIRION is the only provider (unit price around 200k€).
- The UK (University of Liverpool) spent 57k€ on a first development by ORTEC that the UK would like to count towards the capital funding of AGATA.
- The ASC thanks the UK for this endeavour and agreed that this funding can be credited to the UK if a complete detector, with new crystal, is delivered. This requires additional funding from someone in the collaboration.

Capital Resources up to 2024

Funds already allocated and Purchase already made/on-going MoU Phase 2: first 5 years: 2021-2025

- **Finland (MoU Phase 2-5y: 278 k€)** very difficult to get funds in 2023 and 2024
- **France (MoU Phase 2-5y: 2249 k€)** spent 2131,1 k€ up to 2024

2021: 163,5 k€	15,5 k€ (IRFU: for LVPS electrotechnics)
	148 k€ (IN2P3: for 1 ATC 110 k€ + STARE boards 38 k€)
2022: 739,3 k€	731,4 k€ (GANIL: 2 capsules, IN2P3: 2 capsules)
	7,9 k€ (IRFU: Components Autofill)
2023: 690,3 k€	509,6 k€ (GANIL: 1 capsule 180,8 k€+ 1 cryostat 148k€, CEA: 1 capsule 180,8 k€)
	100,6 k€ (GANIL: electronics for SMART hub 85,6 k€, IJCLab: STARE components 15 k€)
	80 k€ (IJCLab: DAQ 80)
2024: 497,0 k€	538 k€ (GANIL: 2 capsules 357 k€, IN2P3: DAQ 140 k€ + 41 k€ FEE GANIL)
2025: 332 k€	(IRFU: 1 cryostats 134 k€ + GANIL: FEE 134 k€ + DAQ/STARE 64 k€ IJCLab)
- **Germany (MoU Phase 2-5y: 2249 k€)** GSI: 1 full ATC in 2023-2025 – spent 776,1 k€ up to 2024
BMBF: grant not accepted

2023: 51 k€	51 k€ (GSI: DAQ)
2024: 725,1 k€	725,1 k€ (GSI: 3 capsules: 535,8 k€, 1 cryostat 137,3 k€, electronics: 25 DIGIOPT12 boards 52 k€)
2025: 104 k€	(GSI: electronics)
- **Italy (MoU Phase 2-5y: 2249 k€):** spent 1884,4 k€ up to 2024

2020: 79,8 k€	79,8 k€ - Phase 2 (35,6k€ for cables for 2pi +28,8k€ for digiopt12+ 15,3k€ for TRENZ boards)
2021: 503,5 k€	503,4 k€ (HV 22,25 k€ + Autofill 72 k€ + 2 ATCs 220 k€ + DIGIOPT12 189 k€)
2022: 378,3 k€	378,3 k€ (2 capsules 365,7 k€ + 250ADCs 12,6 k€)
2023: 473 k€	472,9 k€ (2 capsules 361,6 k€ + 1000ADCs 31.35 k€ + 10 full DIGIOPT12 80k€)
2024: 451 k€	450,6 k€ (2 capsules 357,2 k€ + Cooler 18k€ + TRENZ 68k€ + component DIGIOPT12 7,4k€)
2025: 419 k€	(2 cryostats + electronics)

Capital Resources up to 2024

Funds already allocated and Purchase already made/on-going MoU Phase 2: first 5 years: 2021-25

- **UK (MoU Phase 2-5y: 1684 k€): spent 1628,9 up to 2024**
 - 2020: 721 k€ 721 k€ - **Phase 2** (104 k€ mechanics DL + 617k€ for 3 capsules UWS)
 - 2021: 237,6 k€ 112 k€ (Cryostat York)
 - 79,4 k€ (28,8 k€ 16 digiopt12 core UWS + 50,6 k€ electronics York)
 - 46,2 k€ (DL: mechanics)
 - 2022: 68,1 k€ 31,2 k€ (12,9 k€ 35 STARE boards York + 18,3 k€ electronics UWS)
 - 36,9 k€ (UWS: 1 LVPS group of 8 channels)
 - 2023: 507,2 k€ 385,8 k€ (Liverpool: 2 capsules + complement for the 3° capsule)
 - 121,1 k€ (electronics 59,5 k€ UWS + 61,5 k€ York)
 - 2024: 95,0 k€ 95,0 k€ (electronics 16,7 k€ York + 77,3 k€ HV system York)
 - comment: Moreover, UK has invested 57k€ in a new detector being manufactured by ORTEC
- **Spain (MoU Phase 2-5y: 561 k€): spent 413,7 up to 2024**
 - 2021: 66,1 k€ (electronics components/cabling /mechanics)
 - 2022: 38,3 k€ (electronics components/cabling /mechanics)
 - 2023: 219,3 k€ (electronics)
 - 2024: 89,9 k€ (electronics)
 - 2025-2026: about 330 k€ (1 capsule + 1 cryostat)
- **Sweden (MoU Phase 2-5y: 842 k€)** application as soon as possible
- **Poland (MoU Phase 2-5y: 278 k€)** application as soon as possible
- **Bulgaria (MoU Phase 2-5y: 278 k€)** No news
- **Turkey (MoU Phase 2-5y: 278 k€)** No news
- **Hungary (MoU Phase 2-5y: 0 k€)** No news

2024 Operation Costs

Operational costs 2024

Country	OC funds MoU share (k€)	Funds allocated (k€)
Bulgaria	23	
Finland	27	27
France	130	65
		42,9
		22,1
Germany	130	77,7
Hungary	36	36
Italy	130	130
Poland	23	
Spain	36	36
Sweden	46	39
Turkey	36	
UK	100	100
TOTAL	717	575,7

- Finland: as expected
- France: as expected
- Germany: Universities (IKP) 51,7 k€ as expected
GSI: 26 k€ as expected
(new in AGATA for 20% of German contrib.)
- Hungary: as expected
- Italy: as expected
(out of which 5 k€ were anticipated in 2023)
- Poland: **no funds available**
- Spain: 2024-26 OC (36 k€ + 38 k€ + 43 k€) approved
- Sweden: KTH and Lund contribution (Uppsala stopped contributing after J. Nyberg retirement)
+163 k€ residue 2023 as Common account residue
- UK: OC for 2024-2026 (100 k€ + 105 k€ + 121 k€) approved
- Turkey: **no funds available**
- Bulgaria: **no funds available**

Total contributions 2024 **(80,3%) 575,7 k€**

Operational costs 2024 Spent

Fixed expenses:

- LN2 (array + Detector lab LNL): 118 k€
- Detector labs: 31,4 k€
- GRID: CNAF 0 k€

Priority:

- Cryostat/Preampl. Spare Parts: 107,0 k€
*test cryostat (IRFU, IKP),
5 "2-pieces endcap", spare dewar*
- Capsule repairs: 60,5 k€
8 annealings

Maintenance/Replacement:

- Electronics replacement 154,3 k€
- Data Analysis replacement: 17,7 k€
- HV boards repair 2,2 k€

Shipping:

- Transport 2,6 k€
- Exchange rate costs 14,7 k€

Exceptionally, IKP had 61,5 k€
to prolongate detector WG leader
after June 2024 on OC funds

Item	current expenses	Common account expenses
Detector & Infrastructure		
LN2	118,0	
Capsule maintenance/repair	16,7	43,9
Cryostat maintenance/repair		107,0
HV/LV system, infrastructure	0,0	2,2
Detector laboratory (consumables etc.)	28,5	2,9
Electronics & DAQ		
Electronics maintenance/repair	2,3	152,0
DAQ maintenance/repair		
Other costs		
Grid costs + Data Analysis	0,0	17,7
Shipping costs	2,6	0,0
Mechanics etc.		
Exchange rate costs		14,7
Total operation & maintenance costs (excl. personnel)	168,1	340,4
		508,6

Total expenses 508,6 k€

Prolongation of WG leader 61,5 k€

Total Use of OC 570,1 k€