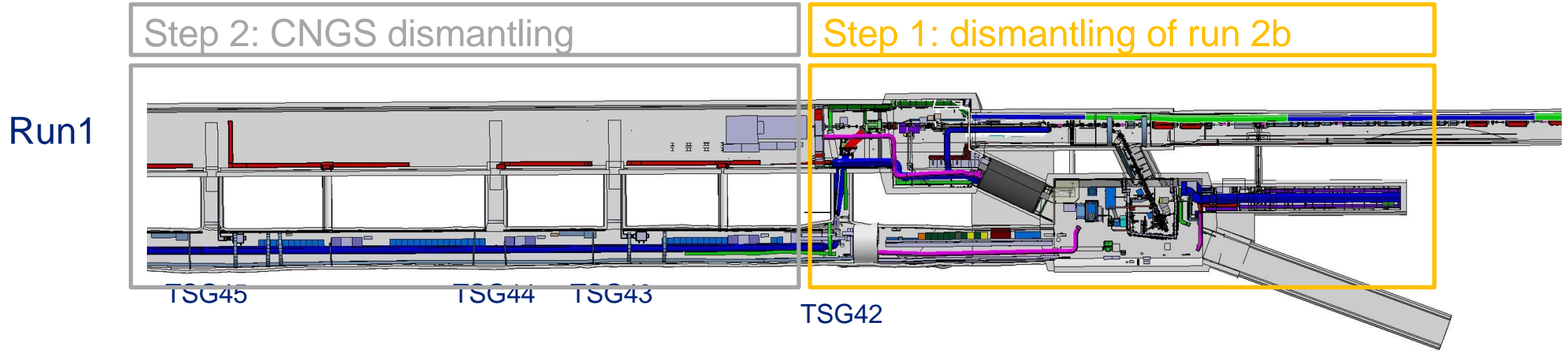


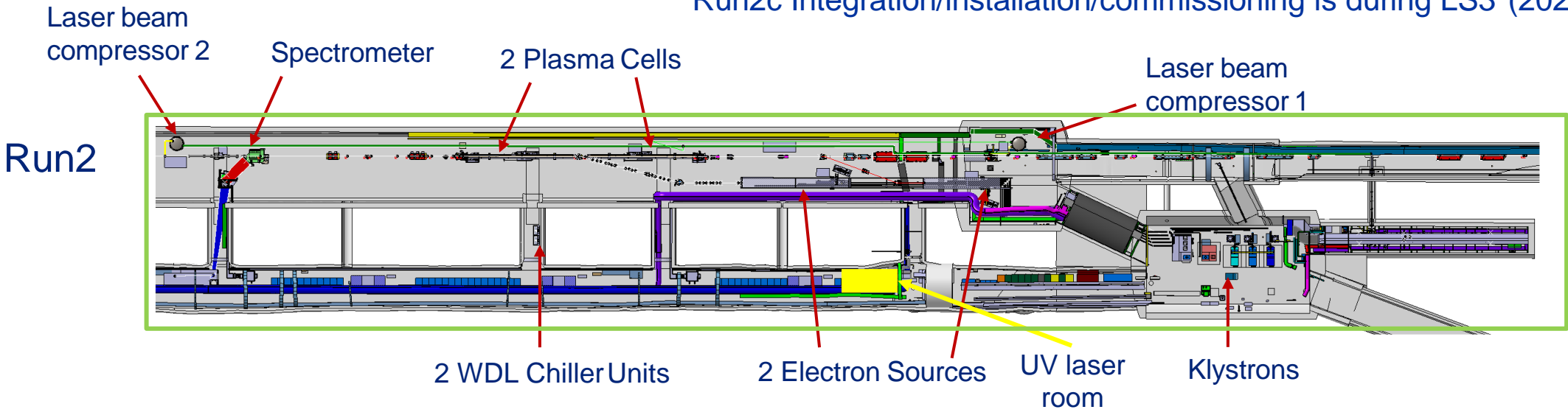
From AWAKE 2b to AWAKE 2c

De-cabling AWAKE 2b and installation (EN-EL) of AWAKE 2c

Discussion with EN-EL, 14/3/2024



AWAKE CNGS Area Dismantling is before & during LS3 (2025-2026)
 Run2c Integration/installation/commissioning is during LS3 (2026-2028)



Step 3:
 Run2c
 installation

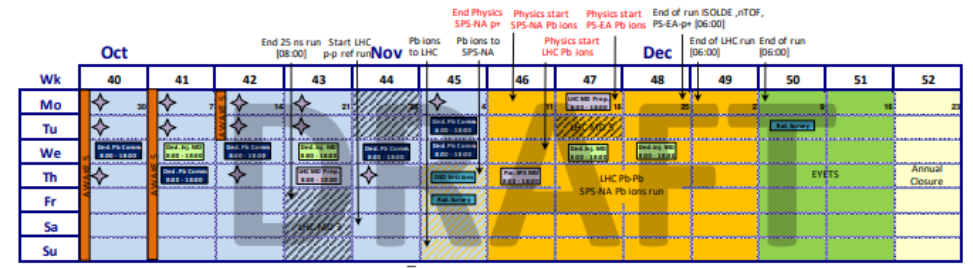
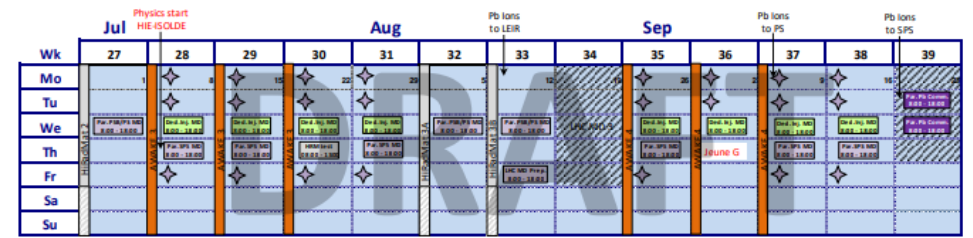
Timeline

	2021				2022				2023				2024				2025				2026				2027				2028							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Injector schedule (SPS)	LS2			YETS				YETS				YETS				EYETS							LS3													
Run 2a - Operation																																				
Run 2b - Installation new plasma source																																				
Run 2b - Operation																																				
CNGS & AWAKE dismantling																																				
Run 2c - Installation services, cables, equipment																																				
Run 2c - Hardware commissioning																																				
Run 2c - Commissioning with beam & operation																																				

	2024					2025					
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
Operation Run 2b											
Run 2b dismantling											
Disconnection/decommissioning of all equipment				4 months							
Transport of equipment				2 months							
Decabling of Awake											
Identification of cables with purple tape				4 months							
decabling campaign								2 months			
CNGS dismantling											15 months

DRAFT

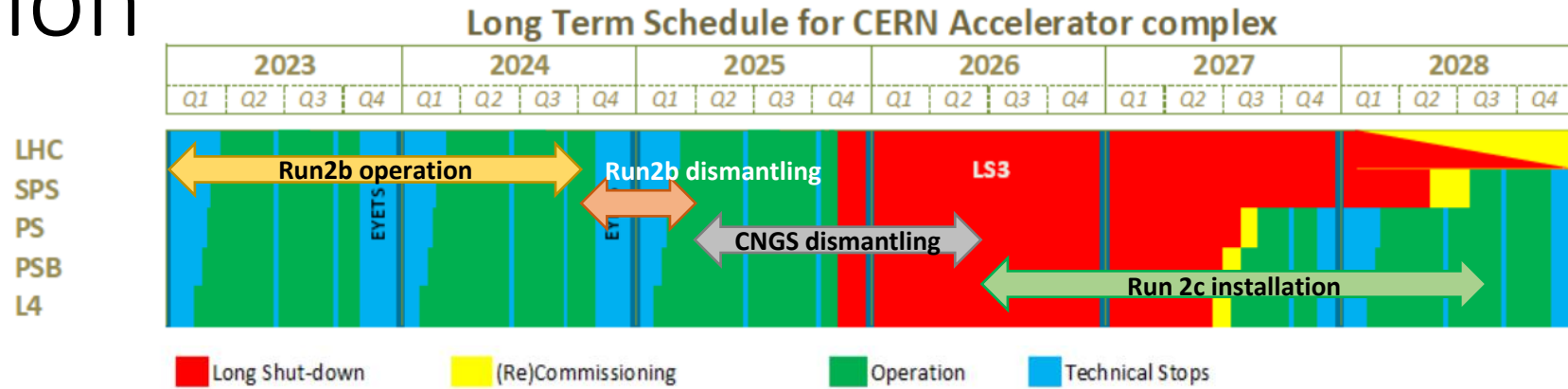
- End of Awake operations: **October 2024**
- Run 2b dismantling: 2 months of decommissioning + 3 months of transport
- Decabling: ~2 months of works



If the 2 additional weeks of beam approved → ~1 month shift

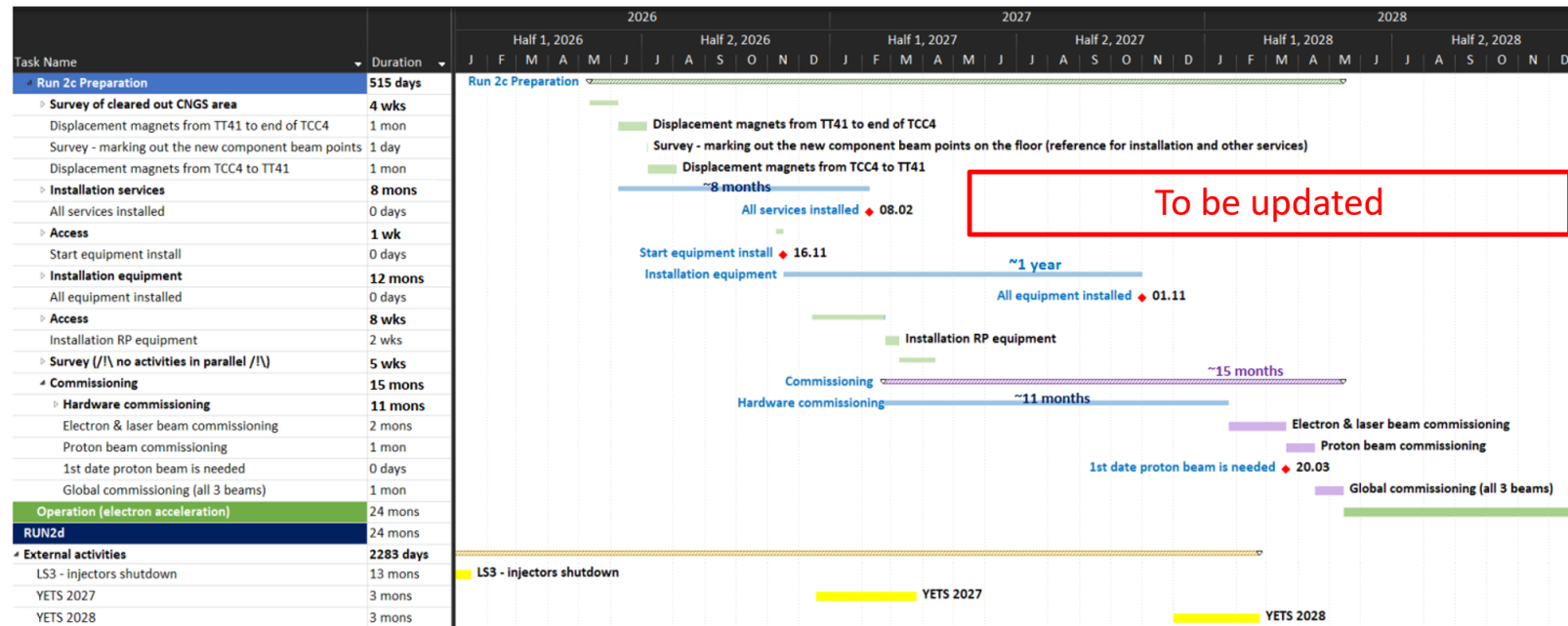
Run 2c installation

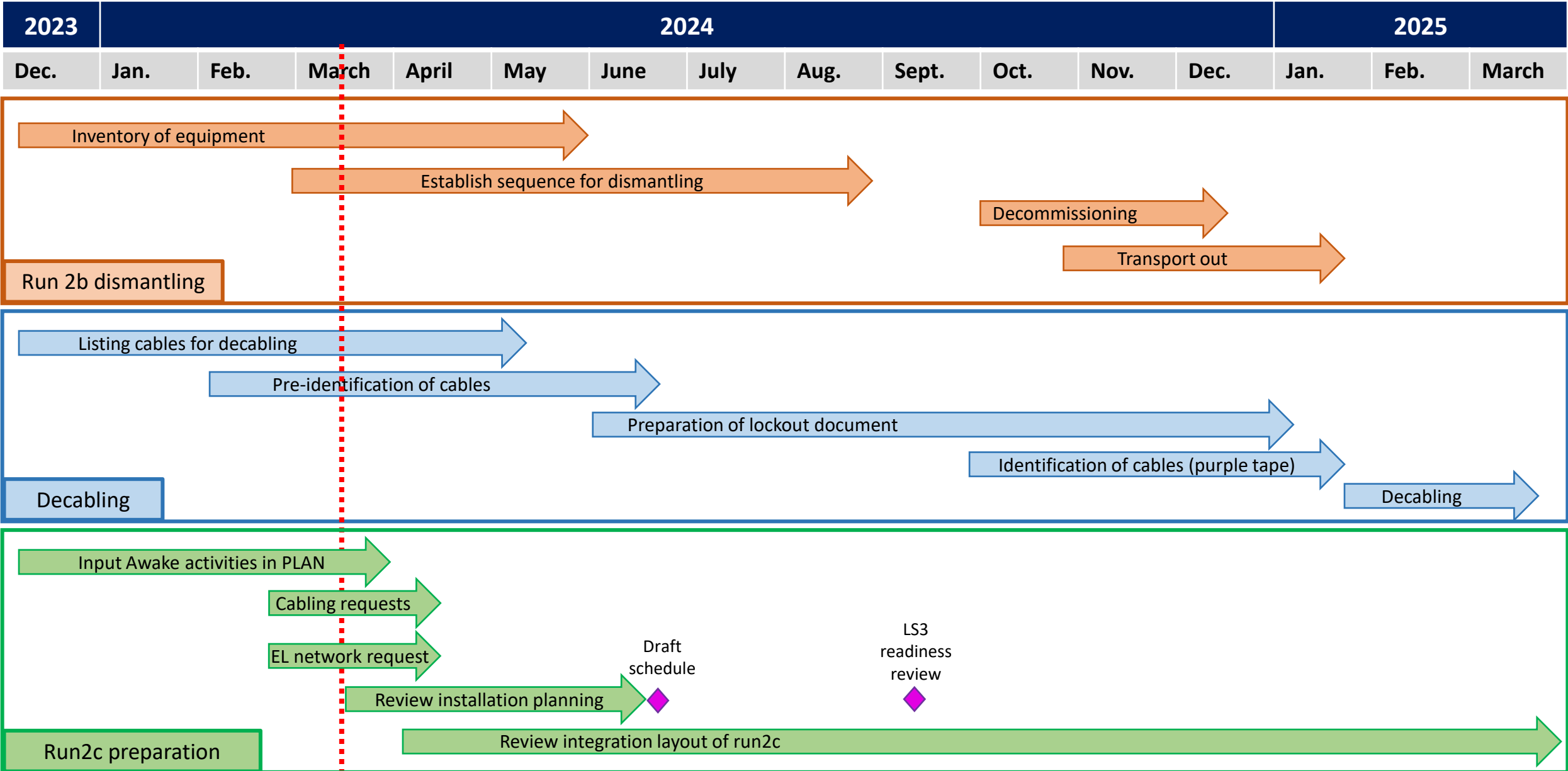
- Installing run 2c during LS3 brings some constraints:
 - Availability of resources
 - Respect deadlines linked to LS3 even though the project is not yet approved
- For AWAKE, next milestones:
 - PLAN** activities by **31.03.2024**
 - Cabling** request by **15.04.2024**
 - Electrical network** request by **15.04.2024**
 - Review of run2c schedule** for June 2024



AWAKE run 2c installation schedule

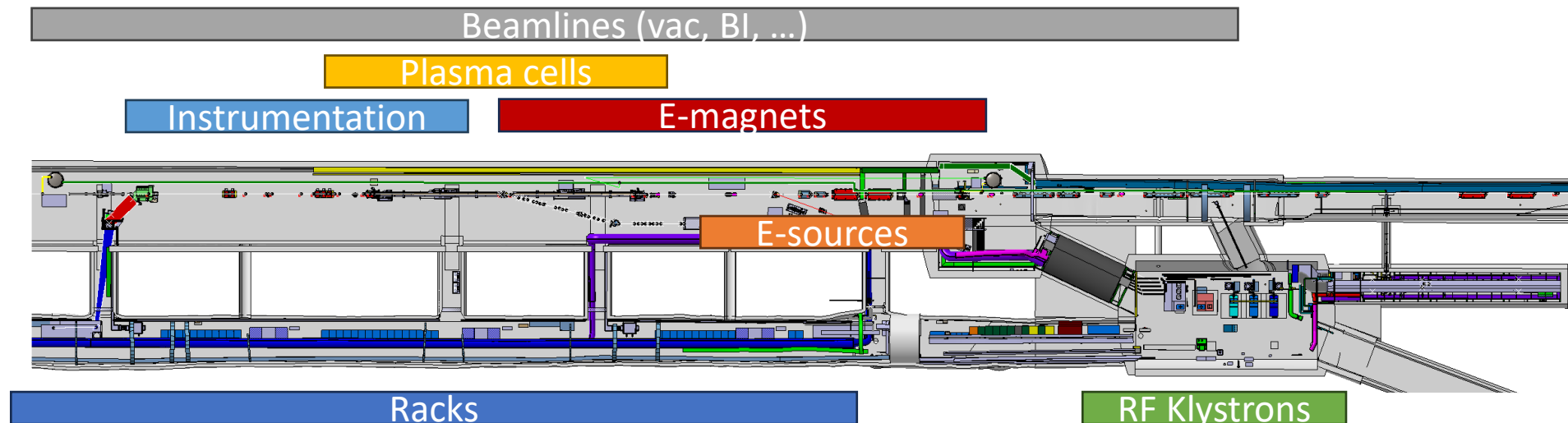
As presented in the CSR of 2021





What we know: cabling

- Cable routing study to be done.
 - The area will be de-cabled
 - New cables can use all 6 TSG4x galleries between TSG4 and TCC4
 - TT43 will be empty (formerly e-beam) and can also be used for cable trays



What we know: cabling & de-cabling

- Estimate of cable amount exists – extrapolated from Run1/Run2ab
- Cost and resource estimate from 2021 C&S Review on EDMS 3056166
- Reasoning behind cabling & rack estimates (extrapolation) on EDMS 3062059.

Assumptions

Baseline assumptions considered by Project (not verified by EN-EL-CS)

Signal Cabling RUN 1 = 791 kCHF, and for Run 2 extrapolated to 920 kCHF (DC Cabling not included)

Racks Run 1 = 55 kCHF, and extrapolated for RUN 2= 34 kCHF

assume 50% material, 50% contractor



Notes and additional assumptions by EN-EL-CS:

- EL Cabling includes 34 kCHF for racks (estimated by the project). Estimations based on project assumptions, in particular the support quota for studies and supervision.
- EL Cabling costs don't take into account a possible displacement of Awake control room to surface buildings. It doesn't take into account neither installation of new cable trays.
- Cost collums between "E" and "K" includes the support quota for studies and supervision conducted by PJAS/Fellow/FSU. This specific cost is presented in collum V.
- The FTE presented between collums M and S, are the minimum CERN staff required for this activity. Its availability is conditioned by CERN projects priorities and can't be taken as a commitment.
- As a preliminary approach, the de-cabling materials cost are considered half of RUN1 cabling costs = 791kCHF/2;

WP	Name	GROU P	cost											cost TOTAL [kCHF] (incl. grad)	workfor											workfor ce TOTAL [kCHF] 2024- 2032	
			2022 [kCHF]	2023 [kCHF]	2024 [kCHF]	2025 [kCHF]	2026 [kCHF]	2027 [kCHF]	2028 [kCHF]	2029 [kCHF]	2030 [kCHF]	2031 [kCHF]	2032 [kCHF]		ce 2022 [FTE.yr]	ce 2023 [FTE.yr]	ce 2024 [FTE.yr]	ce 2025 [FTE.yr]	ce 2026 [FTE.yr]	ce 2027 [FTE.yr]	ce 2028 [FTE.yr]	ce 2029 [FTE.yr]	ce 2030 [FTE.yr]	ce 2031 [FTE.yr]	ce 2032 [FTE.yr]		
WP24.1	EL - Electrical System	EN-EL	0	0	70	199	378	194	0	0	0	0	0	841	0.00	0.00	0.25	0.50	0.50	2.00	0.00	0.00	0.00	0.00	0.00	3.25	100
WP24.2	EL - Cabling AC & DC	EN-EL	0	0	0	322	904	211	0	0	0	0	0	1437	0.00	0.00	0.00	0.09	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.36	265
WP24.3	EL - Decabling	EN-EL	0	0	40	448	10	0	0	0	0	0	0	498	0.00	0.00	0.04	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	102

What we know: electrical infrastructure

- Document M. Lonjon March 2021

2471171 v.2 | ELG-GENNET-EE-0116 v.2 ● Released  CERN Internal
 Estimation de l'Upgrade Run2 de l'expérience AWAKE *by MICKAEL BERTRAND LONJON* 

WP	Name	GROU P	cost											cost TOTAL [kCHF] (incl. grad)	workfor											workfor ce TOTAL [FTE.yr]	cost grads TOTAL [kCHF] 2024- 2032	
			2022 [kCHF]	2023 [kCHF]	2024 [kCHF]	2025 [kCHF]	2026 [kCHF]	2027 [kCHF]	2028 [kCHF]	2029 [kCHF]	2030 [kCHF]	2031 [kCHF]	2032 [kCHF]		ce 2022 [FTE.yr]	ce 2023 [FTE.yr]	ce 2024 [FTE.yr]	ce 2025 [FTE.yr]	ce 2026 [FTE.yr]	ce 2027 [FTE.yr]	ce 2028 [FTE.yr]	ce 2029 [FTE.yr]	ce 2030 [FTE.yr]	ce 2031 [FTE.yr]	ce 2032 [FTE.yr]			
WP24.1	EL - Electrical System	EN-EL	0	0	70	199	378	194	0	0	0	0	0	841	0.00	0.00	0.25	0.50	0.50	2.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	100
WP24.2	EL - Cabling AC & DC	EN-EL	0	0	0	322	904	211	0	0	0	0	0	1437	0.00	0.00	0.00	0.09	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.36	265
WP24.3	EL - Decabling	EN-EL	0	0	40	448	10	0	0	0	0	0	0	498	0.00	0.00	0.04	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	102

What we know: electrical infrastructure

- Document M. Lonjon March 2021 EDMS 2471171

5. Budget

Zone/équipement concerné:	Coût:
Adaptation et consolidation du TSG4	341000 Euros
Salle et équipement LASER	25000 Euros
Equipement RF	20000 Euros
Cellule PLASMA	17000 Euros
Zone TCC4	95000 Euros
Participation aux frais d'étude *	90000 Euros
Imprévus	75000 Euros (15%)
TOTAL :	663000 Euros

* Nous prévoyons d'utiliser une ressource type Fellow pour la préparation de l'étude de ce projet. Cette ressource sera utilisée à 0.3 FTE par an sur les 3 ans du chantier.

2471171 v.2 | ELG-GENNET-EE-0116 v.2

Released

CERN Internal

Estimation de l'Upgrade Run2 de l'expérience AWAKE

by MICKAEL BERTRAND LONJON

Total Cost & Workforce	Cost [kCHF]			Total Cost [kCHF]	Total workforce [FTE.yr]
	Material	Contractor	VIA/Fell/PJAS		
Item 1	530			530	
Item 2		245		211	
Item 3					3.25
Item 4			100	100	
Total	530	211	100	841	3.25

WP	Name	GROU P	cost											cost TOTAL [kCHF] (incl. grad)	workfor											workfor ce TOTAL [FTE.yr]	cost grads TOTAL [kCHF] 2024-2032	
			2022 [kCHF]	2023 [kCHF]	2024 [kCHF]	2025 [kCHF]	2026 [kCHF]	2027 [kCHF]	2028 [kCHF]	2029 [kCHF]	2030 [kCHF]	2031 [kCHF]	2032 [kCHF]		ce 2022 [FTE.yr]	ce 2023 [FTE.yr]	ce 2024 [FTE.yr]	ce 2025 [FTE.yr]	ce 2026 [FTE.yr]	ce 2027 [FTE.yr]	ce 2028 [FTE.yr]	ce 2029 [FTE.yr]	ce 2030 [FTE.yr]	ce 2031 [FTE.yr]	ce 2032 [FTE.yr]			
WP24.1	EL - Electrical System	EN-EL	0	0	70	199	378	194	0	0	0	0	0	841	0.00	0.00	0.25	0.50	0.50	2.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	100
WP24.2	EL - Cabling AC & DC	EN-EL	0	0	0	322	904	211	0	0	0	0	0	1437	0.00	0.00	0.00	0.09	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.36	265
WP24.3	EL - Decabling	EN-EL	0	0	40	448	10	0	0	0	0	0	0	498	0.00	0.00	0.04	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	102

Extra: Surface building CNGS dismantling

- SCE contact: David Gomez
- Services contacts:

Optical Fibre: Jeremy Blanc	Electrical Infrastructure: Mickael Lonjon	Doors: Jordi Bossy, Juha Sakkinen
Wifi and Ethernet: Marc-Antoine Denis	HVAC and Water: Alejandro Mejica	Shielding Blocks provision & storage: Michael Lazzaroni
Access System: Gregory Smith	Safety Equipment: Pierre Durand	Overhead crane: Roberto Rinaldesi

- Installation services ~March-May 2025, will need cables.
- Proposal: dedicated meeting with service contacts and EN-EL cabling
- (needed before 15/4 or not?)