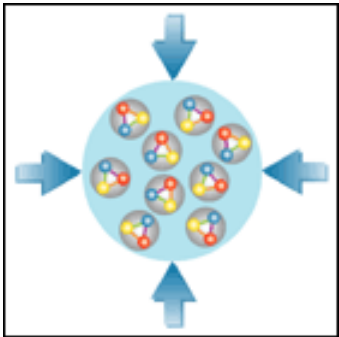
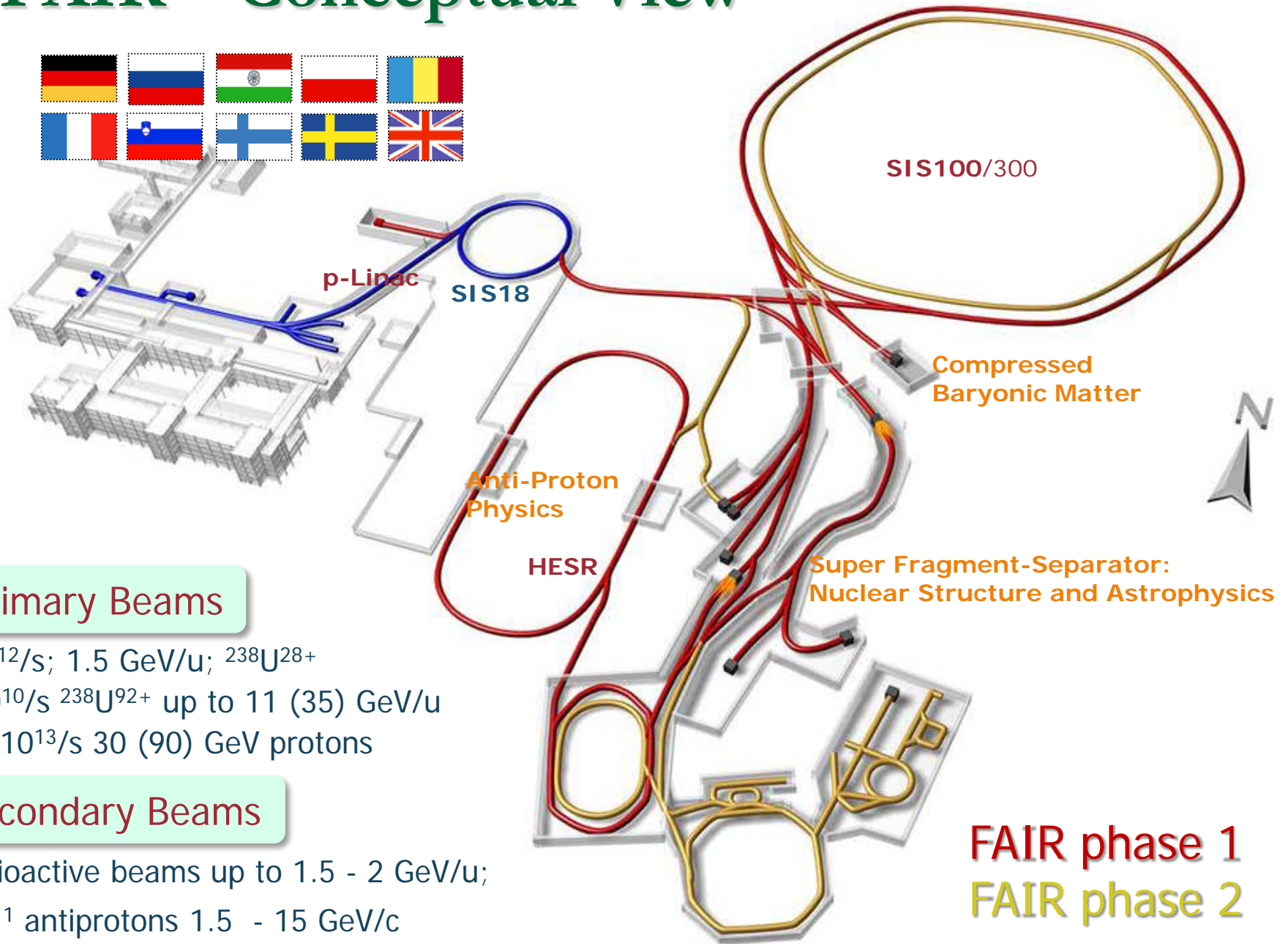

CBM Timeline



Walter F.J. Müller, FAIR, Darmstadt

CBM-STAR joint Workshop
18 March 2017

FAIR – Conceptual View



Primary Beams

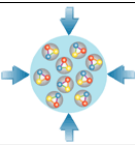
- $10^{12}/s$; 1.5 GeV/u; $^{238}\text{U}^{28+}$
- $10^{10}/s$ $^{238}\text{U}^{92+}$ up to 11 (35) GeV/u
- $3 \times 10^{13}/s$ 30 (90) GeV protons

Secondary Beams

- radioactive beams up to 1.5 - 2 GeV/u;
- 10^{11} antiprotons 1.5 - 15 GeV/c

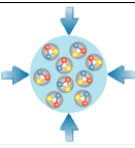
FAIR phase 1
FAIR phase 2

GSI/FAIR Project Re-Organization



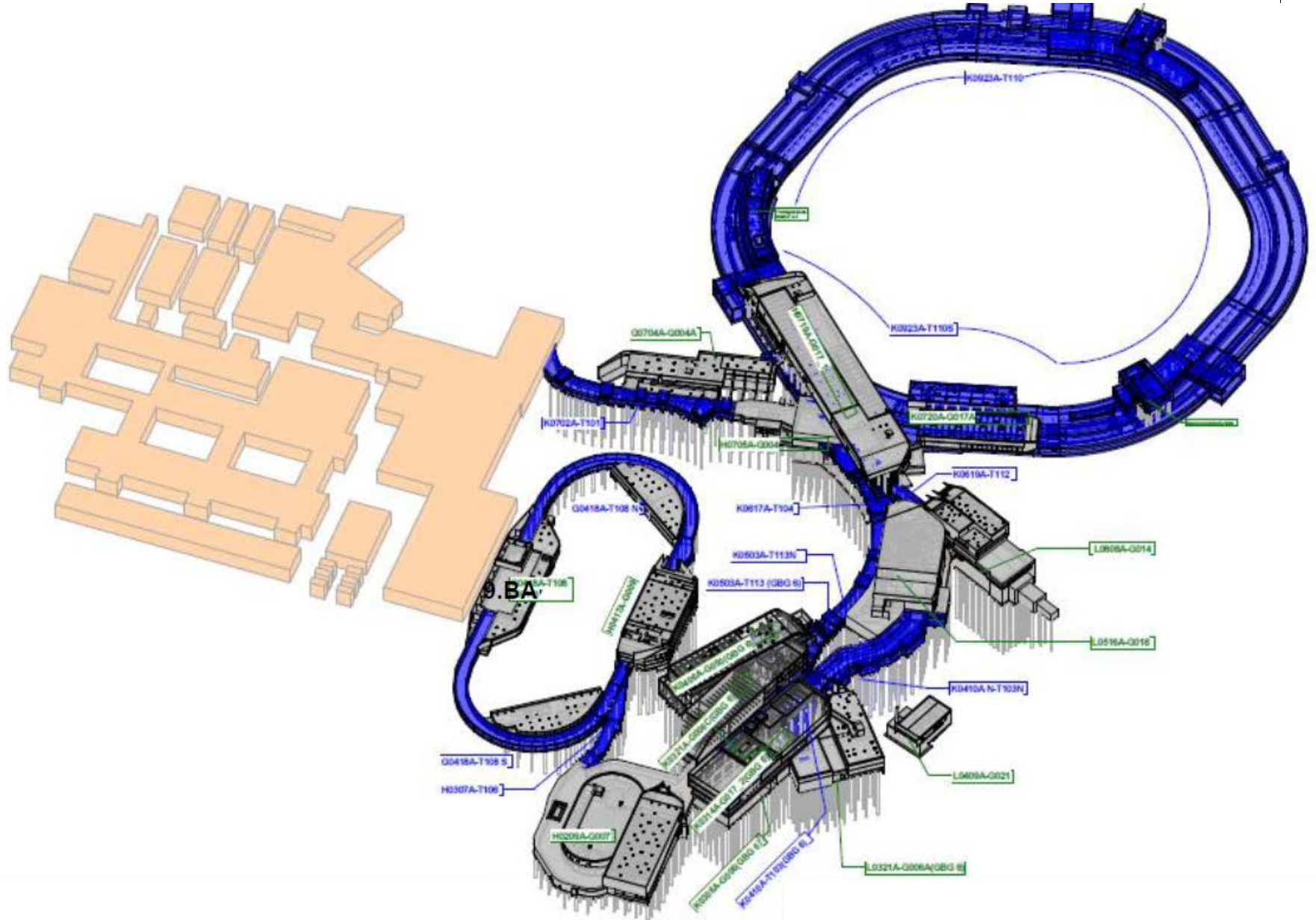
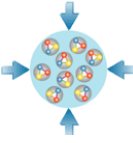
- *GSI and FAIR were two separate organizations*
- *starting 2014 joint managing directors were appointed*
 - Nov 2014: Ursula Weyrich (Administrative)
 - Feb 2016: Jörg Blaurock (Technical)
 - Jan 2017: Paolo Guibellino (Scientific)
- *in 2016 GSI/FAIR were re-organized*
- *GSI/FAIR is today one single organization.*
- *They are still two separate legal entities, but this is mostly relevant for lawyers and accountants, but otherwise not relevant anymore.*
- *The legal merger will come.*

GSI/FAIR Project Re-Organization

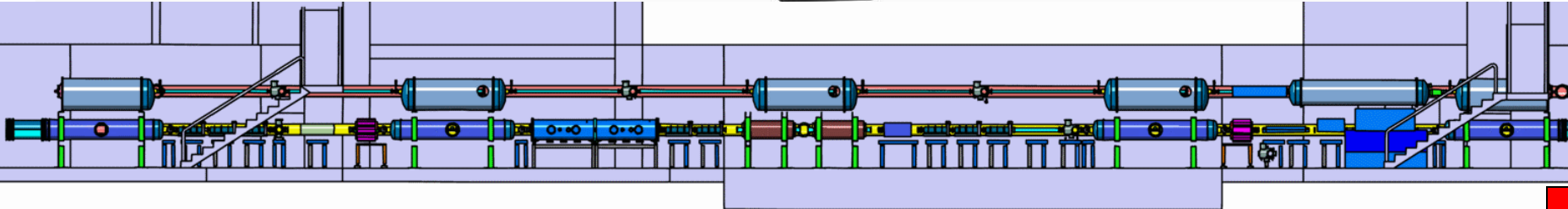
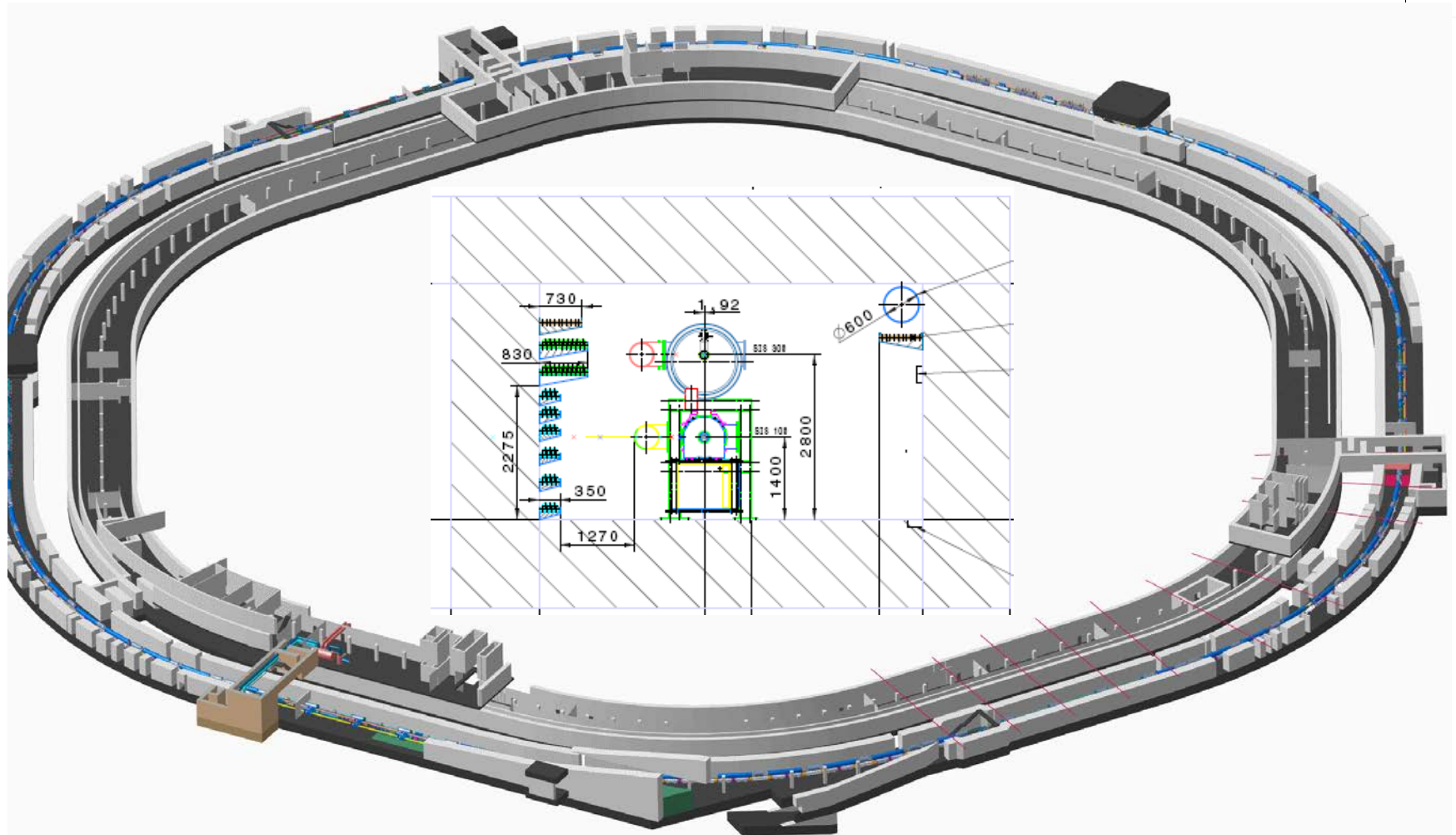
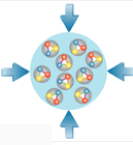


- The new joint GSI/FAIR organization, for a first time, provides *proper communication paths* between
 - civil construction
 - accelerator
 - experiments
- Some initial phases of civil construction were done
 - construction area cleared
 - foundation pillars buildbut stalled afterwards
- *Civil construction is now back on track*
 - new construction manager: Uwe Kreische
 - persons involved in CC are *concentrated* in one 'task force'

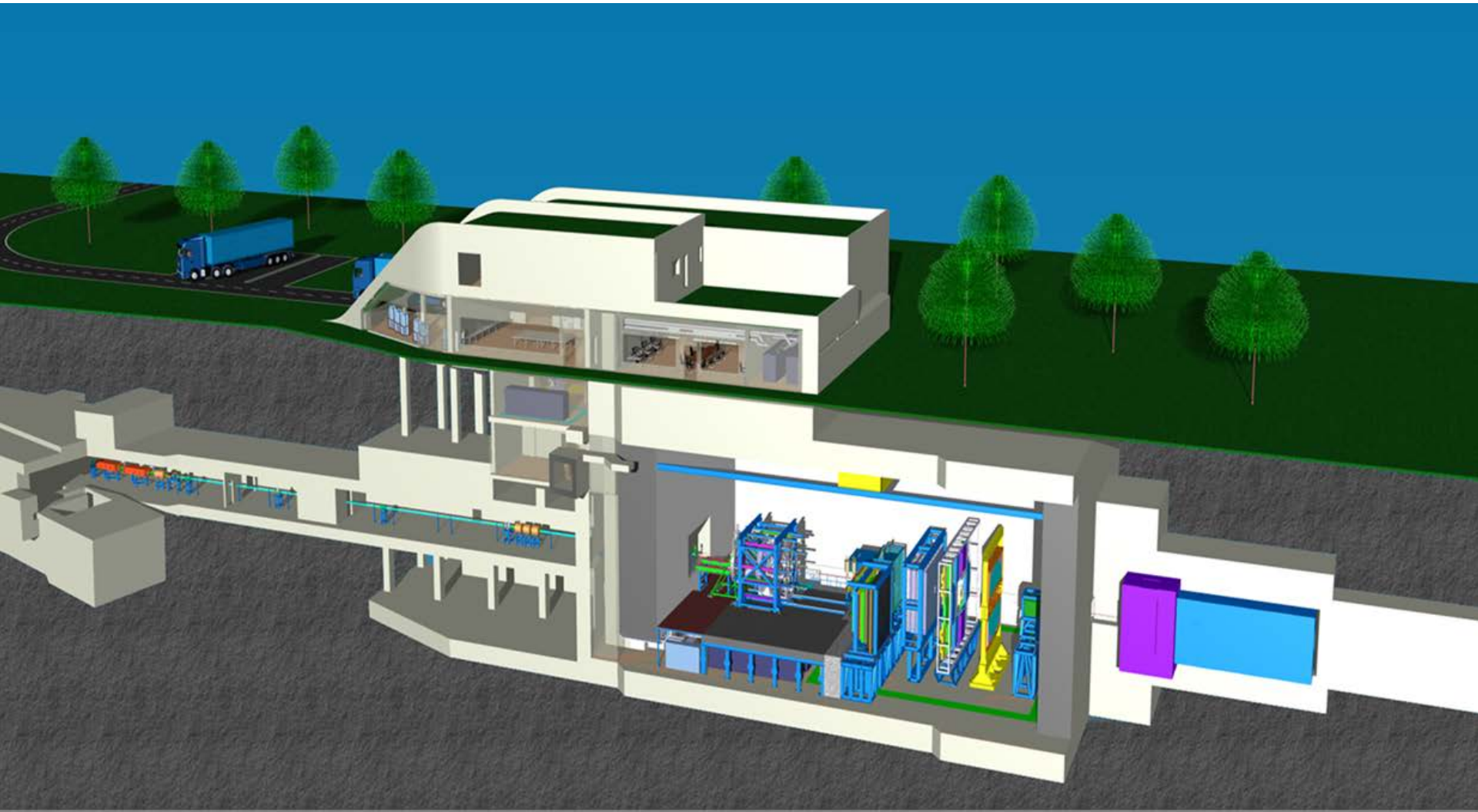
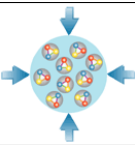
FAIR – Many Engineer Years Later



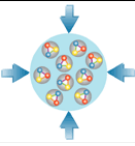
Tunnel for SIS100 and (later) SIS300(+)



G014 – Home for CBM and HADES



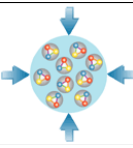
Status Civil Construction



- New tendering *concept* was accepted by BMBF
- a *funding* pre-release of *203 M€* for CC approved by BMBF on September 13th 2016
- 1st CC lot *went for tender* on September 26th 2016
(*water management and excavation*)
- 2nd CC lot *went for tender* in November 22nd 2016
(*shell construction 'north area', includes SIS100 and CBM*)
- start of excavation: mid-2017
- start of shell construction: late 2017 / early 2018

The ball is rolling !! No project slippage anymore !!

CBM Technical Design Report Status



#	Project	TDR Status
1	Magnet	approved
2	STS	approved
3	RICH	approved
4	TOF	approved
5	MuCh	approved
6	HADES ECAL	approved
7	PSD	approved
8	MVD	submission 2017
9	DAQ/FLES	submission 2017
10	TRD	submission 2017
11	ECAL	submission 2017

Technical Design Report for the CBM

Compressed Baryonic Matter Experiment

Superconducting Dipole Magnet

The CBM Collaboration

November 2012

Technical Design Report for the CBM

Compressed Baryonic Matter Experiment

Silicon Tracking System (STS)

The CBM Collaboration

GSI Report 2013-4
October 2013

Technical Design Report for the CBM

Compressed Baryonic Matter Experiment

Ring Imaging Cherenkov (RICH) Detector

The CBM Collaboration

April 2013

Technical Design Report for the CBM

Compressed Baryonic Matter Experiment

Projectile Spectator Detector (PSD)

The CBM Collaboration

March 2013

Technical Design Report for the CBM

Compressed Baryonic Matter Experiment

Time - of - Flight System (TOF)

The CBM Collaboration

March 2013

Technical Design Report for the CBM

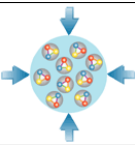
Compressed Baryonic Matter Experiment

Muon Chamber (MUCH)

The CBM Collaboration

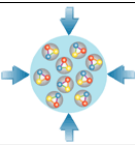
December 2013

FAIR Baseline Schedule



- Major **consolidation of all planning** done in 2016
- Goal of the management was
 - to create a **conservative** planning (*"done not later than"*)
 - to have, for a first time, an **integrated** planning
 - civil construction
 - accelerator
 - experiments
 - covering construction, installation and commissioning phases
 - for GSI campus based activities also **resource loaded**
 - which serves as **baseline**
 - to **substantiate the earlier statements**
 - buildings finished 2022
 - FAIR operational 2025

Planning Structure: CBM part

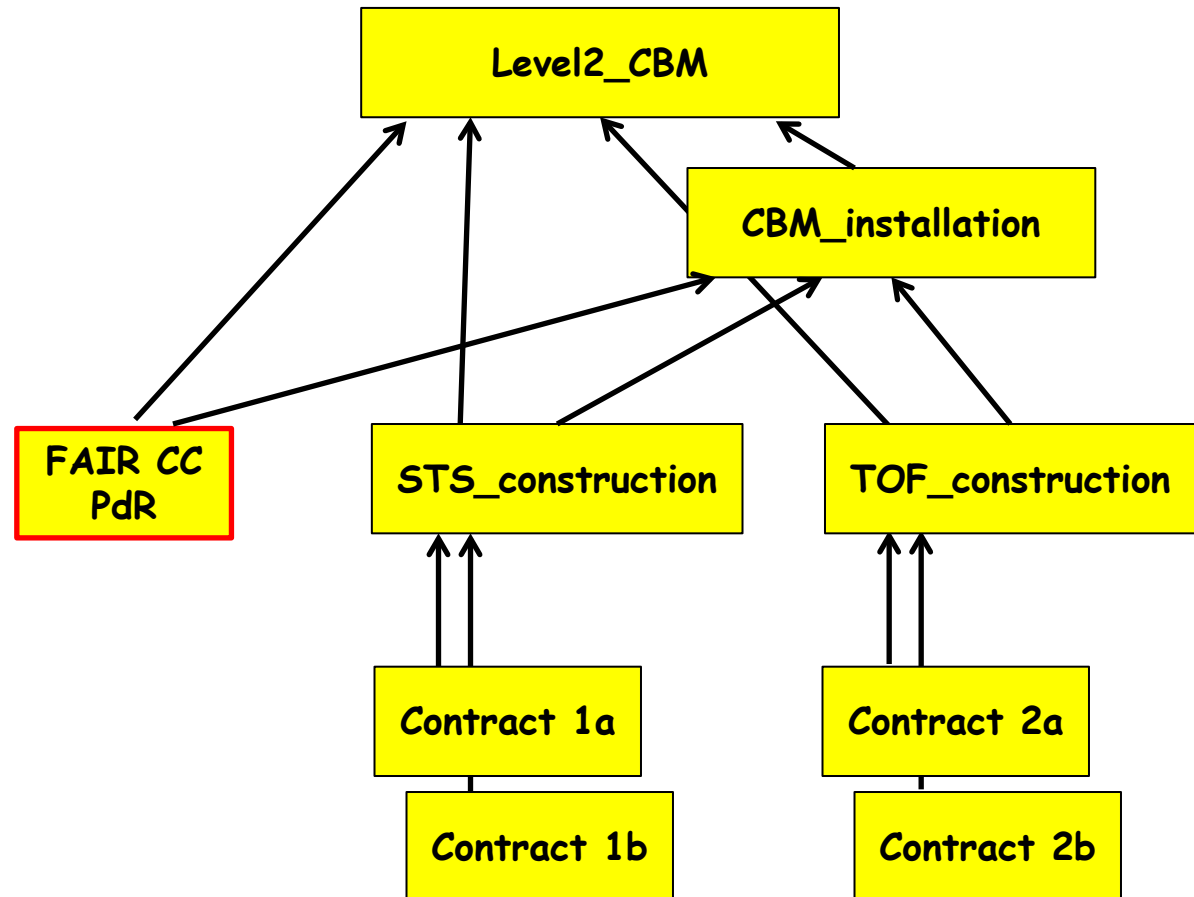


Management overview

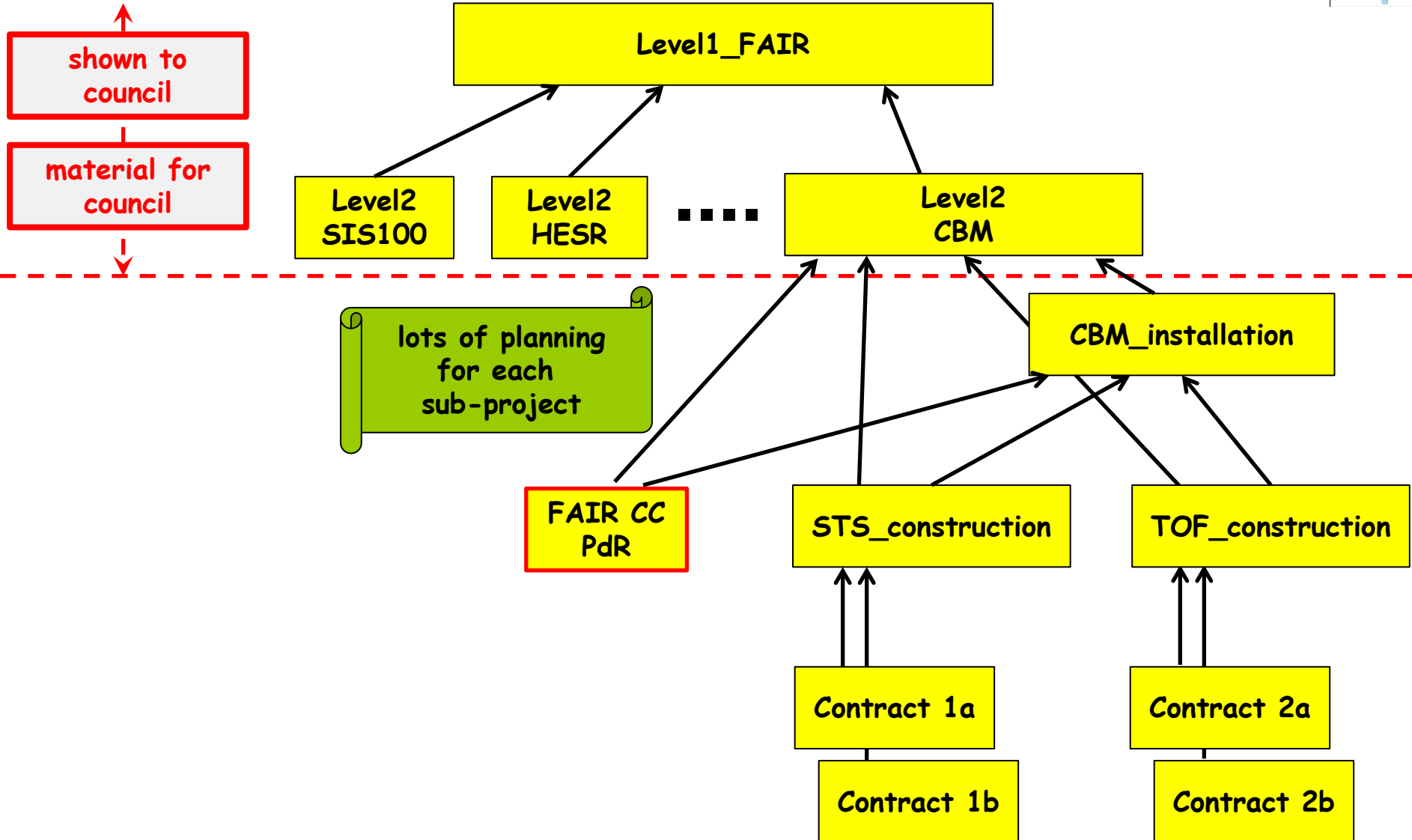
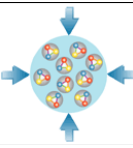
Installation and commissioning w/o beam
→ CBM ready for beam

Detector construction
→ ready for installation

Contracting and procurement



Planning Structure: Full Picture



FAIR Schedule

- Major effort
- Presented to FAIR council on December 6th, 2016
- Very positive reception

Integrated Project Master Schedule Level-1 Baseline of December 2016



Delivering - NFI Meeting December 2016-2018

Summary & Methodology

This integrated master schedule was developed in order to steer the project. The current release was saved as baseline to measure future progress. The design and civil construction schedules, procurement schedules for accelerator and experiment components, installation schedules, as well as the commissioning schedule for the whole project are completely incorporated into the integrated master schedule. Plans with varying detail level allow planning and steering according to the responsibilities in the project, namely on work package leader, subproject leader and overall project level.

The current master schedule is consistent with the dates presented on 20th FAIR Council. Finalization of installation of components will be reached end of 2022. Full operation for the overall project will be achieved until December 2025. Resources have been assigned to the tasks within the Level-3 schedules by name. Overload for individual people in certain timeframes is currently in the process of being analyzed and then being successively eliminated from the schedules.

Work on the schedules and tailoring of the schedules according to the organizational structure of responsibilities has increased the ownership and dedication of work package leaders and subproject leaders towards their respective milestones. Clear responsibilities are created by mirroring the work packages for the components of FAIR, the responsible leaders in the organizational structure and the time schedules.



Figure 1: Topology of Schedules reflects the different roles and responsibilities in the project and aggregates major milestones from Level 3 plans bottom-up to the Level-1 project master schedule. Interconnections of plans are realized with links in between the milestones.

Integrated Master Schedule: Baseline



* Data Date: November 28th 2016

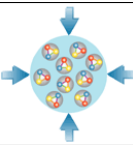


Figure 3: Group photo taken during the focus Workshop on project planning in Hongkai, Taiwan on September 28-30th. The first draft of an integrated project master schedule was presented and discussed. A roadmap towards FAIR Council for resource assignment by name, integrated installation planning and a fundamental commissioning plan was approved.

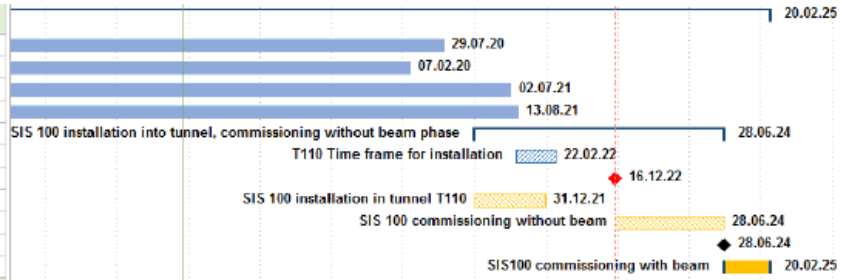
Signatures of Level-1 Project Team

Name	Role	Name	Role	Signature
Jörg Blaschke	Technical Managing Director	Klaus Aichele	SPL, p-FUNIC & p-bar Separator	
Jürgen Herberich	Project Manager & Technical Director	Andreas Kopp	SPL, Collector Ring	
Ulrich Müller-Pfeifferle	Chairman of Technical Integration	Oliver Preussner	SPL, High Energy Storage Ring	
Ralf Fuchs	Member Technical Integration	Wolfgang Aichele	SPL, COBL Area	
Frank Becker	Head PMO	Angela Schulz-Denkau	SPL, APRX Area	
Natalya Winters	Head PMO Project Planning	Jürgen Gert	SPL, NUBAR Area	
Walter Spiller	SPL, SPS/STARS	Lutz Schmidt	SPL, PANDA Area	
Hank Simon	SPL, Super-IDs	Uwe Kowatsch	Director FAIR Site & Buildings	
Hartmut Reich-Spinger	SPL, Common			

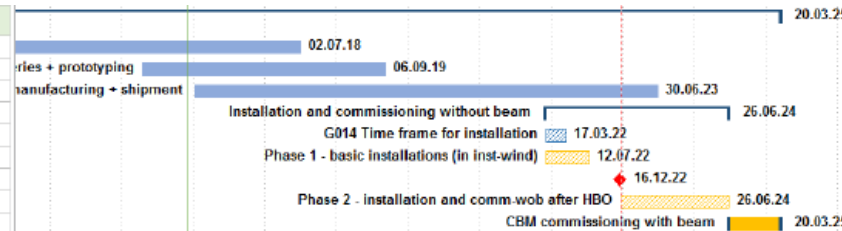
FAIR Schedule: SIS100 and CBM



120	SIS100	174,17 mons	17.10.2011	20.02.2025
121	SIS 100 planning phase	114,6 mons	17.10.2011	29.07.2020
122	SIS 100 manufacturing of pre-series phase	99,25 mons	02.07.2012	07.02.2020
123	SIS 100 manufacturing of series phase	97,2 mons	21.01.2014	02.07.2021
124	SIS 100 shipment, SAT A phase	101,1 mons	14.11.2013	13.08.2021
125	SIS 100 installation into tunnel, commissioning without beam phase	45,6 mons	31.12.2020	28.06.2024
126	T110 Time frame for installation	6,75 mons	29.07.2021	22.02.2022
127	Acceptance by HBO	0 mons	16.12.2022	16.12.2022
128	SIS 100 installation in tunnel T110	13,06 mons	31.12.2020	31.12.2021
129	SIS 100 commissioning without beam	20 mons	19.12.2022	28.06.2024
130	SIS 100 ready for beam	0 mons	28.06.2024	28.06.2024
131	SIS100 commissioning with beam	8,42 mons	28.06.2024	20.02.2025

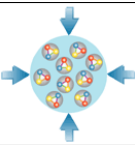


233	CBM	152,67 mons	08.07.2013	20.03.2025
234	Phase 2: design and planning	65 mons	08.07.2013	02.07.2018
235	Phase 4: pre-series + prototyping	44,5 mons	11.04.2016	06.09.2019
236	Phase 5+6: manufacturing + shipment	84,6 mons	05.01.2017	30.06.2023
237	Installation and commissioning without beam	33,55 mons	01.12.2021	26.06.2024
238	G014 Time frame for installation	3,1 mons	02.12.2021	17.03.2022
239	Phase 1 - basic installations (in inst-wind)	160 dys	01.12.2021	12.07.2022
240	Acceptance by HBO	0 mons	16.12.2022	16.12.2022
241	Phase 2 - installation and comm-wob after HBO	398 dys	19.12.2022	26.06.2024
242	CBM commissioning with beam	9,52 mons	26.06.2024	20.03.2025



- The CBM bottom line:
 - Dec 2021 to Jul 2022 1st installation window
 - Dec 2022 Building acceptance
 - Dec 2022 to Jun 2024 Installation & commissioning w/o beam
 - Jun 2024 to Mar 2025 Commissioning beam from SIS100

CBM Schedule: TOF Installation



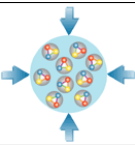
118				TOF	34 wks	02.01.23	25.08.23
119				TOF - install power supplies (E10-SA)	4 wks	16.01.23	10.02.23
120				TOF - install gas system (E30-GCR)	4 wks	02.01.23	27.01.23
121				TOF - install+comm modules	12 wks	10.04.23	30.06.23
122		1.1.1.5	S007.A119	TOF - comm-wob	8 wks	03.07.23	25.08.23
123		1.1.1.5	S007.M11	TOF - ready for beam [M11]	0 days	25.08.23	25.08.23

- The CBM bottom line (reminder):
 - Dec 2022 to Jun 2024 Installation & commissioning w/o beam
 - Jun 2024 to Mar 2025 Commissioning beam from SIS100
- The CBM TOF bottom line:
 - Apr 2023 to Jul 2023 Installation

There should be no schedule conflict with STAR-BES-II

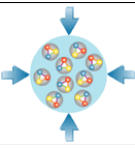


The End



Thanks for your attention





Backup Slides