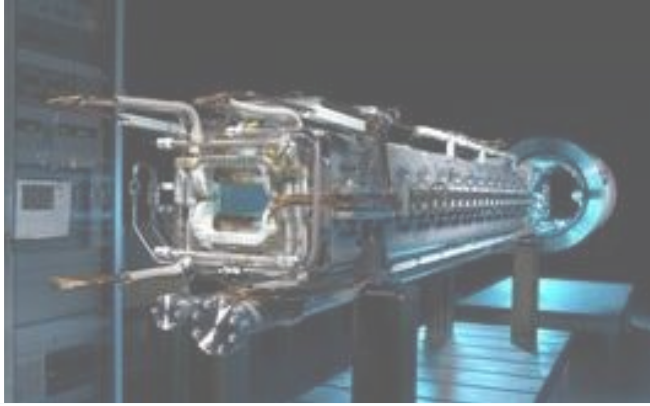




Status of the FAIR Project

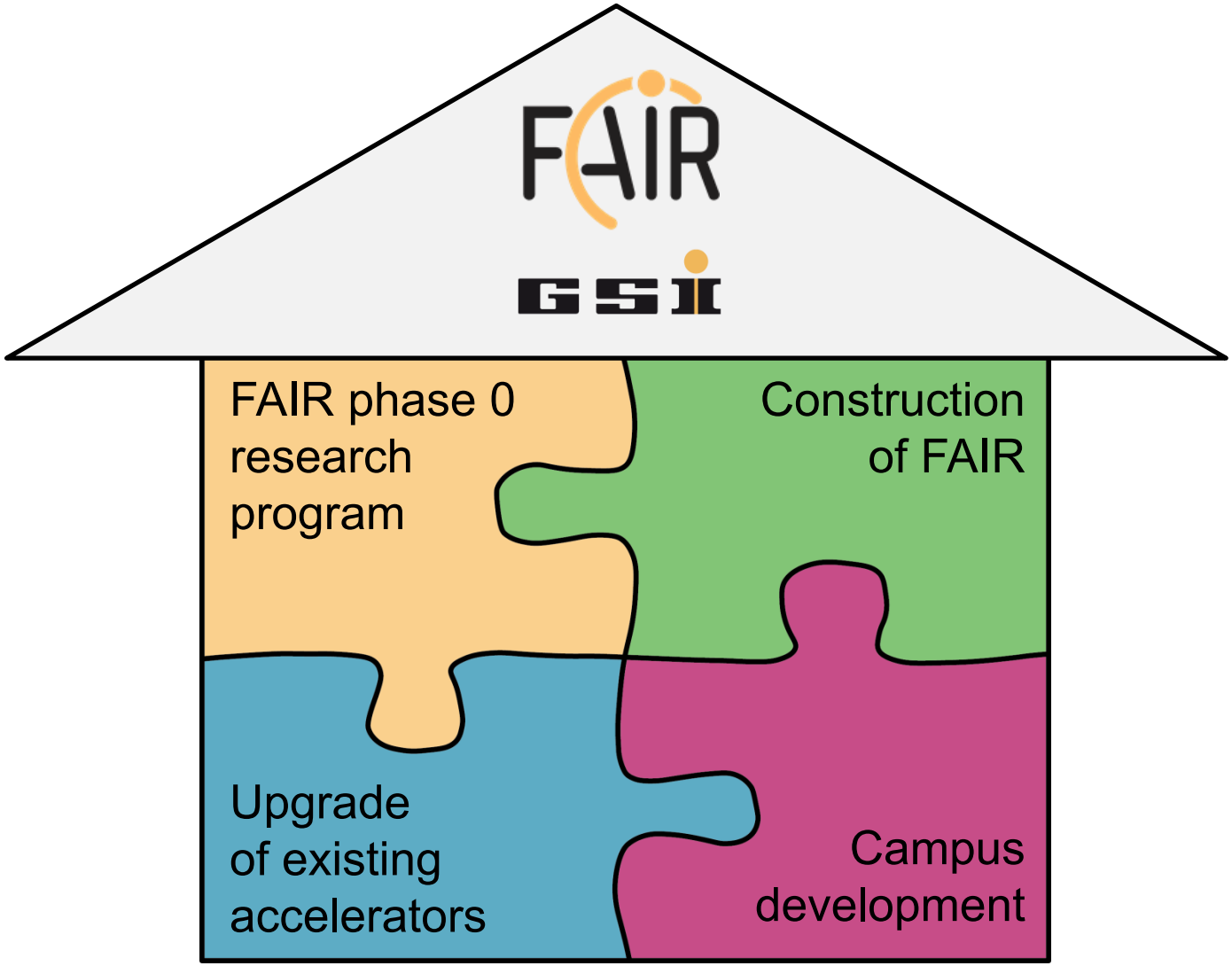
Jürgen Henschel

FAIR Project Leader / Technical Director GSI & FAIR

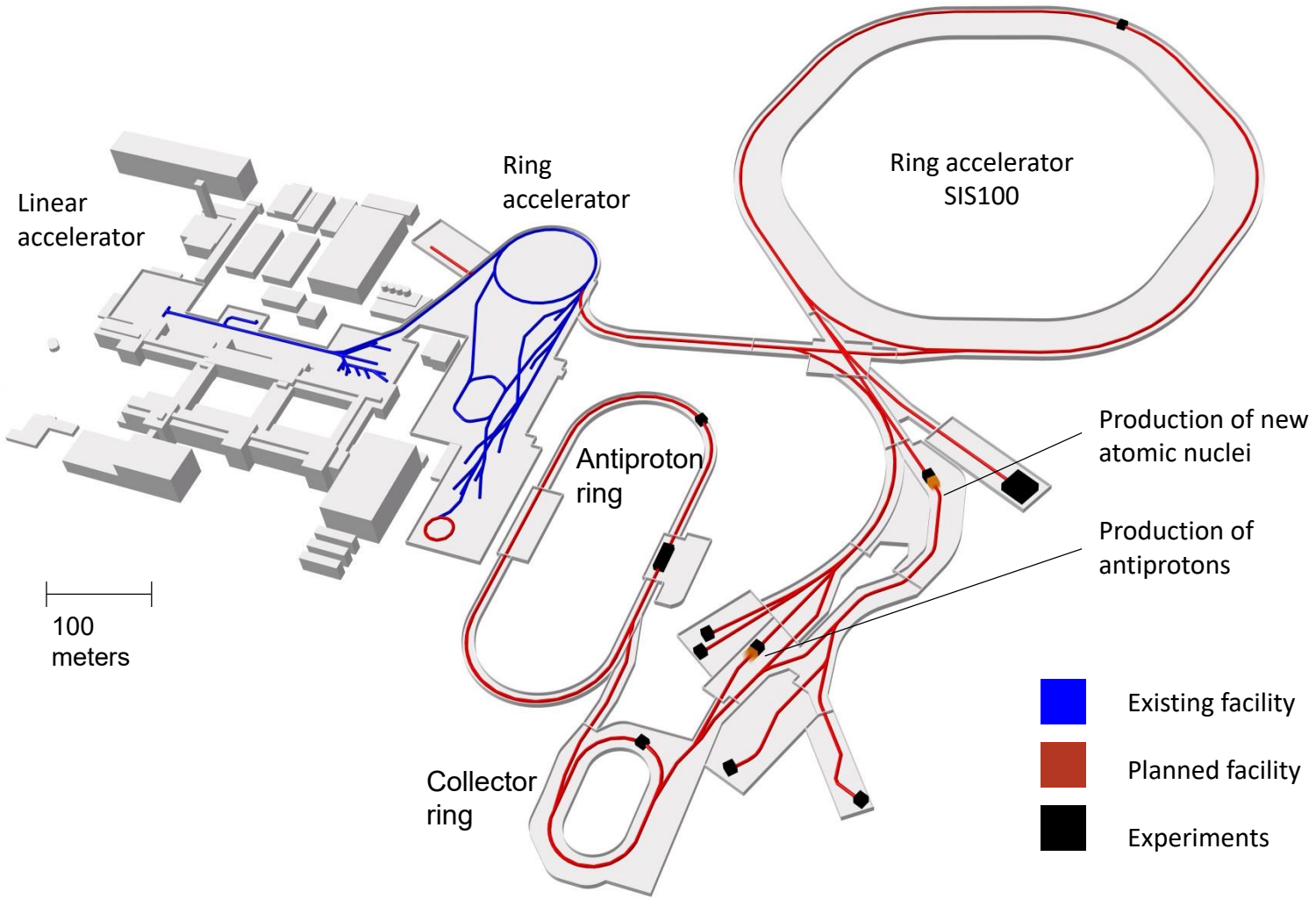
Finland France Germany India Poland Romania Russia Slovenia Sweden UK

FAIR

FAIR Strategic objectives



FAIR – The Facility



FAIR Status

- New Organization FAIR & GSI ✓
- Integrated resource loaded Project Master schedule ✓
- Project Management Process ✓
- Reorganization FAIR Site & Buildings ✓
- Reorganization of Planning / Tendering and Awarding for Civil Construction ✓
- Communication strategy ✓

Scope of the FAIR Project – The Modularized Start Version (MSV)

APPA

- SPARC: atomic physics in strong fields
- WDM+Hedgehob: dense plasma physics
- BIOMAT: biomedical and materials research

CBM

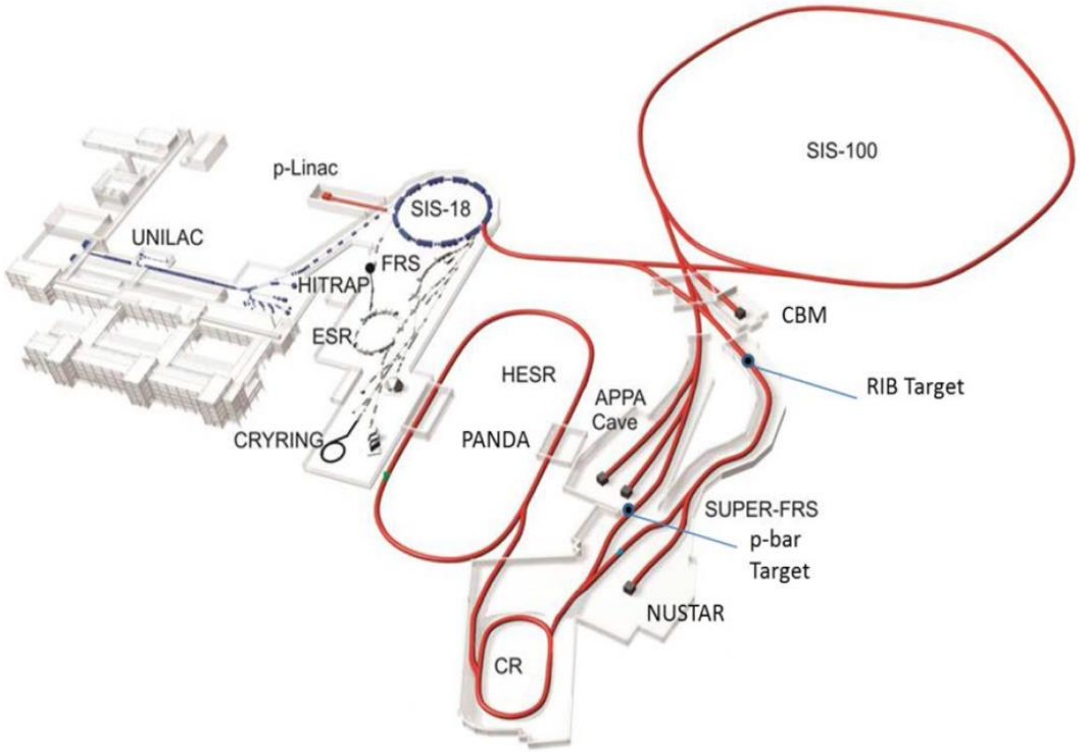
- HADES : hadrons in dense nuclear matter
- CBM: compressed baryonic matter

NUSTAR

- R3B: kinematically complete reaction studies with relativistic radioactive ion beams
- ILIMA: In ring lifetime and mass spectroscopy
- HISPEC/DESPEC: In beam and stopped beam spectroscopy of exotic nuclei
- MATS: Mass and lifetime spectroscopy in traps
- LASPEC: laser spectroscopy of exotic nuclei

PANDA

- Hadron physics with antiprotons



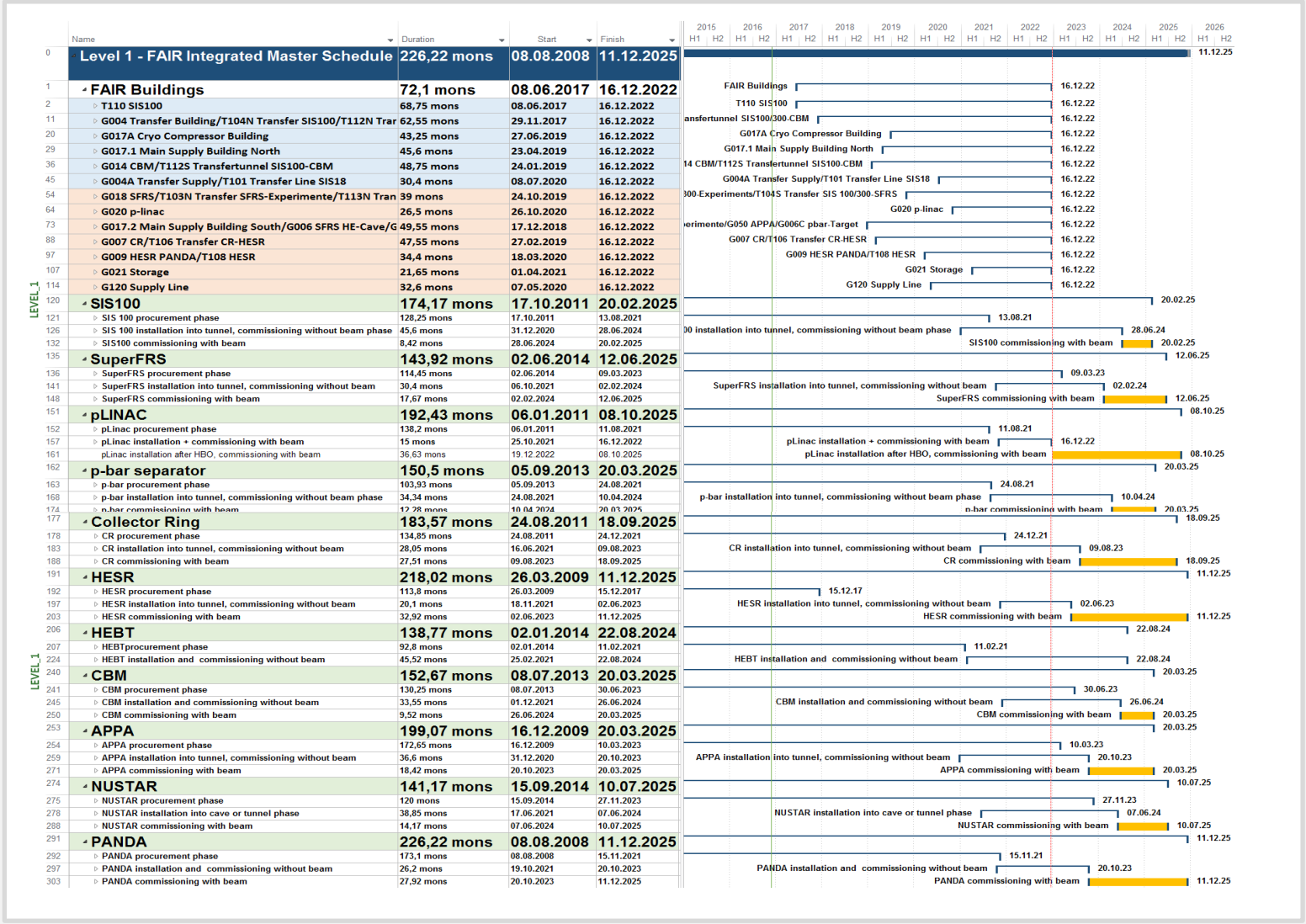
FAIR Status

- Planning scope is the MSV
- The completion date is in 2025
- Full integration in planning of Civil Construction, Machine & Experiments is achieved
- A staged approach is realized (“Along the Beamline” / North & South) to speed up the start of experiments
- Installation windows prior finalization of Civil construction are defined
- Components (Machine & Experiments) for this installation identified & respective dates set
- Continuous progress measurement is defined and established
- Weekly, monthly and quarterly reviews are scheduled and performed

17th FAIR Council decisions as basis

FAIR Project Master Schedule

Level 1 (Baseline overview) – Council – 7. December 2016



	Name	Duration	Start	Finish
0	Level 1 - FAIR Integrated Master Schedule	226,22 mons	08.08.2008	11.12.2025
1	FAIR Buildings	72,1 mons	08.06.2017	16.12.2022
2	T110 SIS100	68,75 mons	08.06.2017	16.12.2022
11	G004 Transfer Building/T104N Transfer SIS100/T112N Trar	62,55 mons	29.11.2017	16.12.2022
20	G017A Cryo Compressor Building	43,25 mons	27.06.2019	16.12.2022
29	G017.1 Main Supply Building North	45,6 mons	23.04.2019	16.12.2022
36	G014 CBM/T112S Transfertunnel SIS100-CBM	48,75 mons	24.01.2019	16.12.2022
45	G004A Transfer Supply/T101 Transfer Line SIS18	30,4 mons	08.07.2020	16.12.2022
54	G018 SFRS/T103N Transfer SFRS-Experimente/T113N Tran	39 mons	24.10.2019	16.12.2022
64	G020 p-linac	26,5 mons	26.10.2020	16.12.2022
73	G017.2 Main Supply Building South/G006 SFRS HE-Cave/G	49,55 mons	17.12.2018	16.12.2022
88	G007 CR/T106 Transfer CR-HESR	47,55 mons	27.02.2019	16.12.2022
97	G009 HESR PANDA/T108 HESR	34,4 mons	18.03.2020	16.12.2022
107	G021 Storage	21,65 mons	01.04.2021	16.12.2022
114	G120 Supply Line	32,6 mons	07.05.2020	16.12.2022
120	SIS100	174,17 mons	17.10.2011	20.02.2025
121	SIS 100 procurement phase	128,25 mons	17.10.2011	13.08.2021
126	SIS 100 installation into tunnel, commissioning without beam phase	45,6 mons	31.12.2020	28.06.2024
132	SIS100 commissioning with beam	8,42 mons	28.06.2024	20.02.2025
135	SuperFRS	143,92 mons	02.06.2014	12.06.2025
136	SuperFRS procurement phase	114,45 mons	02.06.2014	09.03.2023
141	SuperFRS installation into tunnel, commissioning without beam	30,4 mons	06.10.2021	02.02.2024
148	SuperFRS commissioning with beam	17,67 mons	02.02.2024	12.06.2025
151	pLINAC	192,43 mons	06.01.2011	08.10.2025
152	pLinac procurement phase	138,2 mons	06.01.2011	11.08.2021
157	pLinac installation + commissioning with beam	15 mons	25.10.2021	16.12.2022
161	pLinac installation after HBO, commissioning with beam	36,63 mons	19.12.2022	08.10.2025
162	p-bar separator	150,5 mons	05.09.2013	20.03.2025
163	p-bar procurement phase	103,93 mons	05.09.2013	24.08.2021
168	p-bar installation into tunnel, commissioning without beam phase	34,34 mons	24.08.2021	10.04.2024
174	p-bar commissioning with beam	12,28 mons	10.04.2024	20.03.2025
177	Collector Ring	183,57 mons	24.08.2011	18.09.2025
178	CR procurement phase	134,85 mons	24.08.2011	24.12.2021
183	CR installation into tunnel, commissioning without beam	28,05 mons	16.06.2021	09.08.2023
188	CR commissioning with beam	27,51 mons	09.08.2023	18.09.2025
191	HESR	218,02 mons	26.03.2009	11.12.2025
192	HESR procurement phase	113,8 mons	26.03.2009	15.12.2017
197	HESR installation into tunnel, commissioning without beam	20,1 mons	18.11.2021	02.06.2023
203	HESR commissioning with beam	32,92 mons	02.06.2023	11.12.2025
206	HEBT	138,77 mons	02.01.2014	22.08.2024
207	HEBTprocurement phase	92,8 mons	02.01.2014	11.02.2021
224	HEBT installation and commissioning without beam	45,52 mons	25.02.2021	22.08.2024
240	CBM	152,67 mons	08.07.2013	20.03.2025
241	CBM procurement phase	130,25 mons	08.07.2013	30.06.2023
245	CBM installation and commissioning without beam	33,55 mons	01.12.2021	26.06.2024
250	CBM commissioning with beam	9,52 mons	26.06.2024	20.03.2025
253	APPA	199,07 mons	16.12.2009	20.03.2025
254	APPA procurement phase	172,65 mons	16.12.2009	10.03.2023
259	APPA installation into tunnel, commissioning without beam	36,6 mons	31.12.2020	20.10.2023
271	APPA commissioning with beam	18,42 mons	20.10.2023	20.03.2025
274	NUSTAR	141,17 mons	15.09.2014	10.07.2025
275	NUSTAR procurement phase	120 mons	15.09.2014	27.11.2023
278	NUSTAR installation into cave or tunnel phase	38,85 mons	17.06.2021	07.06.2024
288	NUSTAR commissioning with beam	14,17 mons	07.06.2024	10.07.2025
291	PANDA	226,22 mons	08.08.2008	11.12.2025
292	PANDA procurement phase	173,1 mons	08.08.2008	15.11.2021
297	PANDA installation and commissioning without beam	26,2 mons	19.10.2021	20.10.2023
303	PANDA commissioning with beam	27,92 mons	20.10.2023	11.12.2025

FAIR Project Progress - Accelerator

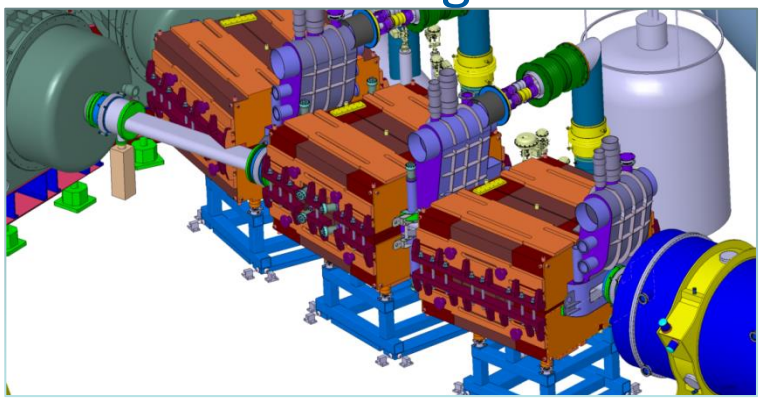
FAIR Project Progress - Accelerators
Highlights

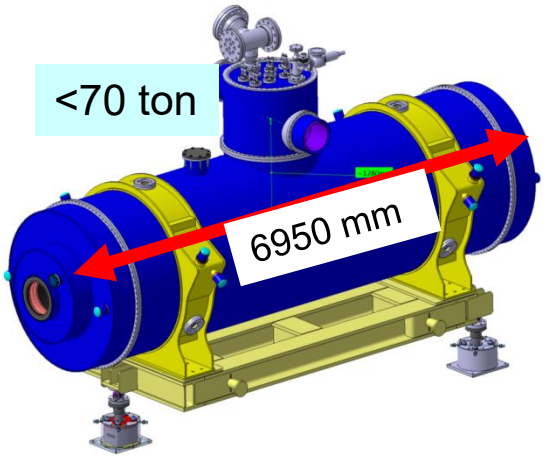
SIS 100:

- Dipoles serial production released (BNG)
- First Of Series (FOS) Quadrupole units tests (Dubna)
- FOS bunch compression cavity released (Aurion)
- FOS acceleration cavity released (RI)
- Injection systems tendered and awarded
- New control system implementation on target schedule

Super FRS:

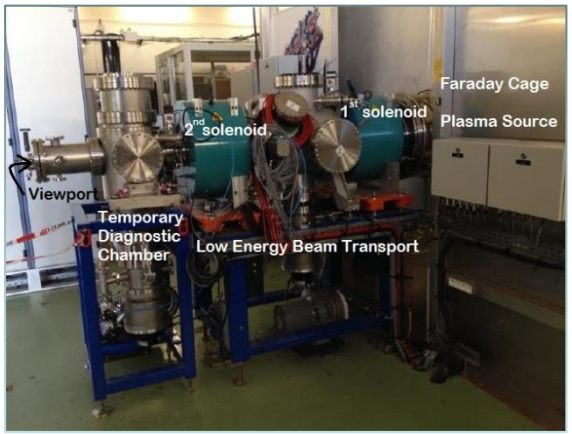
- Design of Pre series SC Multiplets completed PRR 2017
- SC Dipol tender finalized and published
- CERN Magnet testing facility in finalization
- FAT x-slit system successful
- Detectors (ToF, MUSIC) are in contract negotiations
- SC Vacuum chambers spec finalized
- CR for shielding flask

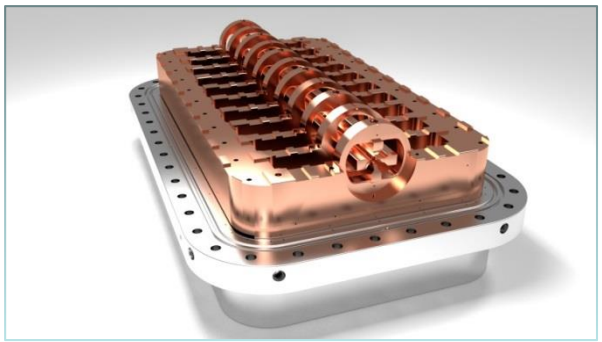




p-Linac / Pbar Target:

- Accelerate building successfully underway (-24 month)
- GAF solution more cost effective than planned (~2 mio.€)
- Proton source (CEA) in commissioning
- Klystron FAT successful (CNRS)
- RFQ (Ladder) design close to completion





FAIR Project Progress - ACC
Highlights

CR:

- CR TDR released
- Component design ramp up
- all needed contracts signed for now

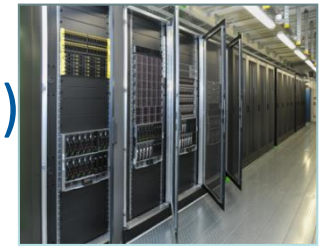
HESR:

- All Dipoles are produced and in delivery to storage area
- QP & Sextupoles in production
- RF equipment pending

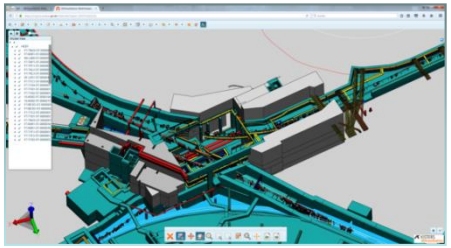
FAIR Project Progress - ACC
Highlights

Commons:

- HEBT Dipoles (2) passed successfully SAT (Efremov)
- Serial Production (52) released, FAT successfully passed



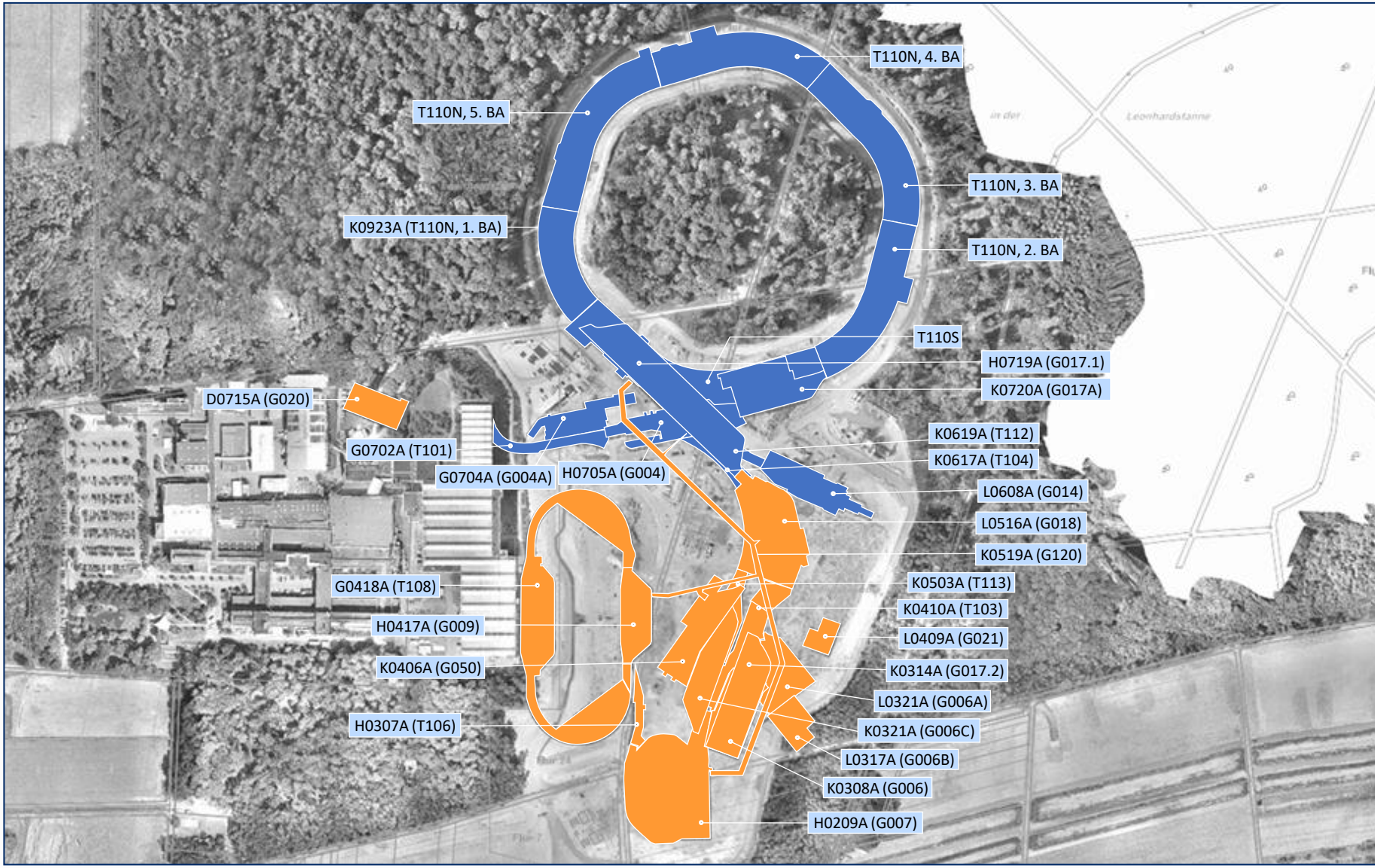
- first 2 power converters (of 196) delivered (ECIL, India)
- Cryo 2 tender in finalization (~ 30 mio.€)
- STF ready for use



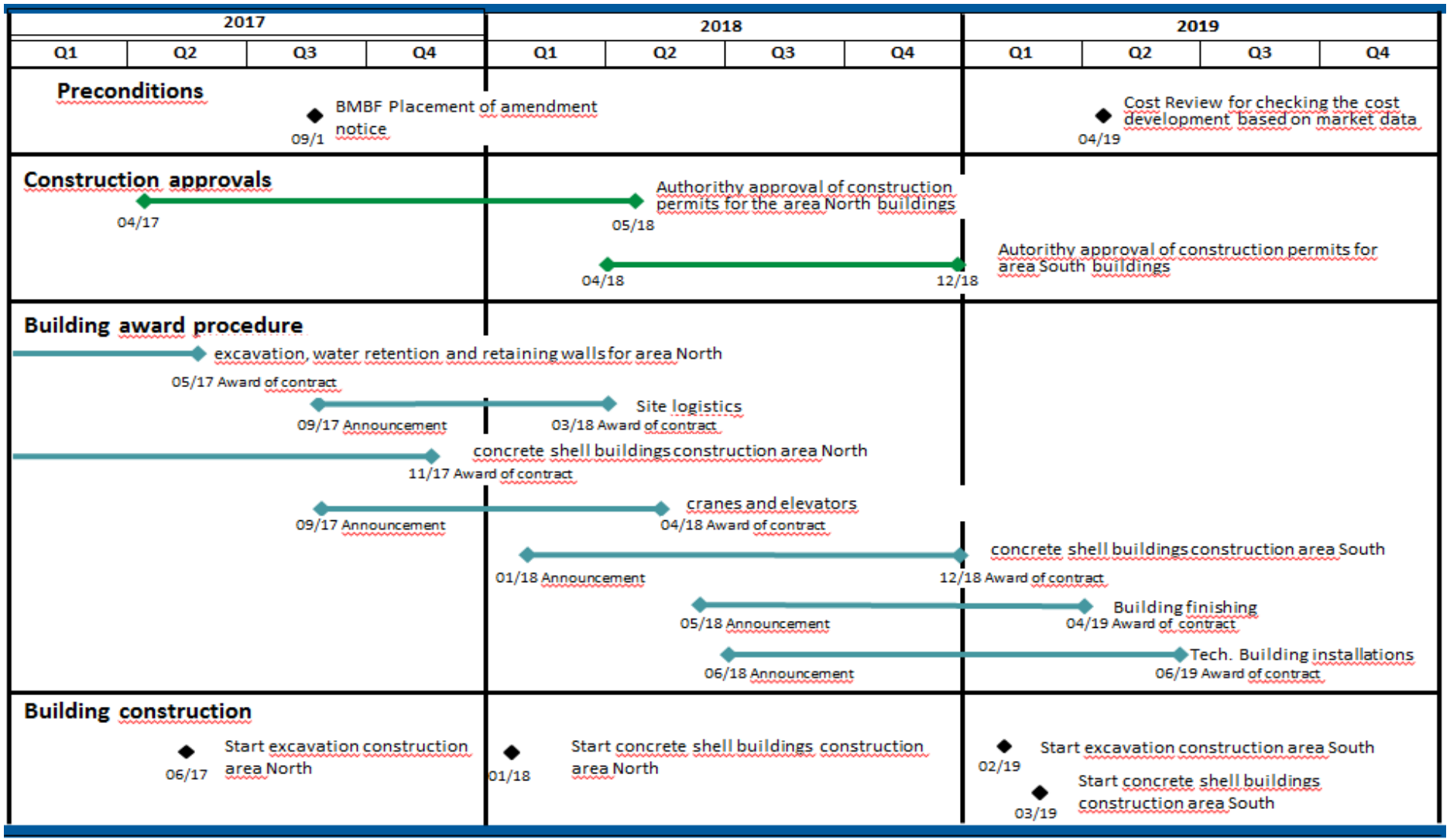
- New control system in rollout

FAIR Project Progress – Civil Construction

FAIR Project Progress – Civil Construction



FAIR Project Progress – Civil Construction



Status: August 2017

FAIR Project Progress – Civil Construction

SIS18 – adaptation works for FAIR

SIS 100 – preparatory works for excavation

Drilling for sheeting steel girder

Piping material for ground water lowering

Piping material for ventilation pipes 800 mm

Overview GSI connection to FAIR tunnel 101

Excavation for underground piping

FAIR Project Progress – next steps

1) Start civil works construction area North in summer 2017
2) Award of building shell construction area North in Q4 2017
3) Award of SFRS Dipoles
4) Tender of Cryo 2
5) Finalization of Experiment strategy for day 1

FAIR R&D needs

The construction of the FAIR facility and the procurement of the components is progressing well. Support from university groups will be especially needed for:

Developments towards highest beam intensities and brightness in the FAIR accelerators

Injectors: Transport of intense ion beams, brightness optimization, rf cavity developments and tests,….

Synchrotrons: Beam dynamics, vacuum, diagnostics, rf-control, ..

Storage rings: Internal targets, beam cooling, …..

Super-FRS: Beam optical model and optimizations, controls….

Components: SC magnet developments for fast ramping,….