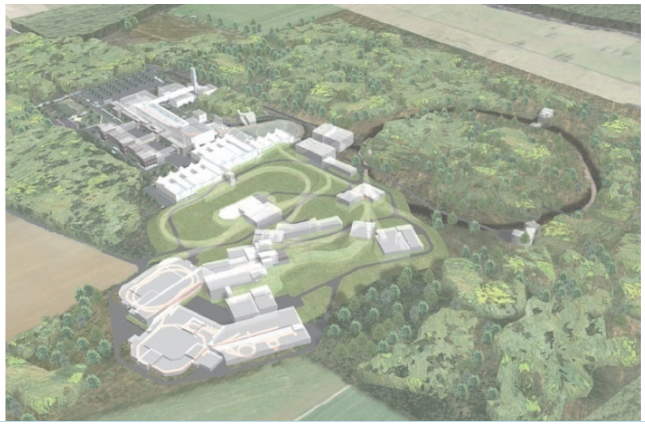
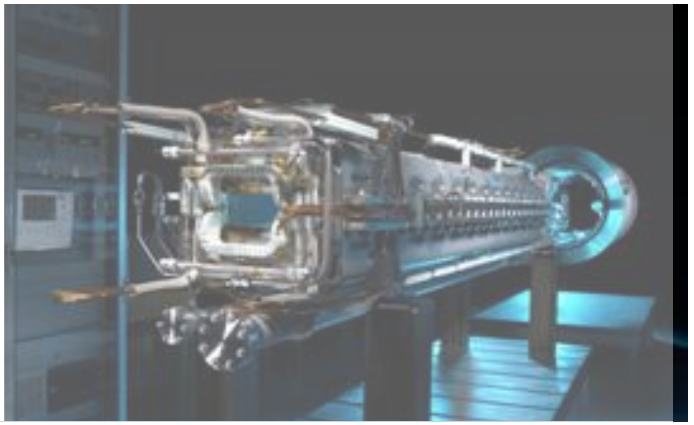



Status of the FAIR Project

Horst Stöcker

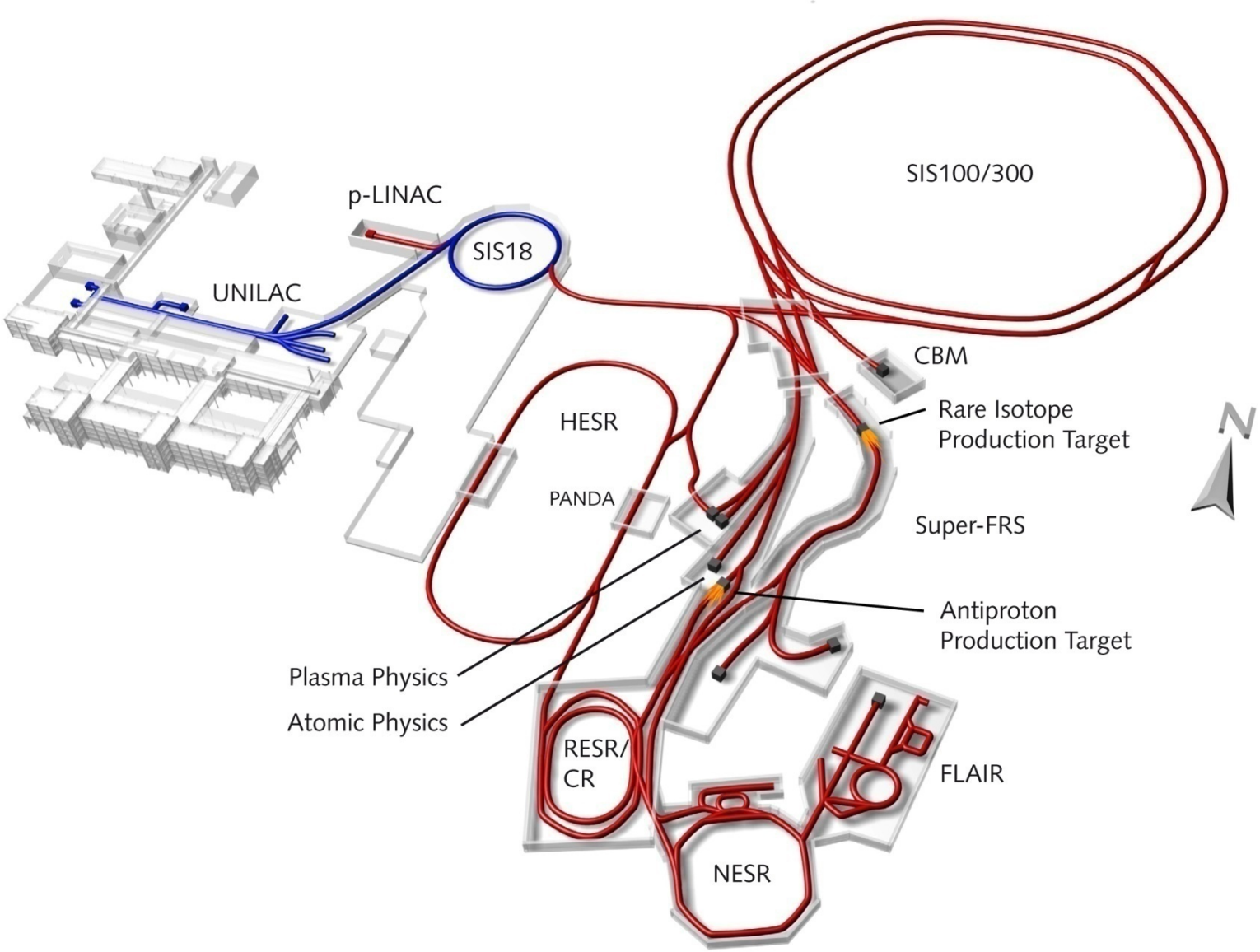
HIM Scientific Council Meeting 16 April 2010

Austria China Finland France Germany Greece India Italy Poland Romania Russia Slovakia Slovenia Spain Sweden U K Saudi Arabia

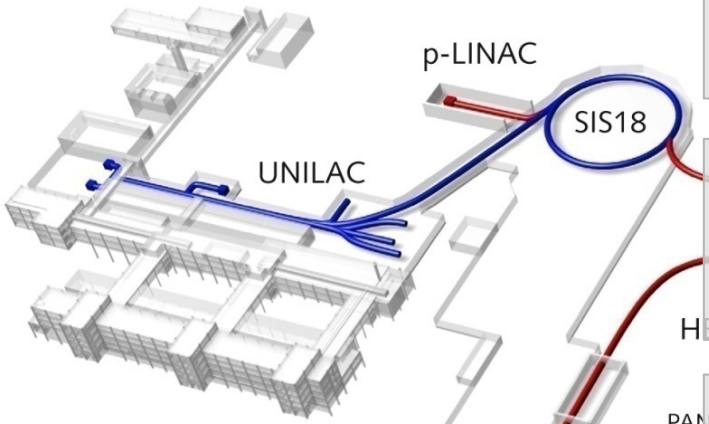
FAIR

GSI
Helmholtzzentrum GmbH
FAIR
GmbH
JÜLICH
FORSCHUNGSZENTRUM
Observers
FAIR Full Version
2017-2025
Austria
China
Finnland
France
Germany
Greece
India
Italy
Poland
Slovakia
Slovenia
Spain
Sweden
Romania
Russia
UK

FAIR Full Version according to BTR 2005



FAIR Full Version according to BTR 2005



Atomic Physics, Plasma Physics and Applications (APPA)
- heavy ions and antiproton beams of several AGeV to rest
- 850 users

Compressed Baryonic Matter (CBM)
- heavy ions beams of 2 to 45 AGeV
- 500 users

Nuclear Structure and Astrophysics Reactions (NUSTAR)
- rare isotope beams from AGeV to rest
- 650 users

anti-Proton ANnihilation at DArmstadt (PANDA)
- cooled antiprotons up to 15 GeV
- 500 users

Rationale for the FAIR Modularized Start Version

Spring 2009 :

- Detailed cost estimate for CC – dramatic cost overrun
- Additional site related construction costs
- Revised cost estimate in 2009 for the accelerator complex – significant cost overrun

Summer/Autumn 2009:

- Germany and State of Hesse announced to cover "site-dependent" construction costs outside FAIR project budget: + 110 M€ !
- Analysis of firm commitments of FAIR Member States

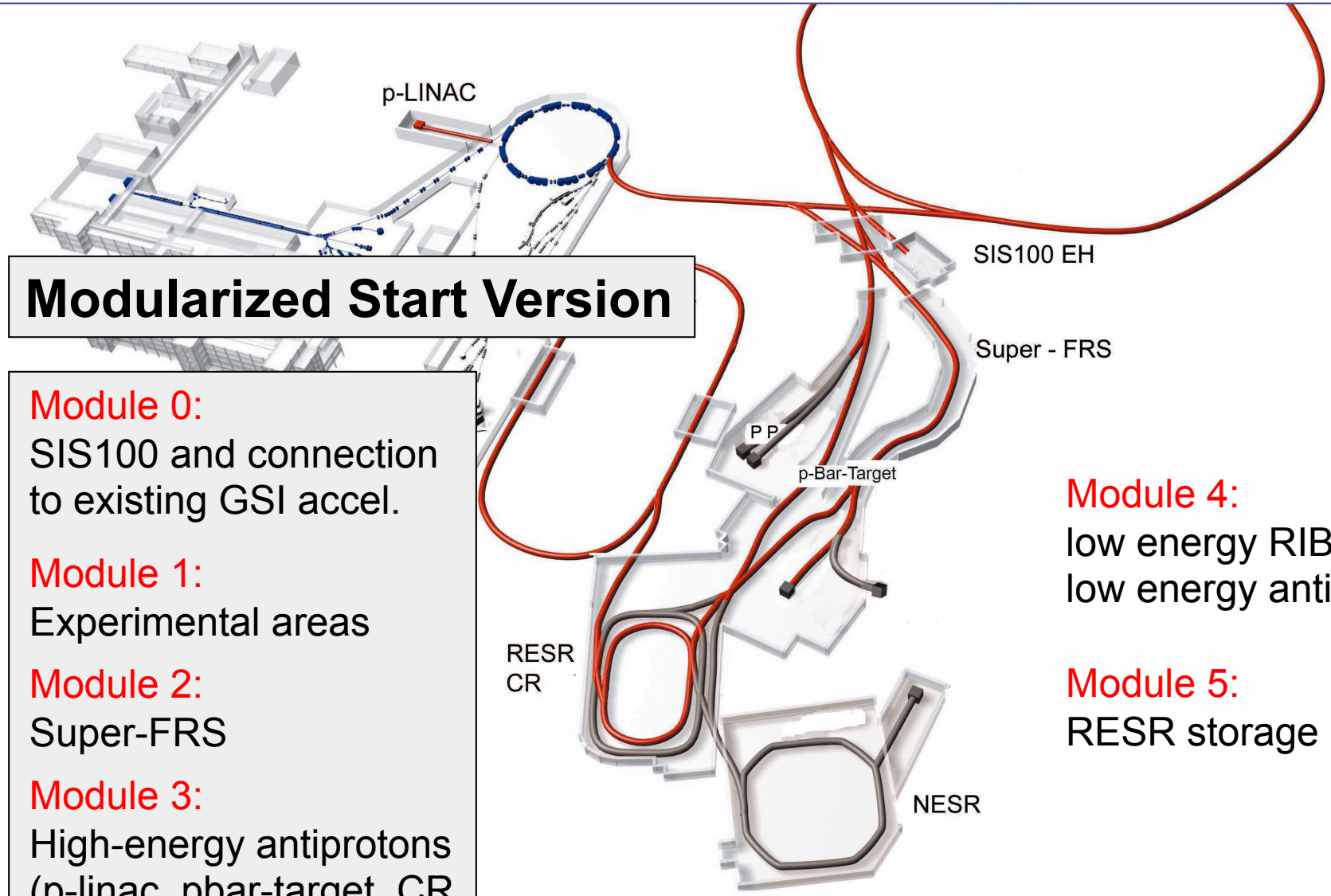
➡ **Development of the FAIR Modularized Start Version**

Development of Project Staging

2003	**Recommendation by WissenschaftsRat – FAIR Realisation in three stages**						
2005	**Entire Facility** **Baseline Technical Report**						
2007	**Phase A**						**Phase B** SIS300
2009	**Module 0** SIS100	**Module 1** expt areas CBM/HADES and APPA	**Module 2** Super-FRS fixed target area NuSTAR	**Module 3** pbar facility, incl. CR for PANDA, options for NuSTAR	**Module 4** LEB for NuSTAR, NESR for NuSTAR and APPA, FLAIR for APPA	**Module 5** RESR nominal intensity for PANDA & parallel operation with NuSTAR and APPA SIS18 Proton Beamline	**Module 6** SIS300 HESR **Cooler** ER

Modularized Start Version

Outstanding research opportunities for *all four* scientific pillars of FAIR at time zero: the Modularized Start Version



Modularized Start Version

Module 0:
SIS100 and connection to existing GSI accel.

Module 1:
Experimental areas

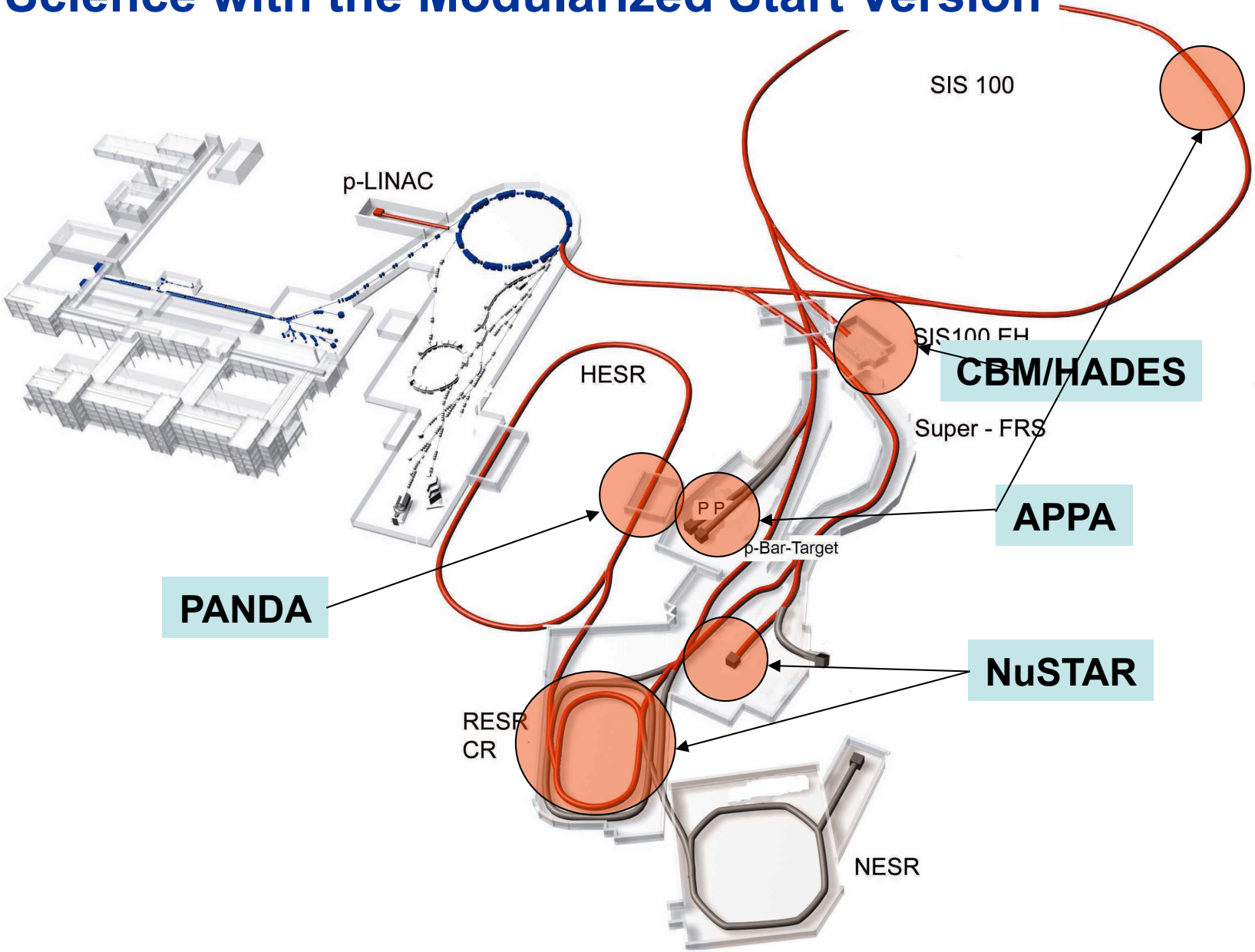
Module 2:
Super-FRS

Module 3:
High-energy antiprotons (p-linac, pbar-target, CR, HESR)

Module 4:
low energy RIB and
low energy antiprotons

Module 5:
RESR storage ring

Science with the Modularized Start Version



Evaluation Board 16 October 2009

1. The Modularized Start Version is the right way to proceed.
2. The project is more focussed and is in even better shape.
3. We should now start as soon as possible!

Cost Estimate Modules 0-3 (Price Basis 2005)

Total accelerator and personnel Modules 0 - 3	**502**
Total civil construction Modules 0 - 3	**400**
Experiment funding	**78**
FAIR GmbH personnel and running costs	**47**
Grand Total Modules 0 - 3	**1027**

all values in M€

Firm Commitments

FAIR Countries	Total declared Contribution (k€)
Austria	5.000
China	12.000
Finland	5.000
France	27.000
Germany	705.000
Great Britain	8.000
Greece	4.000
India	36.000
Italy	42.000
Poland	23.740
Romania	11.870
Russia	**178.050**
Slovenia	12.000
Slovakia	6.000
Spain	19.000
Sweden	10.000
Total	**1.104.660**
Firm Commitments	**1.038.660**

Very recently confirmed by Russia !

not firm for the first batch

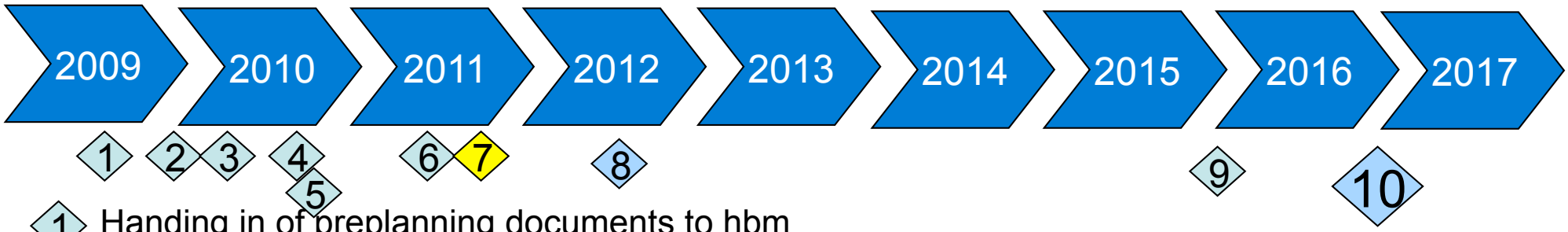
Finance Summary

Cost of Modularized Start Version = 1027 M€

Firm funding commitments of FAIR Partners = 1039 M€

Modularized Start Version secures a swift start within the current funding commitments

Road Map FAIR Site & Buildings



1. Handing in of preplanning documents to hbm
2. Clarification of user requirements Modularized Start Version (MSV)
3. Start revised preplanning for MSV
4. Expected approval of revised planning for MSV
5. Preparation of documents for building permit
6. Expected approval for (partial) building permit
7. Start site preparation (clearing trees)
8. Award contracts on civil construction work lot 1 … 4
9. Completion of civil construction work lot 1 … 4
10. Start installation of accelerators and detectors

First FAIR experiments will not start before 2017/2018 !

Conclusions

- Based on 2009 cost estimates and firm commitments of FAIR Member States the Modularized Start Version was elaborated
- Modules 0-3 ensure a physics programme that is unique, competitive with great discovery potential
- All FAIR science communities can perform excellent physics at time zero
- Facility to be upgraded towards the full version of FAIR (SIS 300, modules 4, 5, PAX, …)
- Setup of the international FAIR company proceeds in parallel – official founding ceremony in autumn 2010
- Roadmap for FAIR: Site & Buildings, Techn. Installations, Commissioning & Start of Exp. Program (~ 2017/18)

14

HIM - Scientific Sections

Spectroscopy and Flavor

SPECF

Physics and Chemistry of Superheavy Elements

SHE

Accelerator and Integrated Detector

ACID

EMP

Electromagnetic Processes in Antiproton Annihilation

MAM

Matter-Antimatter Symmetry in Atomic Physics

THFL

Theory Floor

Midterm Investment Projects Envisaged/ Started in HIM

- **PANDA**: Test bench for 4 MV electron cooler for electron cooling in HESR, upgradable for 8 MV electron cooler *1.5 M€*
- **SHE:** Demonstrator/Prototype for SHE-LINAC *1 M€*
- **Theory:** High Performance Computing in Univ.-Ring with GSI/HGF *1.5 M€*
- *….*