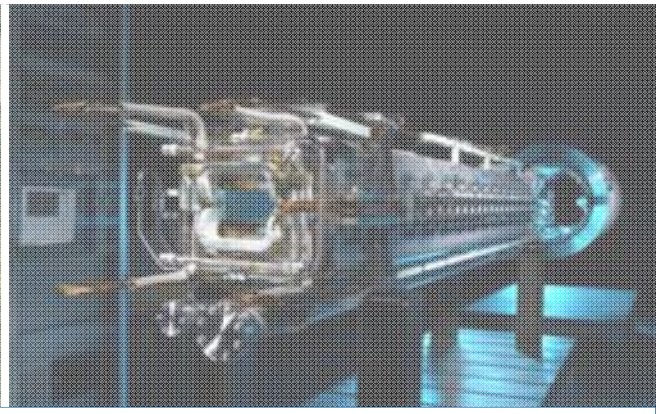




FAIR Modularized Start Version
Status

Dieter Krämer

MAC Feb. 8-10, 2010

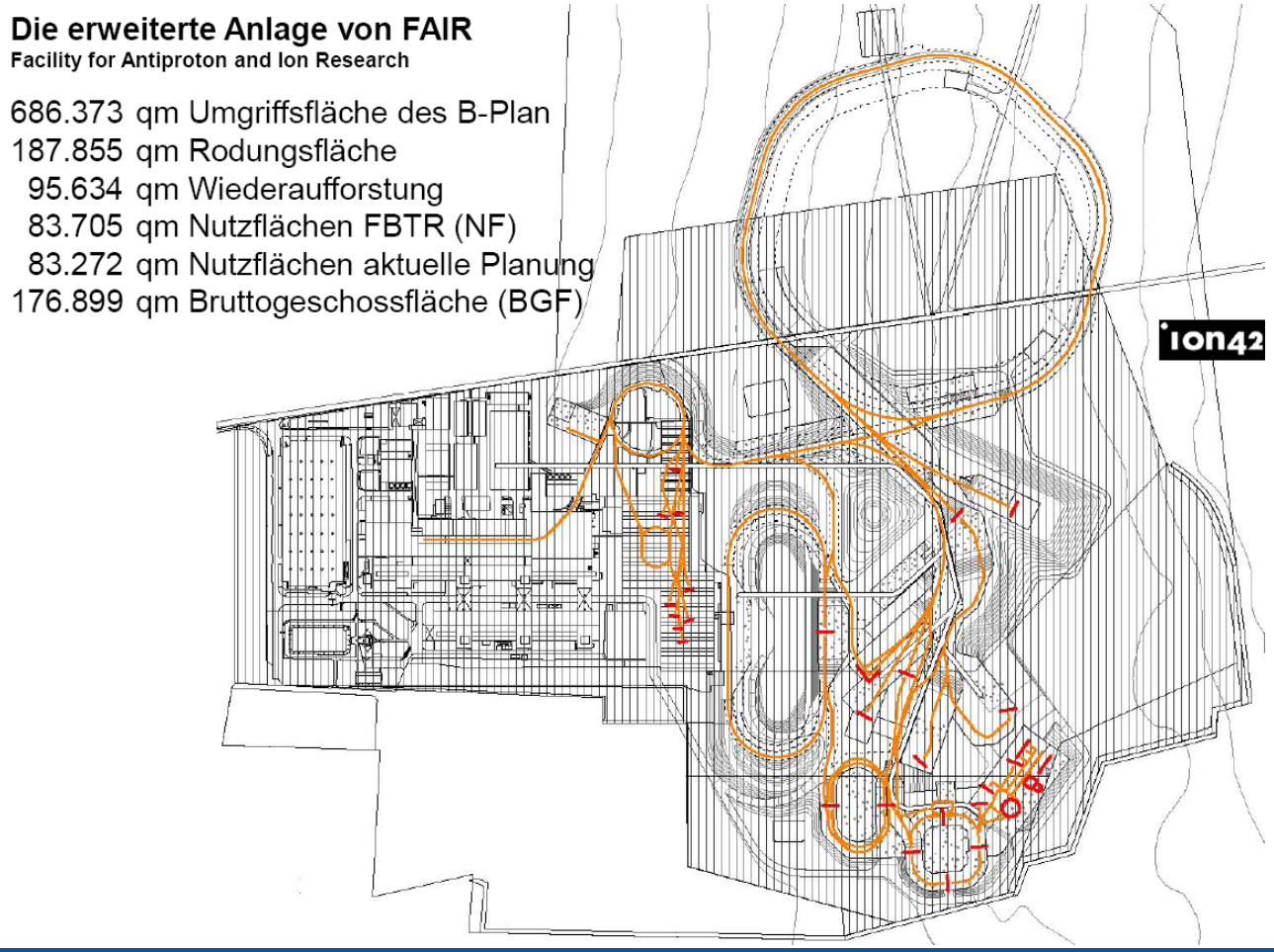
Contents

- **Reviews**
  - Cost review on FAIR civil construction
  - Cost review on accelerators
  - Scientific review
  - Management audit
- **Organizational Aspects**
  - Planned Structure of FAIR and
  - accelerator work packages
- **White Paper/Green Paper**
  - Re-definition of the project “The Modularized Start Version”

- **Workshop**
  - on Radiation Protection at FAIR
- **Antiproton collection and accumulation**
- new concept

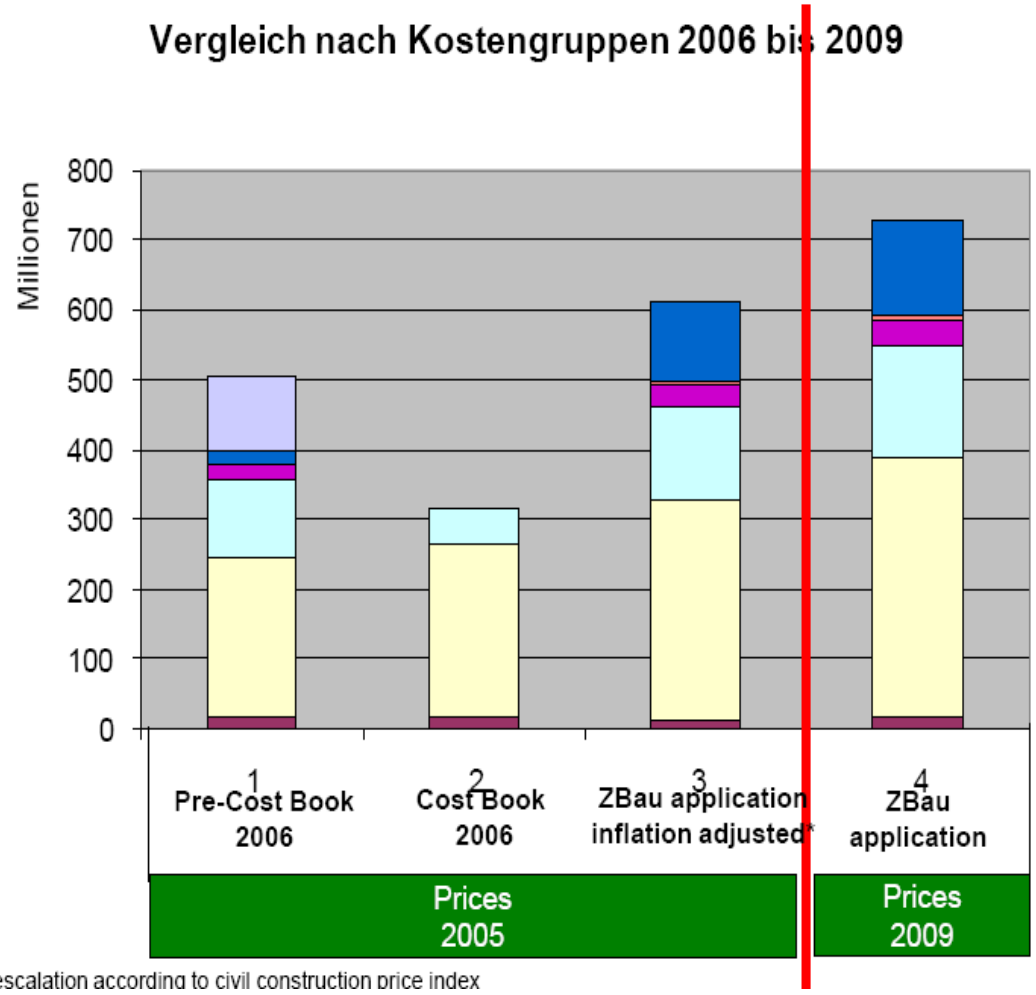
Site and Buildings Cost Review

Requested by BMBF – by Dornier Consulting & Fichtner Management Consulting
as cost evaluation resulted in 722 M€ ± 15% for the full project according DIN276



Cost Review by Dornier & Fichtner

Comparison in between cost categories of DIN 276



*de escalation according to civil construction price index

Costs not considered:
Parts of ancillary costs, Mechanical handling, air condition, IT, water supply, external lighting, access control

CC 700 Ancillary construction costs
Principal's tasks, architect/engineer services, independent expert appraisals, licensing fees

CC 600 Equipment and installations
Orientation systems, furniture

CC 500 External facilities
Land plots, roads and paths, fencing, barriers

CC 400 Structure – building systems
Energy supply, ventilation systems

CC 300 Structure – civil works
Foundation, walls, floor slabs, roofs

CC 200 Furnishing and connections
Furnishing, connection to public utilities supplies

CC 100 Property
Ancillary property costs, site clearance

Conclusions on Site and Buildings

The current construction planning status is of high quality and no fundamentally erroneous costs are indicated

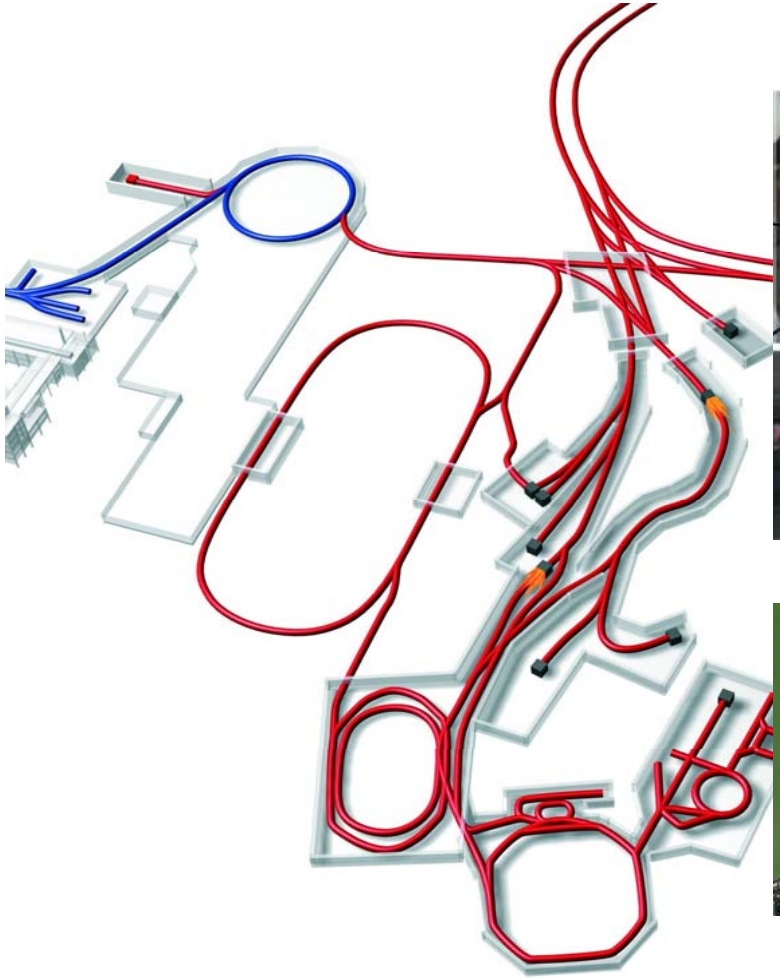
Civil construction – conclusion

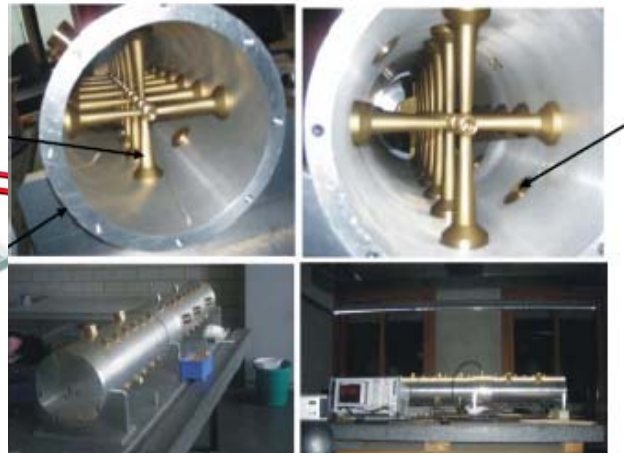
Item	Evaluation
Structure	Within their overall system context, the structure cannot be assigned to a particular type, as they are all one-of-a-kind. The lack of reference structures means they are planning-intensive.
Financeability	With the modules as designed, there is the possibility of configuring a modified start version, which would be realizable within the available budget.
Planning quality	In consideration of the ongoing planning phase of preliminary /schematic design, the present planning features a high degree of planning and cost reliability.

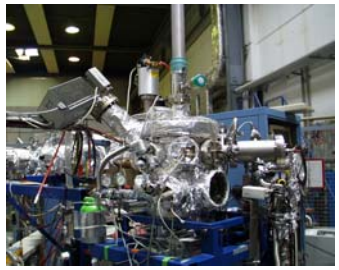
From Dornier Consulting & Fichtner Management Consulting

Cost Review Accelerators

Requested by BMBF – by Dornier Consulting & Fichtner Management Consulting based on re-evaluation of German contributions to the project w.r.t. FAIR Cost Book



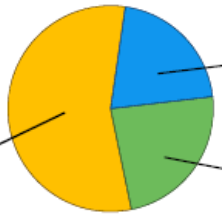




Conclusions by DoFi

The costs determined for the accelerator installations are deemed to be realistic

Accelerator – results and evaluation

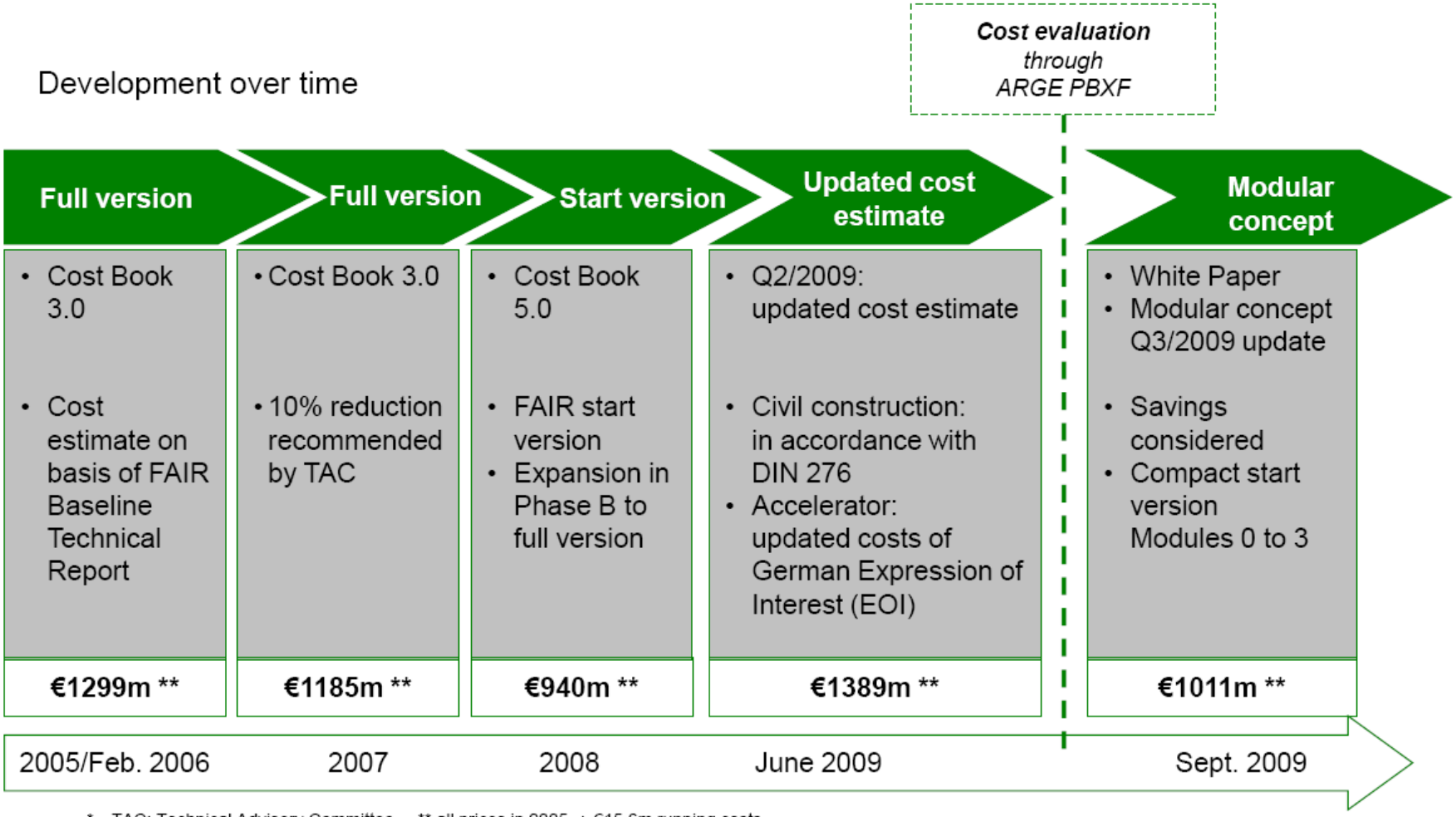
Item	Evaluation
Cost rises 2005 -> 2009	Main reasons for cost Increase: Individual aspects Technical modifications  10 % overall reduction (TAC recommendation) could not be realised Typical Price increase approx. 3% p.a.
Quality	• The modular structure together with the detailed cost determination provide a very good basis for making adjustments according to the scientific objectives and financing possibilities. • Quality and accuracy of cost determination matches the currently attainable possibilities.
Tools	• The tools for further compilation of costs and monitoring construction and installations of the accelerator are very well developed.

From Dornier Consulting & Fichtner Management Consulting

FAIR Cost Estimates

The cost estimates for FAIR have been updated several times

Development over time

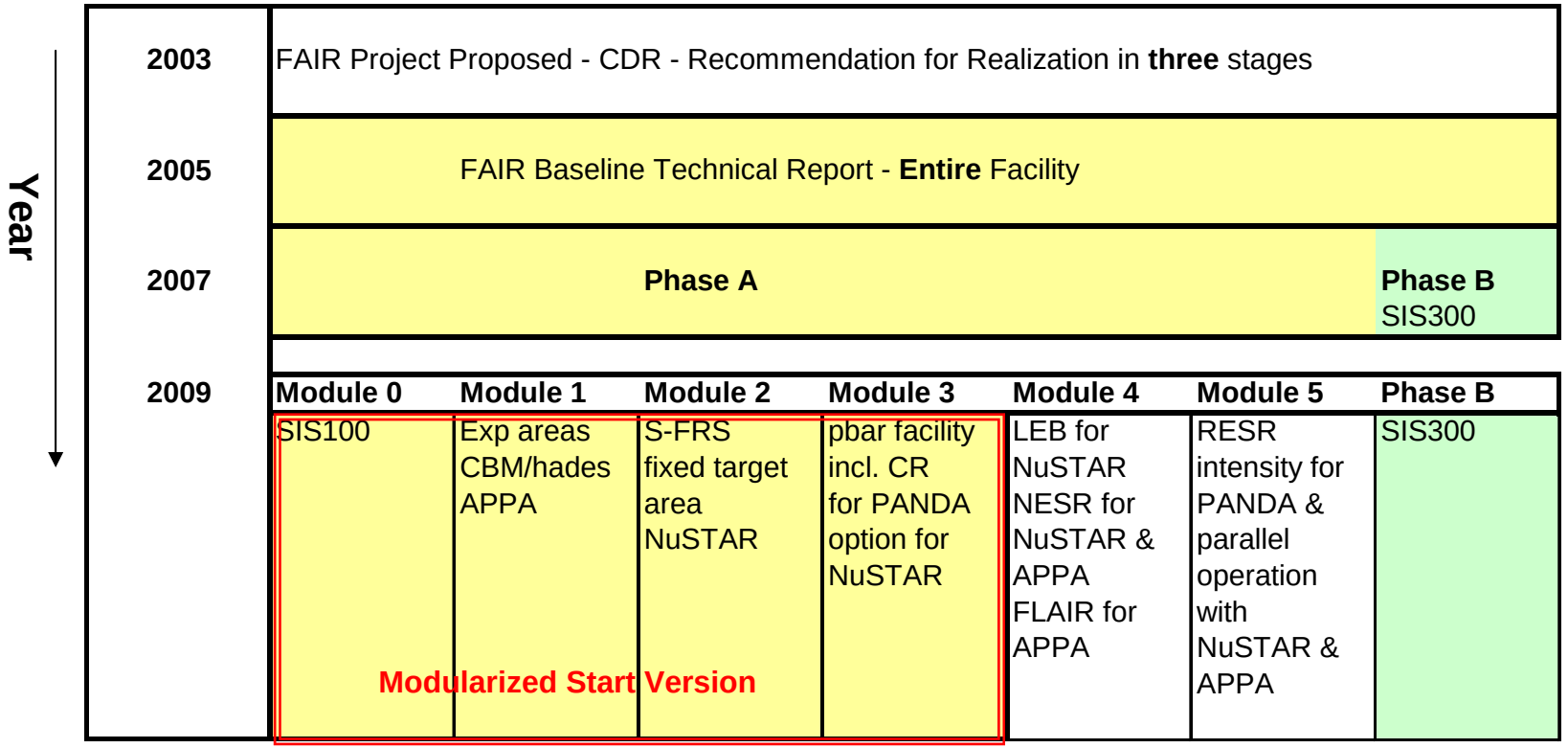


* TAC: Technical Advisory Committee, ** all prices in 2005 + €15.6m running costs

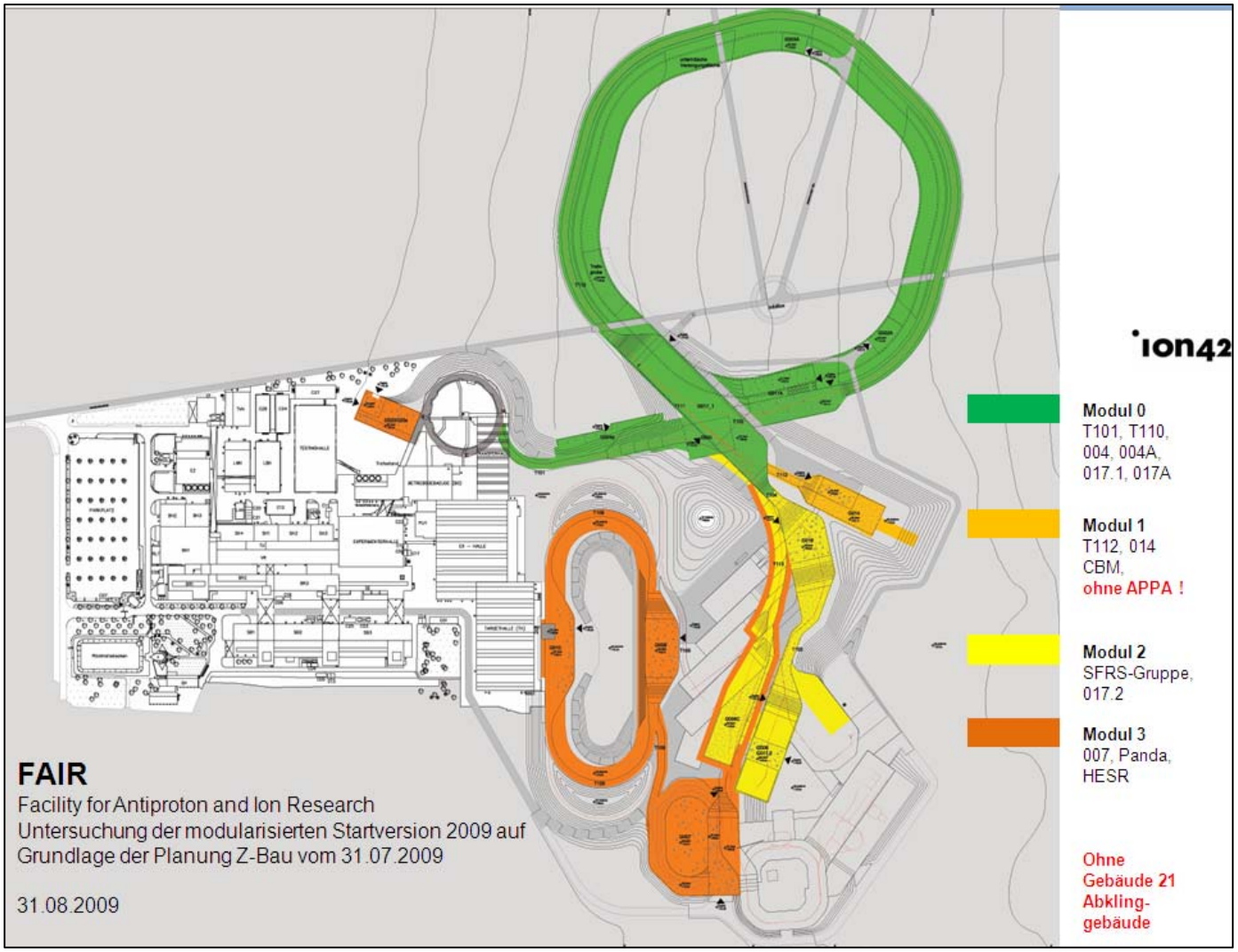
From Dornier Consulting & Fichtner Management Consulting

The Modularized FAIR Project

FAIR is composed a number of loosely coupled building blocks,
this allows a modularization, also w.r.t. to the physics program.



Modularized Start Version Modules 0 - 3



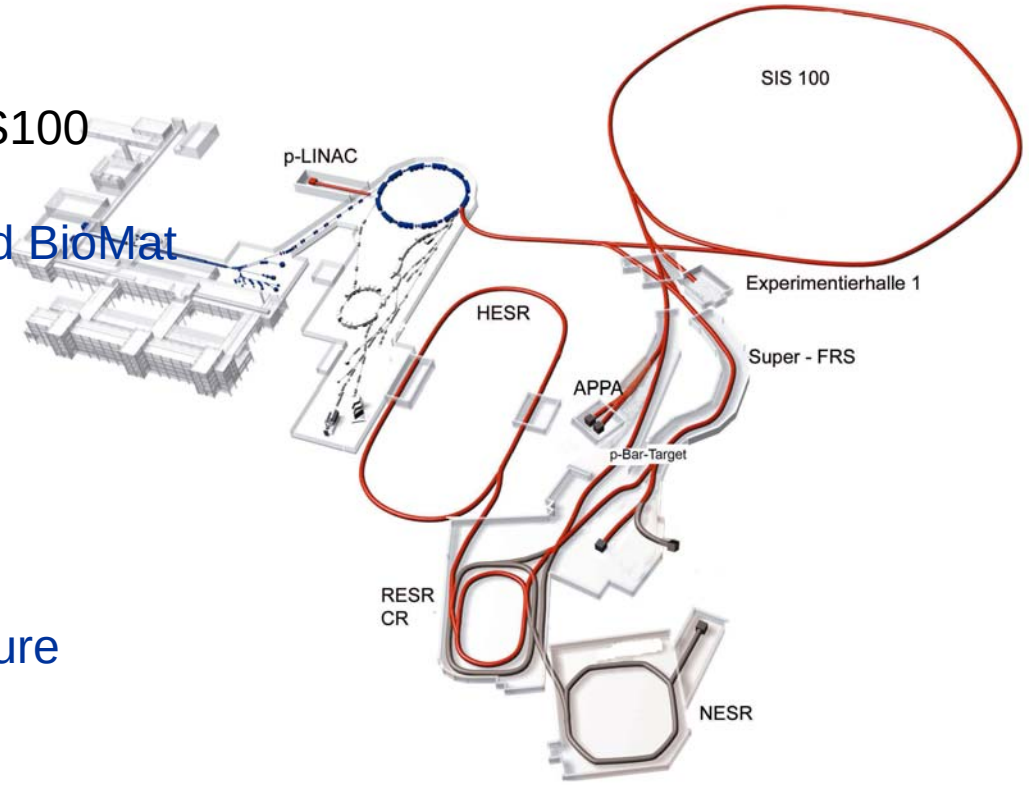
RIBs
for NuSTAR
Antiprotons
for PANDA
beams to CBM
beams to APPA

The White Paper

Intense discussion and prioritization on the international level on the first step to realize on the way for the full facility.

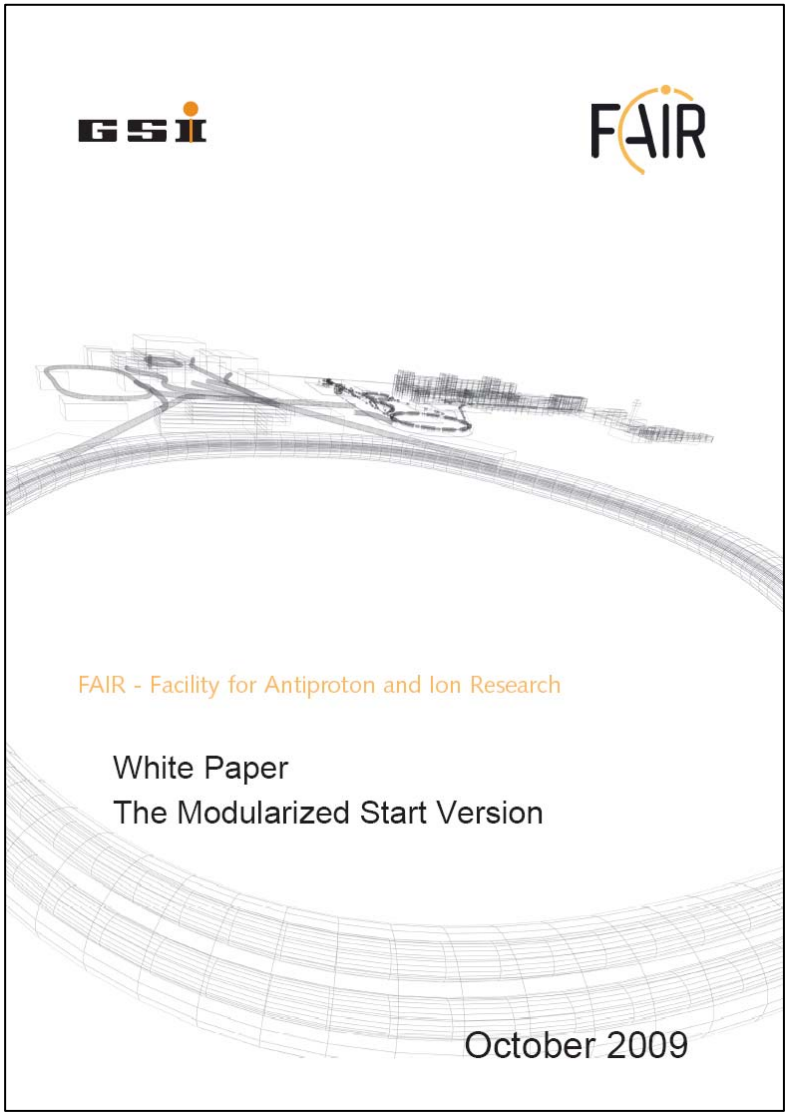
- The central accelerator: SIS100
  also serving CBM/hades & plasma, atomic physics and BioMat in a dedicated APPA-hall
- The antiproton chain
  for PANDA
- The Rare Isotope Chain
  serving NuSTAR

other modules to come in future



White Paper turned Green

- Discussion on international level together with experimenter
- De-scoping without loosing experiment collaborations
- Without sacrificing scientific excellence
- Design to budget



Firm Commitments of FAIR Partners

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**

not firm for the first batch

Kingdom of Saudi-Arabia signed the Declaration to contribute at least 1 %

Scientific Evaluation of the MSV 0- 3

Oct. 16, 2009

Review Panel:

Siegfried Grossmann,

Nigel Lockyer,

Alex Mueller,

Guenther Rosner,

and Robert Rosner

In summary, the FAIR Review Committee applauds the re-scoping of the FAIR project carried out by the project members. We believe that the major financial questions have been positively addressed, and that with the changes embodied by the Modularized Start Version, the path to FAIR is not only distinctly improved, but that the ultimate FAIR facility will actually benefit from the increased focus and refinement. It is also evident to the Committee that the revised FAIR plan has been favorably received by the participating scientific communities, who (as we understand it) fully support the Modularized Start Version.

Organizational Aspects

Decision from GSI Supervisory Board (BMBF & Hesse)

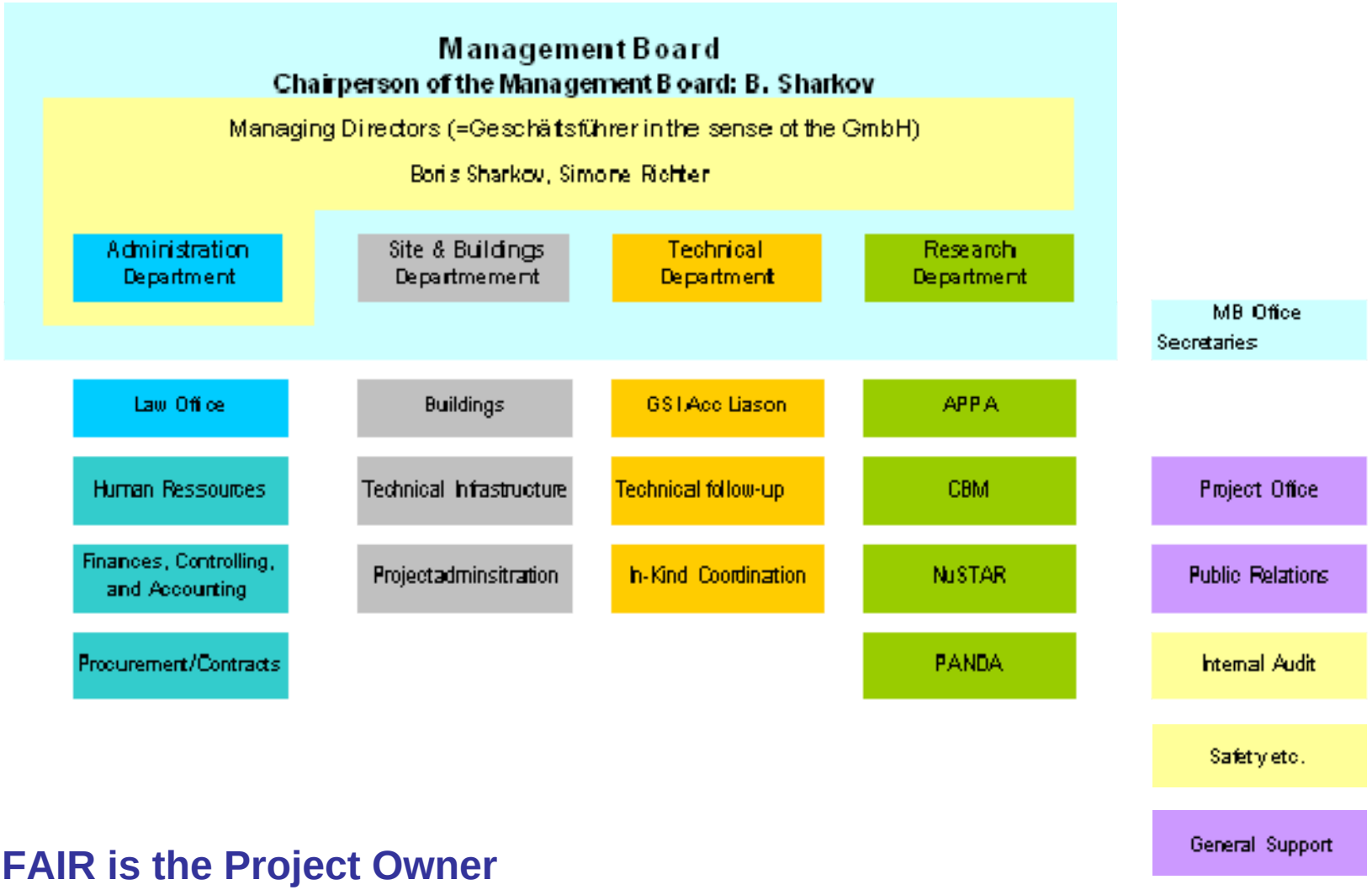
Starting Feb. 1, 2010:

- There will be a 4th managing director (Geschäftsführer) of GSI: B. Sharkov
- His FAIR Division will reflect the structure and tasks of the FAIR GmbH
- The division will be transformed into FAIR GmbH a.s.a.p.
- FAIR will be responsible for Site & Buildings
- The GSI division „FAIR TD“ will be terminated, i.e.

Storage Ring-, Synchrotron-, Magnet- and Theory-Group are redirected to GSI Accelerator Department

planning staff is redirected to the new FAIR Department.

FAIR GmbH Planned Organizational Structure



FAIR is the Project Owner

Progress in Technical Planning

Curved SIS100 dipole under test → presentation

SIS100 quads assembled

Revised Proton-Linac TDR → presentation

Collection of antiprotons in CR

Accumulation in HESR → presentations tomorrow

CDRs for Super-FRS magnets available for review

Progress in Planning on Site & Buildings

Site & Building Documents handed to authorities for approval

Announcement by Federal Government and State of Hesse
to take over 'site-related' costs at a level of 110 M€
⇒ **Those costs are no longer part of the project**

Radiation Protection Workshop

Workshop on Radiation Safety at FAIR

Date December 7th, 2009
GSI –LBH

Chair: Lyn Evans, Chairman FAIR Machine Advisory Committee

Agenda

Dec. 6th, 2009	
19:00	Meeting point at the hotel Bockshaut.
19:30	Dinner at Ratskeller in Darmstadt (by invitation only)
Dec. 7th, 2009	
10:00	Welcome - B. Sharkov, FAIR Scientific Director (des.)
10:15	Introduction to the Workshop - D. Krämer, FAIR Head of Accelerators
10:30	Radiation Safety – Legal Aspects - G. Fehrenbacher, GSI, Head of Radiation Safety Group
10: 45	Design Strategies and Workplan - G. Fehrenbacher, GSI, Head of Radiation Safety Group
11:00	Operation and Failure Conditions for the FAIR Accelerator complex - P. Spiller, Synchrotron and HEBT co-ordinator
11:20	Questions, discussion
11:40	Coffee break
11:50	Radiation Safety Studies on - SIS100/SIS300 - K.Vogt - Super-FRS - E. Kozlova - CBM cave - T. Radon - Antiproton target - K. Knie
12:50	Questions, discussion
13:00	Lunch break
14:00	Implementation of Rad. Safety in Civil Construction planning - R. Schulz, SIS100/SIS300, Super-FRS, CBM cave, Antiproton target
16:00	Questions, discussion, comments
17:15	Coffee break
17:30	Close out
18:00	End of Workshop

→ presentation

Conclusions

- The costs of the FAIR projects were reviewed
- The scope of the FAIR project was adjusted
- A “Modularized Start Version” was agreed upon together with the experiment collaborations
- The Modularized Start Version secures a swift start without sacrefircing scientific excellence and discovery potentials

  - within the current funding commitments

Preparing the Start of FAIR is on-going.