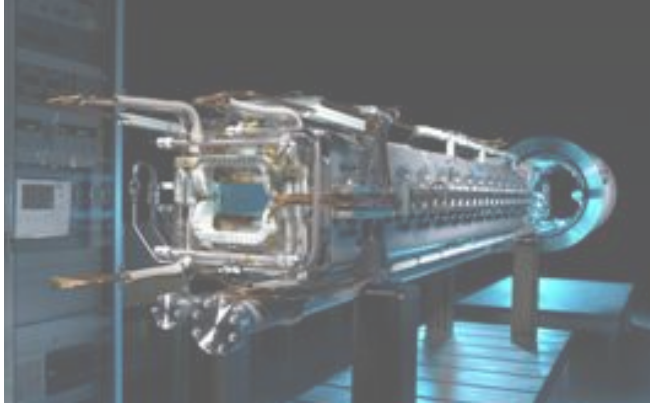




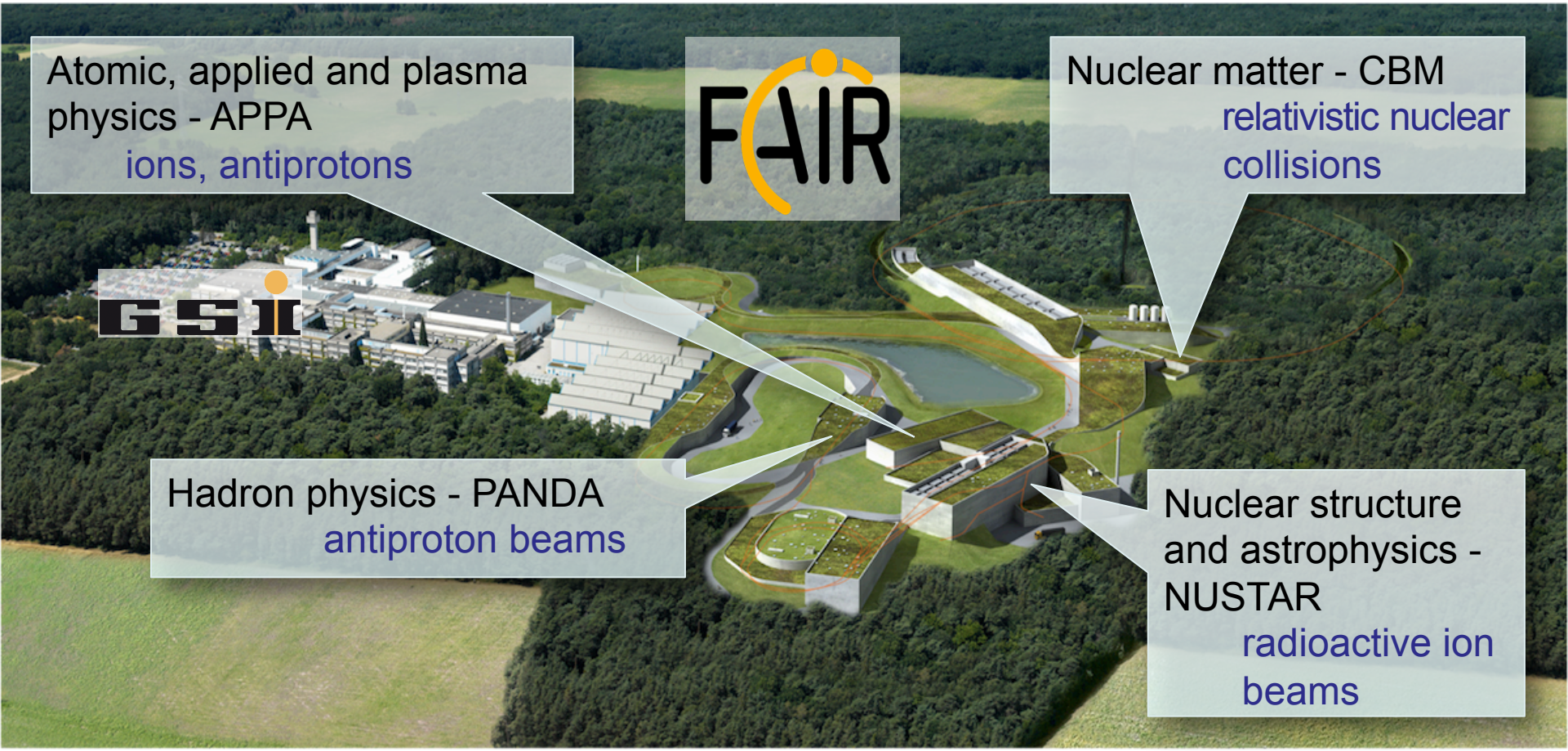
FAIR – Current Status

NUSTAR Week 2013, Helsinki

Alexander Herlert
FAIR

Finland Germany India Poland Romania Russia Slovenia Sweden France UK

Facility for Antiproton and Ion Research

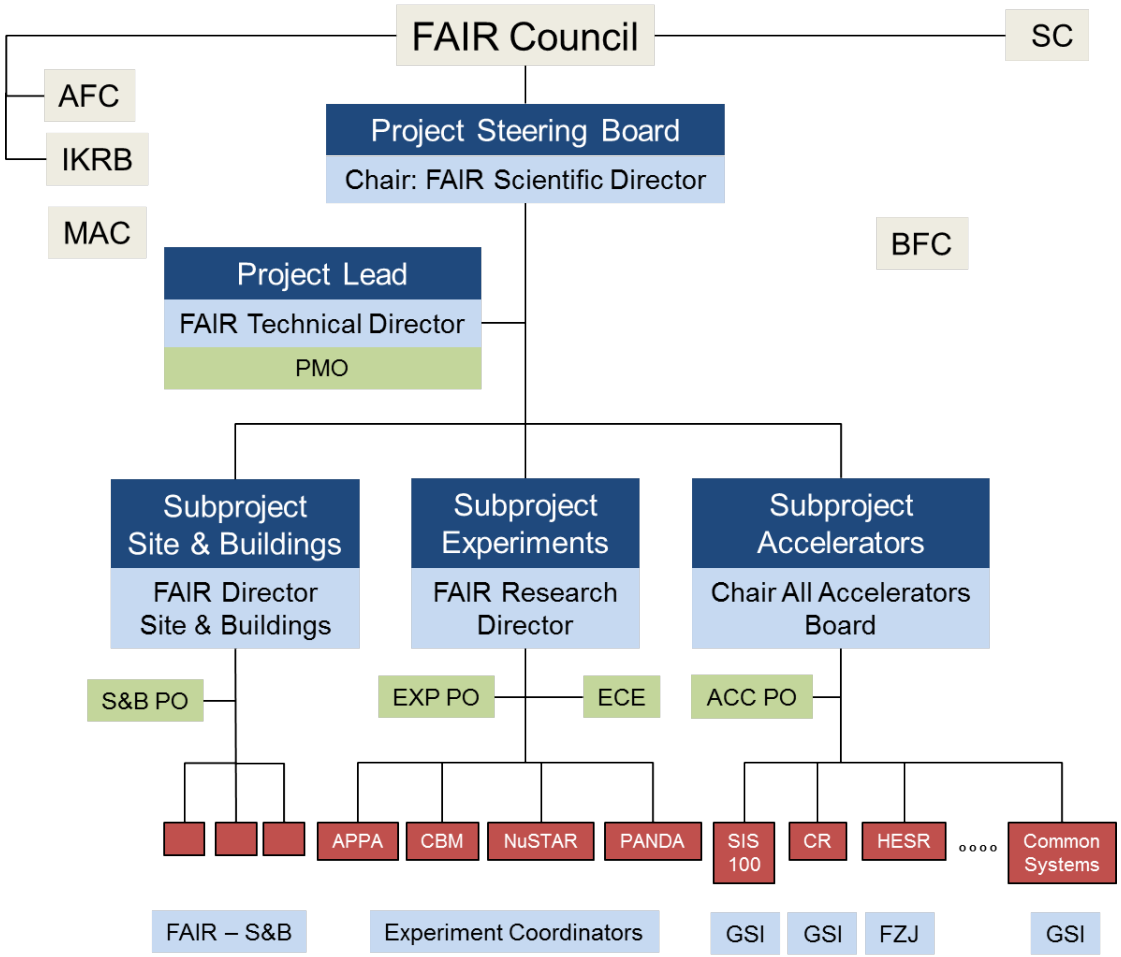


Project Organization

2 companies

- Helmholtz Centre GSI
- FAIR Europe GmbH

- Collaboration for common project
  - ➢ FAIR Project

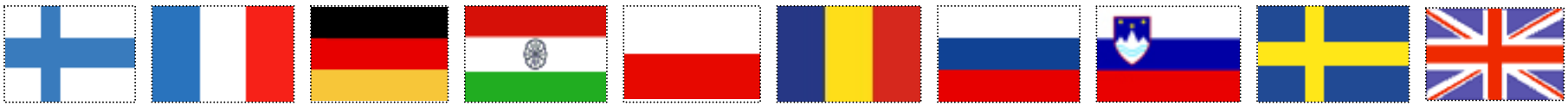


History: FAIR GmbH

Steering company

International Convention

Presently 10 partners:



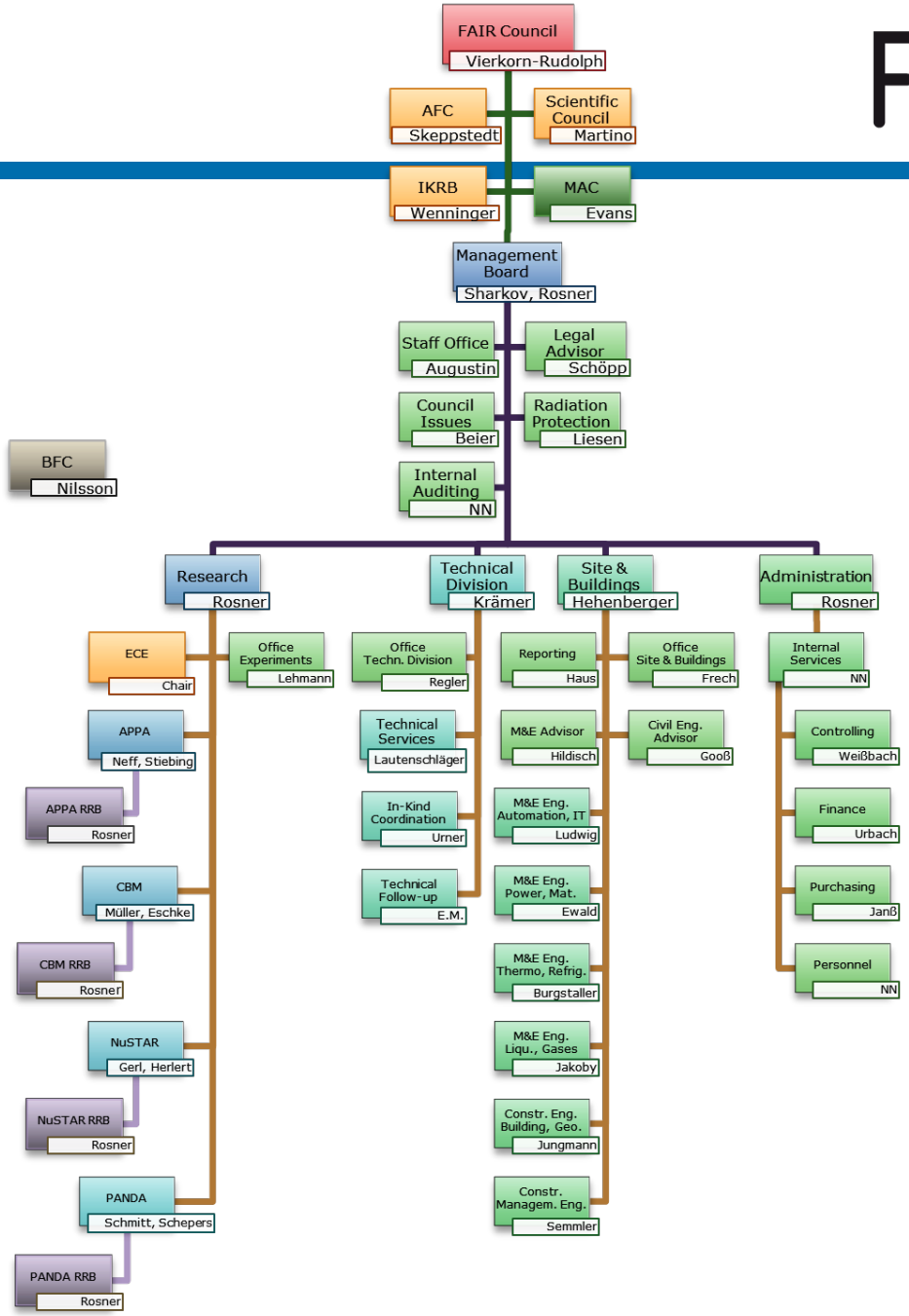
FAIR GmbH

Governed by Council

- Representatives of
  - 9 international shareholders
- Chaired by
  - Beatrix Vierkorn-Rudolph

Further committees

- Administrative and Finance Committee (AFC)
- In-Kind Review Board (IKRB)
- Machine Advisory Committee (MAC)



FAIR GmbH Directorate

- FAIR Council — Vierkorn-Rudolph
  - AFC — Skeppstedt
  - Scientific Council — Martino
  - IKRB — Wenninger
  - MAC — Evans
  - Management Board — Sharkov, Rosner
    - Staff Office — Augustin
    - Legal Advisor — Schöpp
    - Council Issues — Beier
    - Radiation Protection — Liesen
    - Internal Auditing — NN
    - Research — Rosner
    - Technical Division — Krämer
    - Site & Buildings — Hehenberger
    - Administration — Rosner
- BFC — Schuch

FAIR GmbH Research Division

Experiment Coordinators

- in place

Expert Committee Experiments

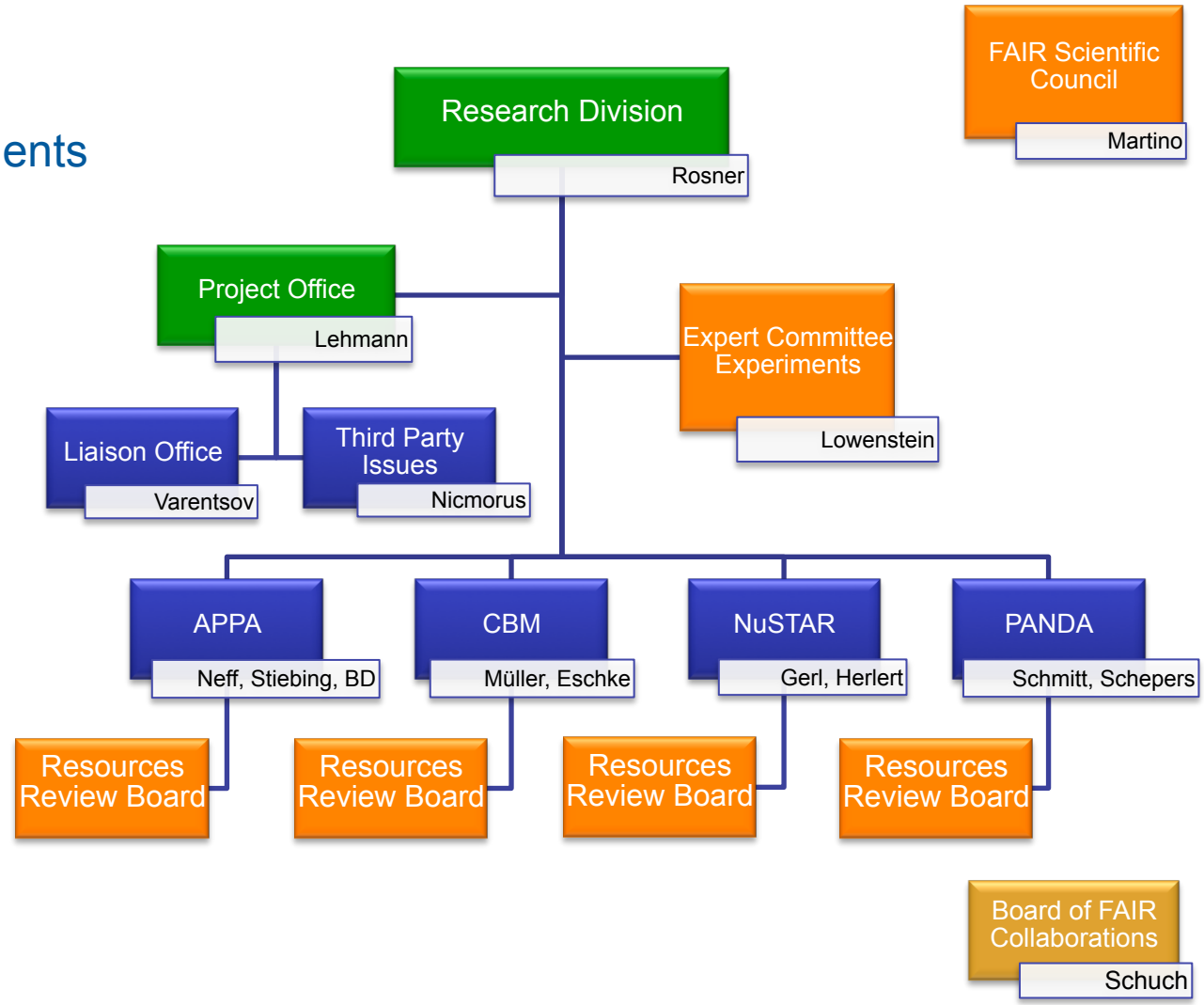
- 3rd meeting
  7 Jan 2014

Scientific Council

- 3rd meeting
  end of 2013

Resources Review Boards

- 2nd meeting in Feb 2014



Helmholtz Centre GSI

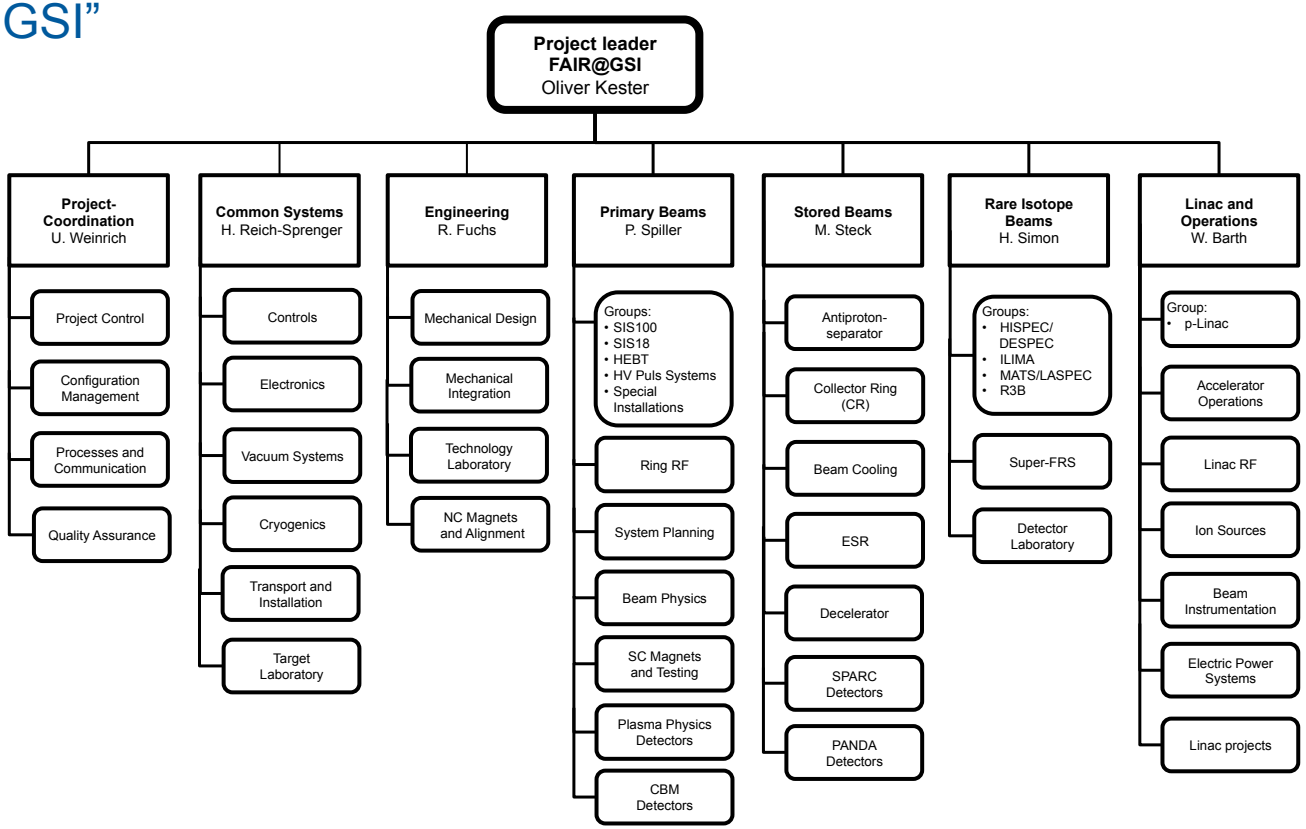
GSI has been restructured

- Main focus FAIR Project
- Head of GSI Council:

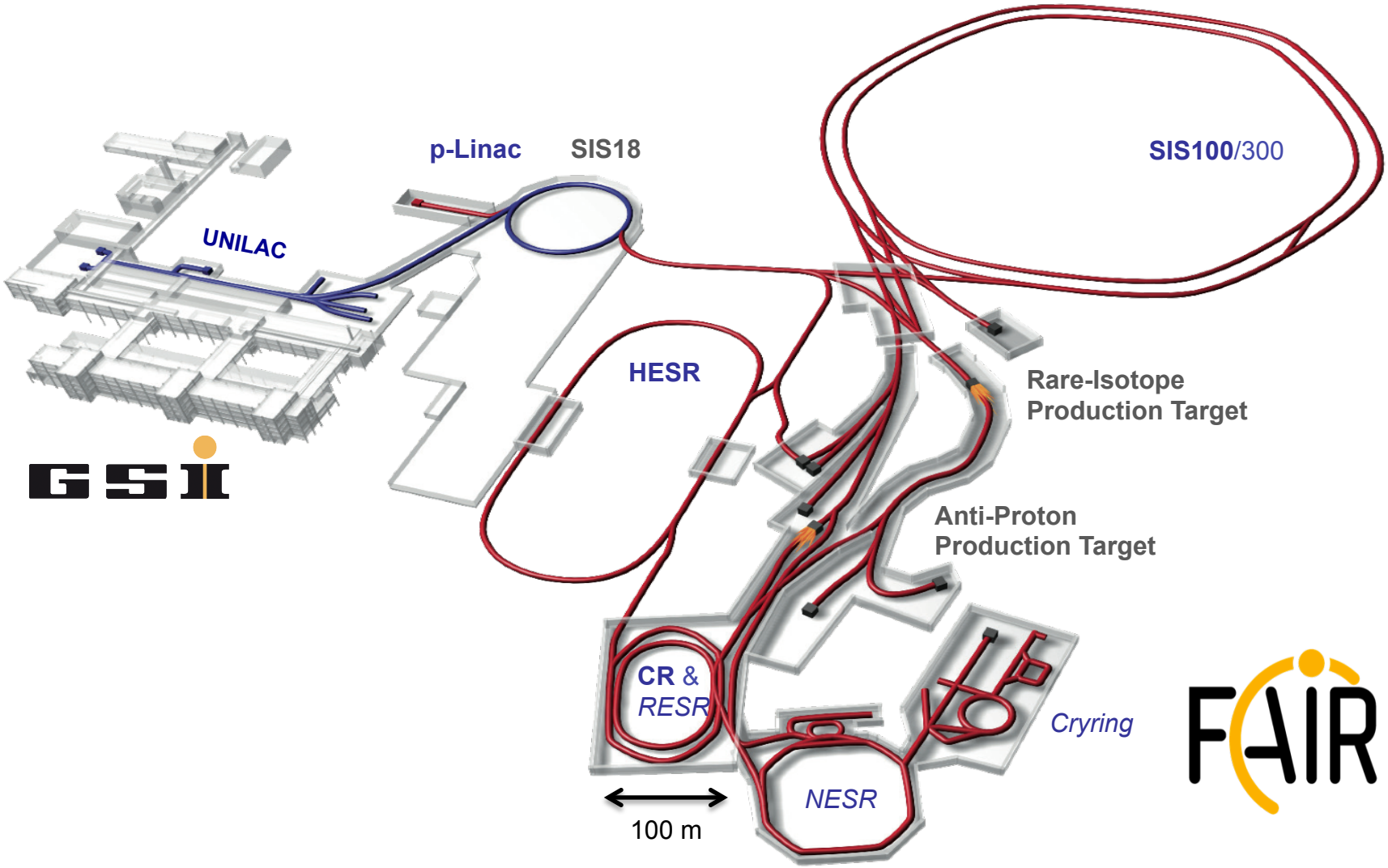
  Beatrix Vierkorn-Rudolph
- GSI managing directors: Horst Stöcker, Peter Hassenbach

Project lead “FAIR @ GSI”

- Oliver Kester



FAIR Project



Staging

Start Version Phase A (SIS100)						Phase B (SIS300)
Modularised Start Version						
Module **0**	Module **1**	Module **2**	Module **3**	Module **4**	Module **5**	
SIS100	**Exp. halls** *CBM & APPA*	**Super-FRS** *NUSTAR*	**Antiproton Facility** *PANDA (APPA, NUSTAR)*	**LEB, NESR, FLAIR** *NUSTAR & APPA*	**RESR** *PANDA, NUSTAR & APPA*	

2017/18

Costs MSV

Accelerators and personnel (including Super-FRS)	502 M€
Civil construction (excluding site related costs)	400 M€
FAIR contribution to experimental end stations *	78 M€
FAIR GmbH personnel & running until 2018 (>8 years)	47 M€
Grand Total MSV, Modules 0 - 3	1027 M€

in 2005 €
(inflation escalation until 2018: ca. +50%)

* Total experimental end stations (excluding Super-FRS): ca. 193 M€ (2005)

Funding Modules 0-3

Contracting Party	Contribution (in 2005 M€)
Finland	5.00
France	27.00
Germany	705.00
India	36.00
Poland	23.74
Romania	11.87
Russia	178.05
Slovenia	12.00
Sweden	10.00
Total	**1.008,66**

- **All numbers in 2005 €**
  escalation until 2018 ca. +50%
  i.e. about € 1.6 billion
- Discussions with Spain and Italy on-going
- Interested parties
  - ESA, Saudi Arabia, Netherlands, China, Turkey, Brazil, Ukraine, S Korea, Japan, USA

Shareholder News

- Poland
  - Jagellonian University ratified 14/3/2013
- France
  - National Assembly ratified on 25/7/2013
  - Expecting decree by president soon

New Associate Member: UK

Funding

German Grants

- 50+146 M€ GSI
- +Verbundforschung
- 65 M€ HESR
- 53 M€ FAIR GmbH

Funding

526 M€ for construction

- largest BMBF grant ever

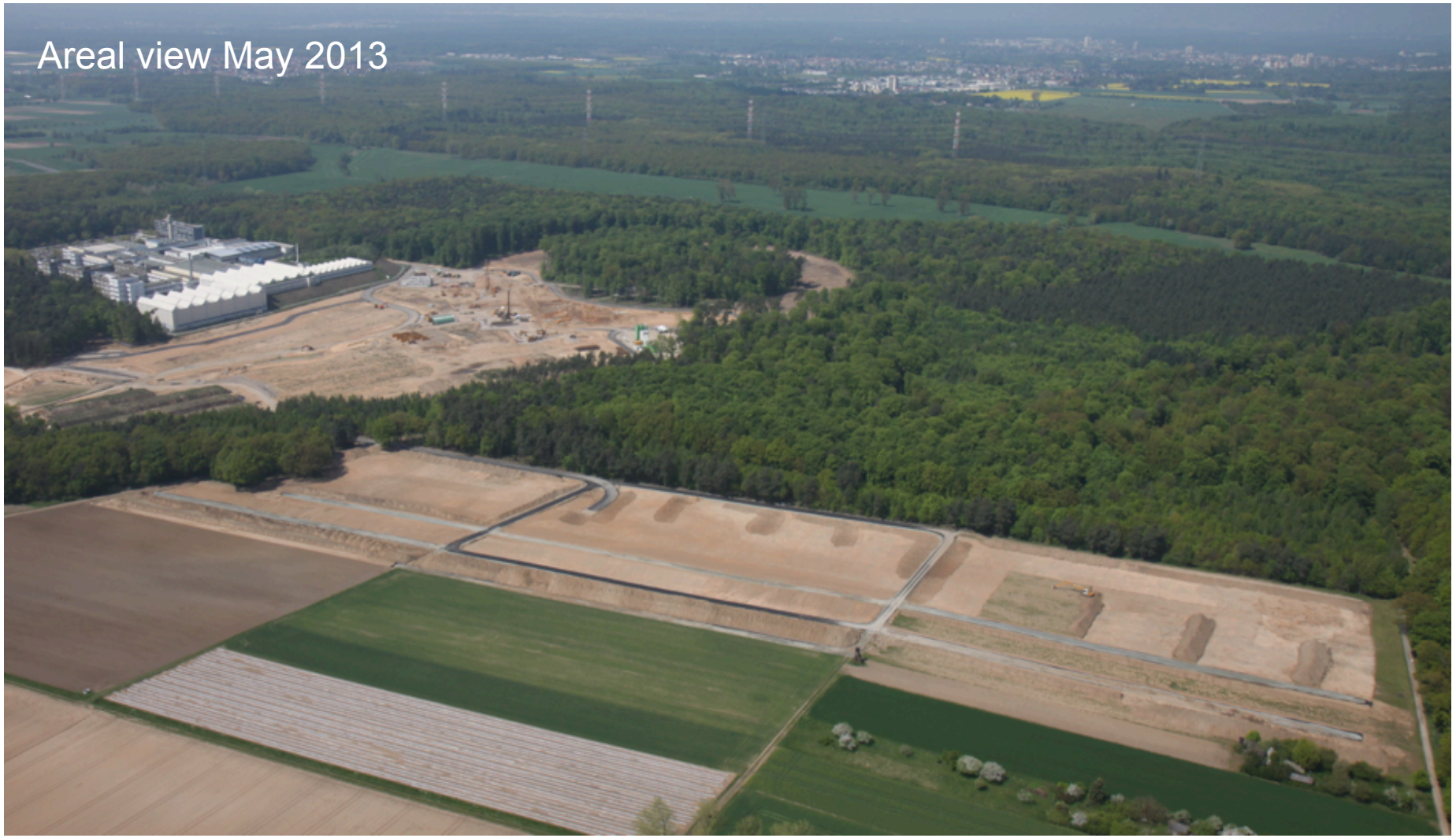
Presented by Hessian State Secretary Ingmar Jung and Federal Parliamentary State Secretary Dr. Helge Braun (1st and 3rd from left)

Licensing Applications / Permits

General construction permit for all buildings by city of Darmstadt: **Oct 2012**

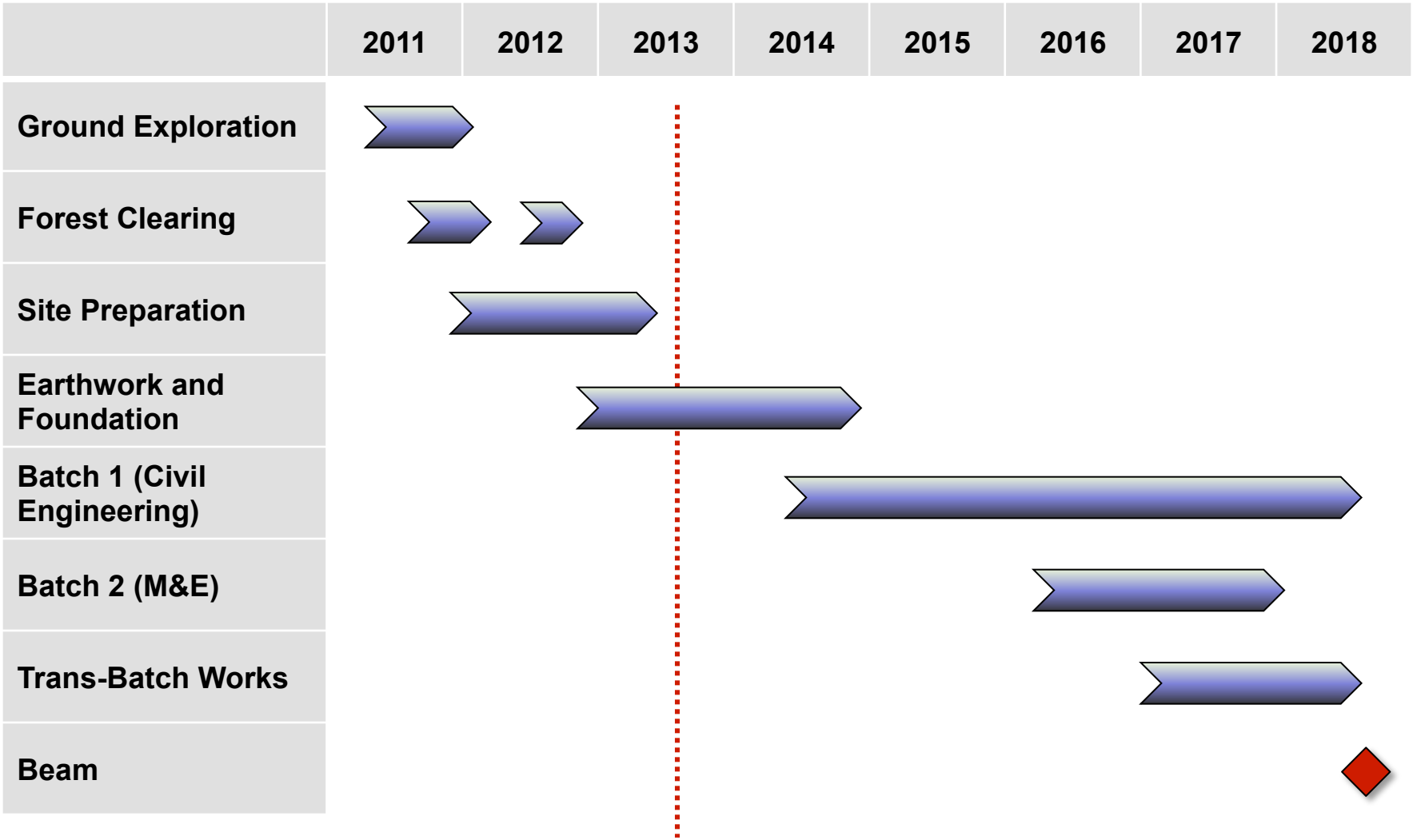
Presented by Brigitte Lindscheid, Head of Darmstadt's Construction Department

Civil Construction



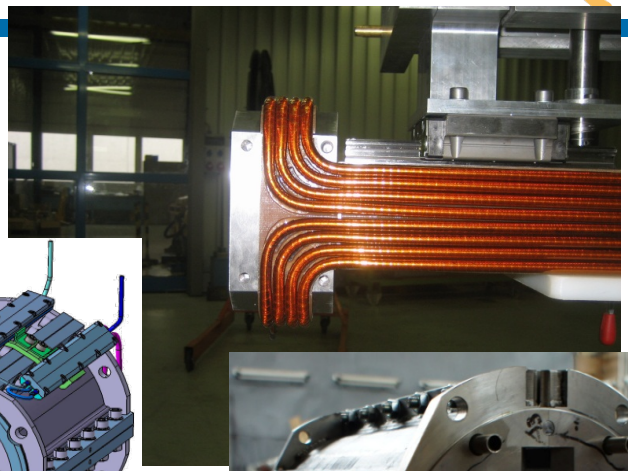
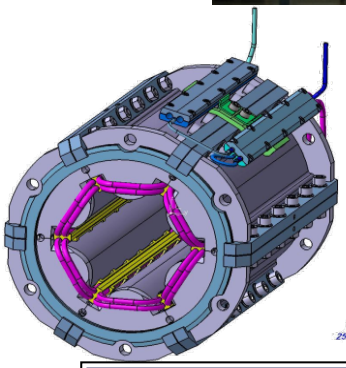
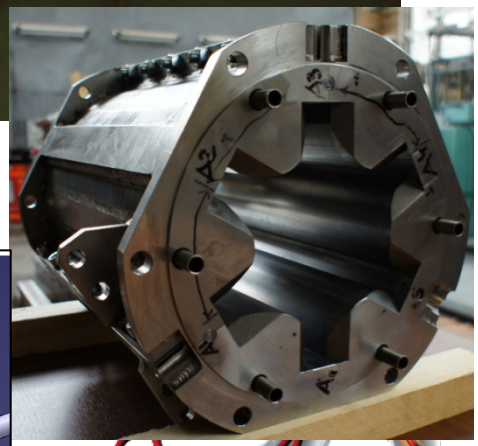
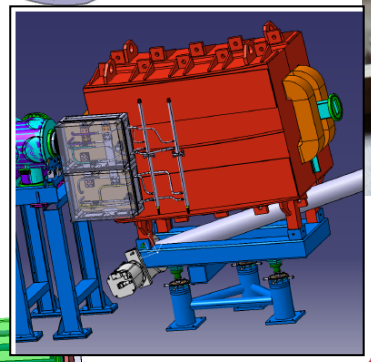
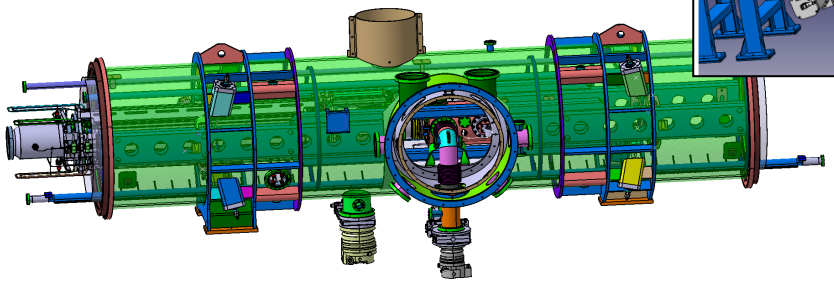
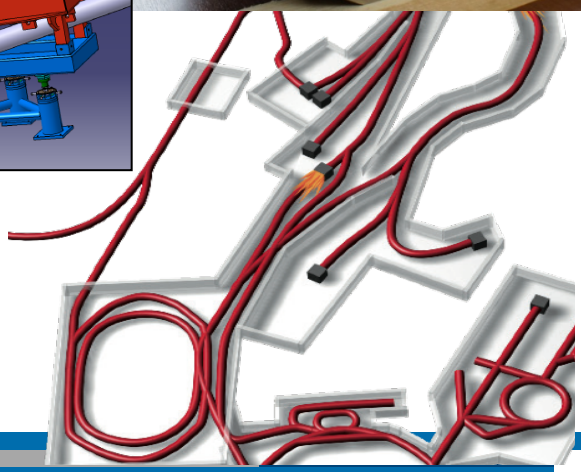
Civil Construction

Roadmap Civil Construction

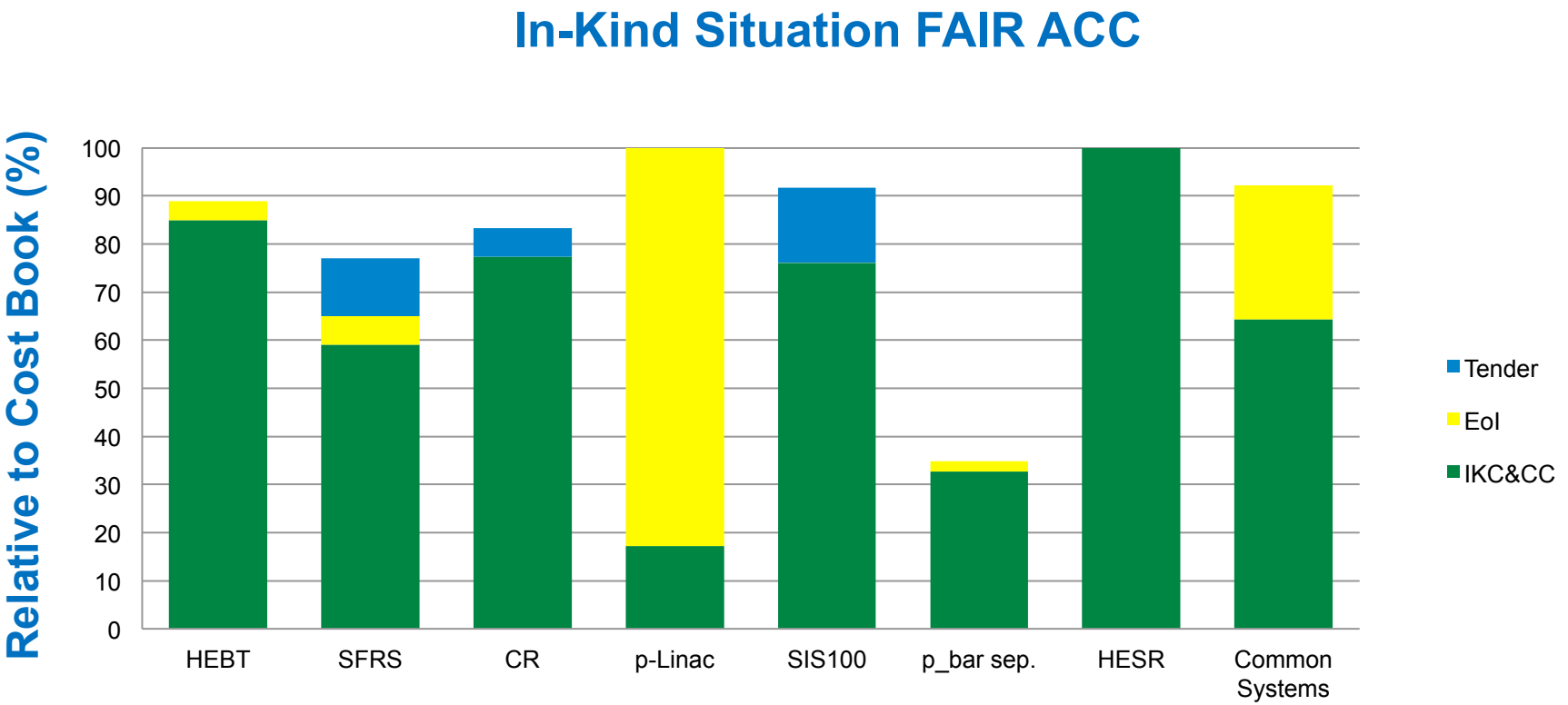


Accelerator's Progress

- SIS 100 dipoles
  - First series delivered & tested
- SIS 100 sextopoles
  - Dubna prototype
- HEBT magnets
  - Efremov, St Petersburg
- SIS 100 quadrupoles
  - JINR, Dubna
- Complete Collector Ring
  - Budker
- "Forgotten beam line" in work
- Timing optimisation

In-Kind Contributions Accelerators



Coverage: 78%by IKC&CC incl. IKRB proposals, 9% by approved tenders, 10% further EoI

Total: 87% coverage

Expected EoIs by GER, FRA, IND, POL, FIN, ROM

Status Experiments

Technical Design Reports

Collab	Total Approved	Approved ECE 1	Submitted ECE 2	Announced for 2013	Total expected
APPA	1	1	2	3	**13**
CBM	2	0	3	1	**11**
NuSTAR	7	3	1	7	**22**
PANDA	4+1?	2	2	7	**16**
Total	**14+1?**	**6**	**8**	**18**	**62**

In preparation

- Collaboration Contracts, General Specifications
- Common timelines for all experiments
- New risk assessment/management
- General Conditions for Experiments
- Cost Book

Construction MoUs

- To be agreed upon in 2014

Resources Review Boards

To negotiate

- Funding, in particular, missing funding
- Construction MoUs
- Operations Budget during commissioning and running phase of experiments

One RRB for each FAIR pillar

- APPA, CBM, NUSTAR, PANDA

Consisting of

- Representatives from all funding agencies involved in the Collaboration
- Collaboration Management
- FAIR Management

Meetings (jointly)

- Once or twice a year
- Organised by FAIR Research Division
- Reports / assessments from
  - Spokesperson
  - ECE Chair
- 1st meeting 4-5 July 2013
  - Successful and very constructive
- 2nd meeting Feb 2014

Contributions through FAIR's Budget

78M€ funded through FAIR's budget

- Procedure accepted by Council on 3 July 2013
  - Partner informs FAIR
  - TDR accepted after ECE recommendation
  - Spokesperson identifies Cost Book entry – in detail!
  - If not fully covered -> RRB
  - If fully funded, FAIR -> Council
  - In-Kind or Collaboration Contract is negotiated
- In practice (future)
  - Unambiguously define work packages (PSP) and assign costs (Cost Book)
  - Prepare draft contract and agree within Collaboration
  - If all is settled -> Request Council decision

FAIR Operation Cost at Runtime

OC WG established by AFC on 15/5/2012

- Members of the OC WG:

  One representative from every FAIR partner

  The FAIR project management

- Chairmen

  AFC Chair and Deputy, Örjan Skeppstedt and Bernard Dormy

- Meetings

  27-28 June 2012, 12-13 Sept 2012, 12-13 Mar 2013, 15-16 Oct 2013

Remit:

- The OC WG shall, for FAIR operation at full luminosity in **2020**:

  Identify the items of the operation cost, e.g.

  cost of personnel, energy, maintenance for accelerators, campus infrastructure, ***experiments and research work***

  Discuss reasonable ways of sharing the operation costs

Operation Cost at Runtime 2020

Entry:			M€	Comment
I	**Material and Expenses (M€)**		**133.5**	
I.1	**Goods, consumables and supplies**		**68.3**	
I.1.1	Accelators:			
I.1.1.1	Operation of accelerators		23.0	
I.1.1.1.1	Accerator R&D project		6.8	
I.1.2	Research		1.0	
I.1.2.1	APPA		0.6	
I.1.2.2	ESR&Cryring		0.5	
I.1.2.3	CBM		2.4	
I.1.2.4	NuSTAR		2.3	
I.1.2.5	PANDA		3.0	
I.1.2.6	EXP R&D projects		21.0	
I.1.2	Other Projects		0.0	e.g. upgrade of the facility
I.1.3	Safety, health, environment		1.7	
I.1.4	Data handling		4.0	
I.1.5	Site& housing		2.0	
I.1.6	Other		0.0	
I.2	**Electrictiy, heating, gas and water**		**56.1**	
	Energy, heating, gas and water			
		Facility & Accelerators	48.3	
		Data handling	1.8	
		APPA	0.4	
		ESR&Cryring	2.2	
		CBM	0.5	
		NuSTAR	0.7	
		PANDA	2.3	
	[For information only: Standby Mode: energy, gas, water			
		Facility	3.9	
		Data handling	1.1	
		Experimental areas]	0.5	
I.3	**Infrastructure maintenance**		**9.1**	
I.3.1	On site		3.1	
I.3.2	Industrial services (service contracts)		3.0	
I.3.3	Repair and maintenance (service contracts)		3.0	
I.4	**Other**		**0.0**	e.g. new buildings/ campus development
II	**Personnel (M€)**		**104.2**	
II.1	**Basic salaries (M€)**		**101.0**	
		100 FTE Management and Admin.	9.4	
		377 FTE ACC	35.4	
		45 FTE ACC R&D	4.2	
		90 FTE Tech. Infrastructure	8.4	
		340 FTE Research Divison; incl. FTE Tech. Infrastructure EXP	31.9	
		125 FTE Workshops & Computing	11.7	
II.2	**Allowances (M€)**		**1.2**	
	Non residents		0.4	
	Family allowances		0.0	
	Special allowances		0.0	
	Overtime		0.5	
	Other		0.3	
II.3	**Social contributions (M€)**		**0.0**	
II.4	**Pension fund (M€)**		**0.0**	
II.5	**Health insurance (M€)**		**0.0**	
II.6	**Taxes/Fees (M€)**		**0.0**	
II.7	**Fellow program (M€)**		**2.0**	
	Total (M€)		**237.7**	

Numbers vetted

- for building maintenance & accelerators operation by a subgroup of MAC
- for Tier 0 computing by an *ad hoc* expert committee
- for research by ECE

Results:

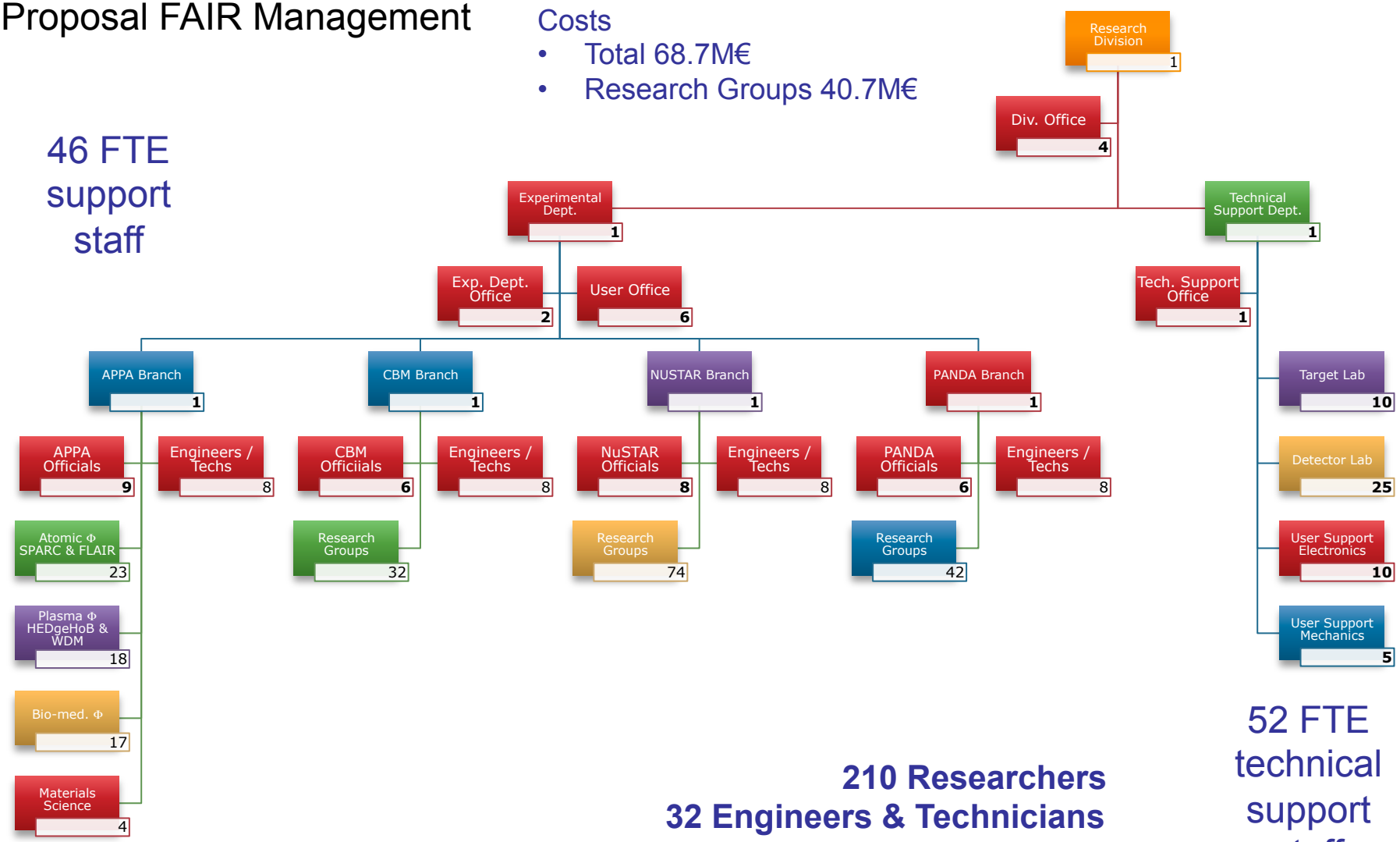
- Infrastructure maintenance
- Accelerators operation
- Tier 0 computing
- In line with estimates

Research Division in 2020

Proposal FAIR Management

Costs
- Total 68.7M€
- Research Groups 40.7M€

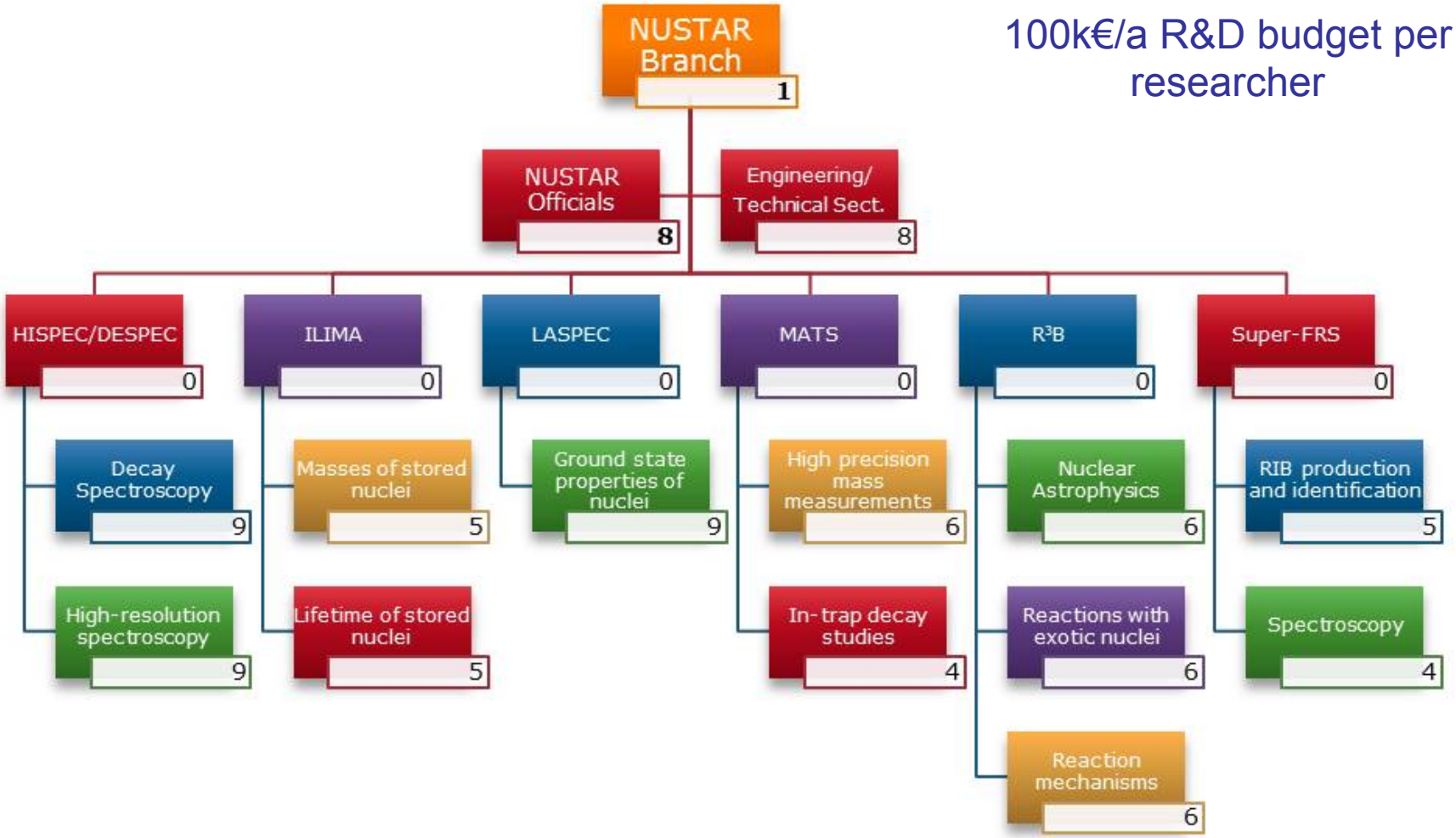
46 FTE support staff



210 Researchers
32 Engineers & Technicians

52 FTE technical support staff

NUSTAR In-House Research



100k€/a R&D budget per researcher

Comparison with Other Labs

Nuclear/Particle Physics	Category	% In-House Researchers	Comment
LHC exp., CERN, Switzerland	International	6-9%	Authorised by lab's management
Nuclotron, JINR, Russia	International	50%	Private communication Dir. Nuclotron (Kikelidze)
DESY, Germany	National	25%	Authorised by lab's management (data from 2010)
TRIUMF, Canada	National	20% (NP) 30% (PP)	Authorised by lab's management
JLab, USA	National	13.4%	Authorised by lab's management
RIKEN, Japan	National	29%	Priv. comm. Hide Sakai
MAMI, Germany	National	44%	Authorised by lab's management
ANL, USA	National	30%	Authorised by lab's management
NSCL, USA	National	42%	Priv. comm. Dir. (Bollen)
J-PARC, Japan	National	10%	Authorised by lab's management
FRIB, USA	National	20%	Planned, Priv. comm. Dir. (Bollen)
FAIR, Germany	**International**	**12%**	**requested**
Synchr. Rad. Lab., ESRF, France	International	7%	Public data (2011)

Status Evaluation Process

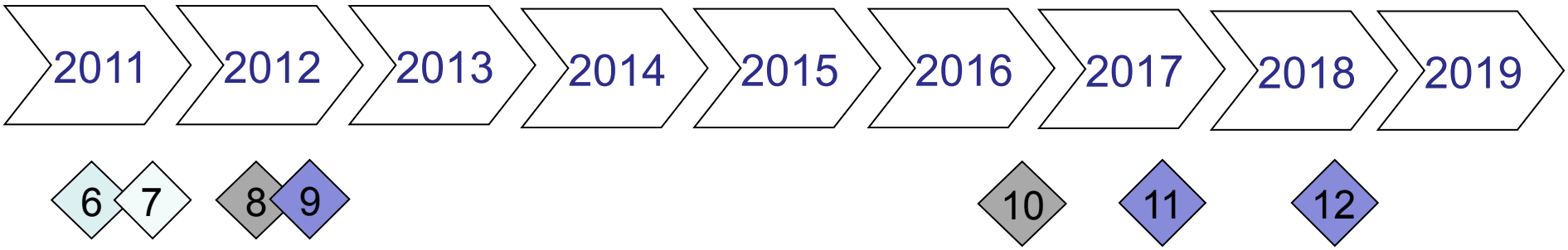
The Expert Committee Experiments, ECE is currently circulating a written report

- Need for Research Division at FAIR in 2020 obvious
- Size rather at the lower end than too high
- Report to be submitted to OC WG of AFC

OC WG will discuss the report

- Upcoming meeting 15-16 Oct 2013
- Feedback to AFC 16-17 Oct 2013

Timelines



- 6 Submission building permits
- 7 Site preparation
- 8 Civil construction contracts
- 9 Building of accelerator & detector components
- 10 Completion of civil construction work
- 11 Installation & commissioning of accelerators and detectors
- 12 Data taking