



SuperB. Status of the machine

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on behalf of the SuperB accelerator team



Status

- In 2012 a new structure of the accelerators division has been provided. At the same time international collaborations with different institutes are in progress.
- The first step was to take stock of the status of the accelerator design after the publication of the SuperB Progress Report
- This enables us to provide a list of open points to be studied, to identify the necessary resources and to set up the project organization
- After the costing activity, at present we are working to produce an engineering footprint of the machine. This is being worked out in parallel with the different machine studies and the TDR.
- This methodology was chosen given the different temporal and manpower constraints



Accelerator organisation

1 Technical coordinator.

Two departments: Accelerator and Technical

Accelerator Dpt: 10 Groups.

The groups leader should assure the coordination of different Working Groups to address the remaining major open questions. We identified 11 WG for the main rings and 6 WG for the injector. In parallel we started with the specifications of the systems that have already been defined. A Working Group is studying the integration of an XFEL into the SuperB complex.

This structure will be re-organised when we will pass from TDR to procurement, production and integration phase.

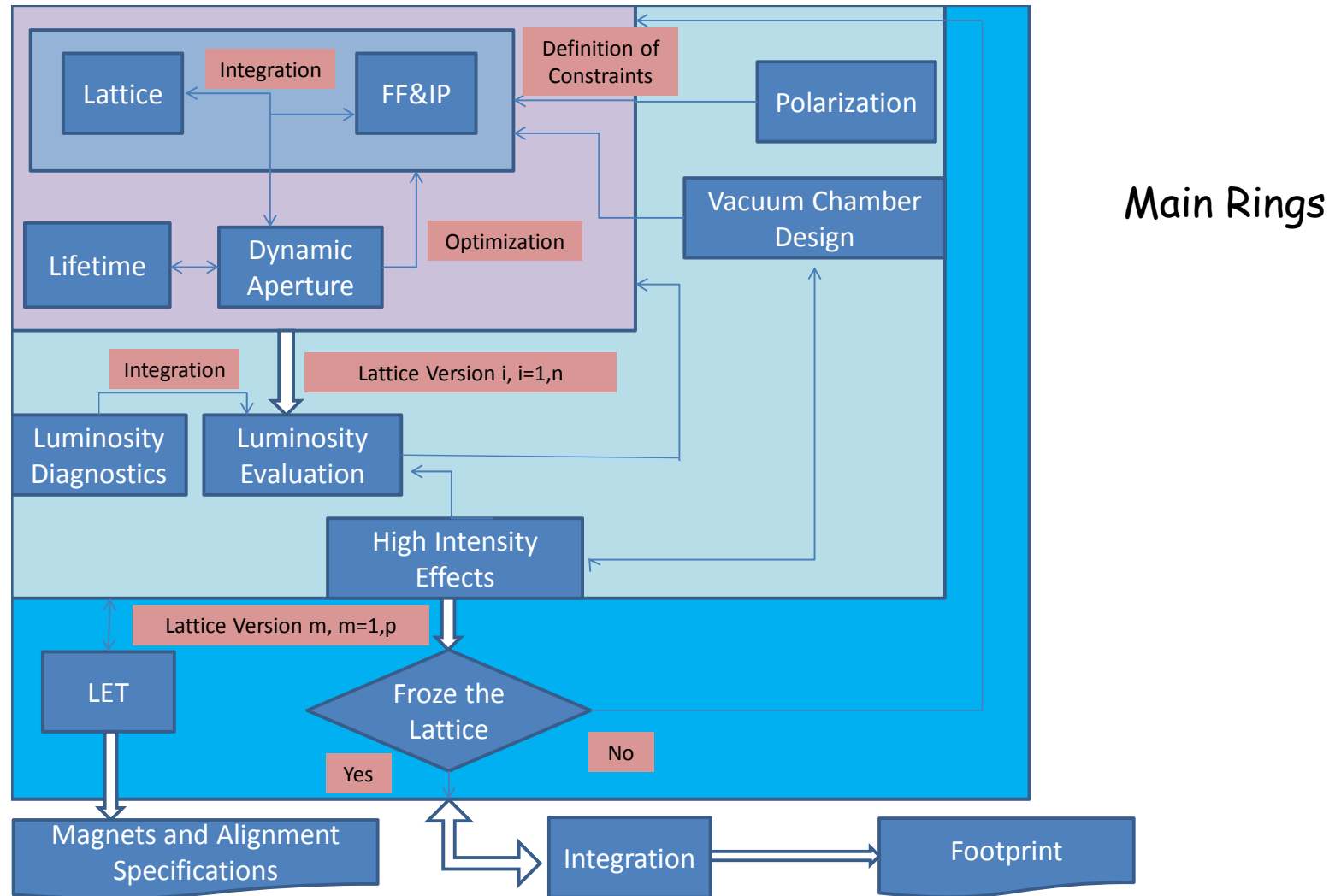


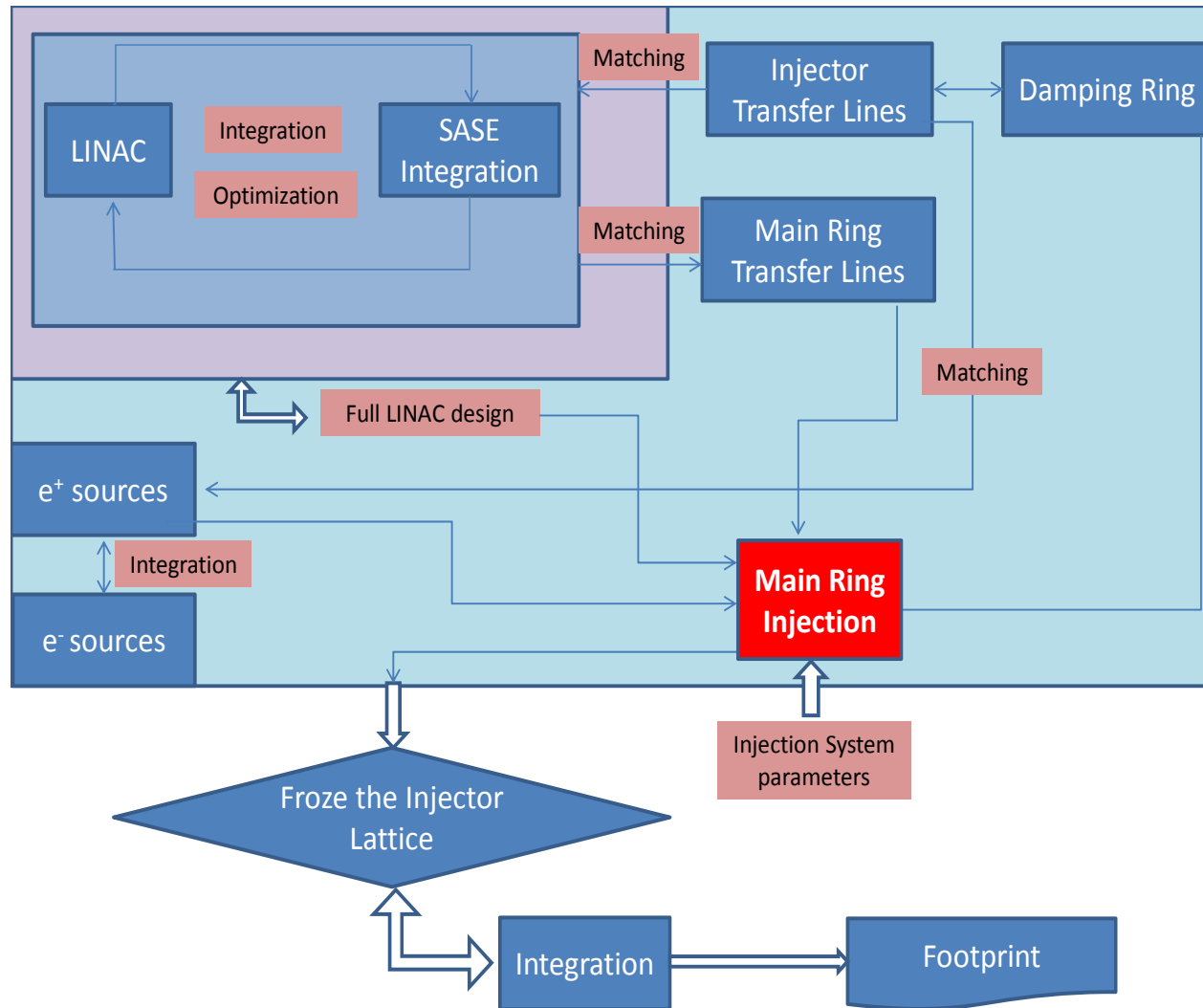
- **WG 1. e^- polarised gun and polarimetry**
- **WG 2 Injector start to end simulations**
- **WG 3 SASE Integration.**
- **WG 4 e^+ source**
- **WG 5 Damping Ring.**
- **WG 6 Transfer Lines and injection**



- **WG 1 Main Rings Lattice.**
- **WG 2 Low Emittance Tuning and Errors.**
- **WG 3 Final Focus and Interaction point.**
- **WG 4 Dynamic Aperture.**
- **WG 5 Luminosity.**
- **WG 6 Luminosity monitor and diagnostics.**
- **WG 7 Lifetime.**
- **WG 8 Polarization.**
- **WG 9 High intensity effects.**
- **WG 10 Vacuum Chamber design.**
- **WG 11 Integration.**

Work Flow

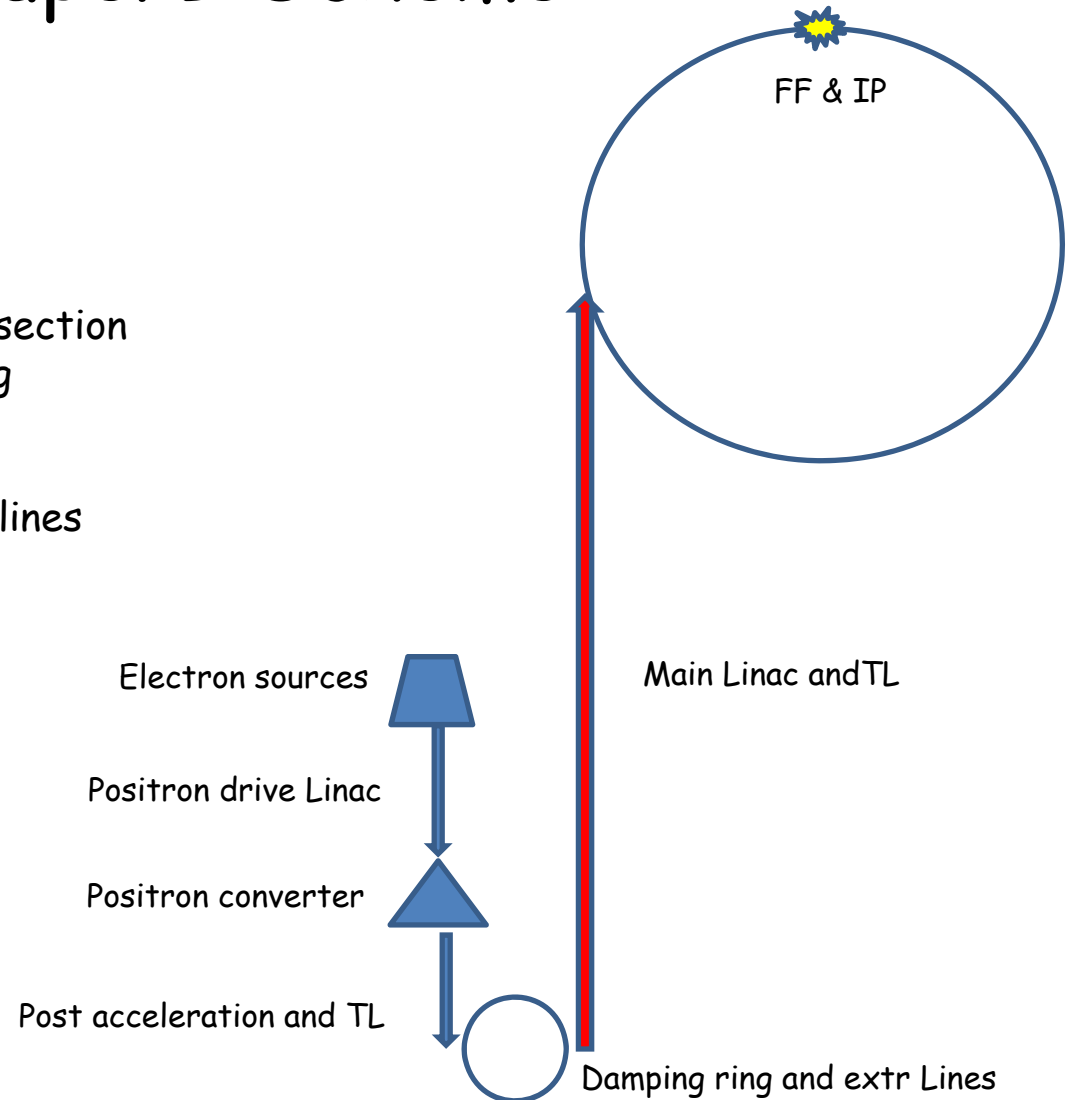




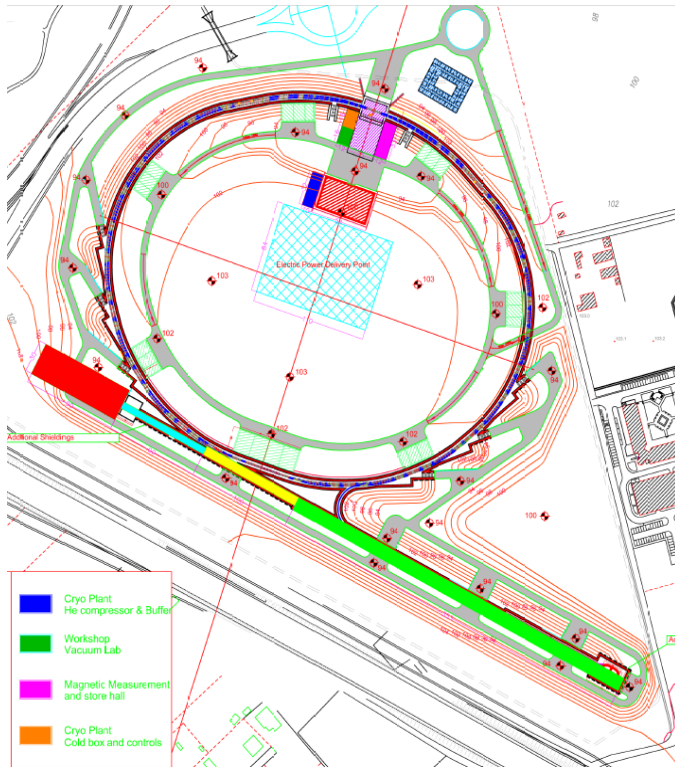
Injectors

General SuperB Scheme

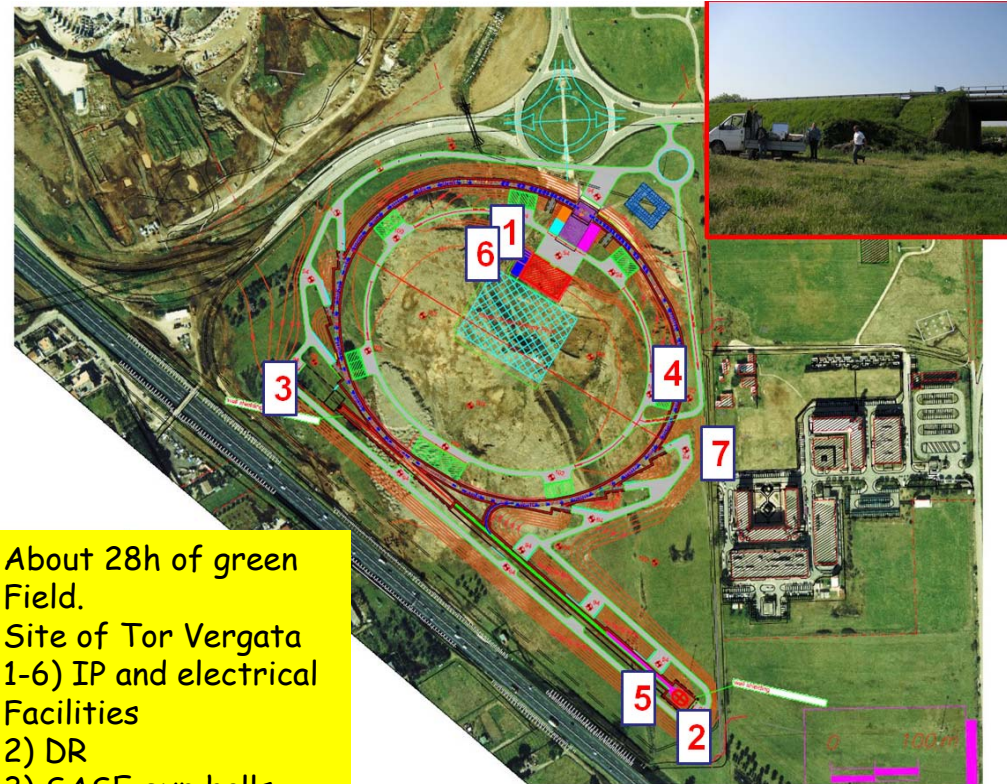
- Lepton sources:
 - Polarised electron gun
 - Positron source drive Linac
 - Positron converter and capture section
- Acceleration Linac to the Damping Ring
- DR Transfer Lines
- Damping Ring
- Damping Ring extraction and transfer lines
- Main Linac
- Main Linac Transfer lines
- Main Rings:
 - Arc Cells
 - Injection section
 - RF
 - Final Focus



The Site. Tor Vergata

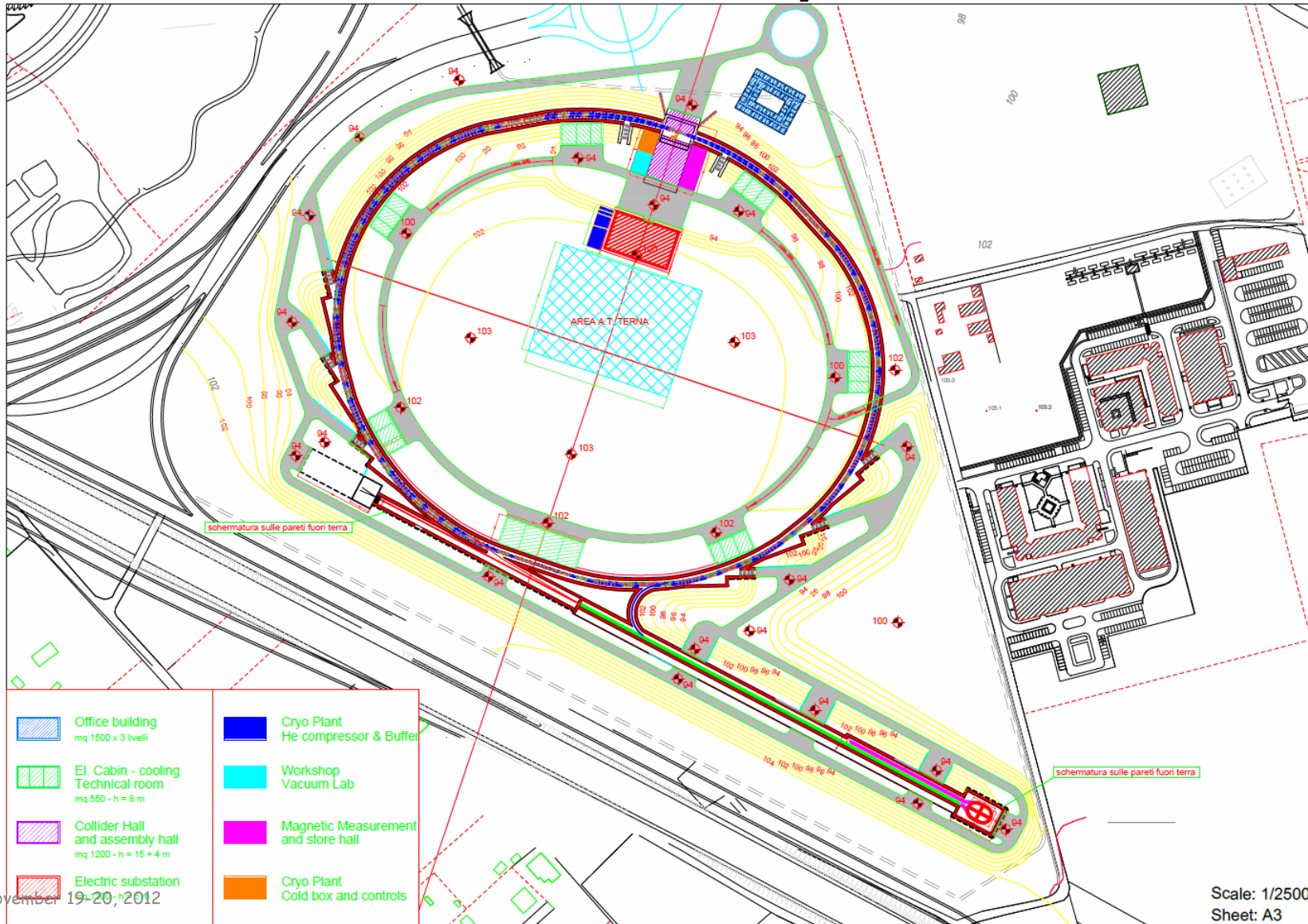


Linac and injectors ~ 500 m
DR ~ 60 m Circumference
Main Rings ~ 1.2 km

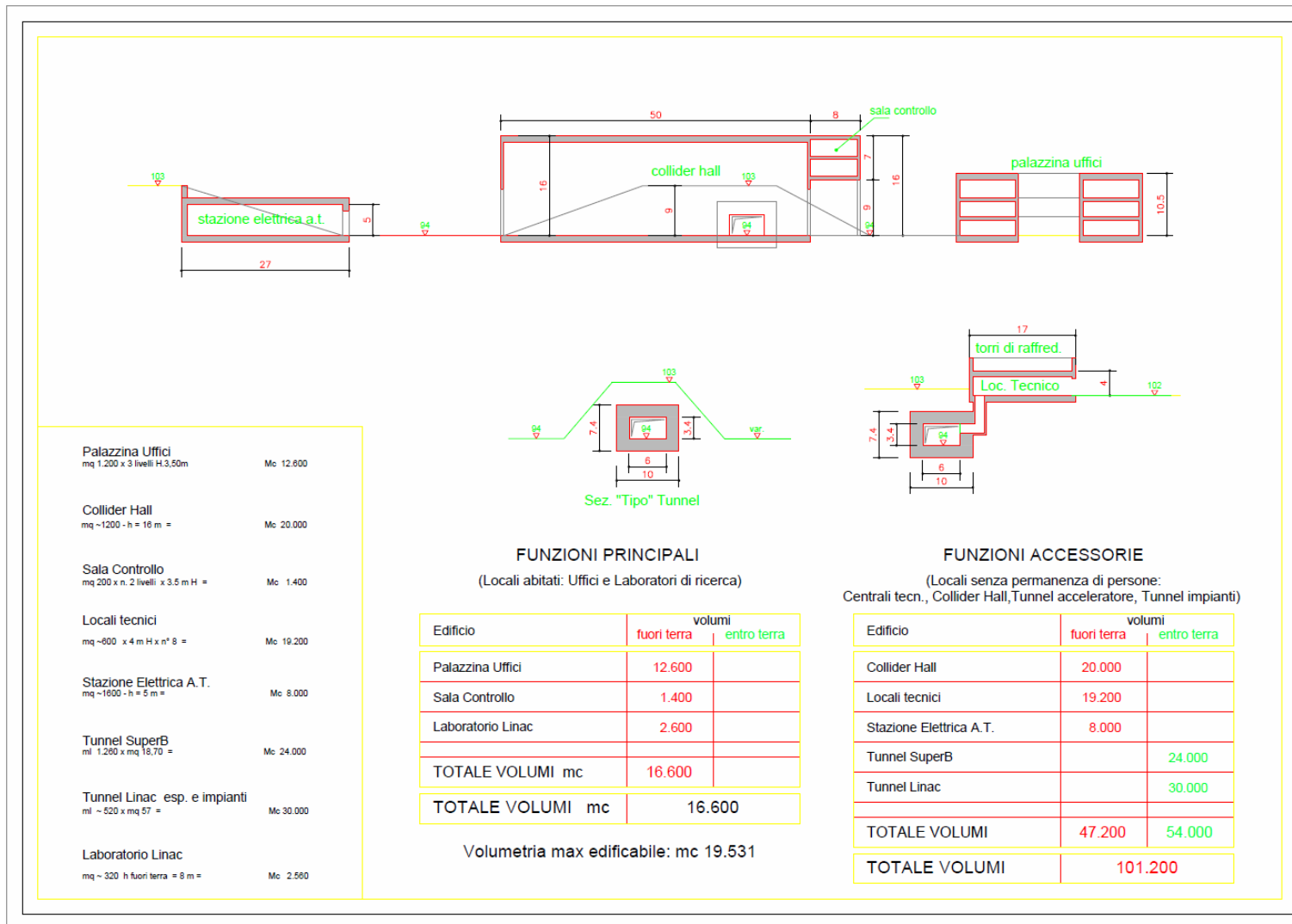


About 28h of green Field.
Site of Tor Vergata
1-6) IP and electrical Facilities
2) DR
3) SASE exp halls
5) Linac
7) CNR

Present Layout



Present Layout

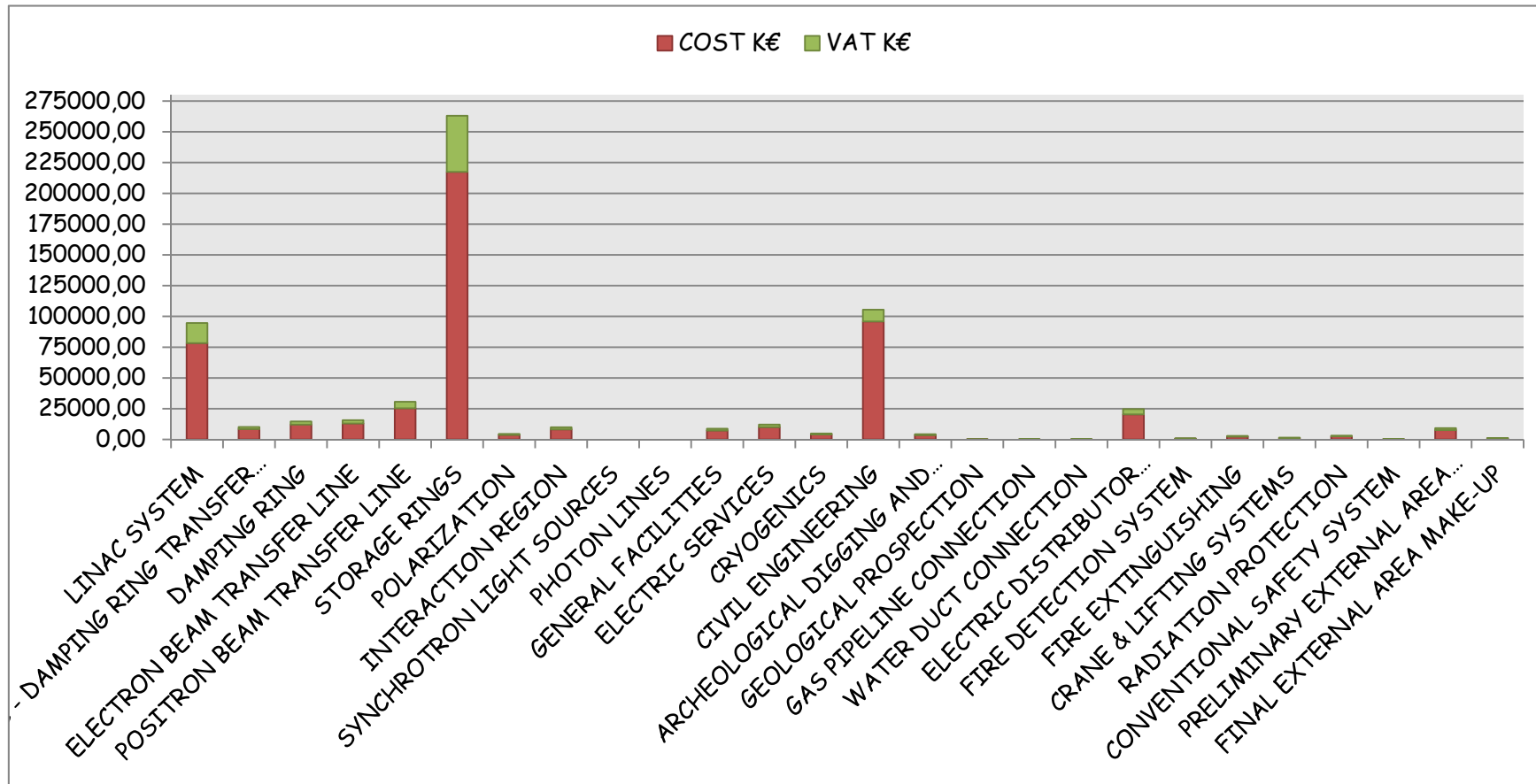




Costing Summary

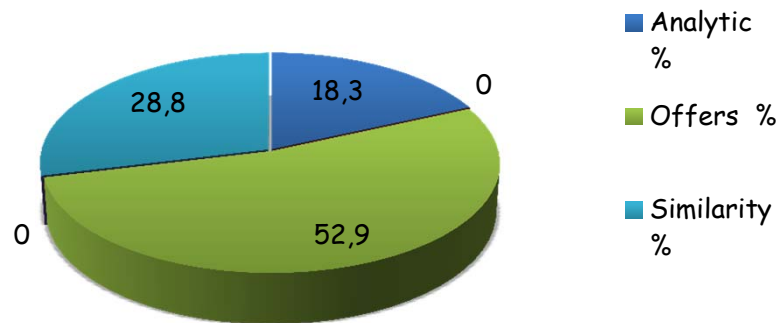
		COST EVALUATION SUMMARY (VAT Excluded)	VAT (21%/10%)		TOTAL	Notes
WBS Number			k€	k€	k€	
1	1	LINAC SYSTEM	78256,84	16433,94	94690,78	
1	2	LINAC - DAMPING RING TRANSFER LINE	8438,09	1772,00	10210,09	
1	3	DAMPING RING	12150	2551,50	14701,50	
1	4	ELECTRON BEAM TRANSFER LINE	12989,84	2727,87	15717,71	Scaled by 1.2 due to lack of lattice
1	5	POSITRON BEAM TRANSFER LINE	25314,27	5316,00	30630,27	Scaled by 1.2 due to lack of lattice
1	6	STORAGE RINGS	217409,374	45655,97	263065,34	
1	7	POLARIZATION	3721	781,41	4502,41	
1	8	INTERACTION REGION	8187,06	1719,28	9906,34	
1	9	SYNCHROTRON LIGHT SOURCES	0	0,00	0,00	
1	10	PHOTON LINES	0	0,00	0,00	
1	11	GENERAL FACILITIES	7279,87	1528,77	8808,64	
1	12	ELECTRIC SERVICES	10028	2105,88	12133,88	
1	13	CRYOGENICS	4018	843,78	4861,78	
1	14	CIVIL ENGINEERING	95905,62	9590,56	105496,18	VAT 10%
1	15	ARCHEOLOGICAL DIGGING AND VERIFICATION	3500	735,00	4235,00	
1	16	GEOLOGICAL PROSPECTION	89,22	18,74	107,96	
1	17	GAS PIPELINE CONNECTION	200	42,00	242,00	
1	18	WATER DUCT CONNECTION	200	42,00	242,00	
1	19	ELECTRIC DISTRIBUTOR CONNECTION	20400	4284,00	24684,00	
1	20	FIRE DETECTION SYSTEM	735,88	154,53	890,41	
1	21	FIRE EXTINGUISHING	2381,5	500,12	2881,62	
1	22	CRANE & LIFTING SYSTEMS	1234,08	259,16	1493,24	
1	23	RADIATION PROTECTION	2622	550,62	3172,62	
1	24	CONVENTIONAL SAFETY SYSTEM	252	52,92	304,92	
1	25	PRELIMINARY EXTERNAL AREA MAKE-UP	7624,89	1601,23	9226,12	
1	26	FINAL EXTERNAL AREA MAKE-UP	1000,00	210,00	1210,00	
		SUPER-B COMPLEX COST	523937,53	99477,26	623414,80	
		PEP II DEVICES EQUIVALENT VALUE	80000,00		80000,00	To be confirmed
		PERSONNEL	105000,00		105000,00	1500 Man*Year
		CONTINGENCY & SPARES	140000,00	29400,00	169400,00	
		GRAN TOTAL	848937,53	99477,26	977814,80	

Cost Distribution

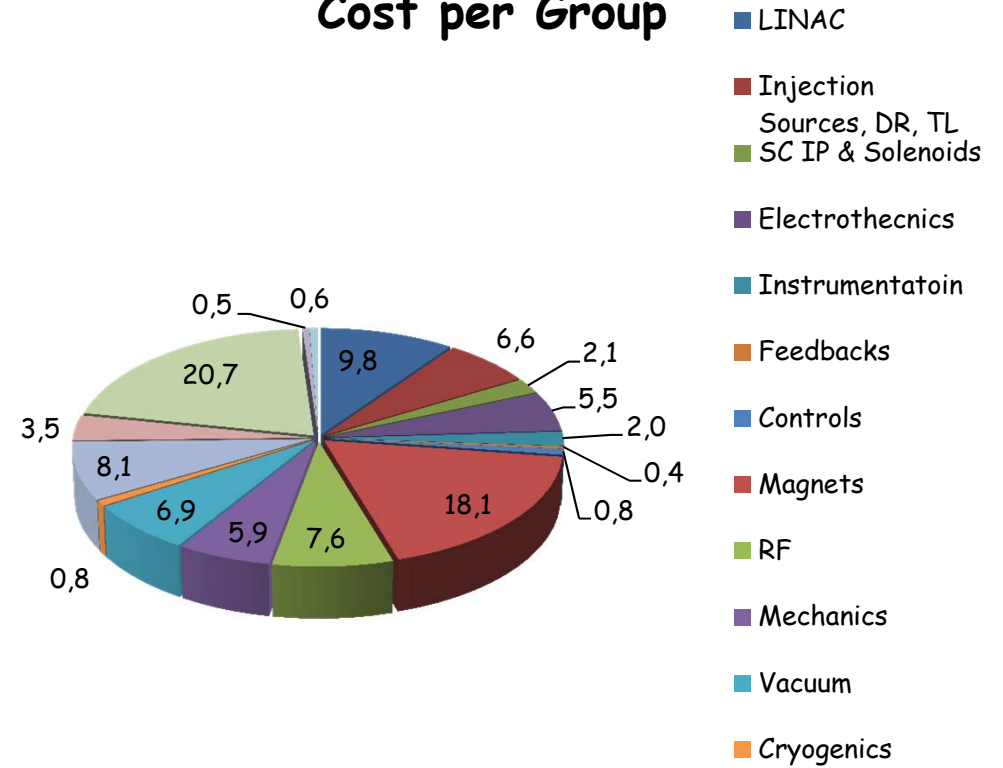


Costing

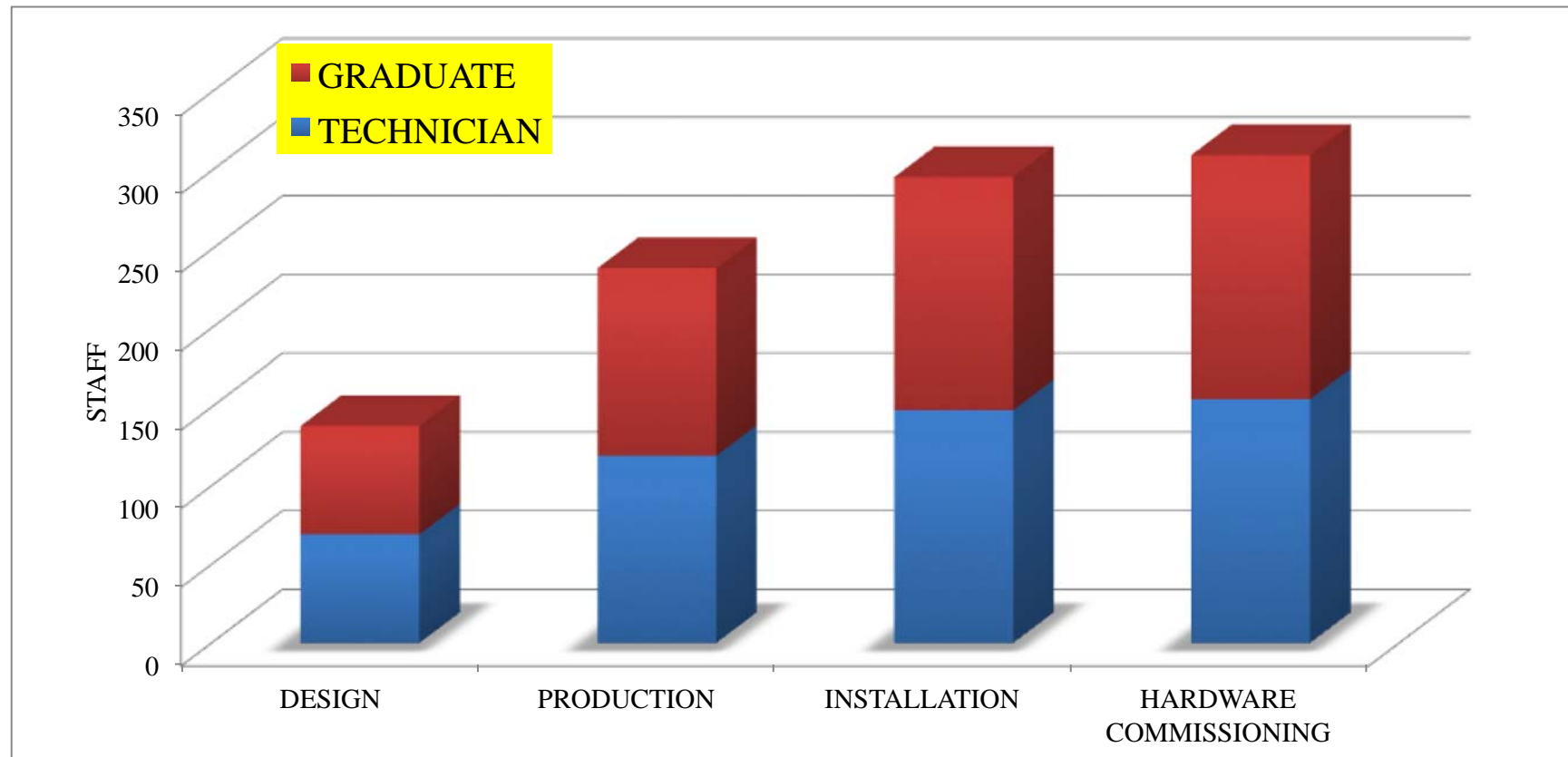
Costing Criteria all systems



Cost per Group

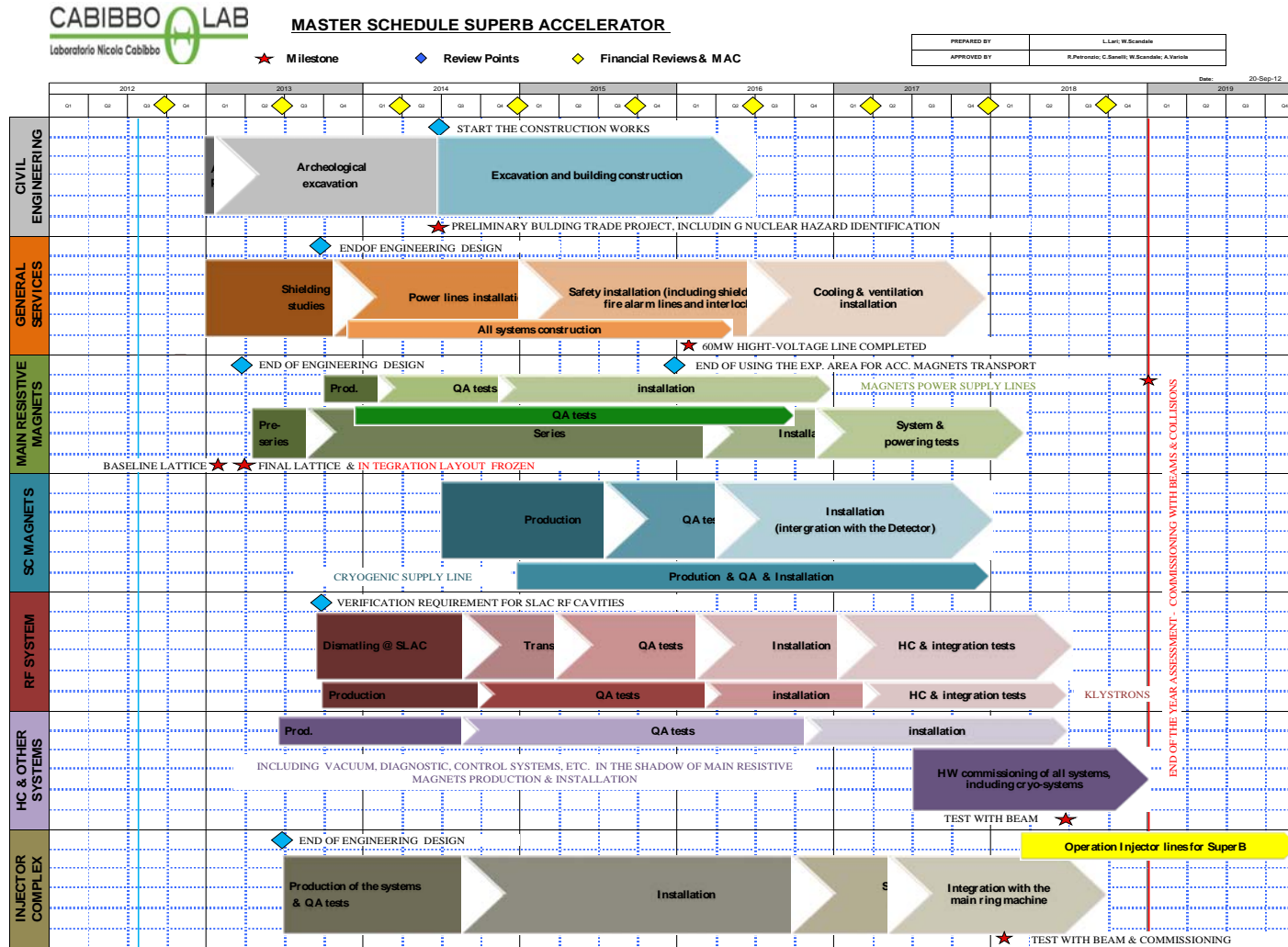


Manpower



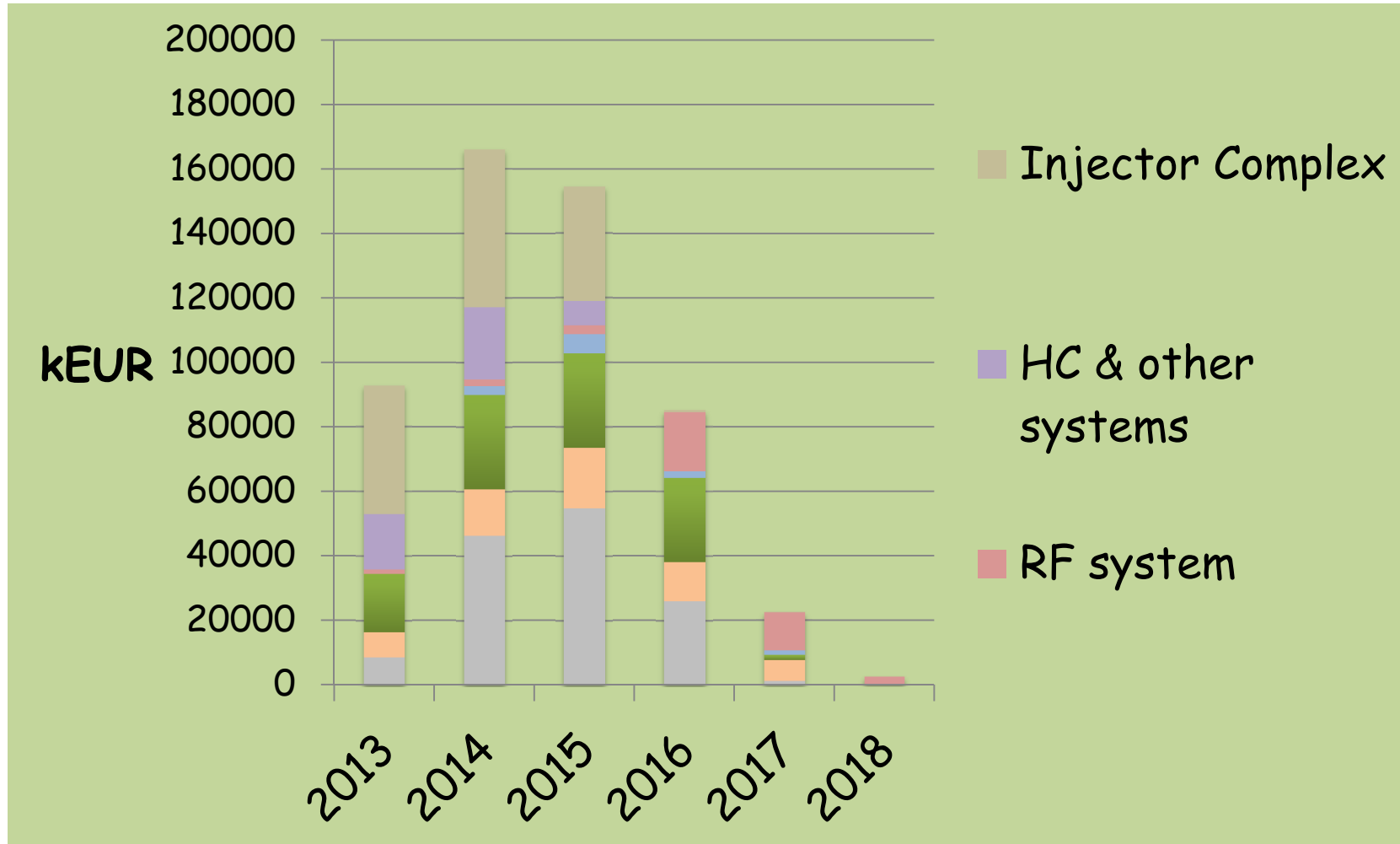


Success oriented planning





Spending Profile



My opinion. What's Next

- Priorities (to close the TDR):
 - Vacuum chamber
 - Impedance budget
 - Magnet design (LET)
 - Dynamical aperture, energy acceptance and lifetime optimization @ 10^{36}
 - Integration and footprint



STATUS

Fioni commission was held in 19th and 20th of November.

The quality of the work was recognized and the cost estimation was considered as reliable enough to have a final minister decision.

Next step => Wait for the 'green light', we hope....!!!!



- What I am expecting from the WG Luminometry:
- 1) Detectors but not only
- 2) How -What measurements (techniques)
- 3) Where, integration
- 4) Absolute and relative precisions
- 5) Machine parameters dependence and cross correlations
- 6) Link to the other beam diagnostics and strategy for luminosity optimization
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- Thank you for your attention