

CERN – Cooling & Ventilation Group

Big Science Sweden Conference 2020

Cooling & Ventilation activities and opportunities

Michele Battistin CERN - EN/CV/PJ
24th November 2020



ENGINEERING
DEPARTMENT

Agenda

- EN & Cooling and Ventilation mandates
- Cooling and Ventilation Projects (2021-2027)
 - 4 cooling
 - 4 ventilation
- Questions & Answers

Engineering Department

EN - Engineering Department Leader: Roberto Losito Deputy: Markus Brugger Secretariat: Géraldine Jean	
Department Head Office (EN-DHO) Roberto Losito Secretariat: Géraldine JEAN	Accelerator Coordination & Engineering (EN-ACE) Katy Karine Foraz Secretariat: Anna Lambert / Marjorie Da Silva
Administration, Resources & Performance (EN-ARP) Luigi Serio Secretariat: Valentina Casadei / Efstathia Kopterou	Cooling & Ventilation (EN-CV) Mauro Nonis Secretariat: Angélique Foussat
Experimental Areas (EN-EA) Markus Brugger Secretariat: Valentina Casadei / Efstathia Kopterou	Electrical Engineering (EN-EL) Nicolas Bellegarde Secretariat: Maryse Claret
Handling Engineering (EN-HE) Ingo Ruehl Secretariat: Valentina Casadei / Efstathia Kopterou	Mechanical & Materials Engineering (EN-MME) Francesco Bertinelli Secretariat: Anna Lambert / Marjorie Da Silva
Survey Mechatronics Measurements (EN-SMM) Alessandro Masi Secretariat: Louisa Catherall	Sources, Targets & Interactions (EN-STI) Simone Silvano Gilardoni Secretariat: Sylvia Martakis

The Engineering Department provides CERN with the **Engineering Competences**, Infrastructure Systems and Technical Coordination required for the design, installation, operation, maintenance and dismantling phases of the CERN accelerator complex and its experimental facilities.

Systems overview



Water cooling
(accelerators, experimental
areas, computing center,
laboratories);

Water network and fire
fighting;

Sump and drainage
pumping systems.



Compressed air production and
distribution.



Ventilation, air conditioning
for underground and technical
buildings:

- Caverns, tunnel;
- Industrial halls, control
rooms, laboratories, clean
rooms.



Detector cooling



Power and control cubicles for
CV plants.

Cooling Plants

*Equivalent to a small town of 25'000 inhabitants, 6% Geneva Canton.
Annual consumption reduced by 40% in last 8 yrs.*

Cooling towers (450 MW)

Chilled water station: 6-12°C (73 MW)

Cooling station (raw water, demineralized water, C₃F₈, C₆F₁₄)

Pipework

Water distribution network: 3 stations

Water consumption (peak)

27

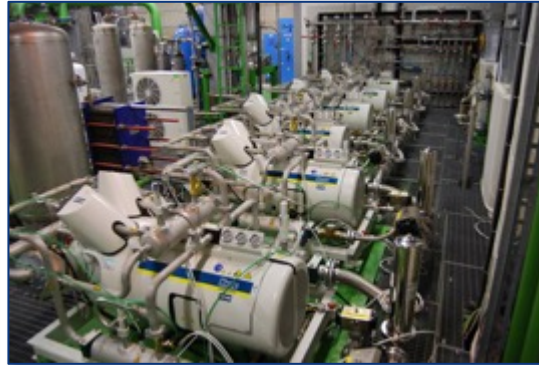
41

150

800 km

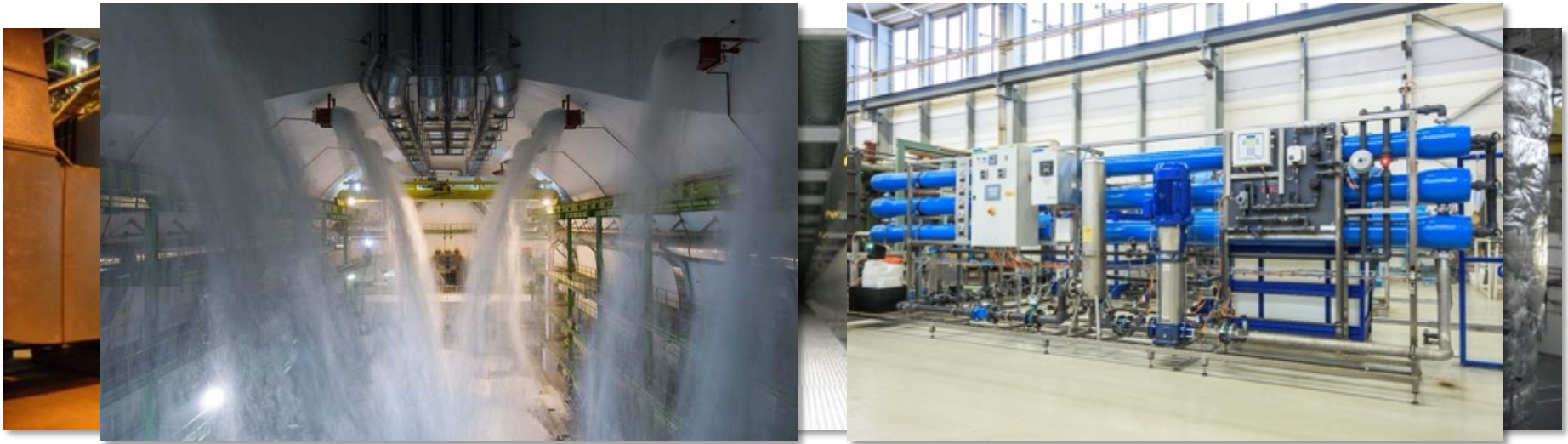
5'400 m³/h

1'260 m³/h



Ventilation, Fluid Systems

HVAC	1'500 units from 2'000 to 120'000 m ³ /h per unit
Fire fighting systems	800 points
Compressed air	14 stations distribution network 200 km
Demineralised water production	20 m ³ /h - 0.1 µS/cm

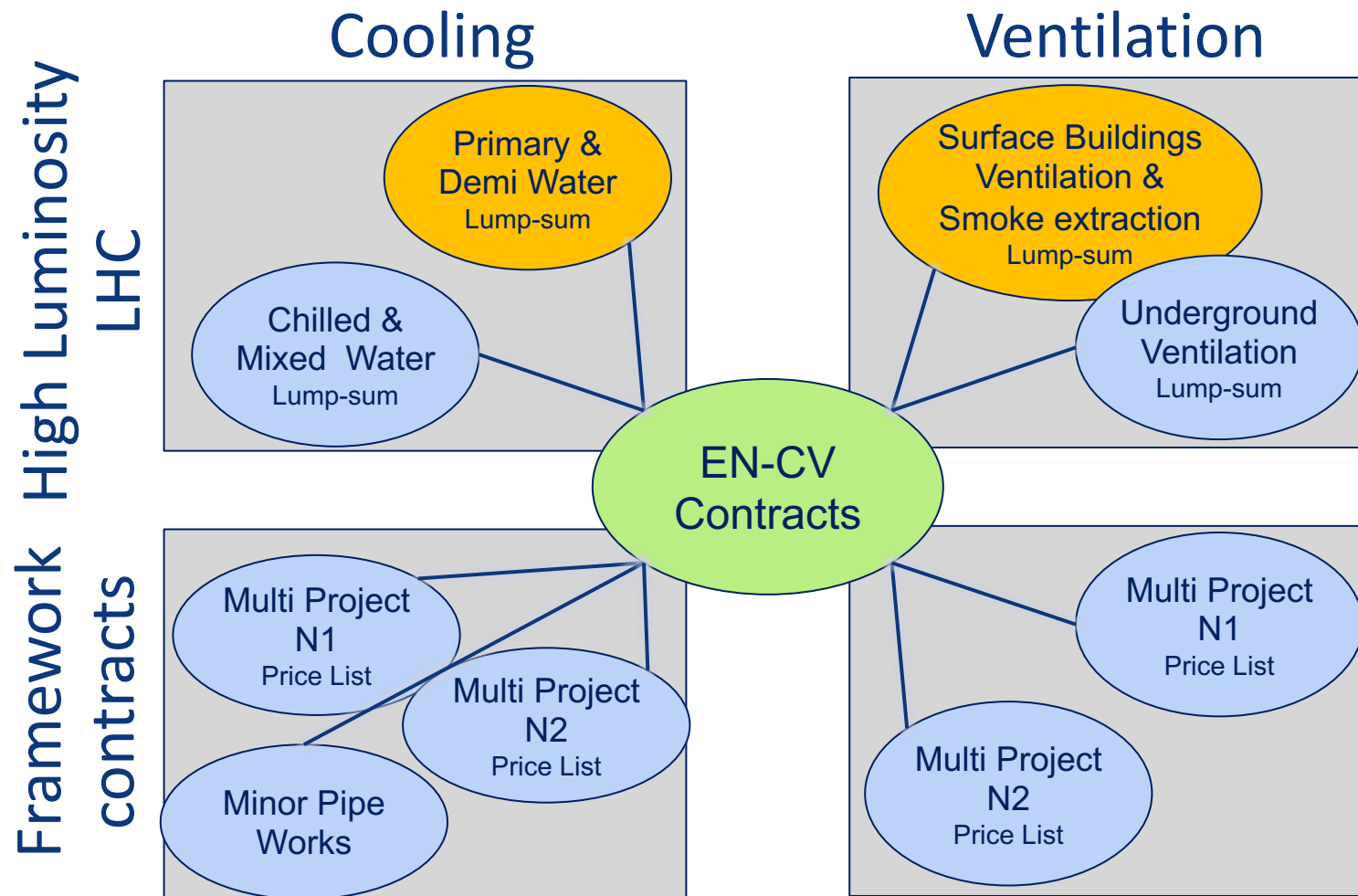


Contract opportunities in 2021 for projects development in 2021-2027



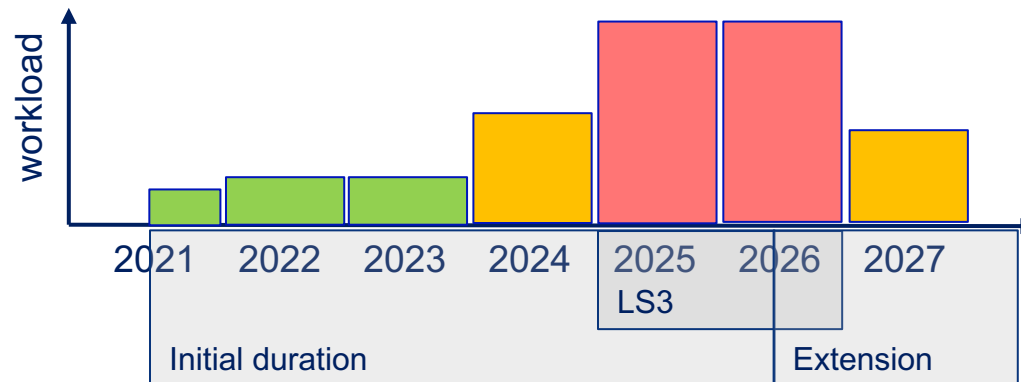
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Contract possibility for Cooling and Ventilation



Cooling systems installation framework contract MS-4552/EN

- 2 x (5+1+1) years contract (2021-2026)
- Design, installation, test, commissioning, as-built
- Price list contracts
- 1-4 projects/year
- 100 k€ to 3.0 M€ project value span
- Higher load during LS3 (2025-2026)

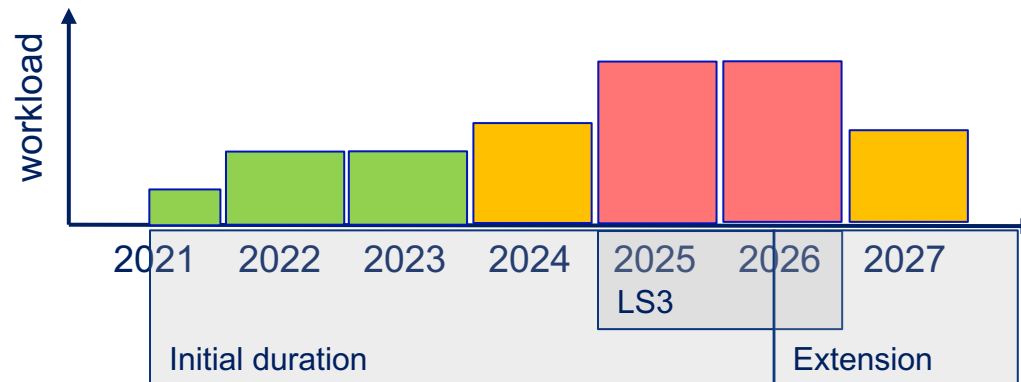


Q1-2021

Ventilation systems installation framework contract

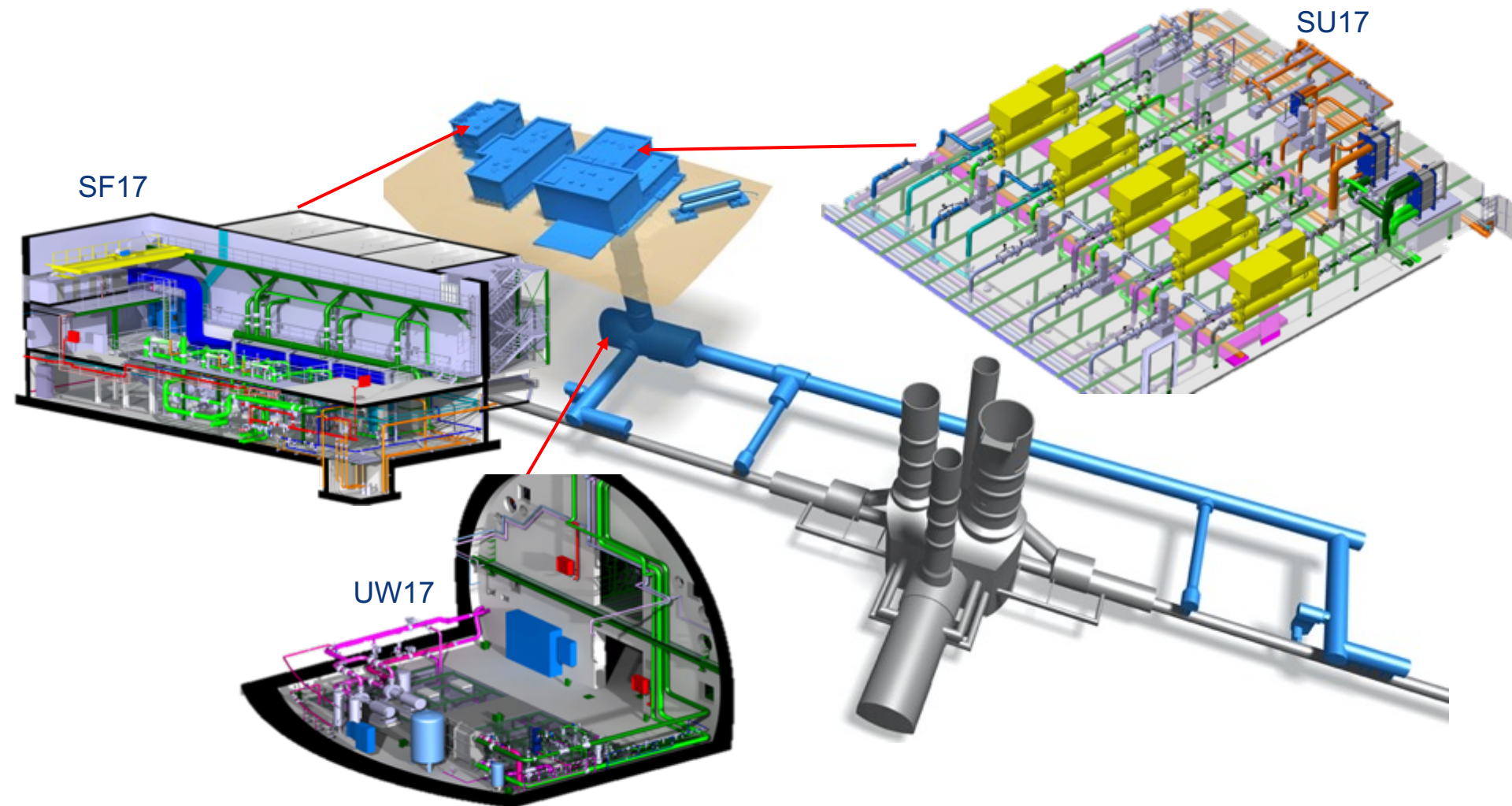
MS-4563/EN

- 2 x (5+1+1) years contract (2021-2026)
- Design, installation, test, commissioning, as-built
- Price list contracts
- 1-4 projects/year
- 100 k€ to 2.0 M€ project value span
- Higher load during LS3 (2025-2026)

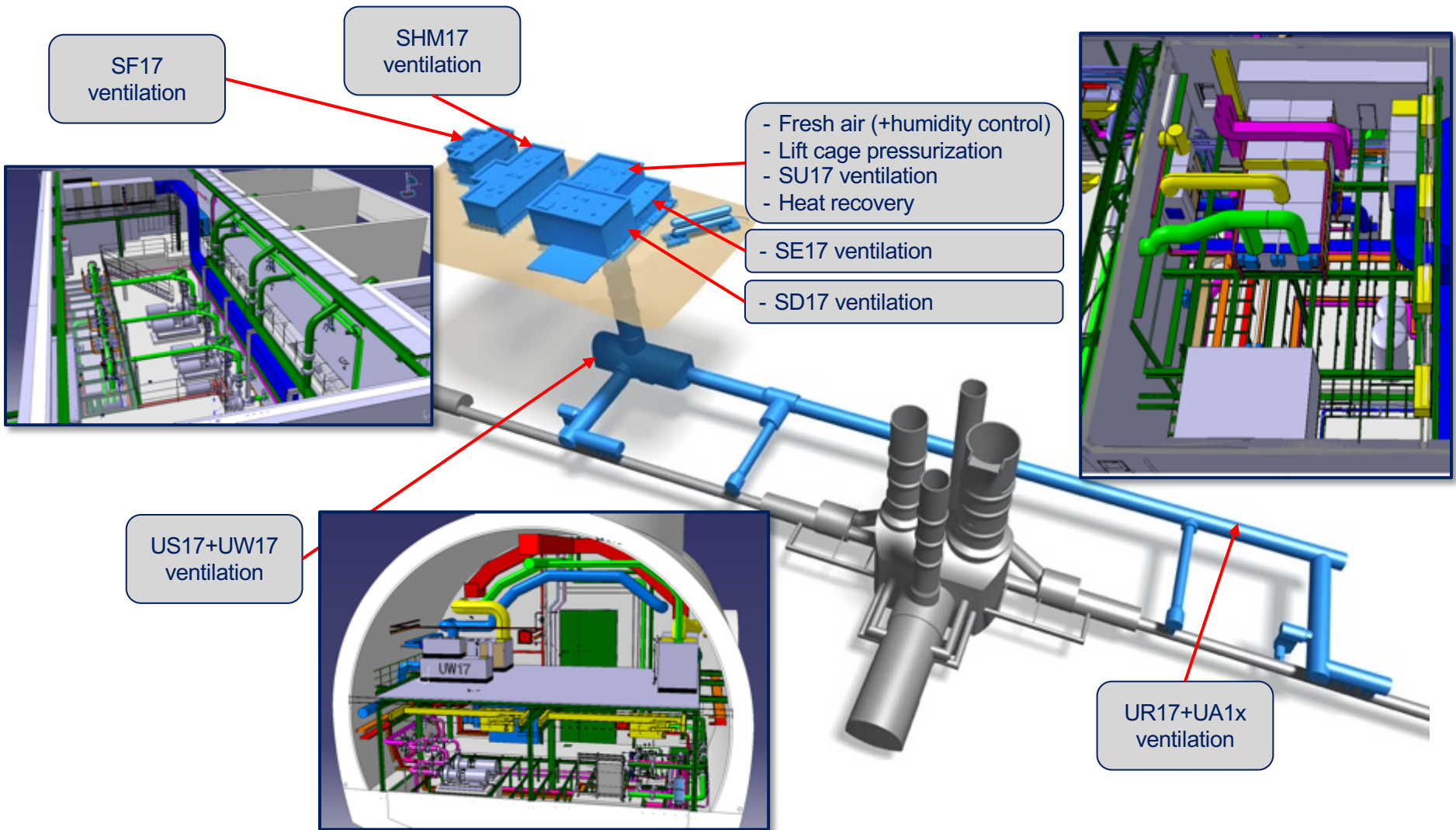


Q1-2021

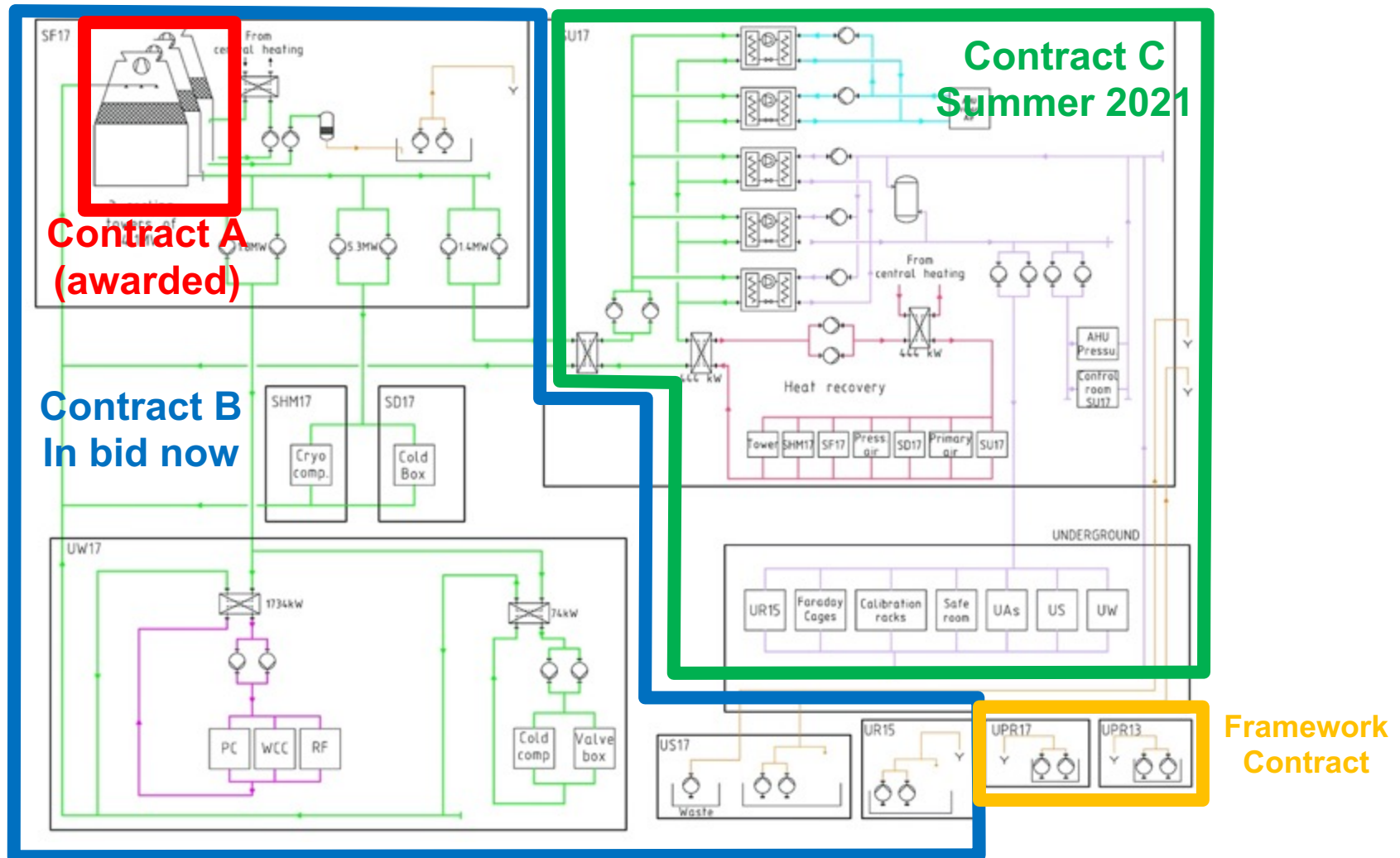
HL-LHC Project – Cooling (Pt1 + Pt5)



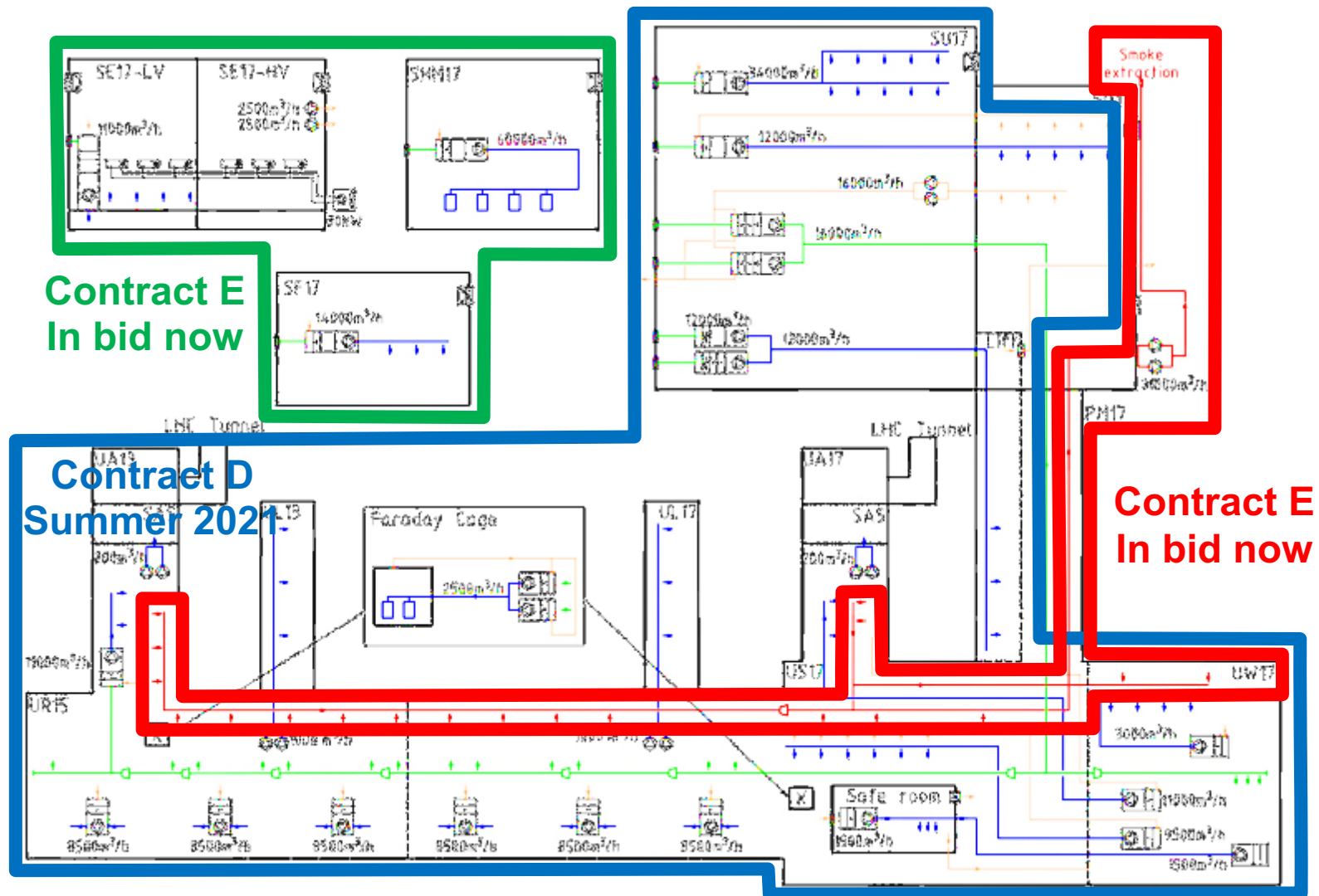
HL-LHC Project – Ventilation (Pt1 + Pt5)







HL-LHC Project – Cooling contracts



HL-LHC Project – Ventilation contracts



Sum-up table of CV needs 2021-2027

				Qualification Criteria		
	#		Type			
Framework Cooling	2	Q4/20	Lump-sum DQE based	3 x 0.7M	12 MCHF	47
Framework Ventilation	2	Q4/20	Lump-sum DQE based	3 x 0.4M	5 MCHF	28
HL-LHC Cooling	2	Q3/20-Q3/21	Lump-sum	3 x 0.7M	8-12 MCHF	47
HL-LHC Ventilation	2	Q3/20-Q3/21	Lump-sum	3 x 0.7M	6-11 MCHF	22-59



Four different contractors for four HL-LHC contracts
 Four different contractors for four framework contracts
 Max two contracts per one company

CV Contact

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