

DUNE ITALIA: Project management

Total Project Cost, Spending Profile, Schedule

S. Bertolucci, L. Patrizzii, Gabriele Sirri
and others



The DUNE project in Italy

Activities of the Italian groups in DUNE began in 2017 as the *NU-AT-FNAL* project proposed to the INFN CSN2 committee (Astroparticle Physics) and then transferred as *DUNE* project to CSN1 committee (Particle Physics) in 2024.

INFN is contributing to the program at FNAL to DUNE on both near (ND) and far (FD) detectors, in particular with the following MAJOR items:

- **SAND**

- The SAND detector is a key element of the ND-complex (and DUNE)
 - INFN plays a key role in the SAND Consortium.

- **PDS** (photon detection system)

- INFN leads the construction of the PDS of both modules (HD-FD and VD-FD)

Contributions and, responsibilities to SAND's construction verification and installation have been formally defined in the bilateral DOE-INFN MoU signed on April 9, 2024.

→ **We need to track core cost ...**

DUNE ITALIA – Project Management

Upon the request of the INFN Technical Scientific Committee (CTS) and in accordance with the Quality Assurance Plan (PAQ) adopted by CSN2 committee, the **DUNE Italian group** has **invested significant resources and time in project management** to control costs and time, manage risks, and ensure quality.

While these activities may seem standard for any project, it is important to highlight that everything is achieved **without allocating any dedicated resources supporting a project office** and **without specialized personnel**.

This is the list of physicists who have spent a good part of their time playing the role of a project manager (Unity is strength!) : P. Bernardini, S. Bertolucci, A. Di Domenico, D. Domenici, S. Di Falco, L. Di Noto, A. Montanari, C. Montanari, L. Patrizzii, G. Sirri, L. Stanco, F. Terranova, N. Tosi... and others.

.... producing lot of project papers



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Rev.
1.0

Validità
Rilasciato

Conceptual Design Report

Conceptual Design of the SAND det

Abstract

This document is the Conceptual Design Report of the SAND Det focusing on the activities involving INFN groups.

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Distribution List:

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Istituto Nazionale di Fisica Nucleare

Technical Design Report

Technical Design Report DUNE Photon Detection

Abstract

This document is the Technical Design Report of the DUNE Photon Detection focusing on the activities of the INFN groups.

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Report for the INFN CTS

Abstract

This document is to provide additional information as requested by the INFN CTS in the follow up of July 2021 DUNE review

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- Chair of Members of the INFN Technical Scientific Council
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Progress Report 2022 Nu-At-FNAL

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Progress Report 2022 Nu-At-FNAL

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... learning how to play with MS Project

File Task Resource Report Project View Help Gantt Chart Format Tell me what you want to do

	Task Mode	Task Name	Cost	Actual Cost	2019		2020		2021		2022	
					H1	H2	H1	H2	H1	H2	H1	H2
0		▲ DUNE ITALIA	23 529 k€	3 180 k€								
1		▲ SAND	18 099 k€	355 k€								
1		▸ GRAIN	3 840 k€	40 k€								
2		▸ KLOE2SAND_cost_pla	4 544 k€	0 k€								
8		▸ KLOE2SAND	0 k€	0 k€								
9		▸ TRACKER	5 315 k€	0 k€								
10		▲ TRIGGER	200 k€	0 k€								
11		Trigger design, reali	200 k€	0 k€								
12		▸ Near Detector Integration and	4 200 k€	0 k€								
14		▸ INSTALLATION	0 k€	0 k€								
2		▲ PDS	5 430 k€	2 825 k€								
1		▸ FD1	1 945 k€	1 748 k€								
5		▲ FD2	3 485 k€	1 076 k€								
6		WLS bars from Glas	393 k€	54 k€								
7		Dichroic filter	1 029 k€	254 k€								
8		Electronics	216 k€	0 k€								
9		Meccanica	120 k€	42 k€								
10		Labor	228 k€	20 k€								
11		SIPMs	1 499 k€	705 k€								

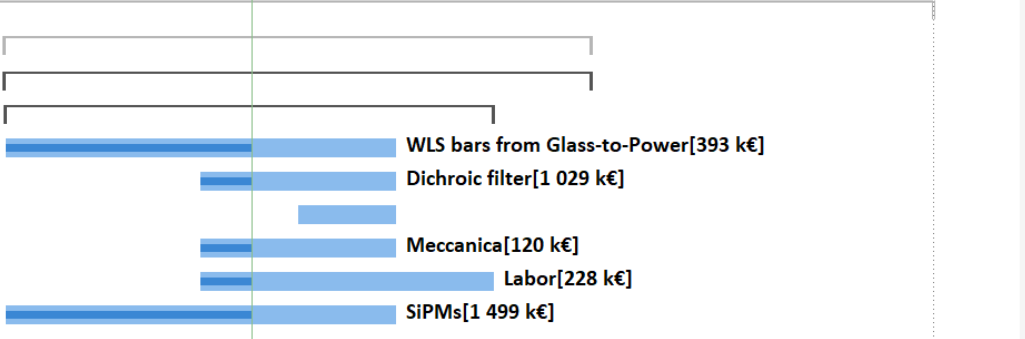
Welcome Organize Tasks

Get organized, save time



Add task details

Set duration and other details to get a better picture of how your project is doing.



... and fighting with the INFN financial DB

Our effort is yielding positive results

We are currently working on integrating the schedules of various subsystems, each at different levels of maturity.

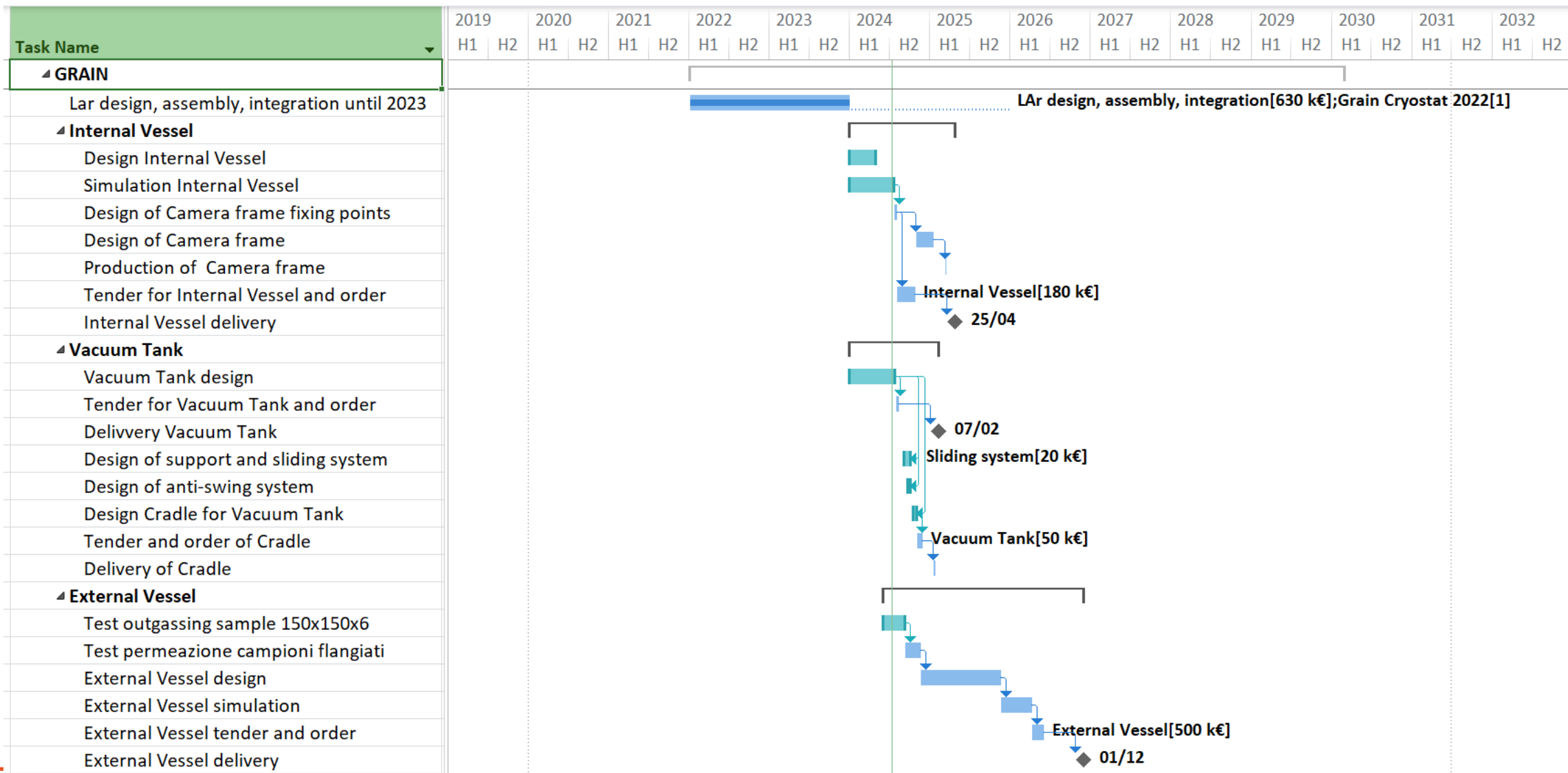
This involves reconstructing the spending profile by verifying fund allocations (Assegnazioni), reviewing placed orders, and identifying core costs.

The work is still in progress, and we expect to achieve a higher level of integration by the DUNE Italia meeting in Q4 2024.

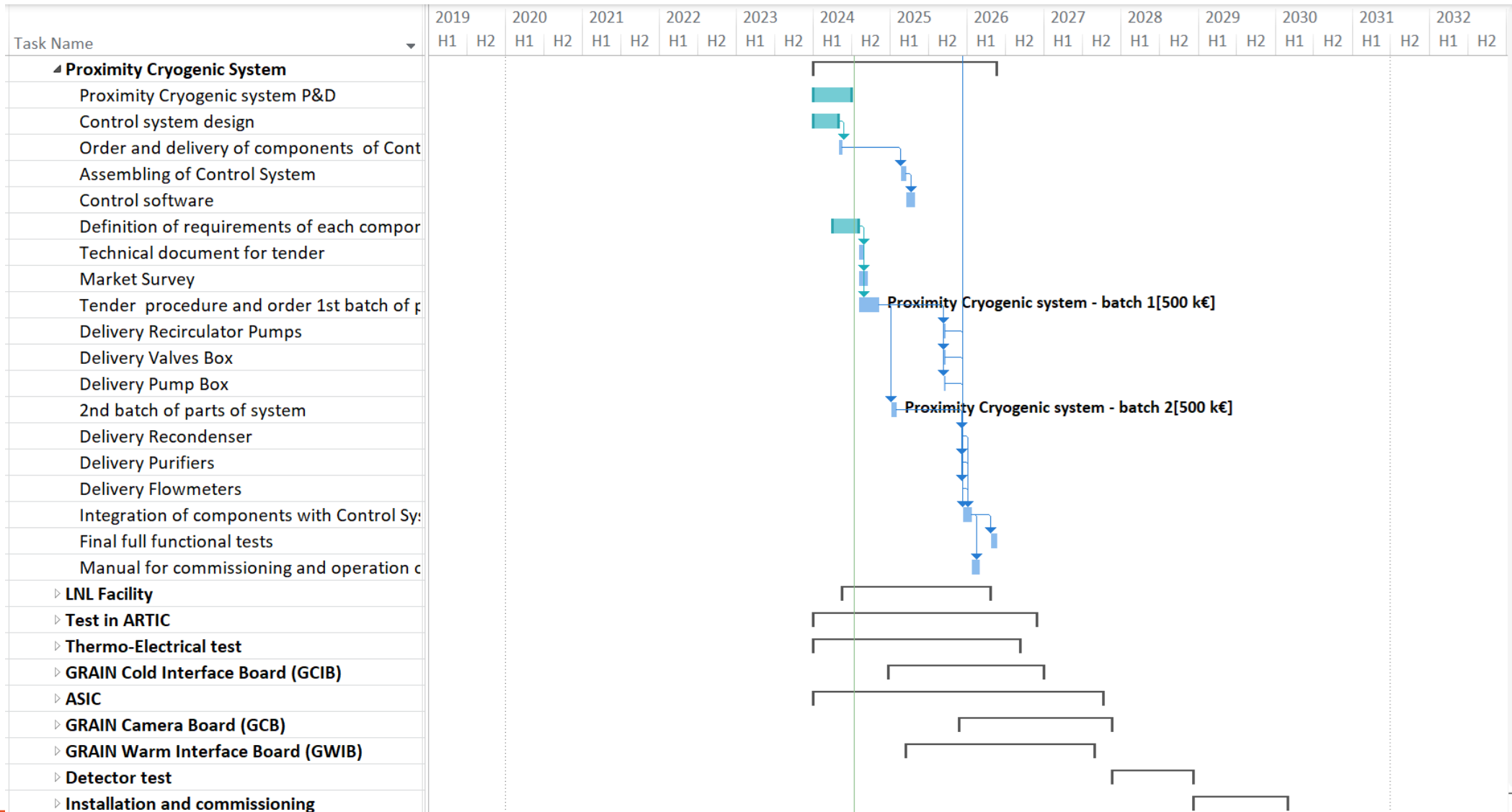
Disclaimer

Please be aware that the following tables and plots are not yet finalized and may not be entirely consistent.

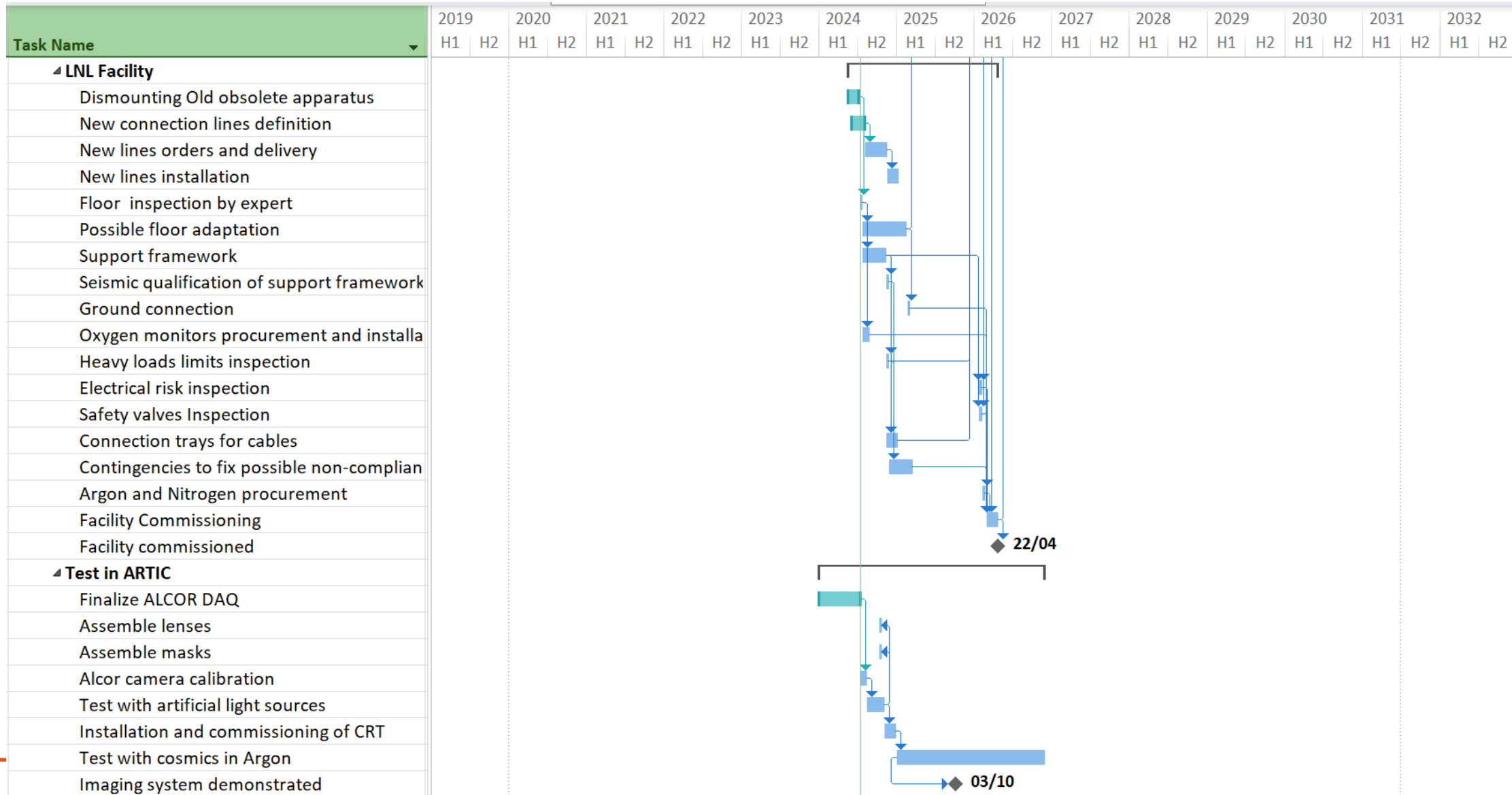
GRAIN



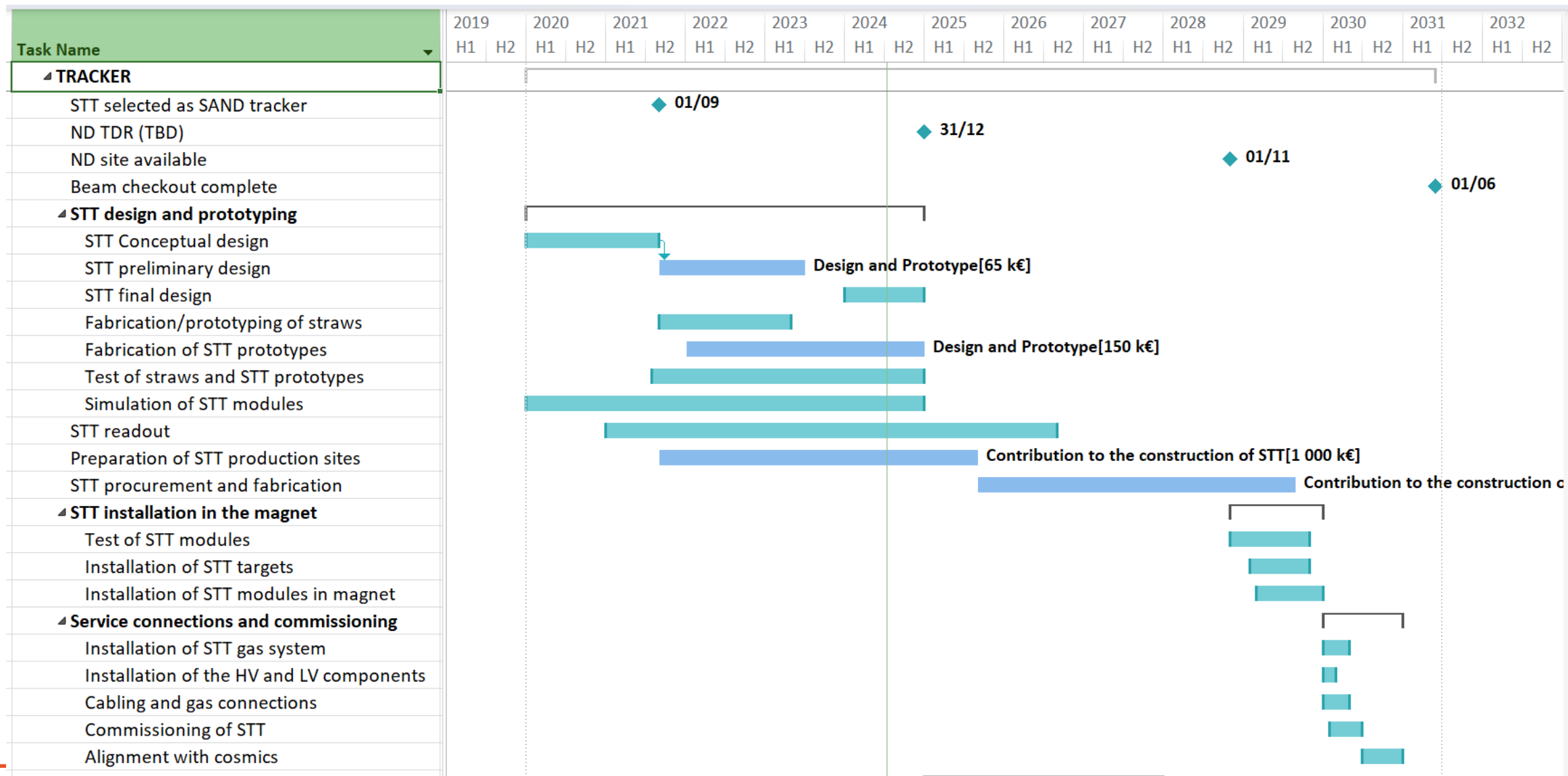
Grain (2)



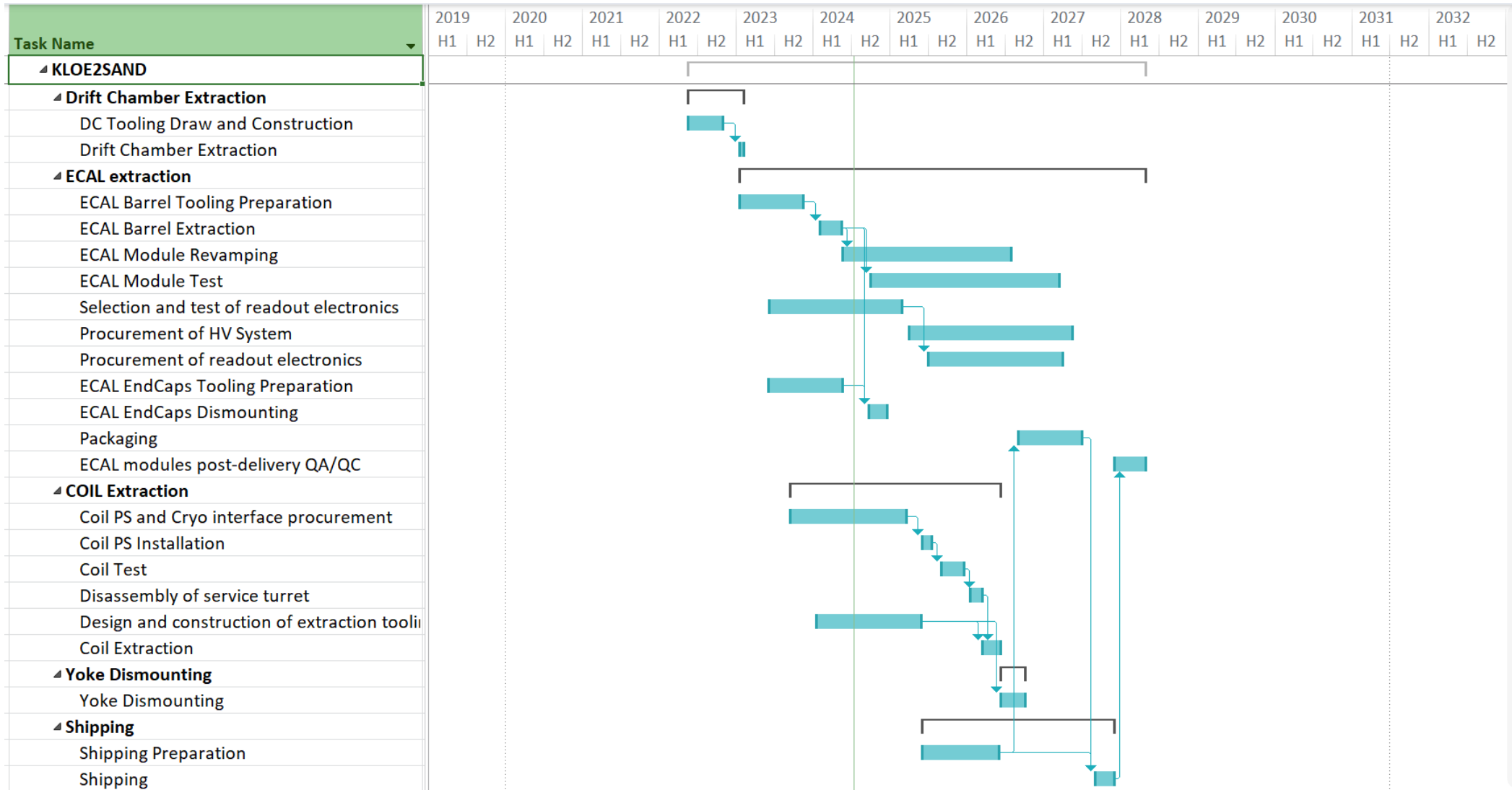
Grain (3)



TRACKER



KLOE2SAND



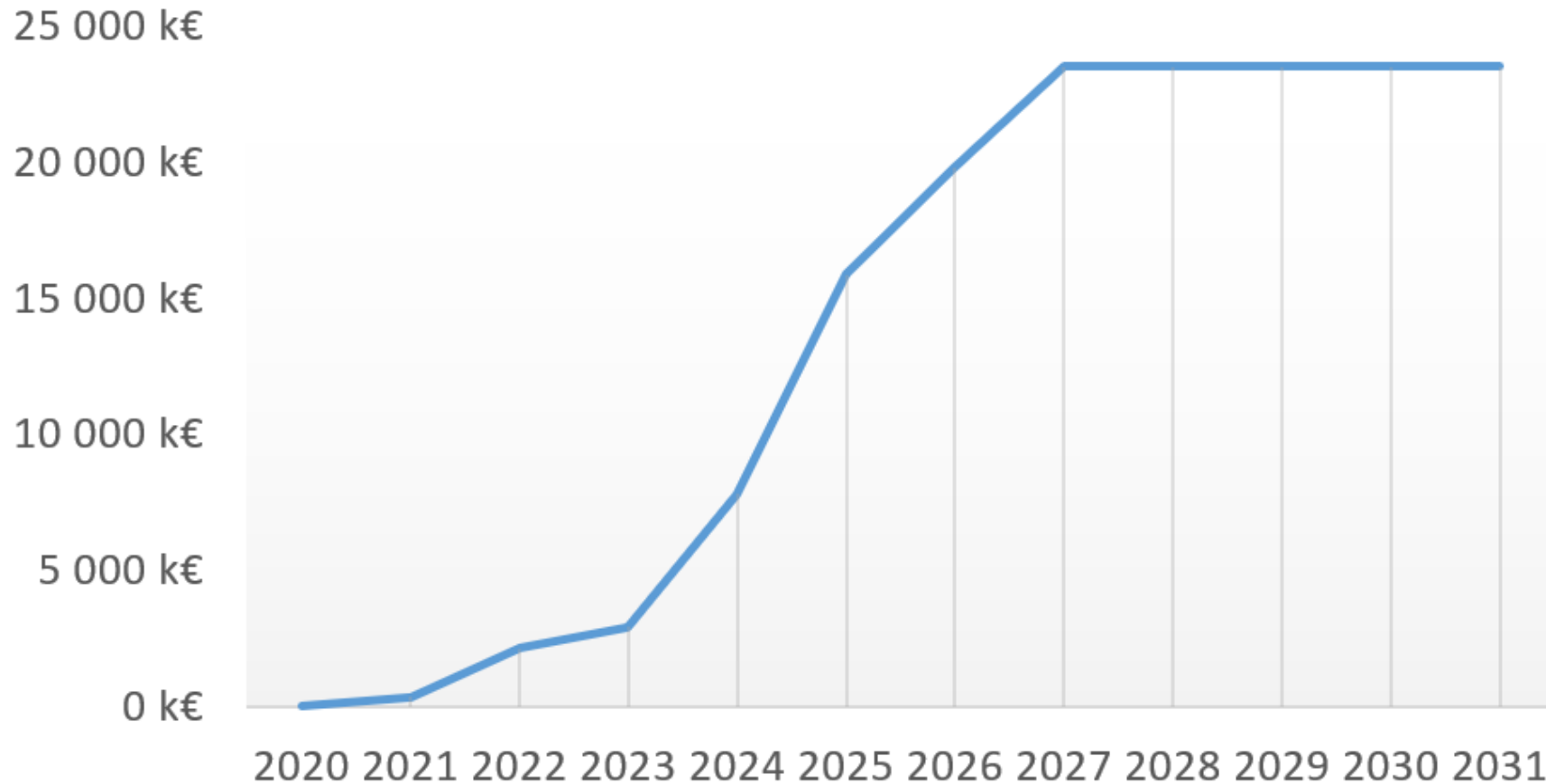
Total INFN Cost (Core SAND+PDS)

INFN Core Cost Spending Profile		2021	2022	2023	2024	2025	2026	2027	Total
SAND									
MAGNET	Yoke								
	Yoke disassembly, packaging, storage at LNF				300				300
	Yoke Integration/Installation							200	200
	Superconducting solenoid refurbishment			100	540				640
	Transport to FNAL (includes EMC)					1300			1300
EMC	EMC test, disassembly, renovation	340	149	300	565	750			2104
GRAIN	LAr design, assembly, integration		40	315	680	1040	980		3055
	Spares, small components and transport to FNAL						200		200
STT	Design and Prototype			65	150				215
	Contribution to the construction of STT					1700	1700	1700	5100
TRIGGER	Trigger design, realization					200			200
PDS									
FD1	SiPM		1583						1583
	electronics				312				312
	module (mass test of supercell)						50		50
FD2	WLS bars from Glass-to-Power		33		40	320			393
	Dichroic filter				479	550			1029
	Electronics					216			216
	Meccanica				80	40			120
	Labor				38	114	76		228
	SiPMs		5		1320	174			1499
ND Integration (Contingency)									
	ND Integration (Contingency)					2000	1500	700	4200
	<i>Core Cost Total</i>	340	1809	780	4504	8404	4456	2650	22943

To be reshuffled
and (slightly) updated

Cumulative cost (Core SAND+PDS)

Cumulative Cost



The table to track the core costs inside MS Project is filling up.

The screenshot shows the Microsoft Project interface with the Resource Sheet table. The table has columns for Resource Name, Type, Cost, and Actual Cost. The data is as follows:

Resource Name	Type	Cost	Actual Cost
Internal Vessel	Cost	180.00 k€	0.00 k€
Vacuum Tank	Cost	50.00 k€	0.00 k€
External Vessel	Cost	500.00 k€	0.00 k€
Sliding system	Cost	20.00 k€	0.00 k€
Proximity Cryogenic system - ba	Cost	500.00 k€	0.00 k€
Proximity Cryogenic system - ba	Cost	500.00 k€	0.00 k€
ASIC engineering run 1	Cost	200.00 k€	0.00 k€
ASIC engineering run 2	Cost	200.00 k€	0.00 k€
ASIC packaging	Cost	100.00 k€	0.00 k€
SiPM matrices (lenses)	Cost	800.00 k€	0.00 k€
Low and High Voltage system	Cost	64.00 k€	0.00 k€
Camera Mother Boards	Cost	56.00 k€	0.00 k€
Grain Cryostat 2022	Material	40.00 k€	40.00 k€

Conclusions

- The DUNE INFN group is dedicating significant resources to project management.
- Our goal is to integrate schedules and costs into MS Project to monitor the schedule closely and track core costs accurately.
- the work is ongoing, an itemized list of core costs is being integrated in MS Project in relation to tasks and schedule.
- A higher level of integration will be achieved by the DUNE Italia meeting in Q4 2024.