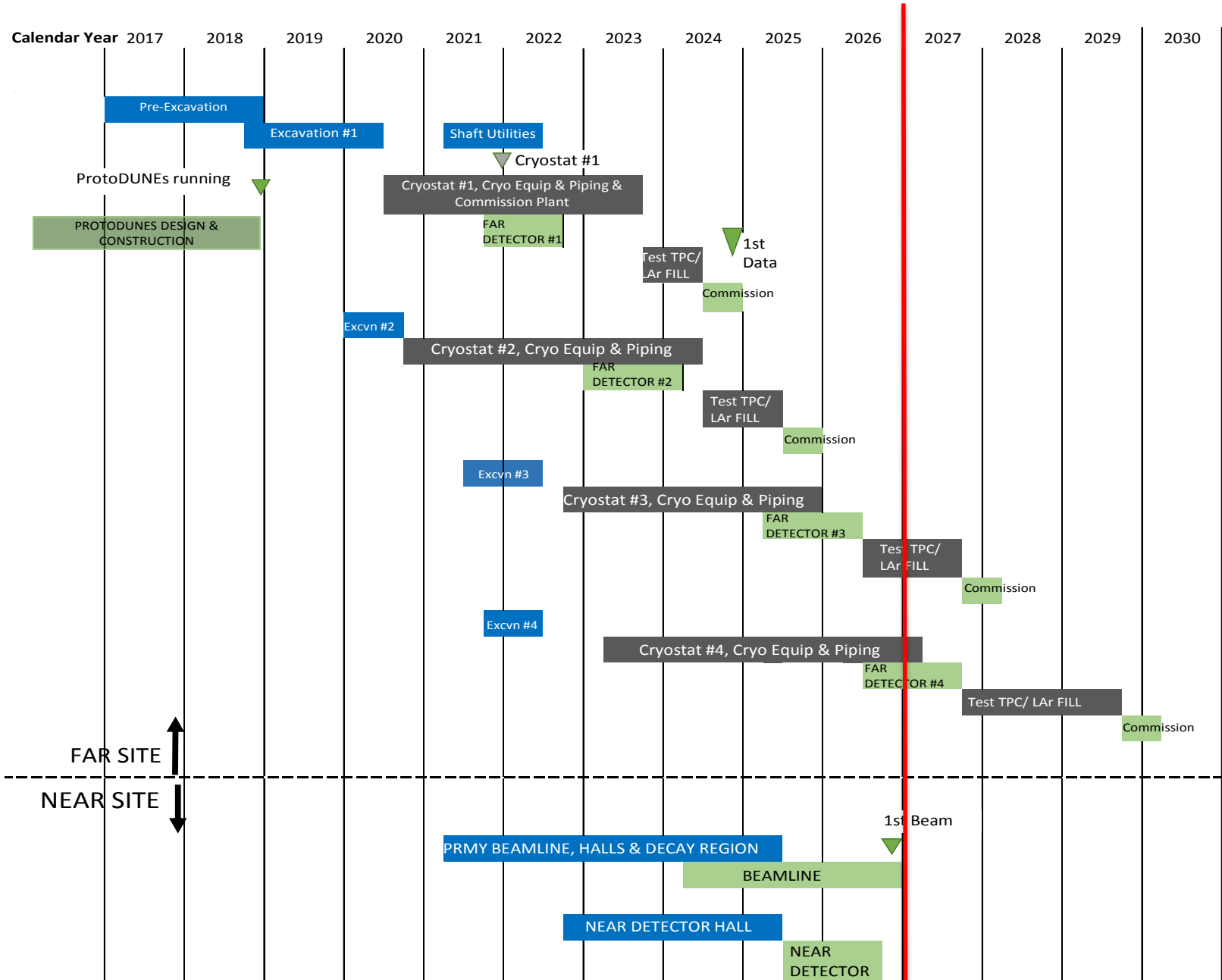


# LBNF/DUNE – Construction Summary



# Far Site Facilities Scope and Requirements

Scope Element	Funding Source	CD-3a Scope
Excavation of 4850L detector and utility caverns and drifts	DOE	
Surface buildings, utility infrastructure, cavern outfitting	DOE	
LN2 cryogenic systems	DOE	
Four 10kt fiducial cryostats	Non-DOE	
LAr cryogenic systems	Non-DOE	
LAr and LN2 cryogenic fluids procurement	DOE and Non-DOE	

- LNG Membrane cryostat is an European technology.
- CERN has now a frame contract with the French firm holding the main IP.
- The support structure requires many mechanical items (beams, flanges, plates, ...) easily available in Europe, which can also be prefabricated.
- Europe with ICARUS and ATLAS has the main knowledge of LAr cryogenic technologies. Several firms available in Europe and interested.

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- *CERN is doing the final design of the cryostats, in contact with the LNG industrial community. We are constructing large prototypes (-> ProtoDUNEs).*
- *CERN has accepted to finance the **first cryostat** construction.*
- *We have the opportunity to build a consortium with several FAs for **cryostat number 2**. Several EU firms can be involved.*
- *There are plenty of opportunities to participate in the engineering of the cryostats, in particular for all the penetrations to the liquid.*
- *Same for the LAr cryogenics. We could effectively use the EU knowledge and market.*

## In practice:

- ***We need to engineer an European in-kind for the second cryostat:***
  - involve European firms in the various procurements
  - more engineering effort (distributed also outside CERN)
    - Prepare the installation scenario (technical teams, QA teams, ....)
    - All this can start with the first cryostat
- ***We need to engineer an European in-kind for LAR cryogenics:***
  - involve European firms
  - We need to strengthen the CERN cryogenics group
  - Distribute the engineering design work also outside CERN
  - Work out the scenarios for installation and commissioning