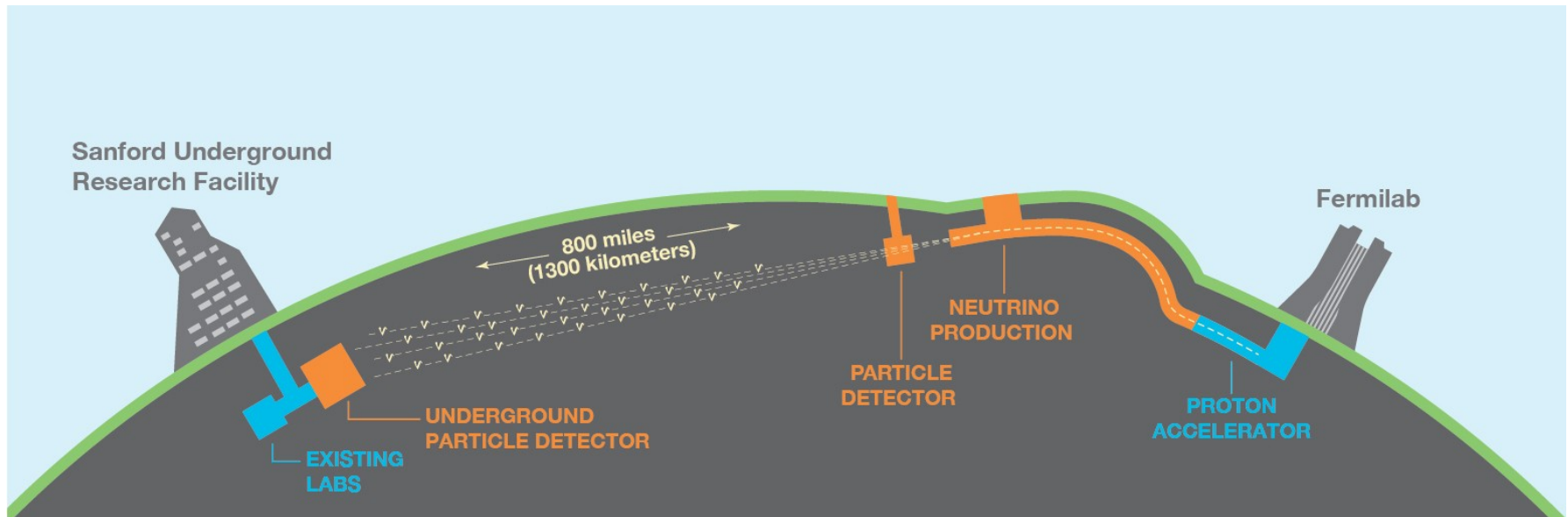


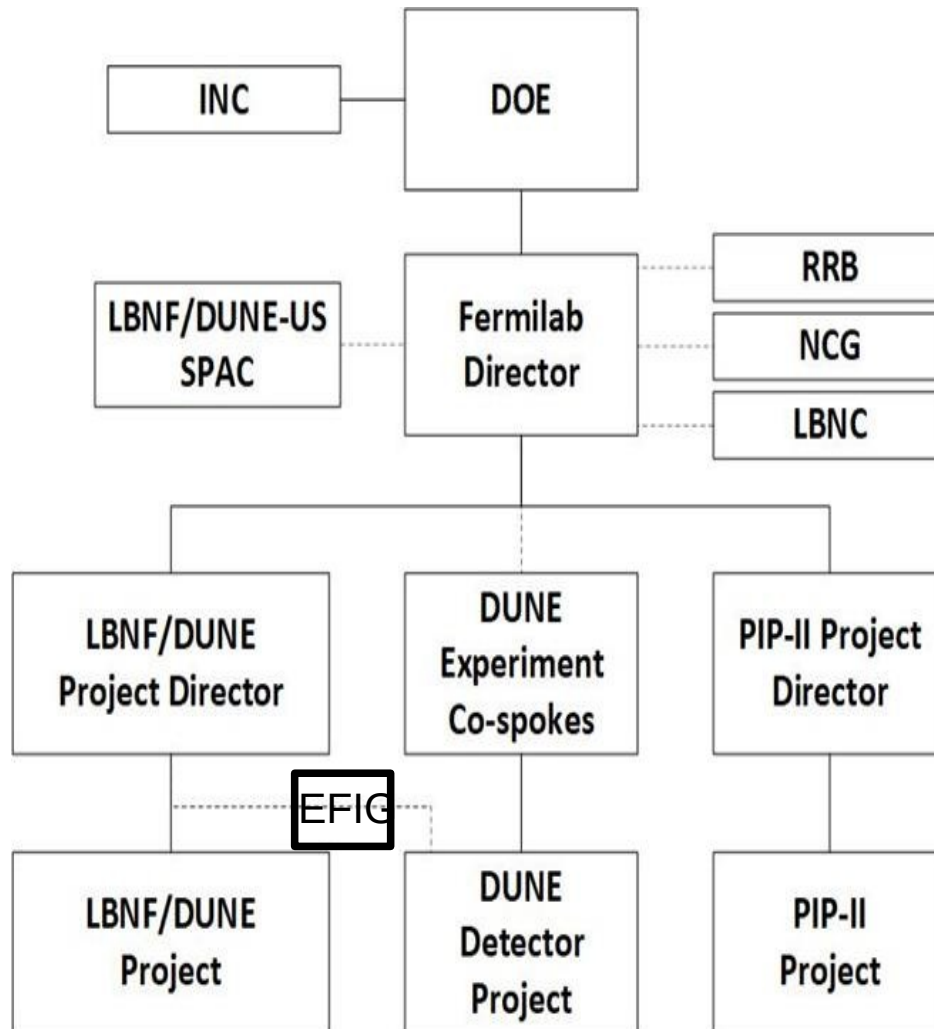
# UK Project Status

Gary Barker

LBNF/DUNE-UK Project Meeting January 2022

# LBNF/DUNE





**DOE** – project sponsor

**INC** – International Neutrino Council, advises DOE (reps. from major partners)

**FNAL** Leadership - Director + Deputy Directors

**RRB** - Resources Review Board, (reps. from funding agencies + FNAL)

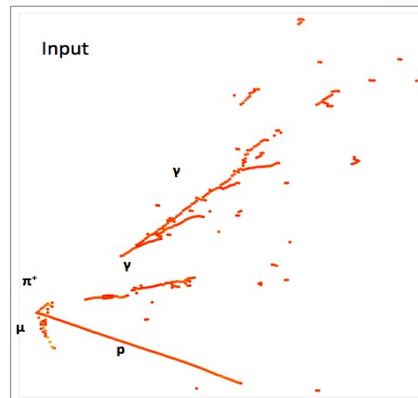
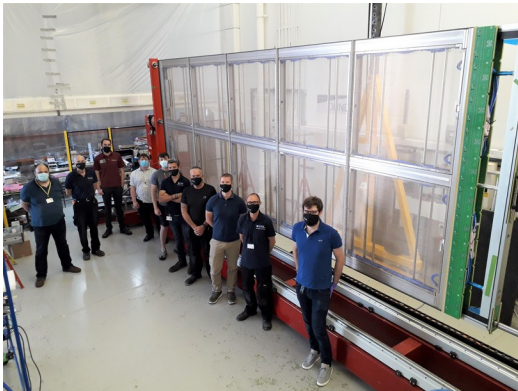
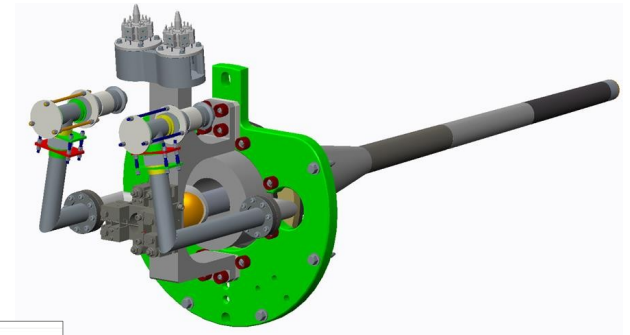
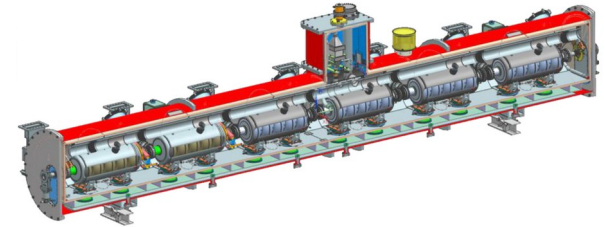
**NCG** – Neutrino Cost Group, oversight of cost and schedule

**LBNC** – Long Baseline Neutrino Committee, physics and technical oversight (reps. from major partners)

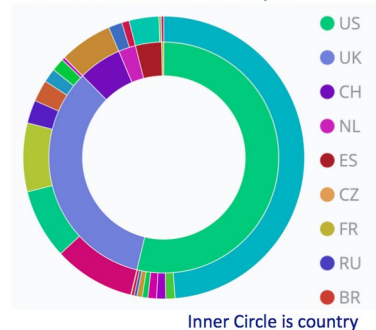
**EFIG** – Experiment-Facilities Interface Group, interface/coordination between LBNF and DUNE

# LBNF/DUNE UK Project

- **PIP-II:** deliver (by end 2025), 3 high beta superconducting RF cryomodules for end stage of PIP-II linac
- **LBNF Target:** supply 1.2MW helium-cooled graphite target plus associated infrastructure
- **DUNE:** 130 APA modules for FD-1; DAQ for DUNE-FD; LAr reconstruction software and computing contributions



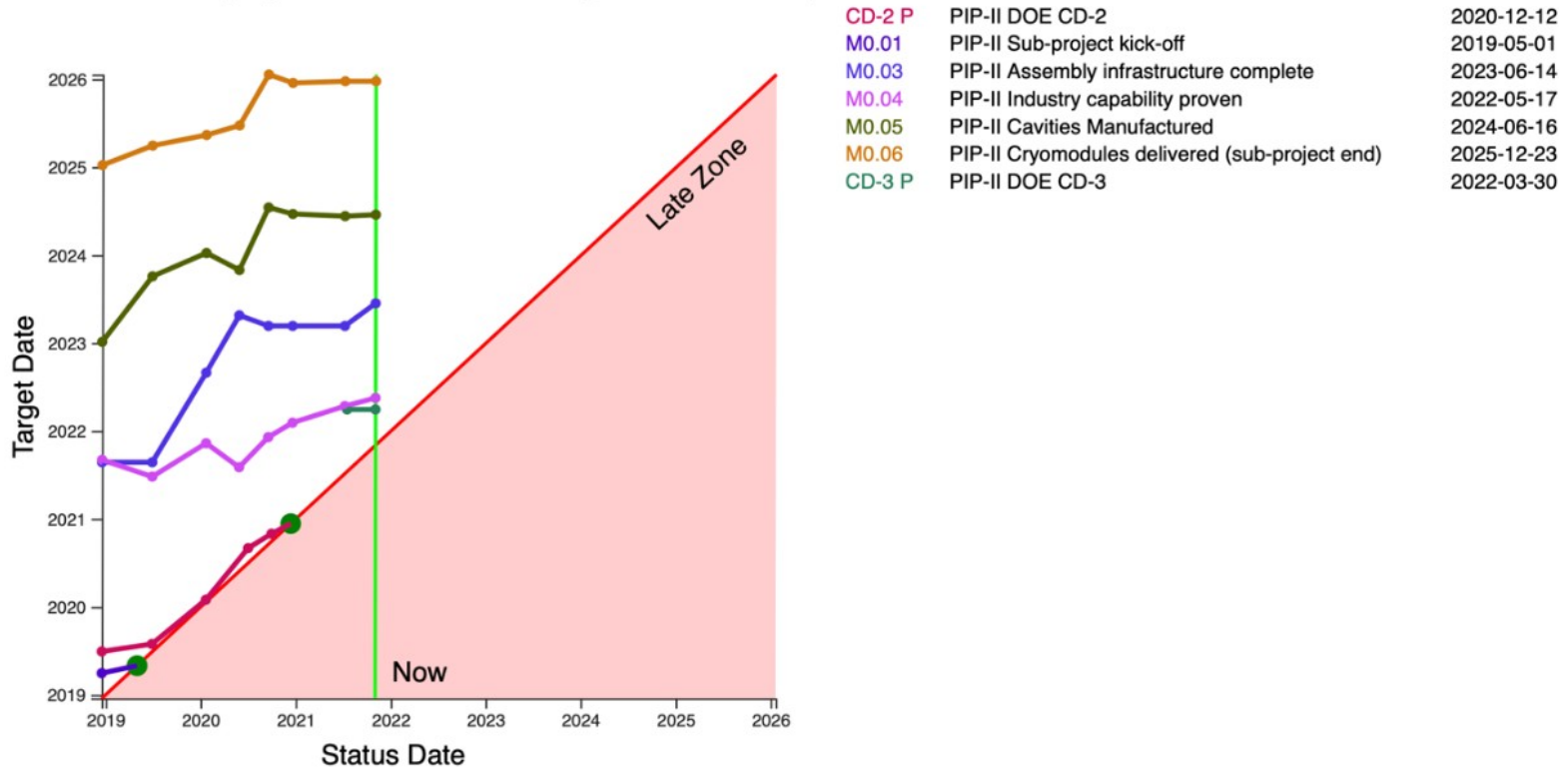
CPU Hour fraction Feb 1 - May 20



# PIP-II

- Int. Project Planning Doc. (PPD) between UK and FNAL is signed and CD-2 achieved
  - FDR for cavities complete but FDR for cryomodules delayed and pending
  - Contract for new clean room at DL signed (ready Feb.)
  - Current Challenges
    - TWI struggling to prove capability before cavity tender deadline
    - Niobium procured is not high enough quality (re-order might be necessary)
    - Cavity FDR called for 10% higher Q-factor. Implications for UK project being considered
-

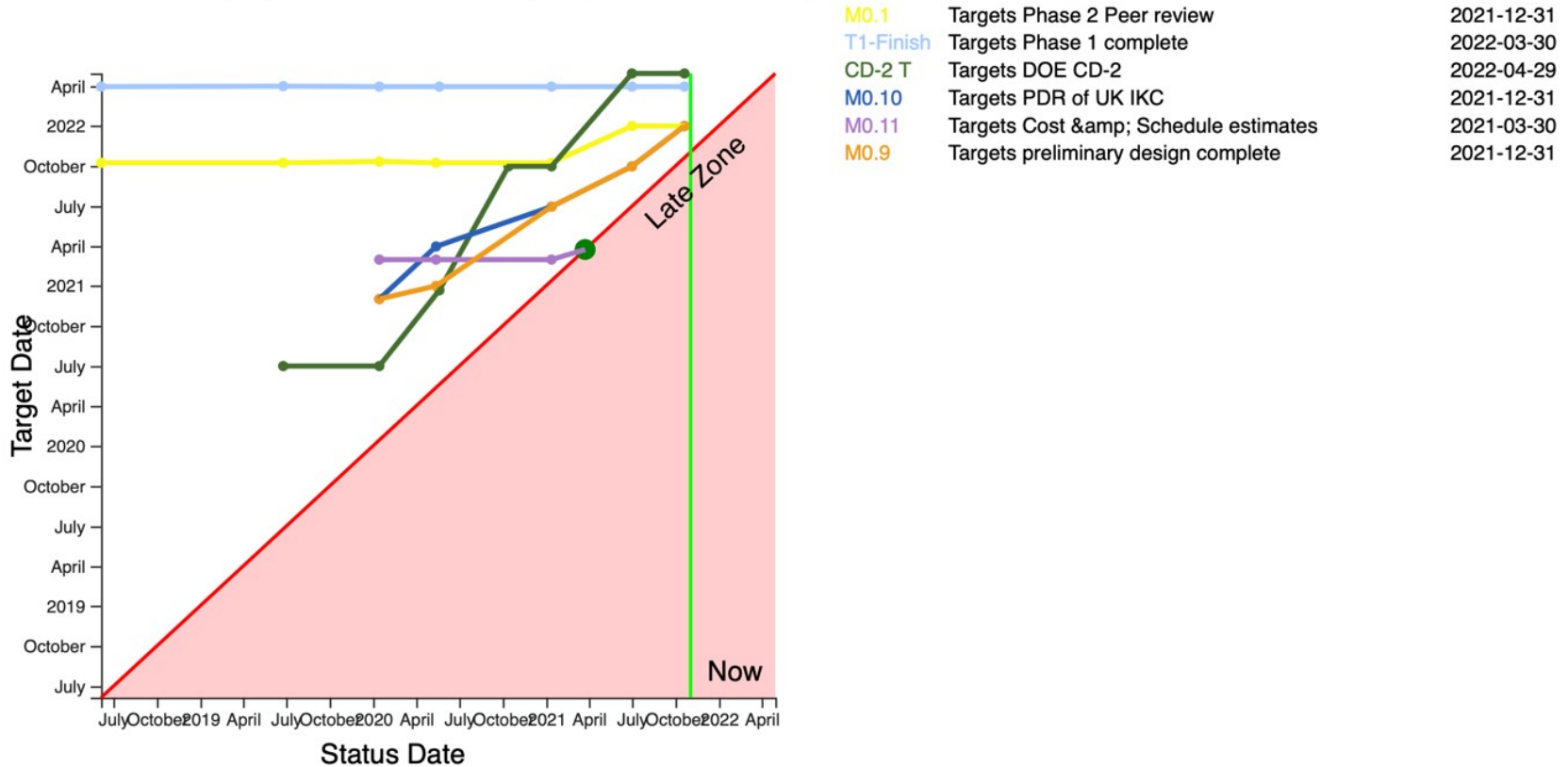
Milestone ID, Display Name, Status Date, Target Date and Completion Date



# Target

- Project split into 2 phases:
  - 2018-22 prepare preliminary design, costing, schedule and submit proposal for Phase 2
  - Phase 2 (the construction project) due to start April 2022
- PPRP meeting for Phase 2 was in October 2021 and has been approved for full funding (including materials R&D and NA61 measurements)
- Project finish 2027 with delivery of target + infrastructure but the Target Station at FNAL will not be ready by then =>further funding needed for integration and commissioning (M&O phase)

## Milestone ID, Display Name, Status Date, Target Date and Completion Date



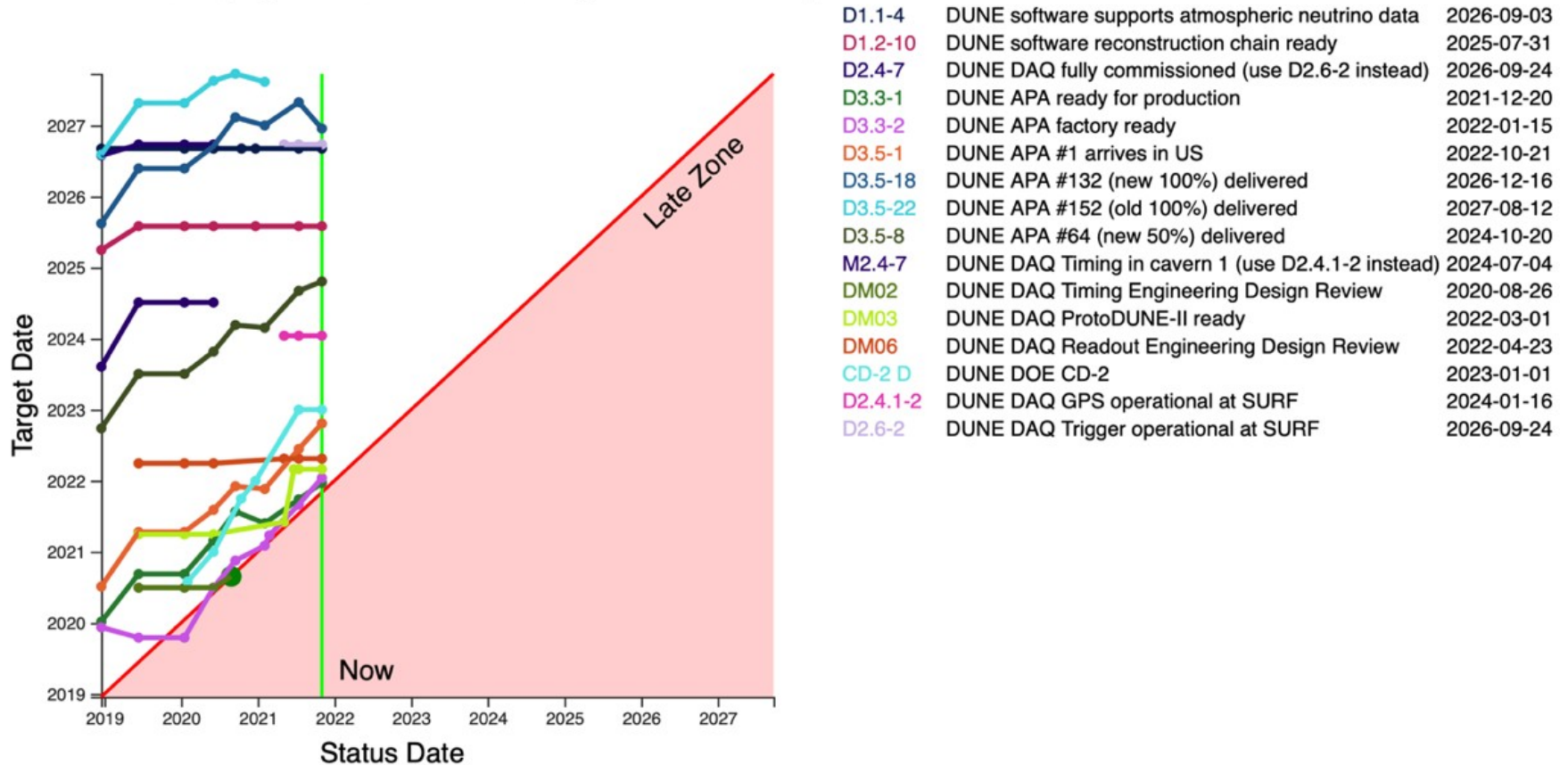


# DUNE

- 3 APAs of final design being made at DL Factory for ProtoDUNE-II @ CERN
- The first APA delivered to CERN and undergone cold box testing; significant timing and DAQ capability supplied by UK group
- Production of 130 APAs for FD-1 now formally approved by STFC PD
- On course to start APA production around April – PRR to happen 1<sup>st</sup> week March
- Many challenges have been overcome: breaking wires, anomalous leakage currents, transport frame design, APA frame design/manufacture, production schedule etc
- Tender process well underway – many challenges to stay within budget!
- Int. DAQ project went through PDR last week – UK leading the technology choice between ATLAS-style readout or an off-the-shelf solution
- Physics and computing sub-projects making good progress



## Milestone ID, Display Name, Status Date, Target Date and Completion Date



# November Project Board Meeting

- A main topic was realising a SC cavity production capability in the UK – part of the BEIS Business Case and significant investment already made with TWI: agreed a detailed analysis of the options prepared for PB a.s.a.p.
- Request for higher Q-value cryomodules should be accommodated by the UK on a “reasonable effort” basis (cost implications handled via UK Change Control)
- Benefits Realisation reporting has to be improved – project should report back all outreach activities

# Things coming up

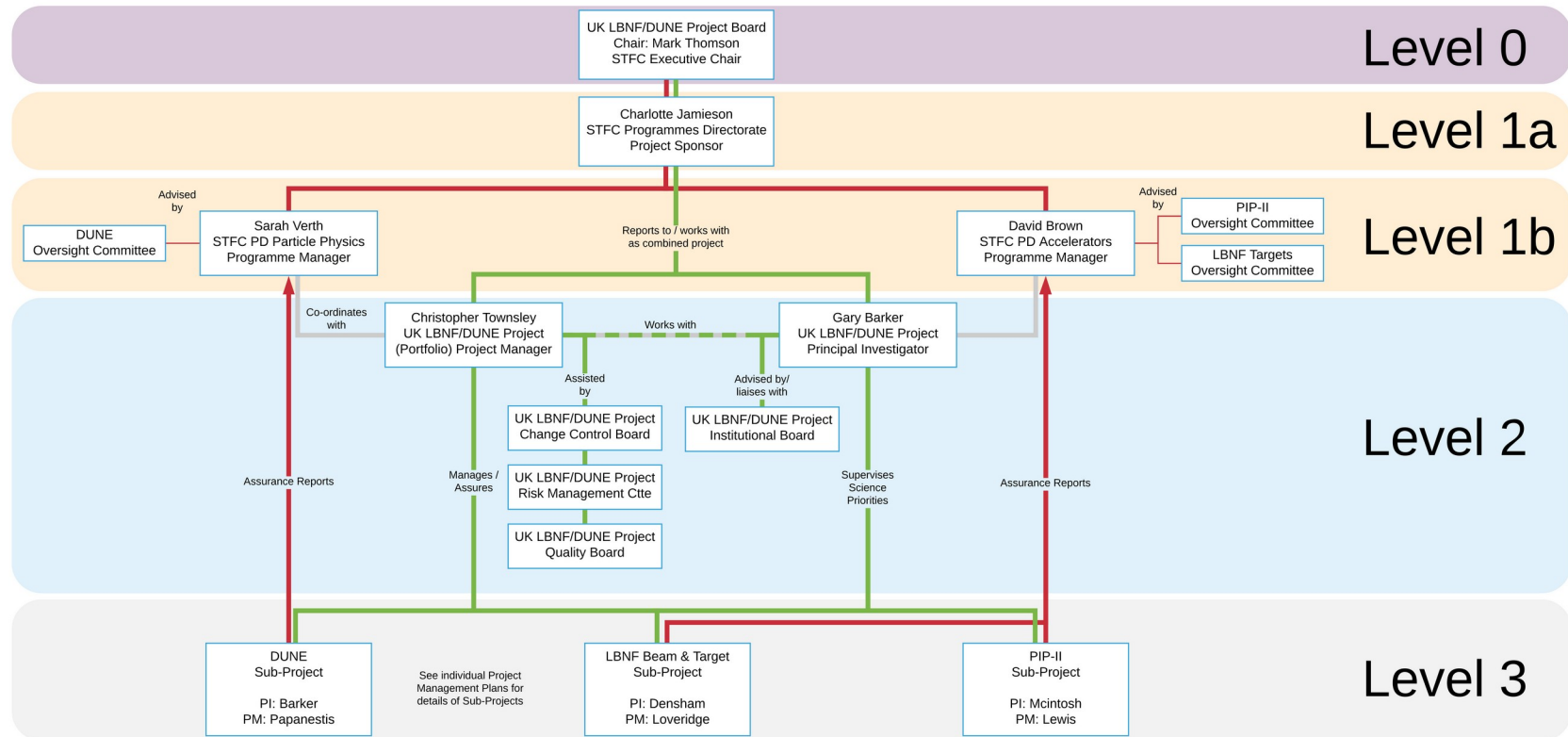
- Our 3<sup>rd</sup> Gateway review happens this week: Government-level to check progress and value-for-money with focus on the business case. Top priority from last review (2019) is to deliver complete/comprehensive Project Management Plan.
- OsC's for PIP-II and Target this month; for DUNE in February
- Mid-term reviews for PIP-II and DUNE UK projects expected in 2022
- Resource Review Board and CD1-RR in April

# Challenges

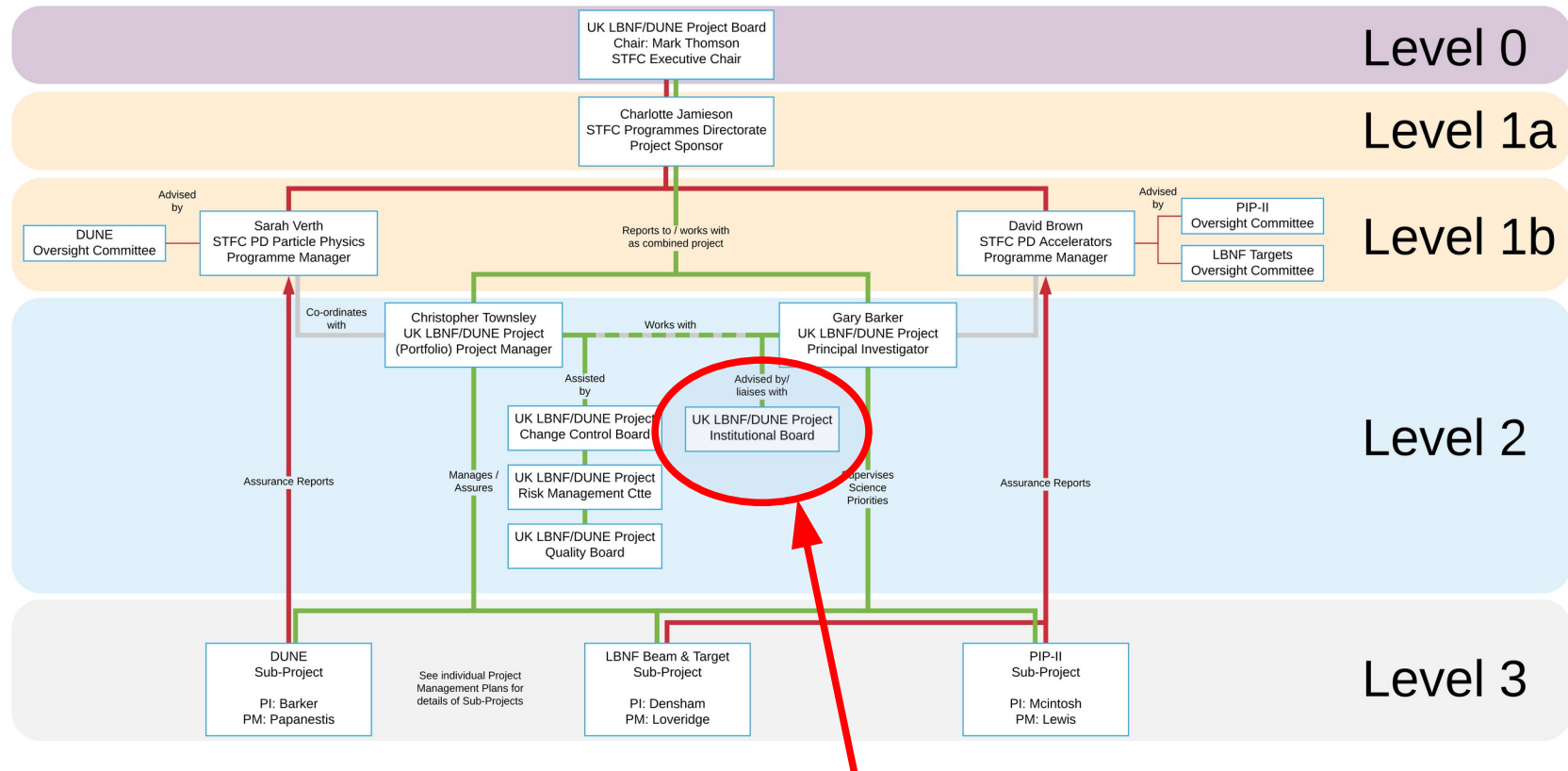
- Cost rises and international project delays
- Personnel: trying to find suitable full-time replacement for Antonis (DUNE PM) for some time; struggling to assemble team of technicians for DL factory; recent success has been appointment of Sandeep Rao as P6 Scheduler
- Delivering the Business Case e.g. making UK-custom readout boards for DUNE DAQ may not be the best option for DUNE
- Securing funds for UK to supply ND DAQ – depends on overspends elsewhere especially with APAs
- Etc!



# Management Structure



# Management Structure



New IB-Chair: Jarek Novak (Lancaster)

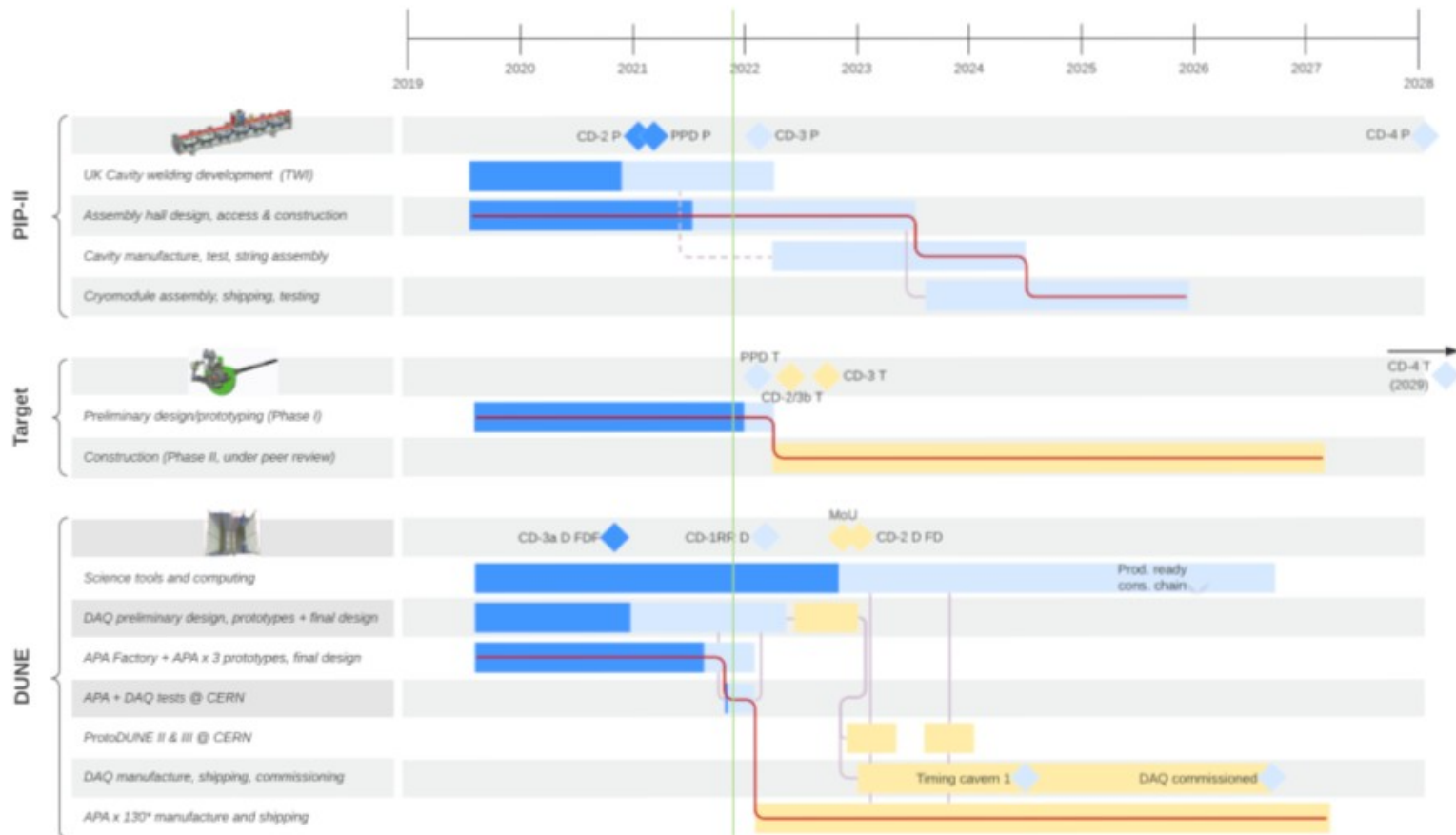
# Conclude

- Across all 3 sub-projects significant progress is being made despite an often very challenging environment
- This is only possible because we have a very talented team, of people who are prepared to work hard to find solutions
- Many thanks to you all and let's continue to push to get LBNF/DUNE-UK delivered

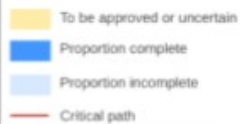


## UK LBNF/DUNE

Simplified critical path | November 2, 2021 | Christopher Townsley



### Legend



### Progress indication

0% not started  
10% started  
50% significant progress  
90% nearly finished  
100% completed

### US DOE approval stages (Critical Decision)

CD-1 RR Approve cost range (refresh)  
CD-2 Approve project plan  
CD-3 Approve start of construction (a.b. ... early release of funds)  
CD-4 Approve start of operations

Timeline does not show procurement activities unless on critical path

### Other acronyms

D DUNE  
FD Far Detector  
FDF Far Detector Facilities  
MoU Memorandum of Understanding  
P PIP-II  
PPD Project Planning Document  
T Target

