



*The purpose of the Exascale Computing Facility Modernization (ECFM) is to ensure that Lawrence Livermore National Laboratory (LLNL) facilities and infrastructure are capable, available, flexible, and adaptable to site future generations of high performance computing systems.*

## Project Background

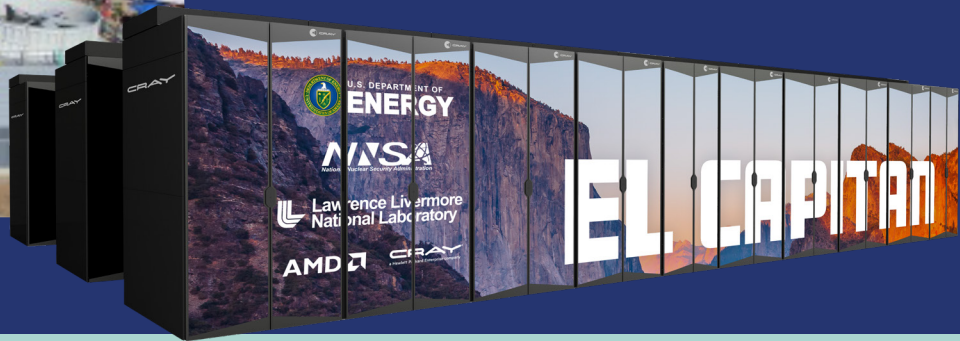
Our high performance computing (HPC) mission focus is centered on simulation, which depends on three closely coupled components: codes, platforms, and facilities. Simulation is only as strong as the weakest of these core components.

Facility mission requirements are addressed in LLNL's HPC facility master plan, which was developed shortly after the completion of Building 453 (B453) in 2004. At that time, a roadmap was needed to transition from terascale to petascale and, ultimately, to exascale. LLNL has been delivering on this master plan for almost two decades, and with ECFM complete, B453 can now site two exascale-class systems simultaneously with the facility scaled to 85MW of power and 28,000 tons of liquid cooling.



### Critical Decision (CD) Milestones

CD-0	CD-1	CD-3A	CD-2/3	CD-4
4/28/2017	5/15/2018	6/20/2019	12/19/2019	5/5/2022



## ECFM Highlights

- ECFM was completed \$9M under budget and 9 months ahead of schedule during the COVID-19 pandemic
- B453 cooling system scaled from 10K tons to 28K tons with new 18K ton cooling tower
- 30" process cooling loop piping extended to B453 for liquid cooling
- Electrical supply upgraded from 45MW to 85MW
- New 115kV transmission line, air switches, substation transformers, switchgear, relay control enclosures, and 13.8kV secondary feeders
- Indoor 13.8kV-480V electrical distribution installed in B453
- New substation energized and placed in service on 2/4/22 by DOE Western Area Power Administration (WAPA)
- New ECFM control system connected to B453 building management system
- Excellent safety record with over 152,000 work hours and no recordable safety events