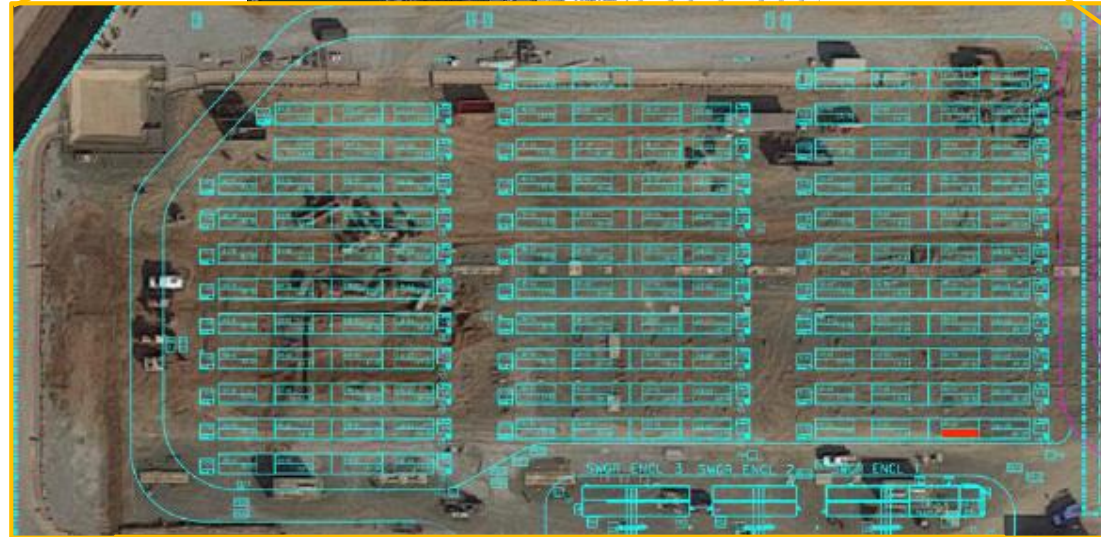


# Elkhorn Battery Energy Storage System

Monterey County Board of Supervisors  
December 13, 2022



- Fire affected 1 Tesla Megapack (out of 256), which failed safely as designed.
- Local fire response operated as expected based on pre-operations collaboration.
- Elkhorn is fully de-energized and currently offline.
- PG&E and Tesla are conducting an investigation to determine the likely root cause of the incident.
  - PG&E is working to implement a complete set of corrective actions and is committed to mitigating the issue and improving its response



*Outline drawing of the 256 Megapacks at Elkhorn BESS  
NOTE: Red rectangle designates the thermal event Megapack*

# What is the Elkhorn Battery Energy Storage System?

- **Located at PG&E's Moss Landing electric substation in Moss Landing, CA**
- **Owned and operated by PG&E**
- **Enough electricity to meet the instantaneous demand of nearly 275,000 homes**
  - **Maximum discharge rate of 182.5 megawatts (MW)**
  - **Capacity to store and dispatch up to 730 megawatt hours (MWh) of energy for four hours**
- Approved by the California Public Utilities Commission (CPUC) in November 2018 to support local capacity requirements and reliability.
- Approved by the Monterey County Planning commission in February 2020.
- Site construction began in July 2020 and the system began operation in April 2022.
- The system was designed, constructed, and is maintained in collaboration with Tesla, and is one of the largest utility-owned, lithium-ion battery energy storage systems.



# What is the purpose of the Elkhorn Battery Energy Storage System?

- **Provides substantial savings for electric customers**
  - **Supports grid reliability and California's decarbonization and climate resilience goals**
  - **Helps integrate renewable energy resources onto the grid**
  - **Reduces reliance on fossil fuel generation**
  - **Enhances overall reliability**
- 
- Designed and constructed to address capacity deficiencies, provide energy and ancillary service
    - Such as, serving as an operating reserve that can quickly be dispatched to ensure there is sufficient generation to meet energy demand.
  - Expected to result in lower overall costs for customers by providing additional local capacity and reducing PG&E's energy procurement costs over its 20-year lifetime.



# What fire safety planning took place in designing the Elkhorn facility? (1 of 2)

- **Emergency Action Plan and Pre-Fire Plan development**
  - **PG&E coordinated with Tesla and North County Fire Protection District**
- **First responder on-site training and system walkthrough before commercial operations with PG&E and Tesla teams**
- PG&E contributed Thermal Imaging Cameras and Air Monitoring Equipment to NCFPD.
- Pre-Fire Plan developed by PG&E fire experts to assist local emergency responders with important safety and emergency response information concerning the facility.
  - Quick reference guide (warnings, hazards, access, firefighting guidance)
  - Site maps, equipment layout drawings, floorplans
  - Explanation of potential hazards including electrical, battery and fluid-filled equipment
  - Explanation of detection, suppression, equipment and remote monitoring systems



# What fire safety planning took place in designing the Elkhorn facility? (2 of 2)

PREPARATION	DETECTION	SITUATIONAL AWARENESS	RESPONSE
Tesla Megapack industry-accepted fire certification <sup>1</sup>	Overtemperature Alarms	Site Cameras (2 fixed, 1 PTZ)	Permanent Water Supply (2 Hydrants)
Emergency Action Plan	Flame Detectors (Fire Alarm)	Expanded Telemetry	Fire Fighting Equipment (Monitor carts & hose)
Pre-Fire Plan	Automated De-energization	Incident Command Building	Water Retention (Expanded Pond 4)
Fire Department Tour/Training	Emergency Stop Button	Thermal Imaging and Air Monitoring Equipment <sup>2</sup>	

1. Underwriter's Laboratory 9540 - Standard for Safety of Energy Storage Systems and Equipment

2. Provided to NCFPD by PG&E for each of the first-out engines Public



## How did PG&E respond to the fire incident at Elkhorn and what was the coordination with local first responder agencies?

- **PG&E's 24x7 Operations Center initiated a call to 911 after receiving thermal alarms.**
- **After flames were detected by the facility's flame detection system, the facility automatically disconnected from the grid as part of the system's safety design.**
- **The incident was managed consistent with the firefighting strategy outlined in the Pre-Fire Plan.**
  - Employed a defensive firefighting strategy allowing the involved Megapack to burn itself out
  - Cooled adjacent Megapacks via fog pattern streams from portable water monitors.



# What are the post-incident actions?

- **PG&E and Tesla are conducting a root cause analysis investigation, determining the likely root cause of the fire incident, and working to implement a complete set of corrective actions.**
  - We have preliminarily identified the likely root cause of the incident as related to an equipment installation issue.
  - Corrective actions including performing an extent of condition and inspection of all other Megapacks on site, additional causal analysis, physical modifications and testing are required before the system is safely returned to operations.
- **Air sampling coordinated by the County Environmental Health Division and conducted by the Environmental Protection Agency and PG&E indicated there was no threat to human health or surrounding environment.<sup>1</sup>**
  - PG&E is coordinating with County Environmental Health and Tesla environmental teams to preserve the local environment and restore the site, specifically:
    1. PG&E collected the water deployed for fire mitigation into tanks. PG&E has sampled the water and appropriately disposed of it under County oversight.
    2. PG&E has conducted soil sampling in the vicinity of the impacted battery and removed impacted soils for proper disposal.
    3. Damaged Megapack removed from site.

1. From The County of Monterey Health Department, Environmental Health Division (September 30, 2022):  
[County of Monterey Environmental Health Shares Air Quality Testing Information and Process During Moss Landing Fire Incident](#)



**Thank You**

