

# Humidor Battery Energy Storage System

Enhancing renewables & resilience for Los Angeles region



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## **Mission**

To accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise.

## **Renewable Energy End-Game**

100% renewable energy; 25% local, interconnected within the distribution grid and ensuring resilience without dependence on the transmission grid; and 75% remote, fully dependent on the transmission grid for serving loads.

- 400 MW / 1,200 MWh Battery Energy Storage System (BESS)
- Installed by Hecate Grid, a leading independent power producer focused on developing, building, owning, and operating stand-alone energy storage projects in the US.
  - Hecate Grid has a pipeline of over 6 GW of BESS throughout the US with 3 GW in California.
- Located in Acton, CA, about midway between Glendale and Lancaster.
- Closest neighborhood will be 4,000 feet from the Humidor project site.
- Will enhance grid reliability, including during times of AC-driven stress and during extreme weather events and other disasters that threaten the broader grid.
- Utilizes disturbed and industrial zoned land buffered by roadways, rail lines, and industrial facilities.
- Will not use any groundwater and will only use LA County Public Works water.
- Will create approximately 100 high paying union jobs during construction and employ several workers for ongoing operations.
- For every 1 MW of capacity in operation, Hecate Grid will invest \$250 annually in local community initiatives, totaling \$100,000 annually at full capacity.

## ABOUT HECATE GRID



- Hecate Grid is a leading energy storage Independent Power Producer (IPP) safely developing and operating standalone storage projects in California and across the US.
- Current development pipeline exceeds six gigawatts (GW) of battery energy storage (BESS) throughout the US with three GW in California.
- In California, Hecate Grid has 15 BESS projects in development, four undergoing construction and one in operation.
- Since 2019, Hecate Grid has successfully operated battery storage systems with no safety or fire incidents.



1. Important location to provide reliability and meet energy demand
2. Significant distances from other facilities, including housing
3. Same safe BESS technology that is already deployed across the United States
4. Respect for environmental & cultural resources, and supportive to private property owners
5. Significant economic benefits to the local community

Important location to provide reliability and meet energy demand

- 1. Reduce grid congestion** by storing excess solar energy from the Antelope Valley (and beyond) in the Humidor BESS and discharging it during peak demand hours to alleviate grid congestion.
- 2. Maximize solar and other renewable energy** that can reach the Los Angeles region, while minimizing the use of gas peaker plants, which are mostly located in highly impacted Los Angeles communities.
- 3. Improve reliability system-wide** including during the hottest hours of the year when AC is exacerbating the grid.

# Humidor will maximize solar while enhancing grid reliability

## Power Plants in the U.S.

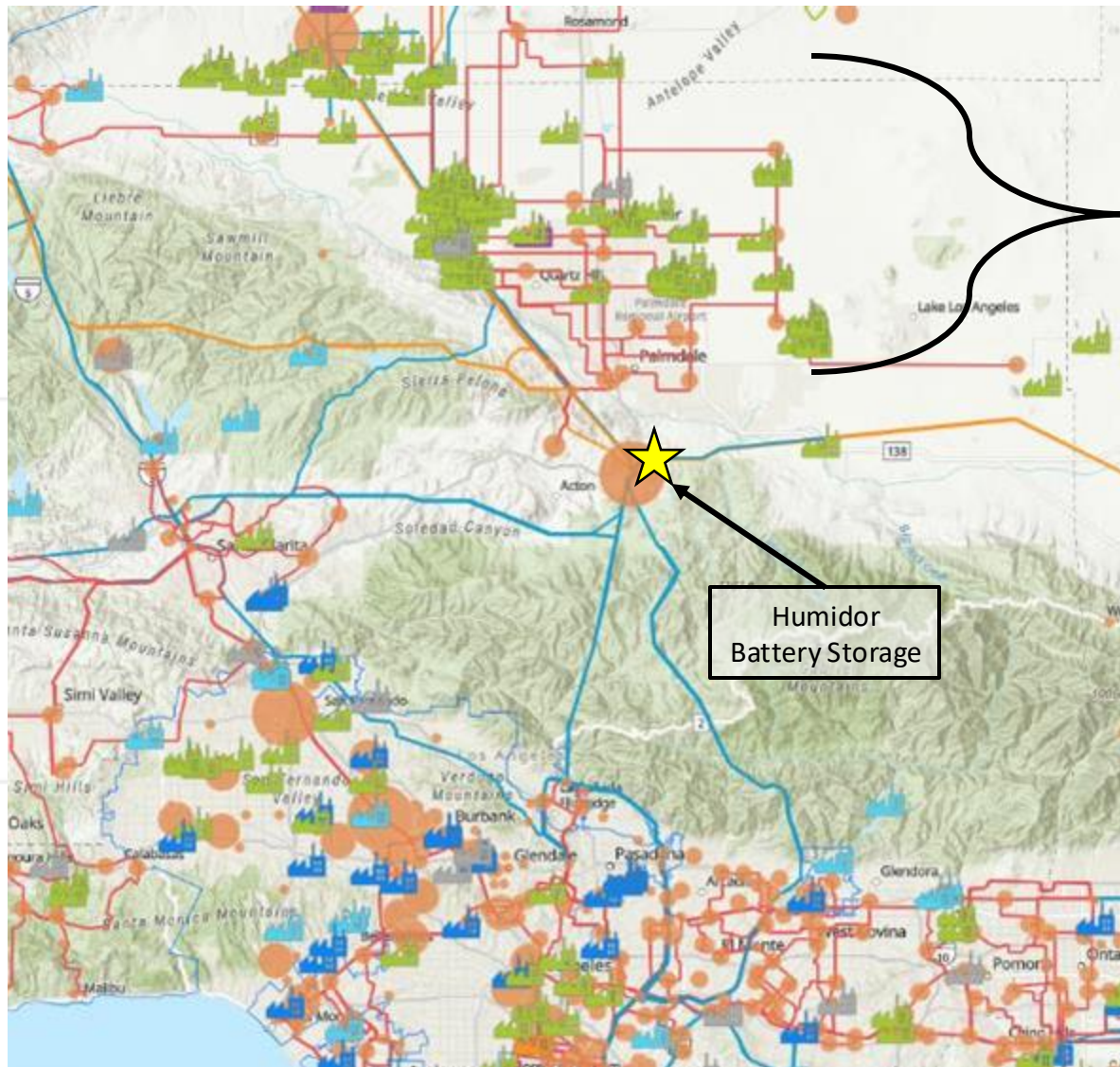


## CA\_Substations\_Final

### Max\_Voltag



## ICA\_Layer - Transmission Circuits



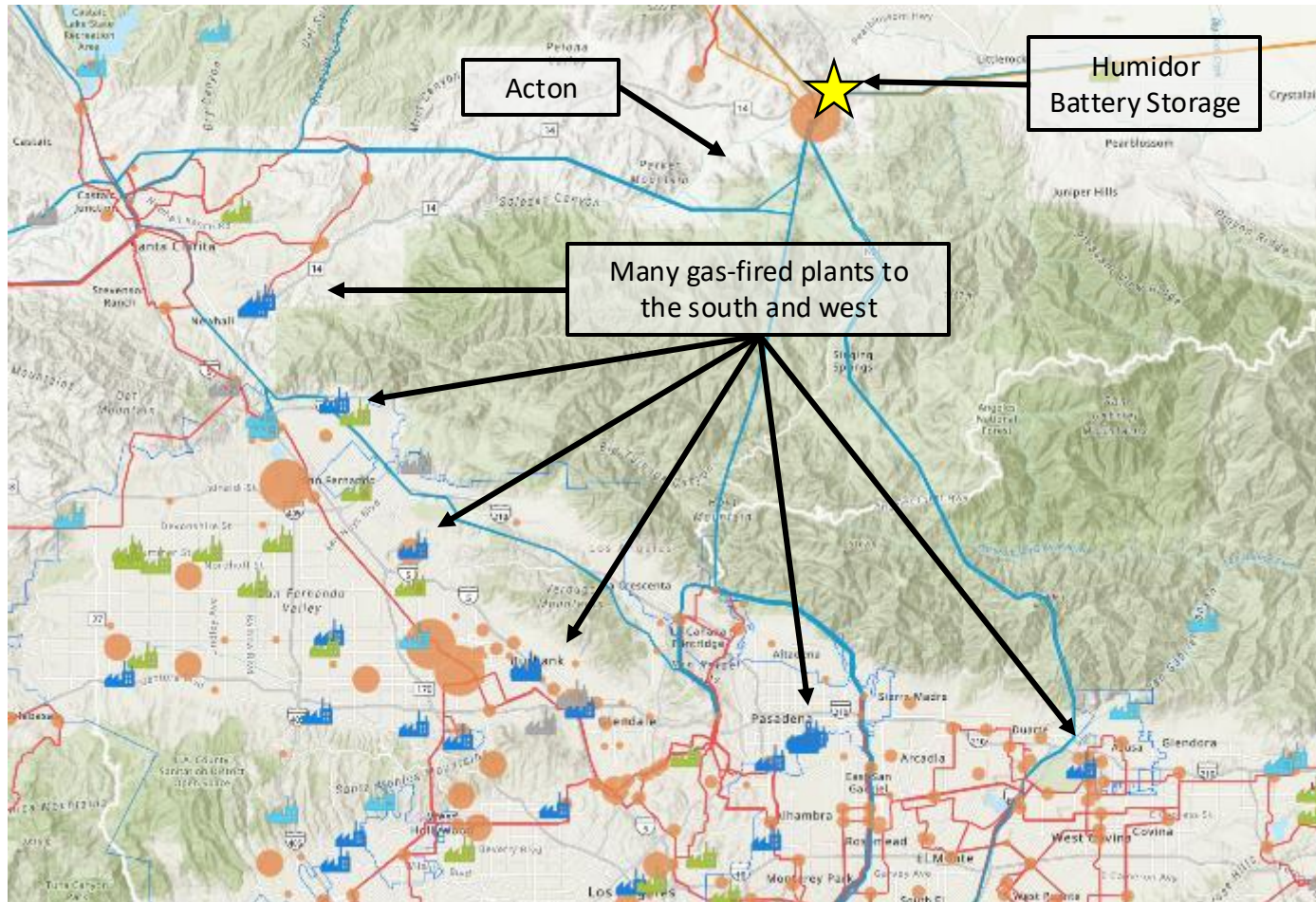
There is a significant amount of solar in the central valley that is attempting to flow down into Los Angeles (LA).

CAISO is careful about adding more solar in the central valley due to grid congestion, so it is slowing down the deployment of additional solar. Too much grid congestion can cause grid outages.

The Humidor Battery Storage Project will address multiple challenges: deliver solar energy to Los Angeles, prevent curtailment, meet peak grid demand, and alleviate congestion. This will help smooth supply and demand, reducing blackout risks.



# Humidor will reduce pollution from especially dirty gas-fired peaker plants

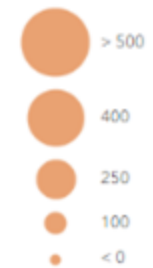


Power Plants in the U.S.



CA\_Substations\_Final

Max\_Voltag

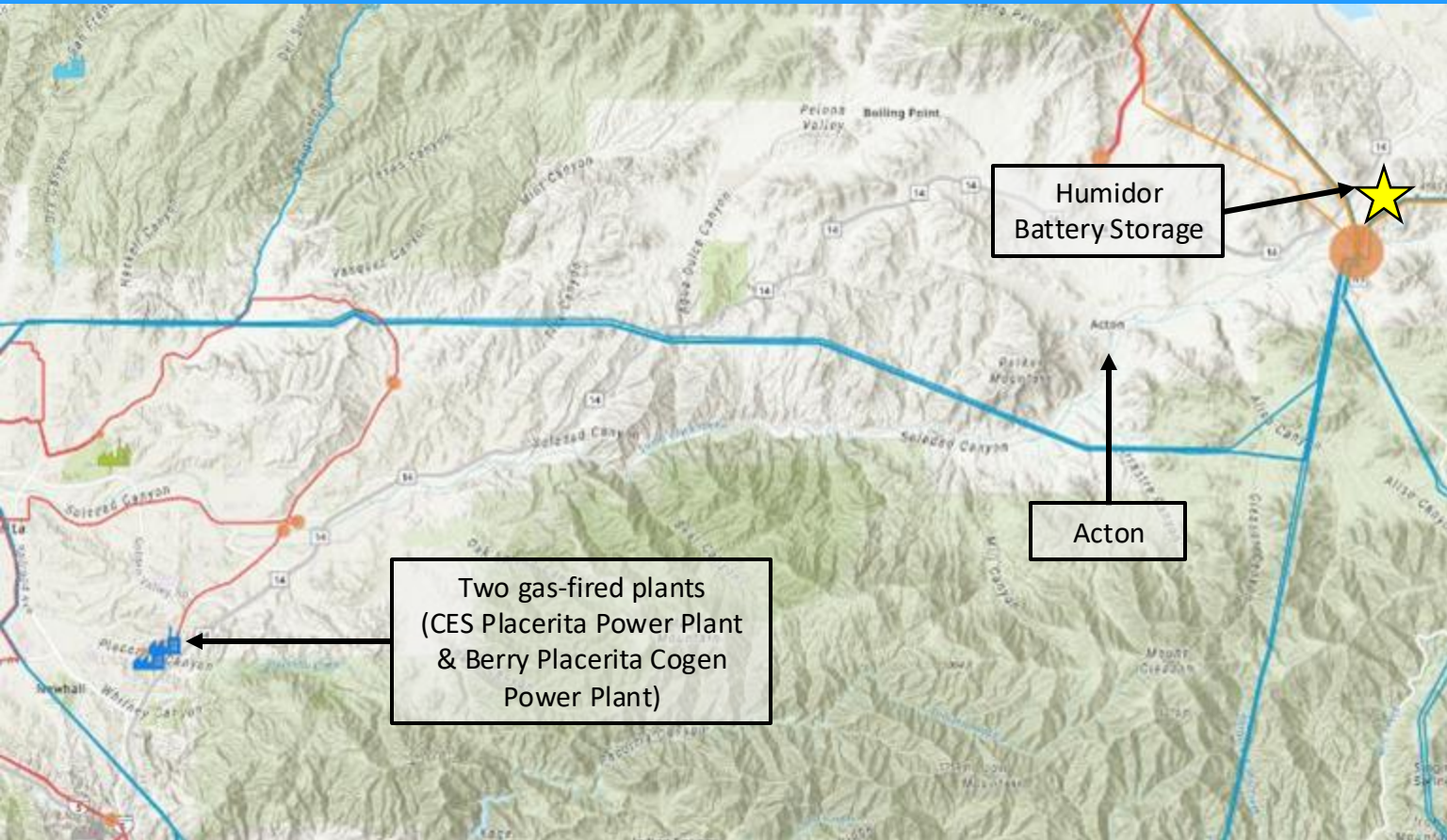


ICA\_Layer - Transmission Circuits



Humidor will help minimize how often dirty gas-fired plants need to run to top off the grid when demand is high. This will keep pollution from those gas-fired plants out of nearby communities.

# Humidor will reduce pollution from especially dirty gas-fired peaker plants (continued)

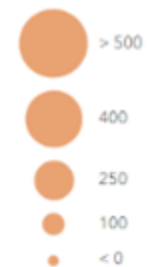


Power Plants in the U.S.



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Max\_Voltag

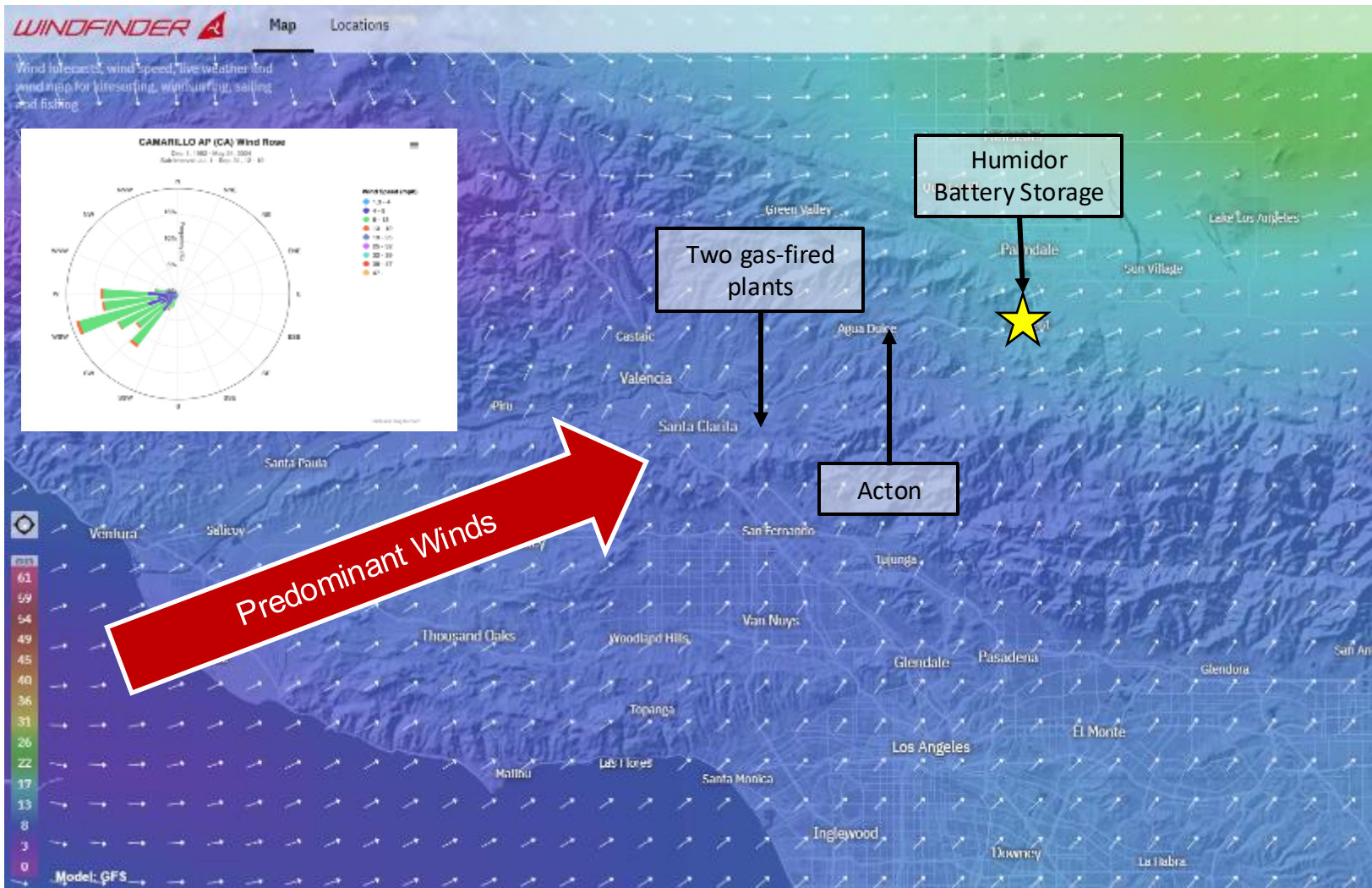


ICA\_Layer - Transmission Circuits



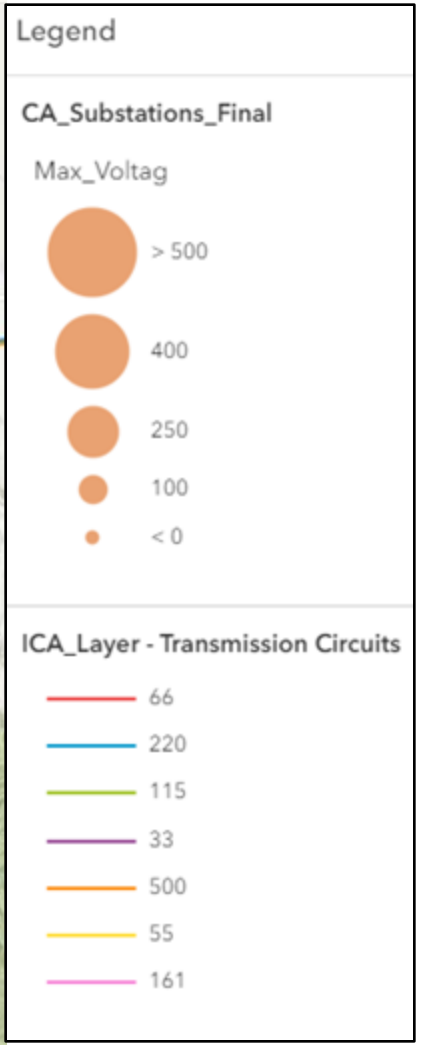
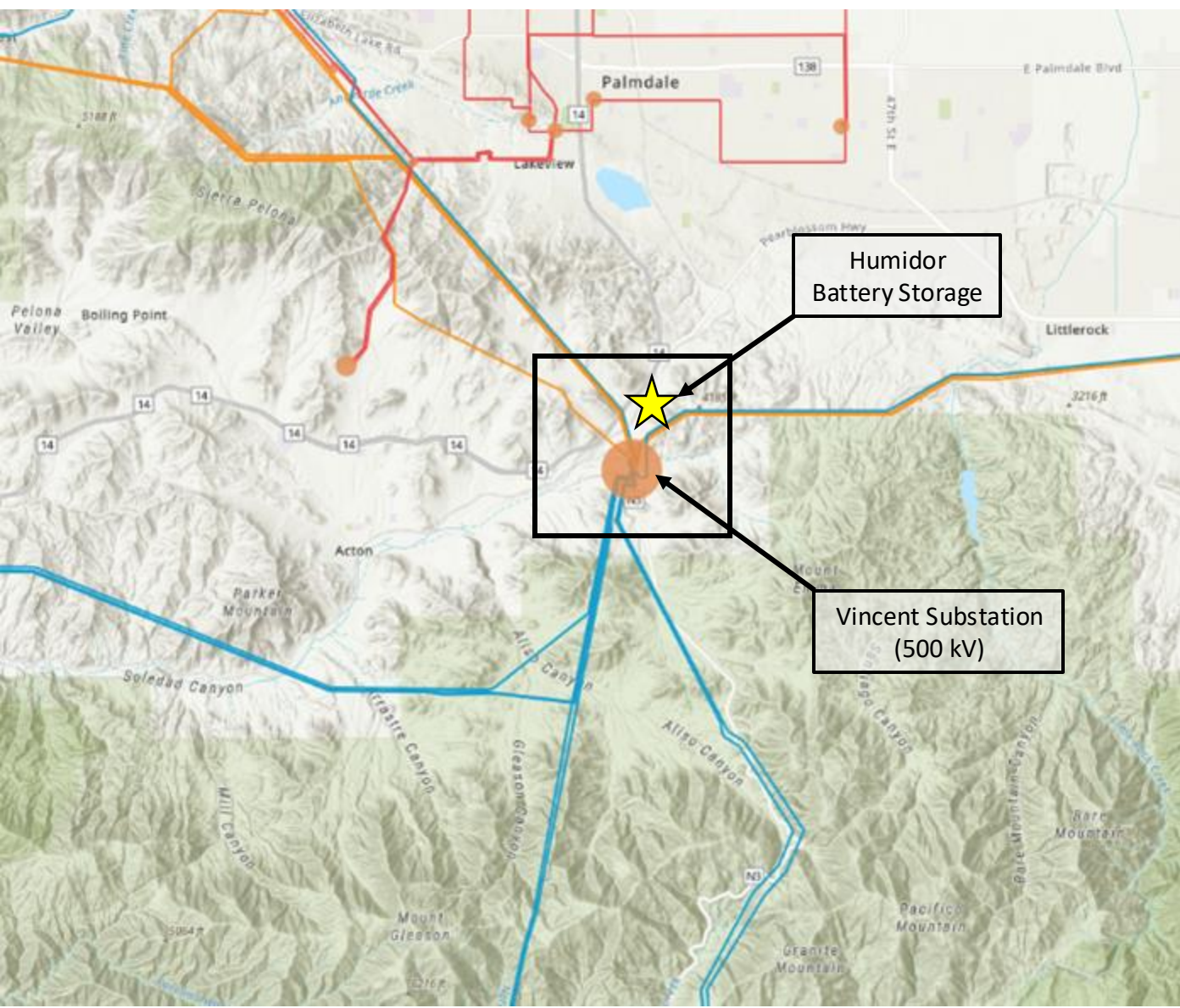
Humidor will help minimize how often dirty gas-fired plants need to run to top off the grid when demand is high. This will keep pollution from those gas-fired plants out of nearby communities.

# Coastal winds push pollution from gas-fired plants through Acton

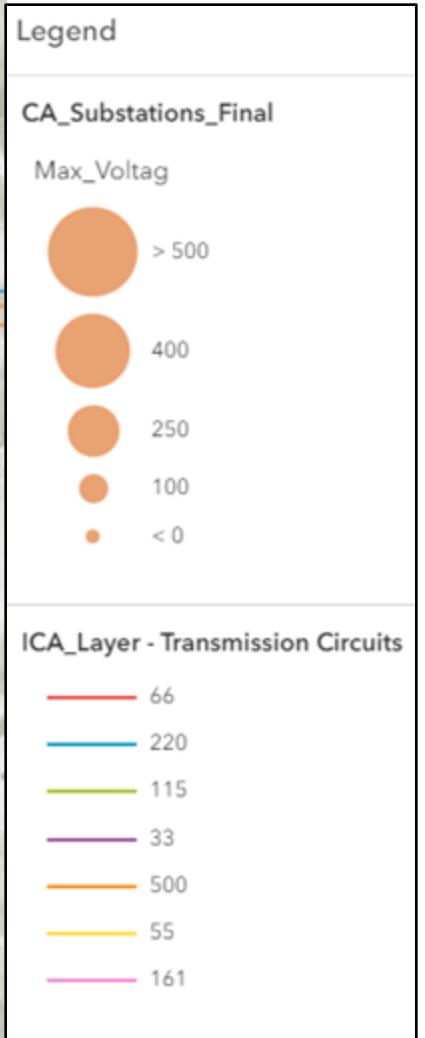
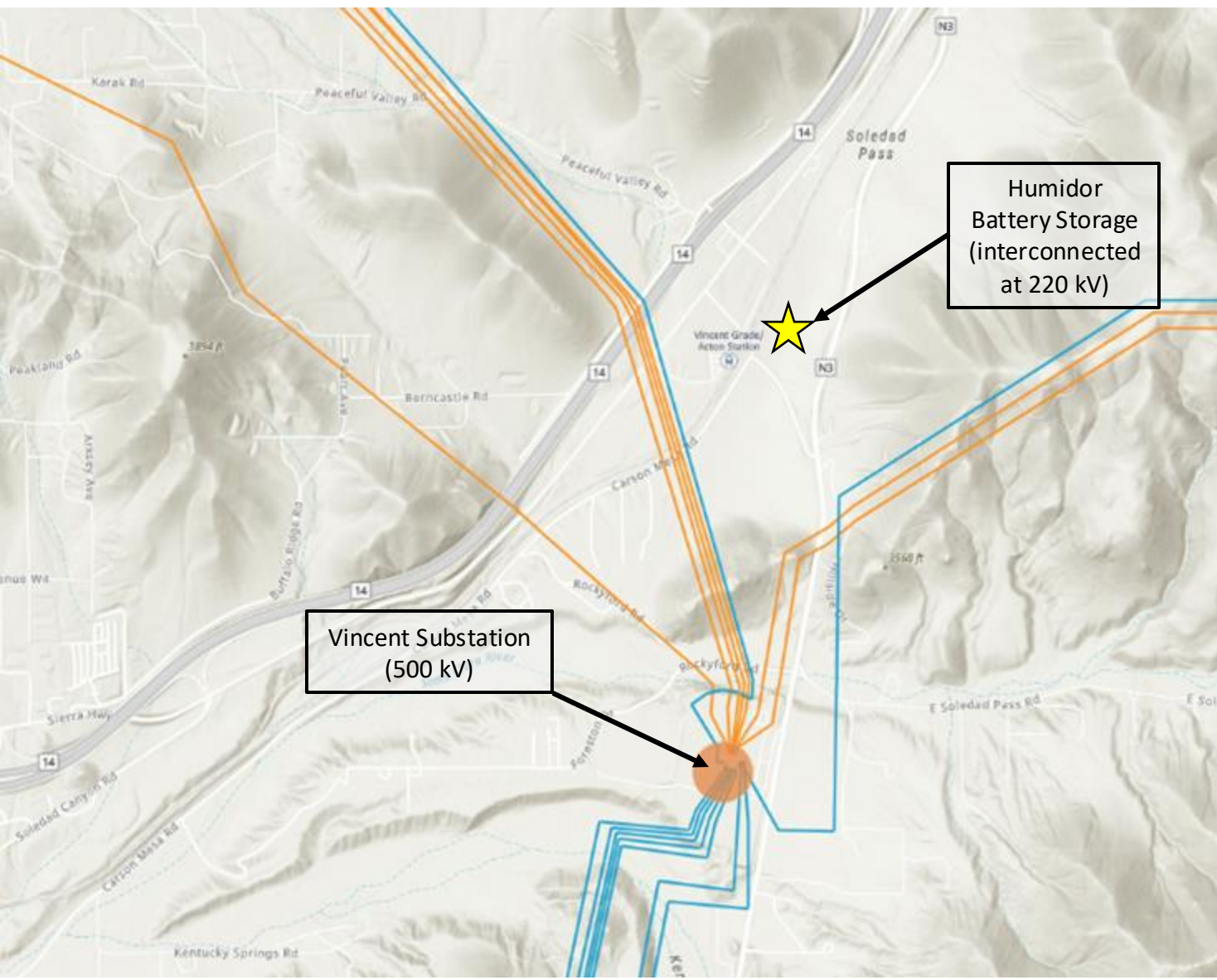


Acton is downwind of gas-fired plants, while Humidor is downwind of Acton

# Humidor energy storage is located at a major grid intersection



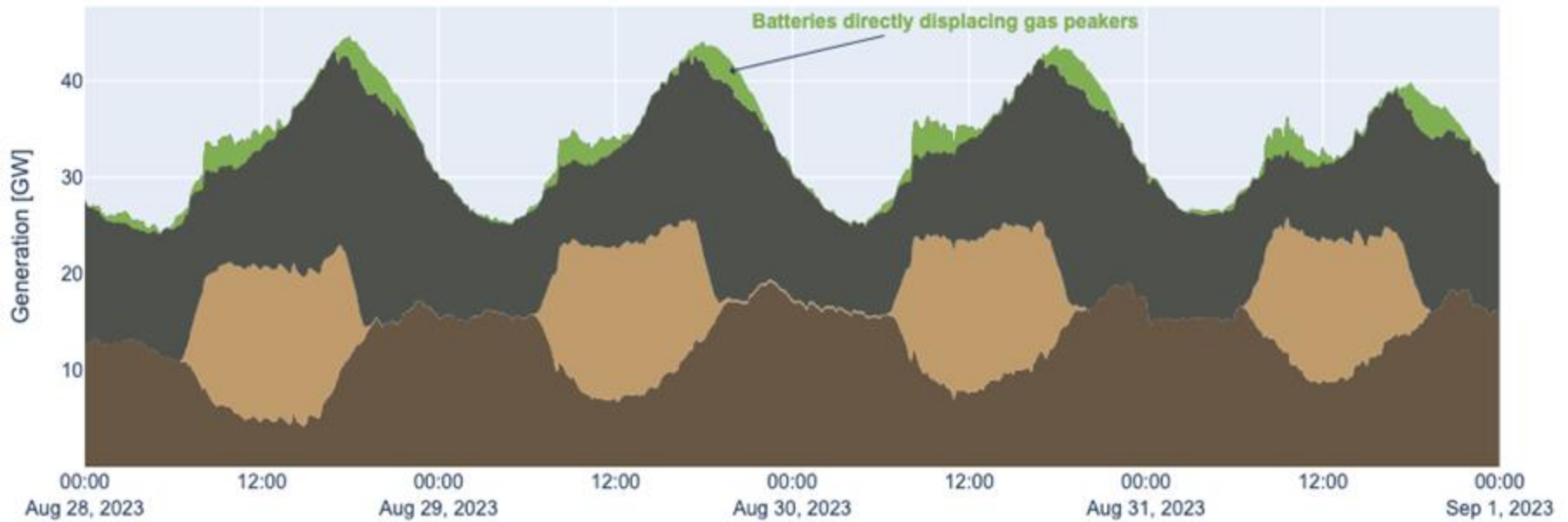
# Humidor is located at a major grid intersection, less than one mile from the massive Vincent Substation



# Time-shifting solar generation helps prevent blackouts

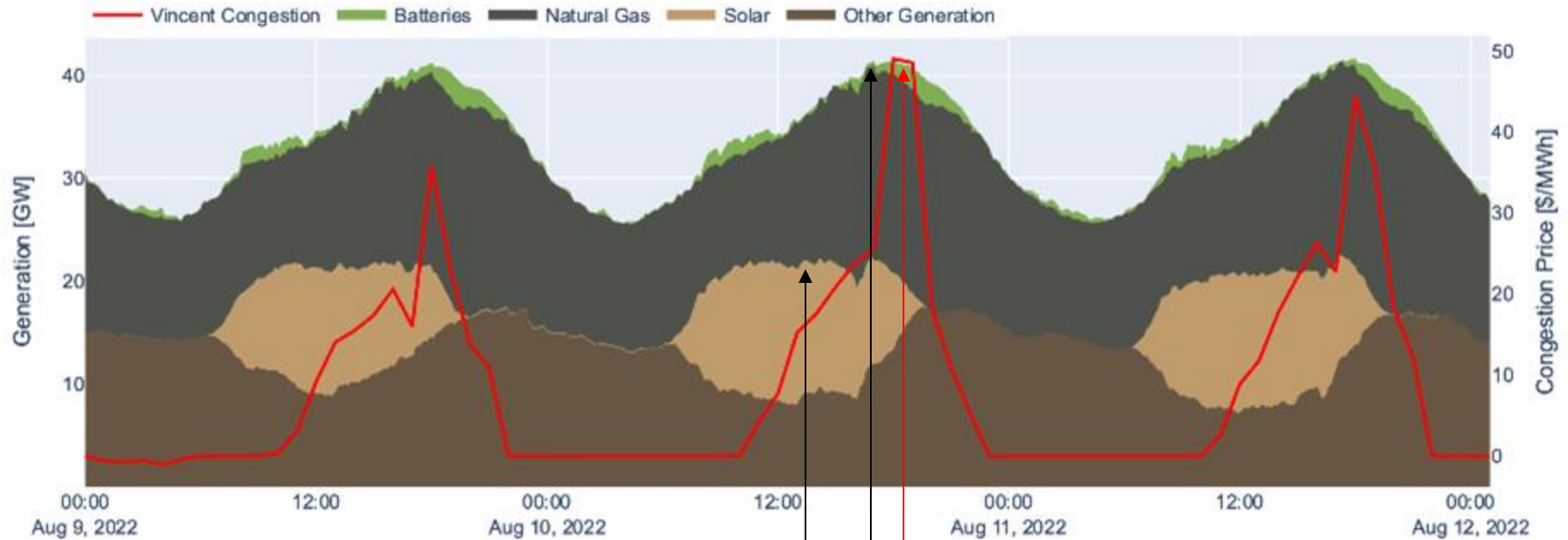
Fuel Mix During CAISO Grid Stress

Batteries Natural Gas Solar Other Generation



# Congestion follows a daily pattern...

Congestion at Vincent Node



1. Solar generation peaks in the early afternoon

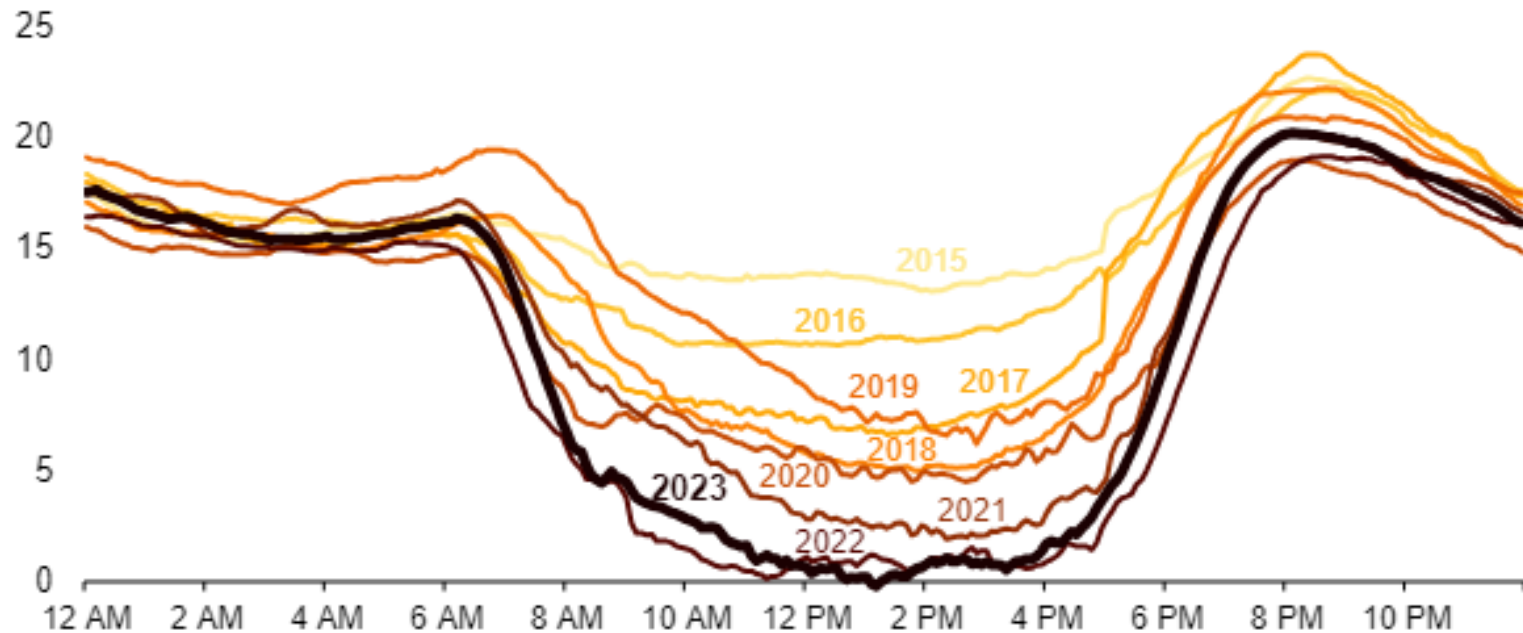
2. Load peaks in the late afternoon

3. Congestion price spikes as load persists and solar production falls

As electricity demand grows and congestion keeps new generation off the grid, reliability degrades and **state-wide blackouts** become more likely!

## California's duck curve is getting deeper

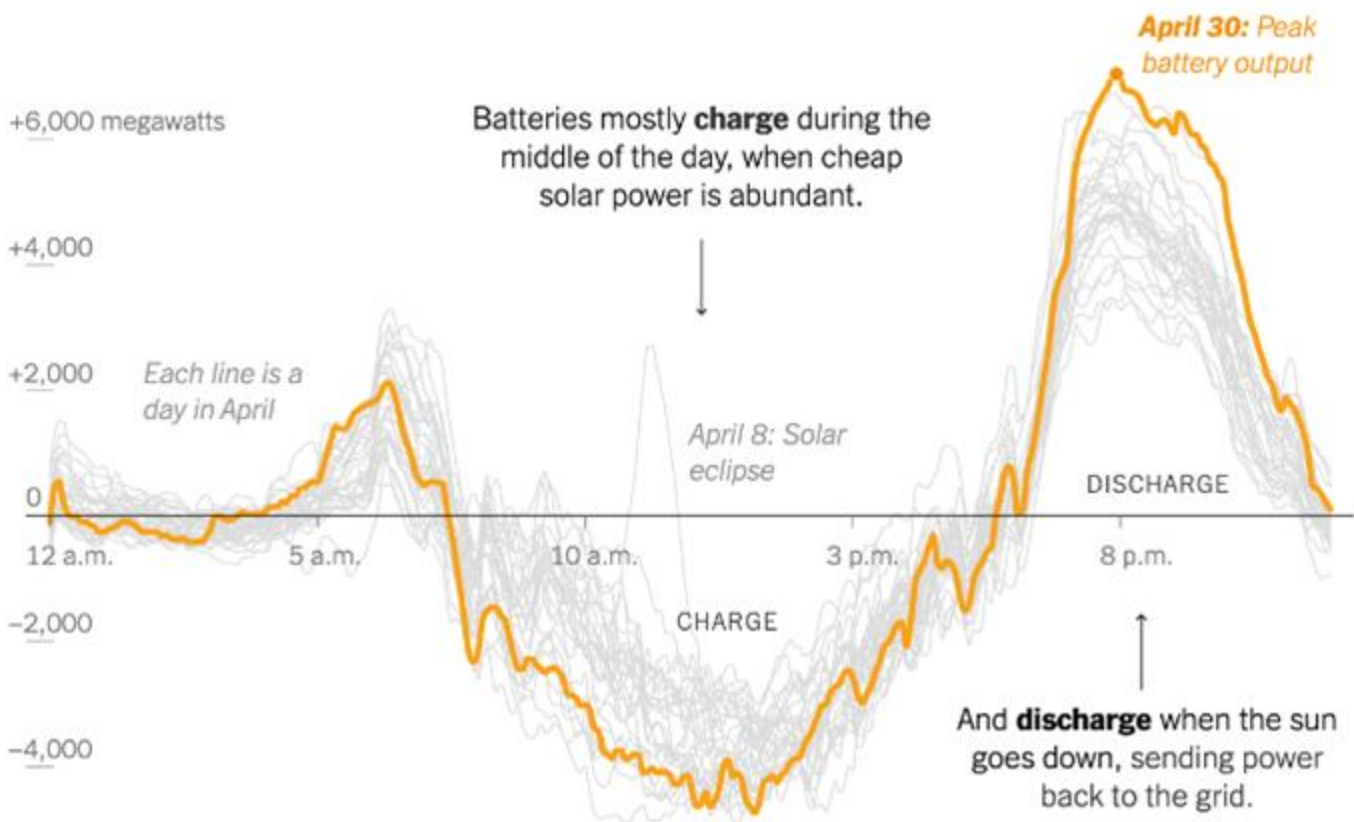
CAISO lowest net load day each spring (March–May, 2015–2023), gigawatts





# Batteries help midday solar serve evening load

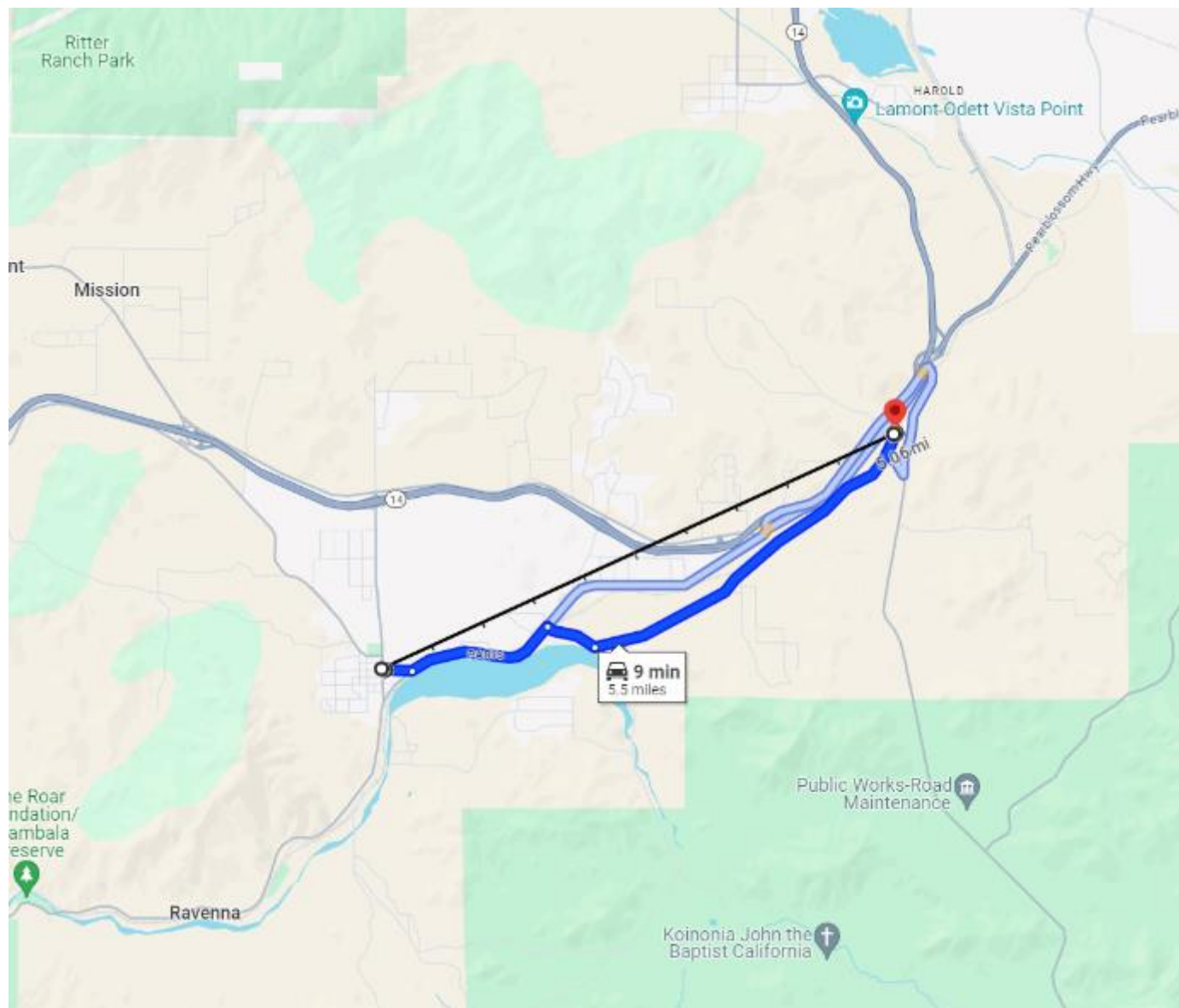
## California How Batteries Operated on the Grid in April 2024



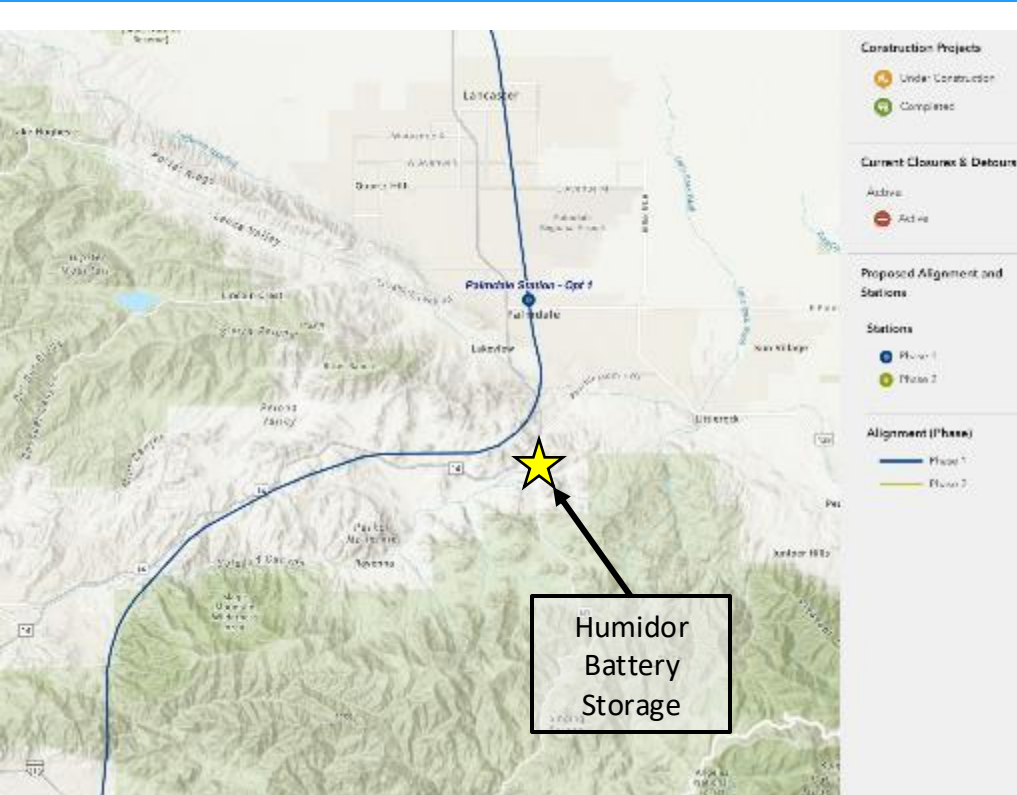
Sources: California Independent System Operator via [Grid Status](#) · By The New York Times

Significant distances from other facilities, including  
housing

# Humidor will be located over 5 miles northeast of Acton, CA



# Utilize already disturbed industrial land



Planned California High Speed Rail route

Source: <https://buildhsr.com/map/>

- Humidor will utilize already disturbed industrial land recently used for a commercial trucking and an electrical subcontractor yard.
- Humidor will also be located near the planned California High Speed Rail.

# Humidor is in an industrially-zoned area

## **HUMIDOR STORAGE LOCATION** | AN IMPORTANT LOCATION FOR BATTERY STORAGE

The proposed project site is far away from residential areas in Antelope Valley. It is located in an industrially-zoned area

between a highway and rail line with nearby grid infrastructure to efficiently hook-up to the energy grid.



A Fair Distance from Town Centers In Antelope Valley



Adjacent to Grid Infrastructure



An Industrial Area Between a Freeway and Rail Line



Far Away From Residential Neighborhoods

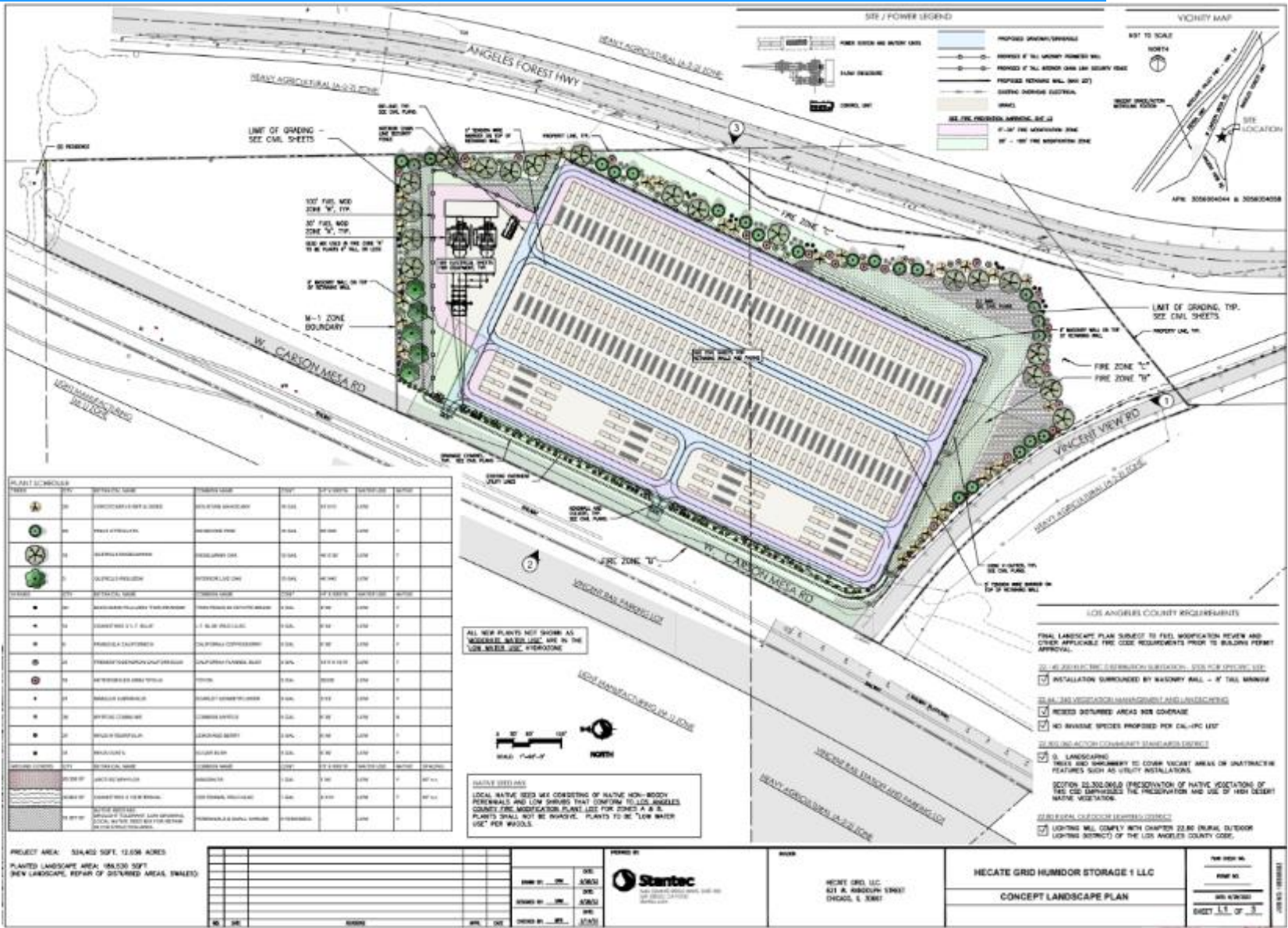


## **VISUALLY SCREENED & WELL-SECURED**

THE PROJECT SITE WOULD INCLUDE AN 8-FOOT-HIGH PERIMETER WALL AND AN 8-FOOT HIGH INTERNAL CHAIN LINK SECURITY FENCE TO INCREASE THE PHYSICAL SAFETY OF THE FACILITY AND REDUCE VISUAL IMPACTS. THERE WILL ALSO BE LOCAL, NATIVE VEGETATION PLANTED AND MAINTAINED TO PROVIDE ADDITIONAL VISUAL BUFFERS AND MATCH THE AESTHETIC OF THE AREA.



# Humidor site plan (continued)





# Humidor concept materials and colors

TENSION WIRE BARRIER (SAFETY RAIL FOR INTERIOR DRIVES)

MATERIAL: METAL



PERIMETER WALL CONCEPT - CMU 8' HEIGHT

MATERIAL: MASONRY



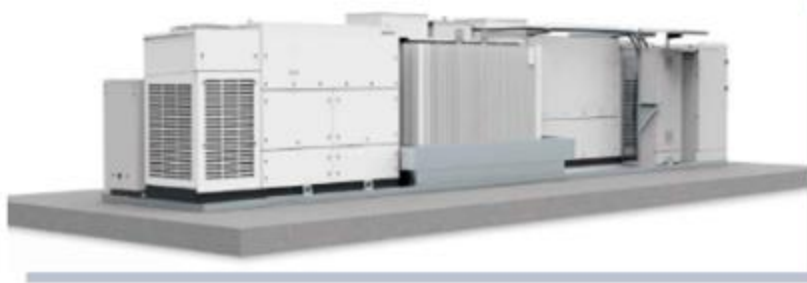
BARRIER 6' TALL CHAIN-LINK SECURITY FENCE (AT EQUIPMENT AREA)

MATERIAL: METAL



FOUNDATION

MATERIAL: METAL COLOR: WHITE



BATTERY UNIT

MATERIAL: METAL COLOR: WHITE



TRANSFORMER ON-PAD

MATERIAL: METAL COLOR: WHITE



PROJECT HV SWITCHGEAR

MATERIAL: METAL COLOR: WHITE





  
 PREPARED BY: Starbuc

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HECAE GRID HUMIDOR STORAGE I LLC  
 CONCEPT COLORS & MATERIALS BOARD

SHEET NO. 11 OF 11  
 DATE: 08/11/2023

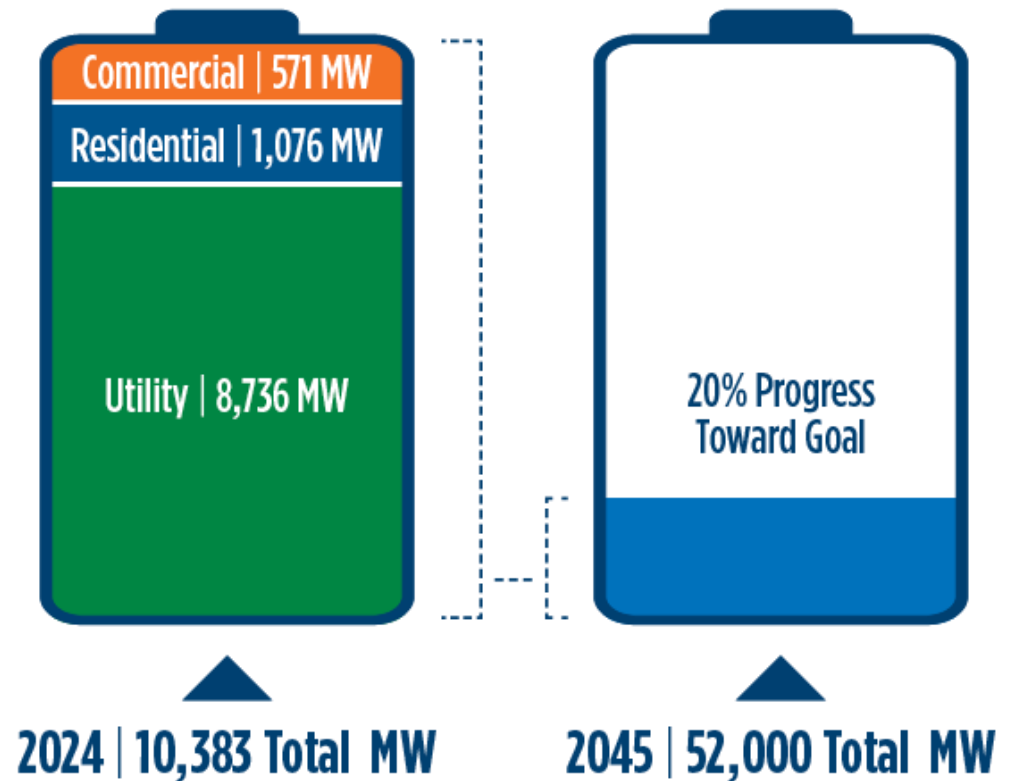
Same safe BESS technology that is already  
deployed across the United States

Same safe BESS technology that is already deployed  
across the United States

- From 2018 to 2024, battery storage capacity in California increased from 500 megawatts (MW) to more than 10,300 MW, with an additional 3,800 MW planned to come online by the end of 2024.
- The state projects 52,000 MW of battery storage will be needed by 2045.

## Energy Storage in California by Type

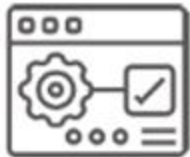
*\* As of April 15, 2024*



Source: CEC, California Energy Storage System Survey

- Hecate Grid is working with the LA County Fire Department to meet or exceed code requirements at Humidor and develop a site-specific emergency response plan to train on the project equipment.
- A [joint study](#) by the Electric Power Research Institute, Pacific Northwest National Laboratory, and TWAICE, determined that problems with system components other than battery cells and modules were responsible for most BESS failures. That the “common storyline...that failures are almost all attributable to battery modules”, is inaccurate.
- [Hazard studies from similar battery projects](#) concluded that the probability is very low that a battery failure would ever require a Fire Department response. The specific probability is that such an event would occur once every 10,989 years. It was also determined that any conceivable fire-related event would be of less concern than a Class A Fire, which is a fire involving ordinary combustibles such as wood, paper, fabric, and plastic.
- [Other hazard studies](#) revealed that risks from any potential exhaust from a battery issue would be of little concern beyond 15 feet from the source battery cabinet. In part, this is due to the simple fact that warm exhaust rises and quickly scatters.

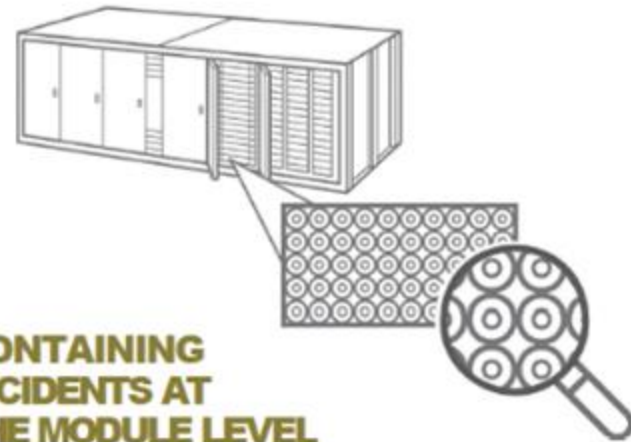
# Same safe battery storage technology that is being deployed across the United States



24/7  
MONITORING



EXTERNAL FIRE  
ALARM CONTROL  
PANELS



## CONTAINING INCIDENTS AT THE MODULE LEVEL

TECHNOLOGY CAN COMPARTMENTALIZE, DETECT AND SUPPRESS, MITIGATING ANY SPREAD OF CELL FAILURES. BMS CAN DISCONNECT INDIVIDUAL MODULES AS NEEDED TO ISOLATE AN ISSUE.



SMOKE AND GAS  
DETECTION  
SYSTEMS



VENTILATION +  
TEMPERATURE  
CONTROL  
SYSTEMS



MEETS OR EXCEEDS ALL LOCAL  
AND STATE FIRE CODES



SITE-SPECIFIC  
ANNUAL TRAINING

## BATTERY STORAGE TECHNOLOGY HAS RAPIDLY ADVANCED – UL9540A

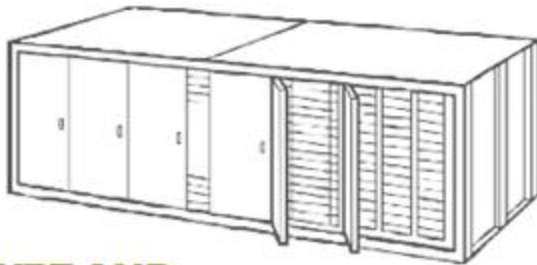
A MODERN, TESTED AND PROVEN APPROACH TO FIRE SAFETY

## EMERGENCY PLANNING + LOCAL COORDINATION

COLLABORATE WITH LOCAL EMERGENCY RESPONDERS THROUGH TRAINING AND EDUCATION TO DEVELOP A COMPREHENSIVE EMERGENCY RESPONSE PLAN.



# Same safe battery storage technology that is being deployed across the United States



## SECURE AND CONTAINED ENCLOSURES

PROPERLY MAINTAINED AND UTILIZED BATTERY STORAGE SYSTEMS ARE NOT A THREAT TO THE ENVIRONMENT OR GROUNDWATER.



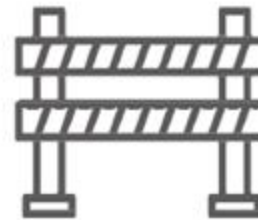
## DECOMMISSIONING

WHEN THE PROJECT REACHES THE END OF ITS USEFUL LIFE, IT WILL BE DECOMMISSIONED. ALL THE COMPONENTS WILL BE CLEARED AND PROPERLY RECYCLED OR DISPOSED OF WITHOUT COST TO LOCALS.



## READILY AVAILABLE WATER SUPPRESSION TOOLS

DESIGN AND INSTALL FIRE HYDRANT NETWORK TO BE USED TO CONTAIN AND COOL BATTERY ENCLOSURES TO AVOID AND OR MITIGATE AGAINST ANY ISSUES.



SAFETY ZONE AROUND THE PERIMETER OF THE FACILITY



GRAVEL BREAKS AND MASONRY WALL



SUBSTANTIAL SETBACKS FROM PARCEL BOUNDARIES



REGULAR MAINTENANCE



SEISMICALLY BRACED AND PROTECTED



THE PROJECT WILL NOT USE GROUNDWATER AND WILL SOLELY USE LA COUNTY PUBLIC WORKS WATER

## ADDITIONAL PHYSICAL SAFETY DESIGN FEATURES

ENHANCEMENTS TO ADDRESS FIRE RISKS

# Recent Otoy Mesa battery fire is not as bad as headlines would indicate

- Is being controlled
- Includes 4-year old battery technology
- Batteries are located in an enclosed building, providing more flammable material, while Humidor would not be
- The cause of the fire has not yet been determined



[Source: The San Diego Union-Tribune](#)

Respect for environmental & cultural resources, and  
supportive to private property owners





- No groundwater will be used, and the site will utilize LA County public water
- Humidor site avoids protected areas, cultural resources or artifacts, and species
- Landowners will leverage their land to earn income from other sources that increase grid reliability

Significant economic benefits to the local community

- Will create approximately 100 union construction jobs
- Will employ 2 to 3 full time staff in addition to a 24/7 remote operations team
- Up to \$100,000/year to local area initiatives throughout the operating life of the project and approximately \$2,000,000/year in annual tax benefits to LA County



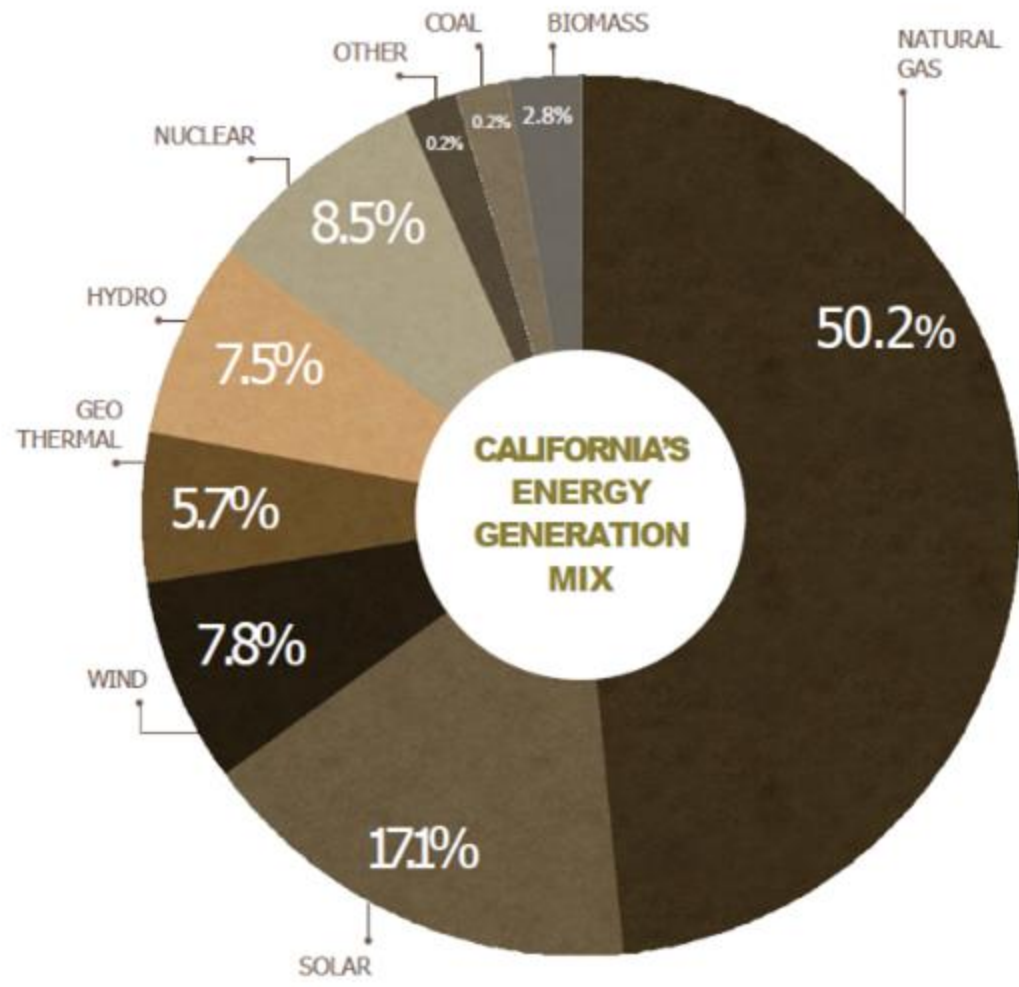
Backup

# Humidor is connecting at one of these two nodes “Vincent\_2\_N100” or “Vincent\_2\_N101”



- Vincent\_2\_N101 node has a Local Marginal Price for energy of \$38.15/MWh (17 May 2024)

Source: [CAISO's Locational Marginal Price \(LMP\) map page](#)



## CALIFORNIA RELIES ON RENEWABLES

CA GETS 1/3 OF ENERGY FROM RENEWABLES

Source: California Energy Commission, 2021 Total System Electric Generation



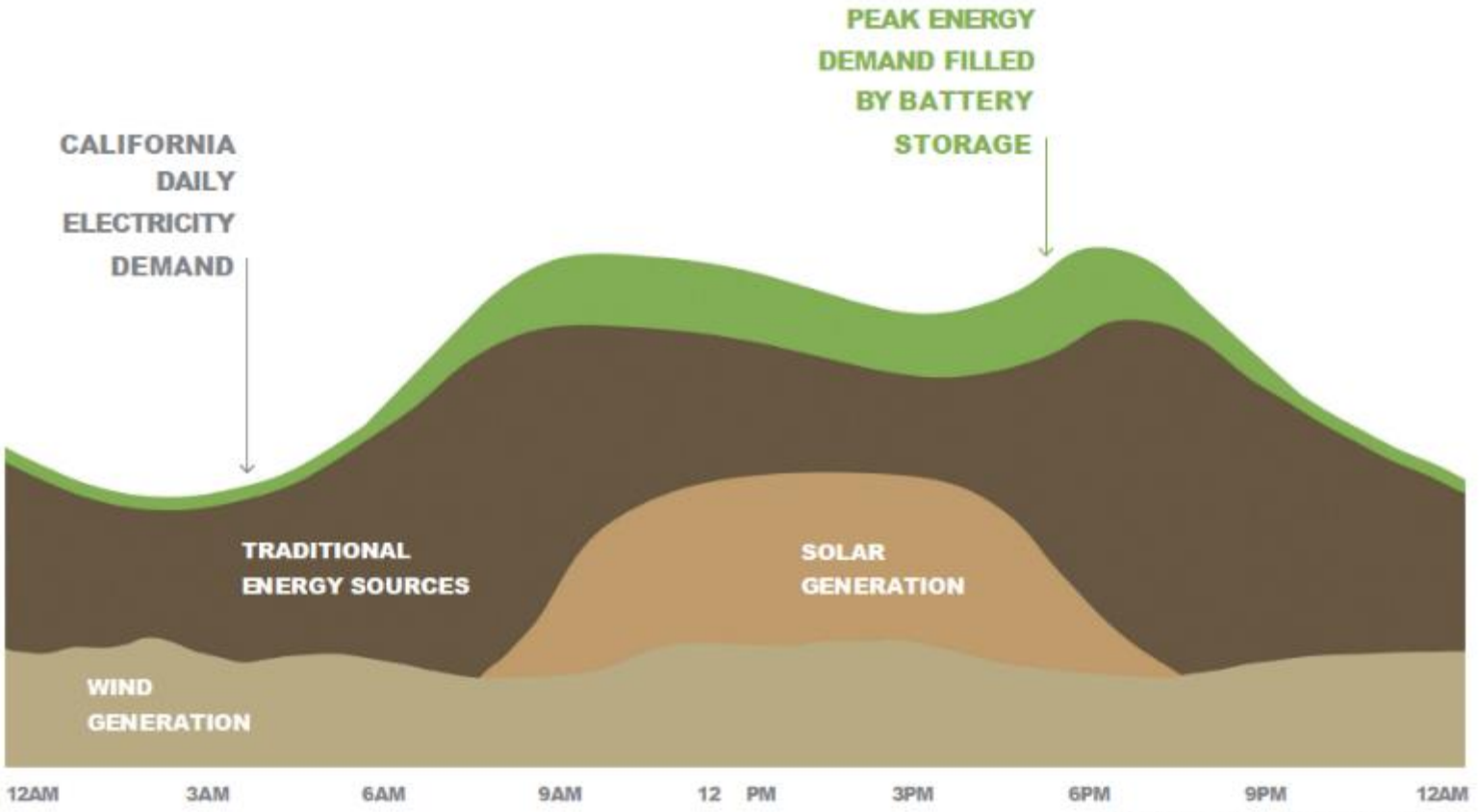
## THE STATE IS VULNERABLE TO POWER OUTAGES & BLACKOUTS

## MEETING PEAK ENERGY DEMAND WITH BATTERY STORAGE

Every day, California enjoys energy production from wind 24/7 and solar during the day, with traditional sources such as natural gas power plants filling the gap. As California energy demand peaks with a growth in daily use, battery storage is being called upon to fulfill the additional demand to avoid brownouts or blackouts.

"ELECTRICITY STORAGE COULD HELP THE UTILITY GRID OPERATE MORE EFFICIENTLY, REDUCE THE LIKELIHOOD OF BROWNOUTS DURING PEAK DEMAND, AND ALLOW FOR MORE RENEWABLE RESOURCES TO BE BUILT AND USED."

- U.S. ENVIRONMENTAL PROTECTION AGENCY, ELECTRICITY STORAGE, ENERGY & ENVIRONMENT WEBSITE



U.S. Energy Information Administration, Today in Energy Webpage