



California ISO

# 2026 & 2030 Final LCR Study Results for LA Basin and San Diego-Imperial Valley Areas

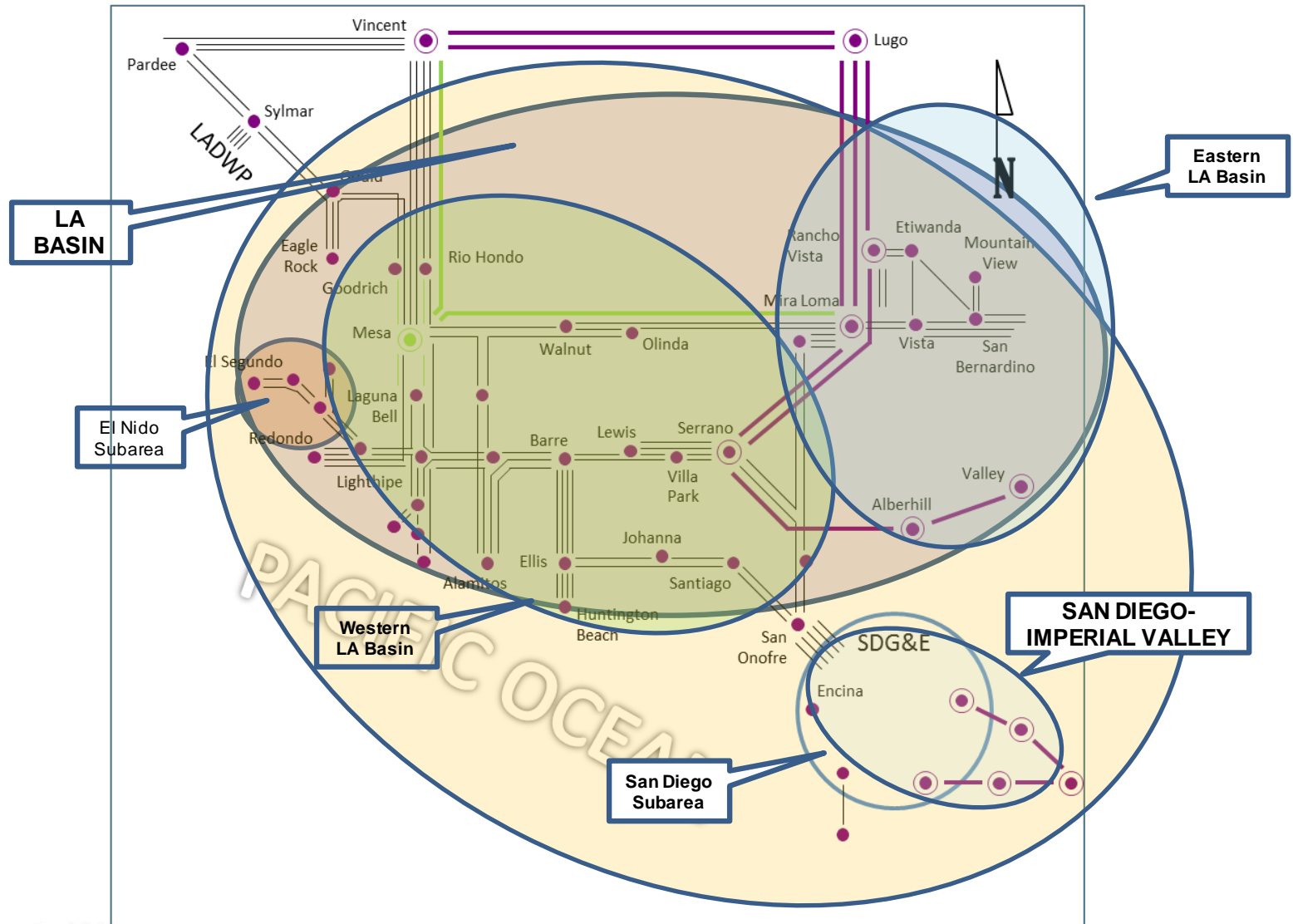
David Le

Senior Advisor Regional Transmission Engineer

Stakeholder Call

April 10, 2025

# LA Basin and San Diego-Imperial Valley Areas



# Major New Transmission and Resource Addition Assumptions

| Project Name  | Service Areas | Expected<br>ISD | Modeled<br>in 2026<br>LCR case | Modeled<br>in 2030<br>LCR case |
|---|---------------|-----------------|--------------------------------|--------------------------------|
| <b>New Transmission Projects</b>  |               |                 |                                |                                |
| Imperial Valley – El Centro 230 kV (“S” line) upgrade                                   | IID / SDG&E   | In-service      | √                              | √                              |
| Ten West Link 500 kV line   | DCRT, LLC     | In-service      | √                              | √                              |
| Laguna Bell – Mesa #1 230kV line upgrade  | SCE           | May 2025        | √                              | √                              |
| Southern Orange County Reliability Upgrade  | SDG&E         | In-service      | √                              | √                              |
| New Serrano 4AA Bank & 230kV GIS Rebuild  | SCE           | 12/2027         |                                | √                              |
| Alberhill 500 kV Method of Service  | SCE           | 12/2029         |                                | √                              |
| <b>New Resource Projects</b>  |               |                 |                                | √                              |
| Alamitos Repowering Project   | SCE           | In-service      | √                              | √                              |
| Huntington Beach Repowering Project   | SCE           | In-service      | √                              | √                              |
| Stanton Energy Reliability Center   | SCE           | In-service      | √                              | √                              |
| Alamitos 100 MW Battery Energy Storage System   | SCE           | In-service      | √                              | √                              |
| Additional Alamitos Battery Energy Storage System (82 MW)                               | SCE           | In-service      | √                              | √                              |
| Cathode Battery Energy Storage System (200 MW)  | SCE           | In-service      | √                              | √                              |
| Local Capacity Area Preferred Resources in western LA Basin (EE, DR, BTM BESS)          | SCE           | In-service      | √                              | √                              |
| Various other battery energy storage systems in SCE and San Diego-Imperial Valley areas | SCE & SDG&E   | 2024-2028       | √                              | √                              |

# LA Basin Area: Loads and Resources

| Loads (MW)                       | 2026         | 2030         | Resources NQC* (MW)                                 | 2026         | 2030         |
|----------------------------------|--------------|--------------|---|--------------|--------------|
| Gross Load                       | 21615        | 23283        | Market/Net Seller                                   | 5670         | 5670         |
| Sum of AAEE, AAFS & AATE         | 79           | 652          | Battery/Hybrid                                      | 3203         | 3203         |
| Data Center                      | 115          | 310          | Wind  | 220          | 220          |
| Behind the meter DG (production) | -2379        | -3270        | Muni/QF   | 1266         | 1266         |
| <b>Net Load</b>                  | <b>19430</b> | <b>20975</b> | LTPP LCR Preferred Resources (BTM BESS, EE, DR, PV) | 175          | 175          |
| Transmission Losses              | 296          | 469          | Existing Demand Response                            | 240          | 240          |
| Pumps                            | 0            | 0            | Solar   | 29           | 29           |
| <b>Loads + Losses + Pumps</b>    | <b>19726</b> | <b>21444</b> | <b>Total Qualifying Capacity</b>                    | <b>10803</b> | <b>10803</b> |

# San Diego-Imperial Valley Area: Loads and Resources

| <b>Loads (MW)</b>                | <b>2026</b> | <b>2030</b> | <b>Resources NQC* (MW)</b> | <b>2026</b> | <b>2030</b> |
|----------------------------------|-------------|-------------|----------------------------|-------------|-------------|
| Gross Load                       | 5155        | 5547        | Market/Net Seller/Wind     | 3950        | 3950        |
| Sum of AAEE, AAFS & AATE         | 31          | 219         | Battery/Hybrid             | 1917        | 2640        |
| Behind-the-meter DG (production) | -518        | -619        | MUNI/QF                    | 3           | 3           |
| <b>Net Load</b>                  | <b>4668</b> | <b>5147</b> | LTPP Preferred Resources   | 0           | 0           |
| Transmission Losses              | 114         | 170         | Existing Demand Response   | 26          | 26          |
| Pumps                            | 0           | 0           | Solar                      | 243         | 243         |
| <b>Loads + Losses</b>            | <b>4782</b> | <b>5317</b> | <b>Total</b>               | <b>6139</b> | <b>6862</b> |

\*August NQC for RA accounting purpose

## El Nido Sub-area LCR (LA Basin)

| Year | Category | Limiting Facility          | Contingency                               | LCR (MW) | 2025 and 2029<br>LCR<br>(MW) |
|------|----------|----------------------------|---|----------|------------------------------|
| 2026 | P7       | La Fresa-La Cienega 230 kV | La Fresa – El Nido #3 & 4<br>230 kV lines | 365      | 261                          |
| 2030 | P7       | La Fresa-La Cienega 230 kV | La Fresa – El Nido #3 & 4<br>230 kV lines | 493      | 284                          |

### Reasons for the changes in the LCR needs:

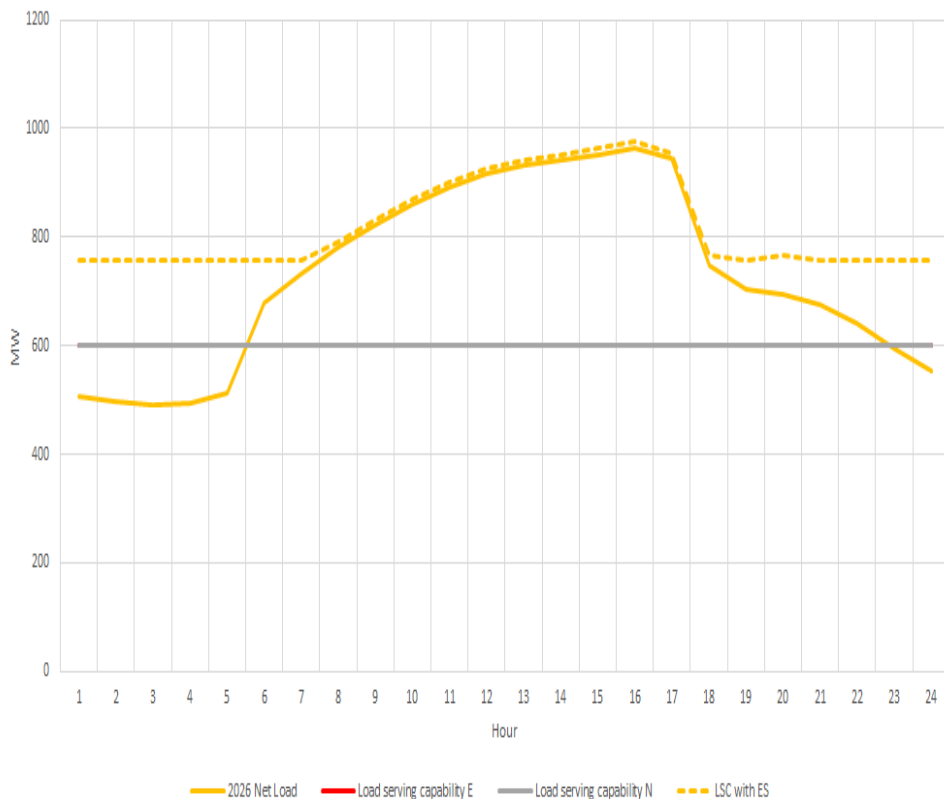
- LCR need increases due to higher demand forecast.

# El Nido Sub-area Load Shape and Estimated Energy Storage Charging Capability Under Critical Contingency

El Nido Sub-area:

2026 projected pk day load profile & approx. LSC (trans + LCR Gen + ES)

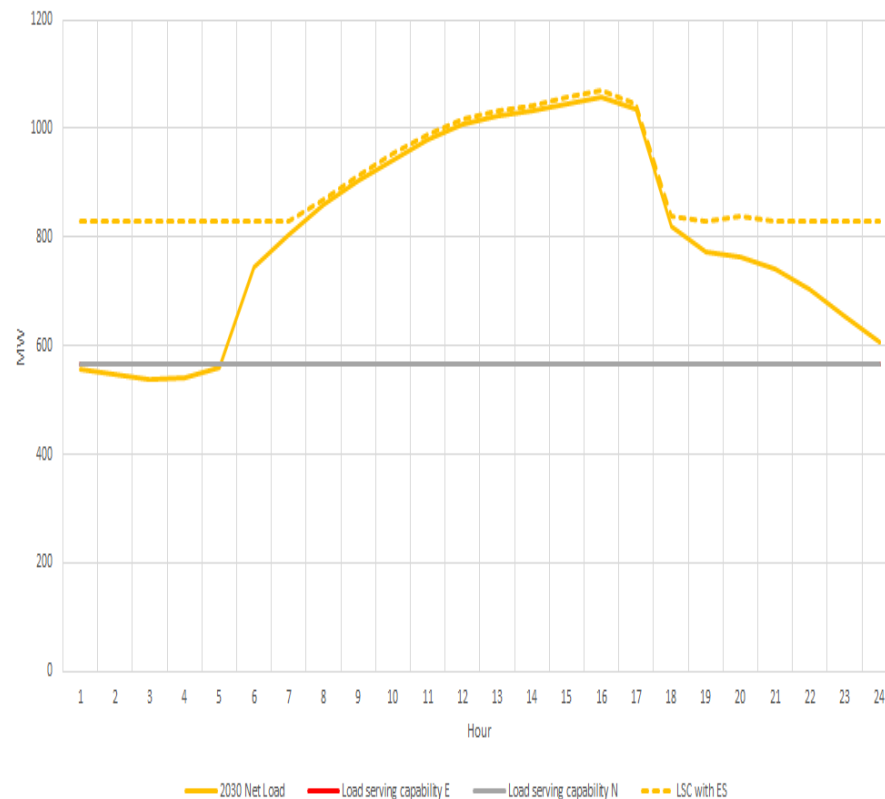
Approx storage size that can be added to this area from charging restriction perspective =  
208 MW and 1562 MWh. Max 4-hr storage = 49 MW



El Nido Sub-area:

2030 projected pk day load profile & approx. LSC (trans + LCR Gen + ES)

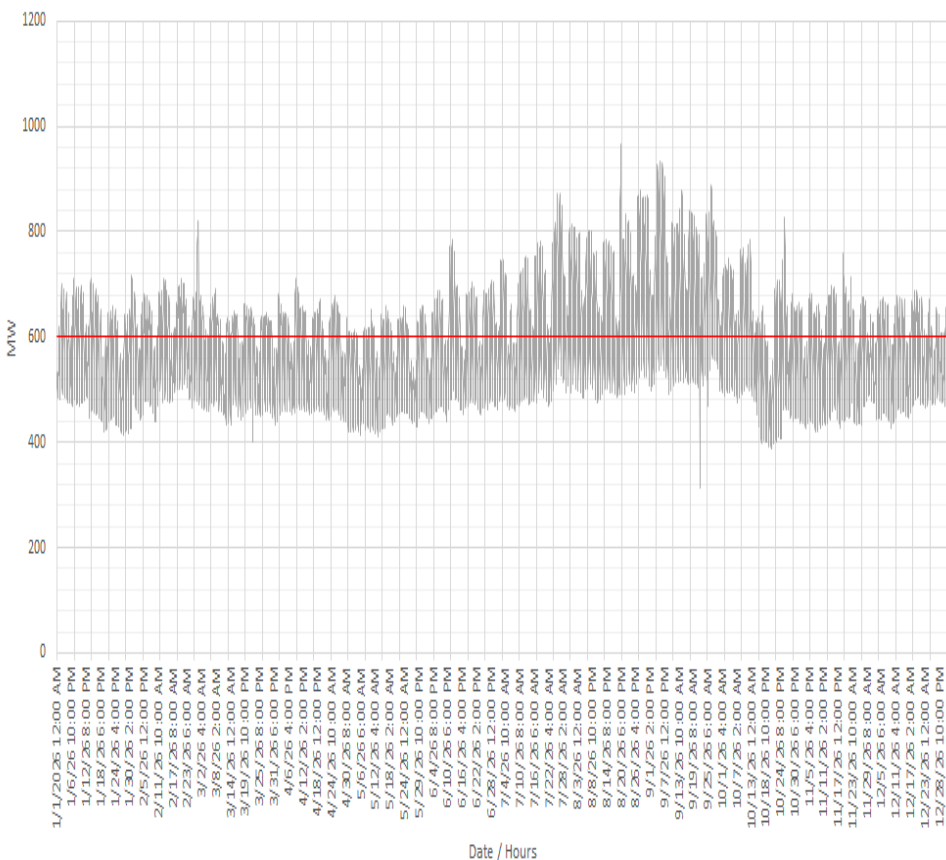
Approx storage size that can be added to this area from charging restriction perspective =  
229 MW and 1711 MWh. Max 4-hr storage = 55 MW



# El Nido Sub-area Annual Load Profile and Load Serving Capability

El Nido Sub-area:

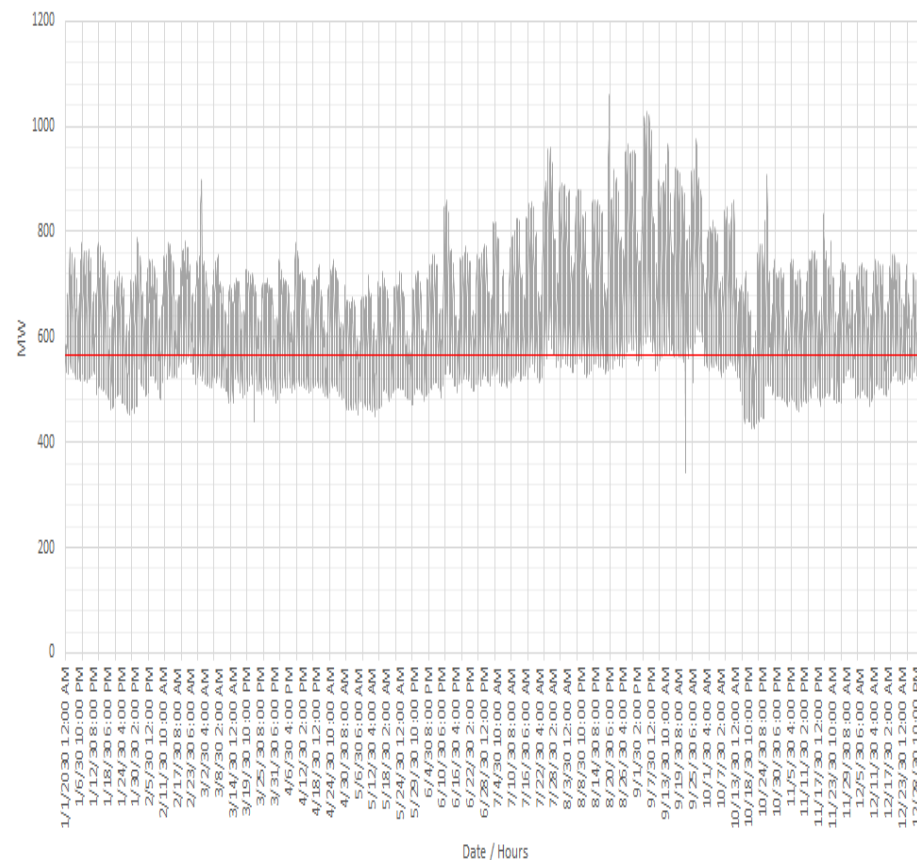
2026 projected load profile & approx. load serving capability (transmission only)



— 2026 projected net load — 2026 approx. load serving capability (transmission only)

El Nido Sub-area:

2030 projected load profile & approx. load serving capability (transmission only)



— 2030 projected net load — 2030 approx. load serving capability (transmission only)



# Western LA Basin Sub-area LCR

| Year | Category | Limiting Facility                     | Contingency   | LCR (MW) | 2025 and 2029 LCR (MW) |
|------|----------|---------------------------------------|---|----------|------------------------|
| 2026 | P6       | Serrano 500/230kV Transformer Bank #2 | Serrano 500/230kV Transformer Banks #3, followed by #1 (or vice versa)            | 3202^    | 3041* (3715**)         |
| 2030 | P6       | Mesa – Lighthipe 230kV Line           | Mesa-Redondo #1 230kV, followed by Laguna Bell-Mesa #1 230kV line (or vice versa) | 3692     | 3053                   |

## Notes:

**2026:** ^ Different contingency constraint. Study assumes that the Laguna Bell-Mesa #1 230kV line upgrade is completed. The Western LA Basin has higher CEC demand forecast.

\* Study results for the scenario where the Laguna Bell-Mesa #1 230kV line upgrade is assumed to be in-service. SCE anticipates the project will be placed in service in May 2025.

\*\* Study results with delay scenario for the Laguna Bell-Mesa #1 230kV line upgrade.

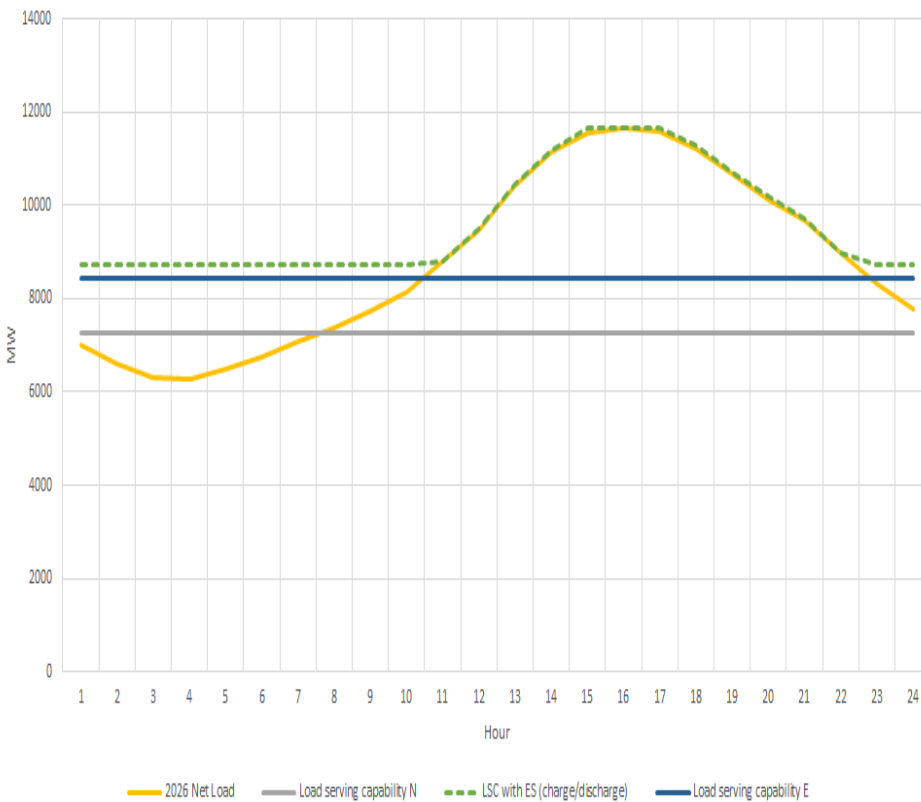
**2030:** the LCR need is higher due to higher demand forecast

# Western LA Basin Sub-area Load Shape and Estimated Energy Storage Charging Capability Under Critical Contingency

Western LA Basin Sub-area:

2026 peak day load profile & approx. LSC (transmission + LCR Gen + ES)

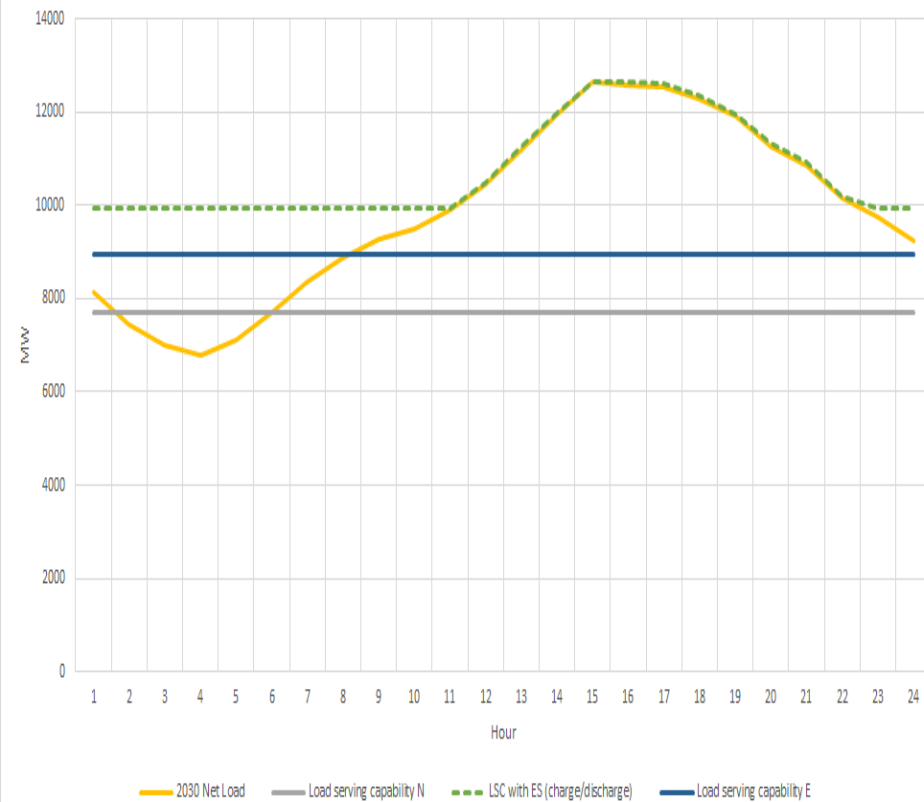
Approx. amount of storage that can be added to this area from charging restriction perspective = 1730 MW and 13885 MWh. Approx. max 4-hr storage = 470 MW



Western LA Basin Sub-area:

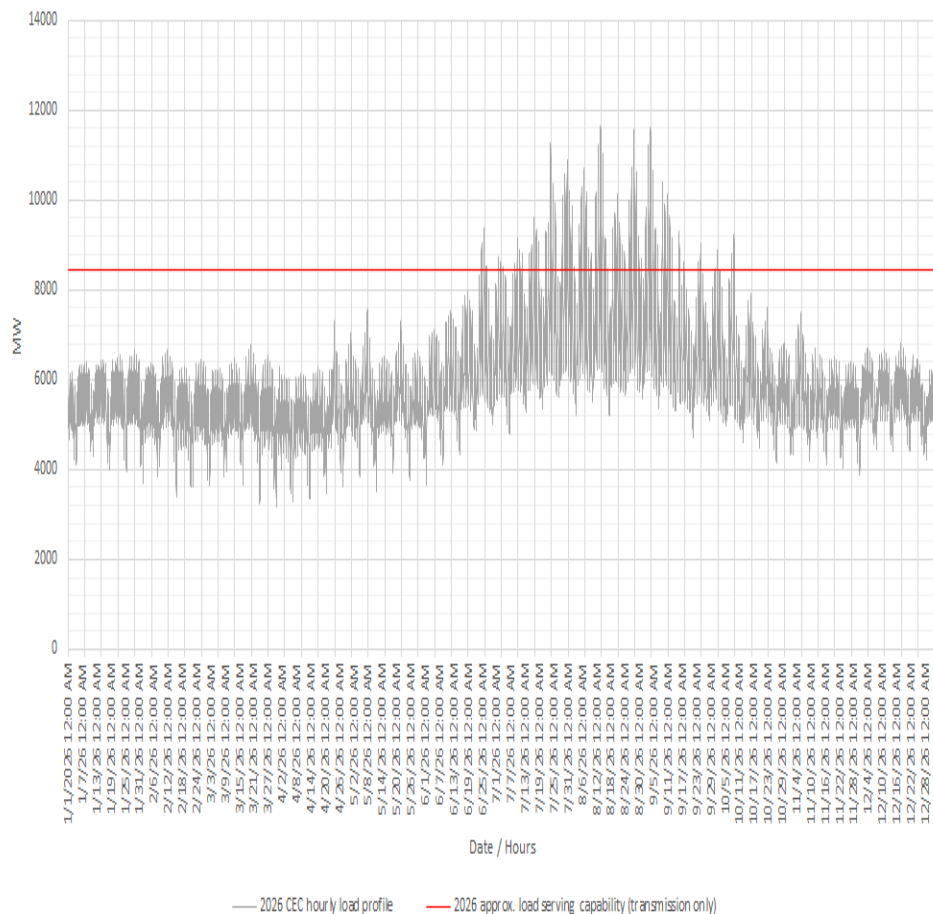
2030 peak day load profile & approx. LSC (transmission + LCR Gen + ES)

Approx. amount of storage that can be added to this area from charging restriction perspective = 1436 MW and 11342 MWh. Approx. max 4-hr storage = 380 MW

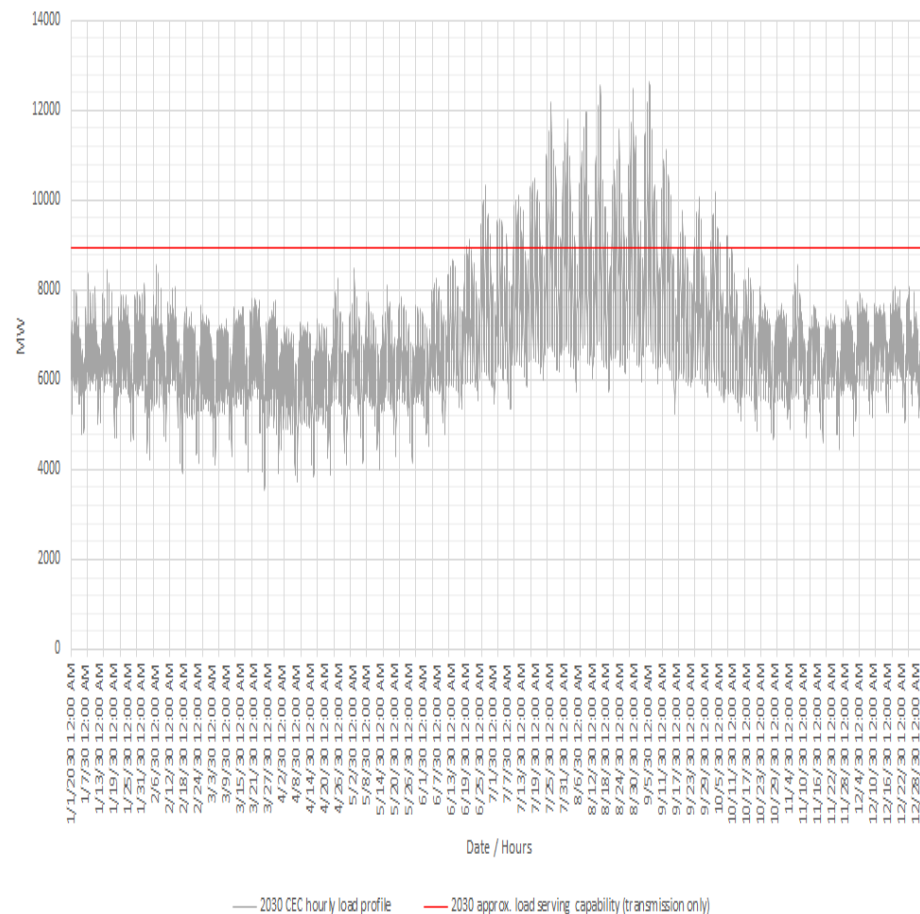


# Western LA Basin Sub-area Annual Load Profile and Load Serving Capability

Western LA Basin Sub-area:  
2026 CEC hourly load profile & approx. load serving capability (transmission only)



Western LA Basin Sub-area:  
2030 CEC hourly load profile & approx. load serving capability (transmission only)



# Eastern LA Basin Sub-area LCR

| Year | Category | Limiting Facility | Contingency   | LCR (MW) | 2025 and 2029<br>LCR<br>(MW) |
|------|----------|-------------------|---|----------|------------------------------|
| 2026 | P1 & P7  | Voltage stability | Lugo – Rancho Vista 500 kV line,<br>followed by N-2 of Lugo – Mira<br>Loma #2 and #3 500 kV lines<br>(common structure) | 2610     | 1082                         |
| 2030 | P1 & P7  | Voltage stability | Lugo – Rancho Vista 500 kV line,<br>followed by N-2 of Lugo – Mira<br>Loma #2 and #3 500 kV lines<br>(common structure) | 3577     | 2023                         |

## **Notes:**

2026: The LCR need increases due to higher demand forecast.

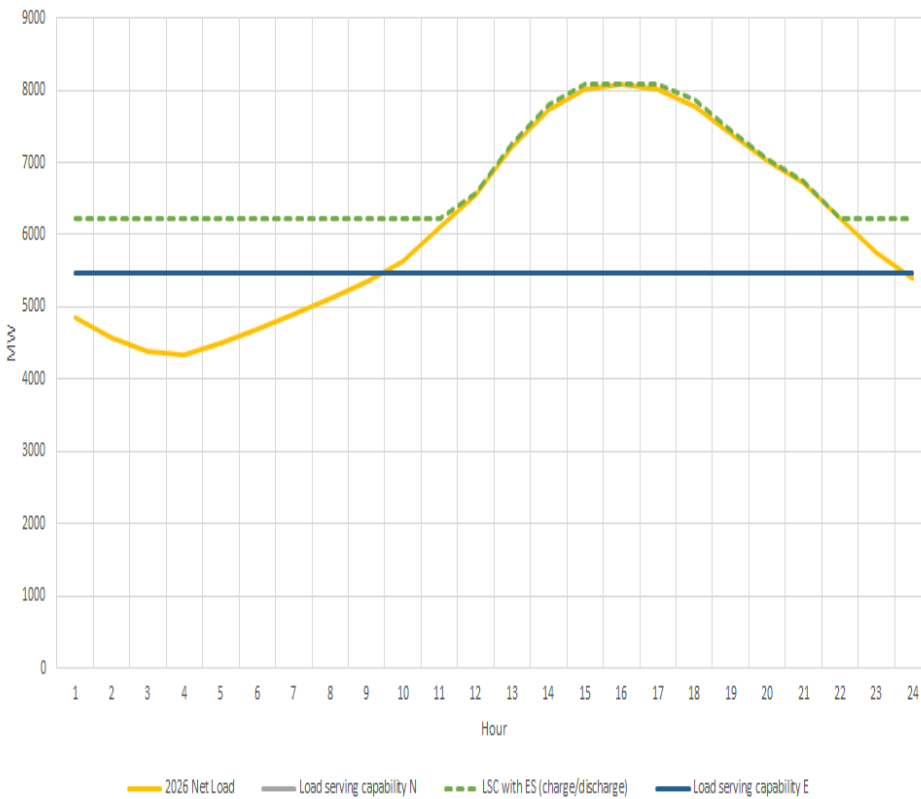
2030: The LCR need increases due to higher demand forecast.

# Eastern LA Basin Sub-area Load Shape and Estimated Energy Storage Charging Capability Under Critical Contingency

Eastern LA Basin Sub-area:

2026 peak day load profile & approx. LSC (transmission + LCR Gen + ES)

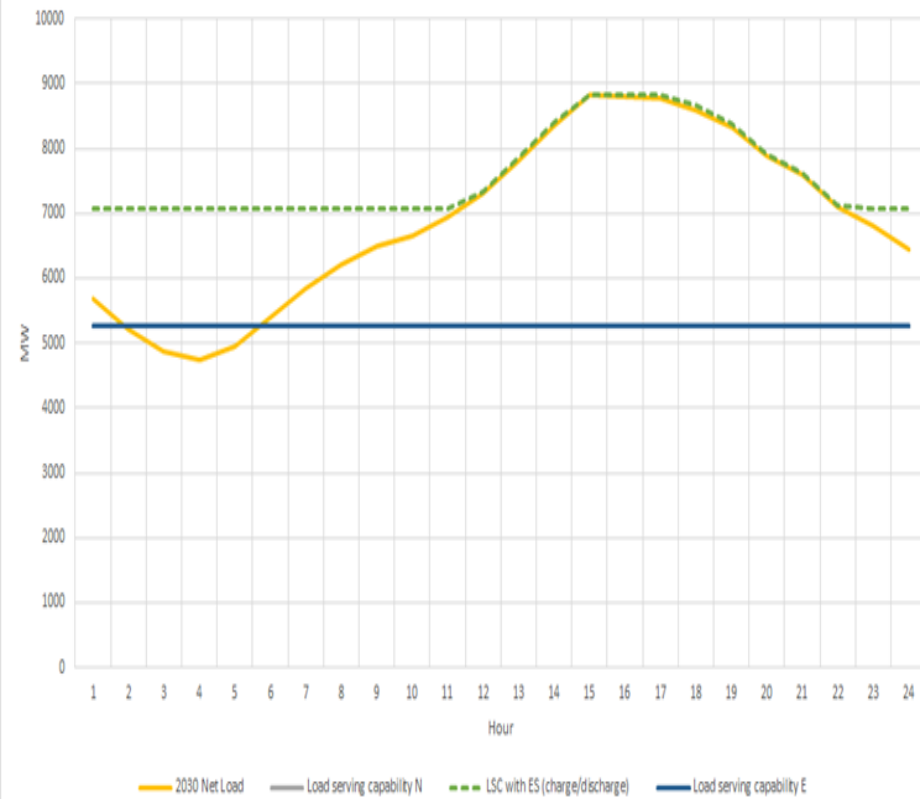
Approx. amount of storage that can be added to this area from charging restriction perspective = 1845 MW and 12657 MWh. Approx. max 4-hr storage = 650 MW



Eastern LA Basin Sub-area:

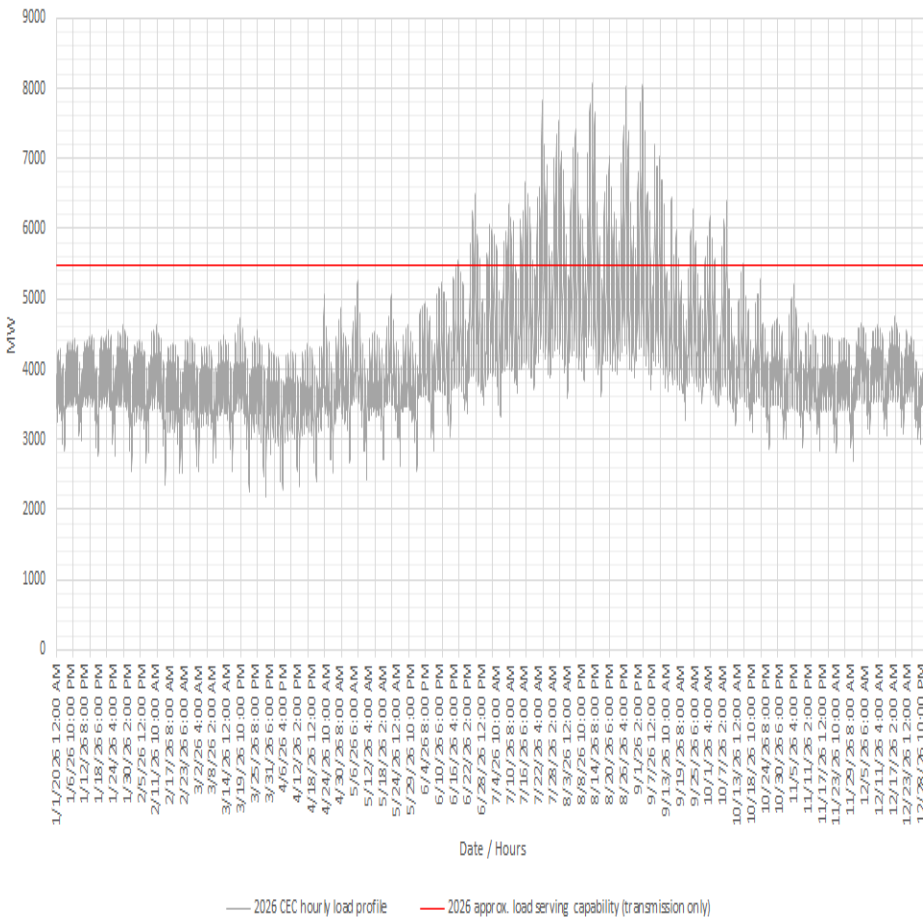
2030 peak day load profile & approx. LSC (transmission + LCR Gen + ES)

Approx. amount of storage that can be added to this area from charging restriction perspective = 1760 MW and 11972 MWh. Approx. max 4-hr storage = 630 MW

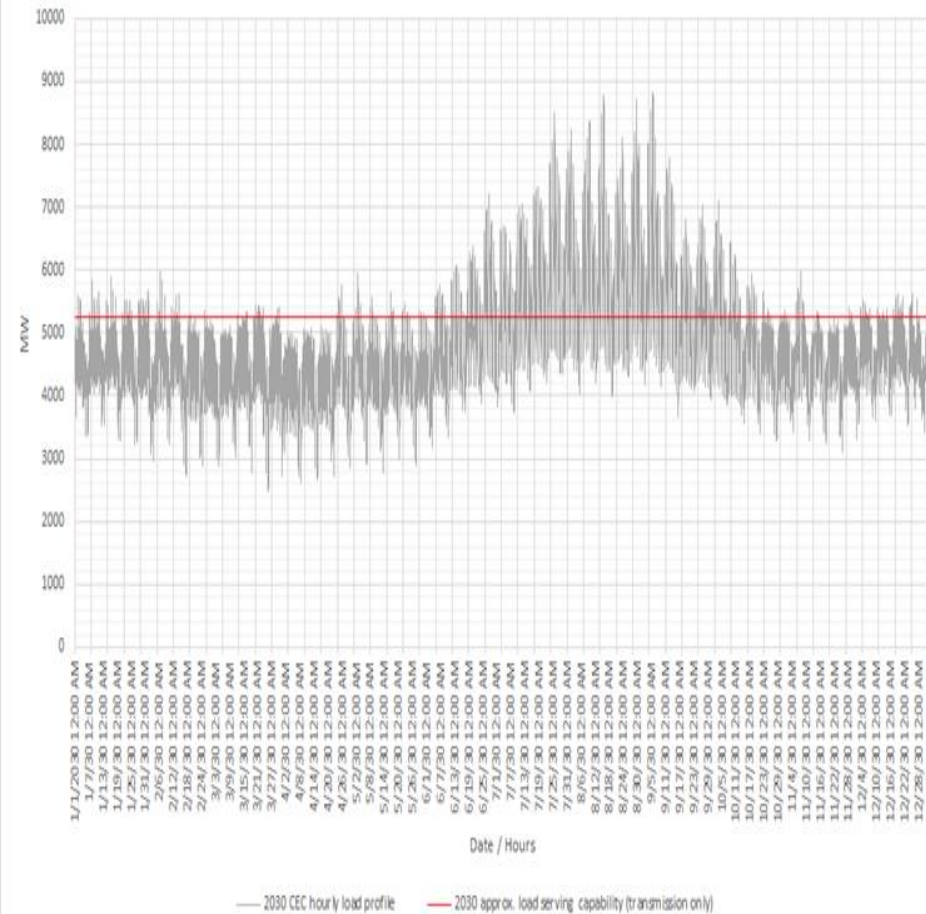


# Eastern LA Basin Sub-area Annual Load Profile and Load Serving Capability

Eastern LA Basin Sub-area:  
2026 CEC hourly load profile & approx. load serving capability (transmission only)



Eastern LA Basin Sub-area:  
2030 CEC hourly load profile & approx. load serving capability (transmission only)



# Overall LA Basin LCR Need

| Year | Limiting Facility                             | Limiting Facility                            | Contingency                                  | LCR (MW) | 2025 and 2029 LCR (MW) |
|------|---|--|--|----------|------------------------|
| 2026 | Sum of Western and Eastern LA Basin LCR needs | See Western and Eastern LA Basin LCR results | See Western and Eastern LA Basin LCR results | 5812     | 4123*<br>(4797)**      |
| 2030 | Sum of Western and Eastern LA Basin LCR needs | See Western and Eastern LA Basin LCR results | See Western and Eastern LA Basin LCR results | 7269     | 5076                   |

## Notes:

- **2026 and 2030:** The overall LA Basin LCR requirement increases due to higher demand forecast for both years
- **2025:** \*Results with Laguna Bell-Mesa #1 230kV upgrade project in-service  
 \*\* Results with Laguna Bell – Mesa #1 230kV upgrade project implementation delay scenario



# Total LA Basin Energy Storage Charging Capability

|                  | Total MW of Energy Storage | Total MWh of Energy Storage | Maximum 4-hour Energy Storage (MW) |
|------------------|----------------------------|-----------------------------|------------------------------------|
| <b>Year 2026</b> |                            |                             |                                    |
| Western LA Basin | 1730                       | 13885                       | 470                                |
| Eastern LA Basin | 1845                       | 12657                       | 650                                |
| Overall LA Basin | 3575                       | 26542                       | 1120                               |
| <b>Year 2030</b> |                            |                             |                                    |
| Western LA Basin | 1436                       | 11342                       | 380                                |
| Eastern LA Basin | 1760                       | 11972                       | 630                                |
| Overall LA Basin | 3196                       | 23314                       | 1010                               |



# San Diego Bulk Sub-area LCR

| Year | Category | Limiting Facility                       | Contingency  | LCR (MW) | 2025 and 2029 LCR (MW) |
|------|----------|---|--|----------|------------------------|
| 2026 | P6       | Remaining Sycamore-Suncrest 230 kV line | ECO-Miguel 500 kV line, system readjustment, followed by one of the Sycamore-Suncrest 230 kV | 2631     | 2709                   |
| 2030 | P6       | Remaining Sycamore-Suncrest 230 kV line | ECO-Miguel 500 kV line, system readjustment, followed by one of the Sycamore-Suncrest 230 kV | 3305     | 3121                   |

## Reasons for the changes in the LCR needs:

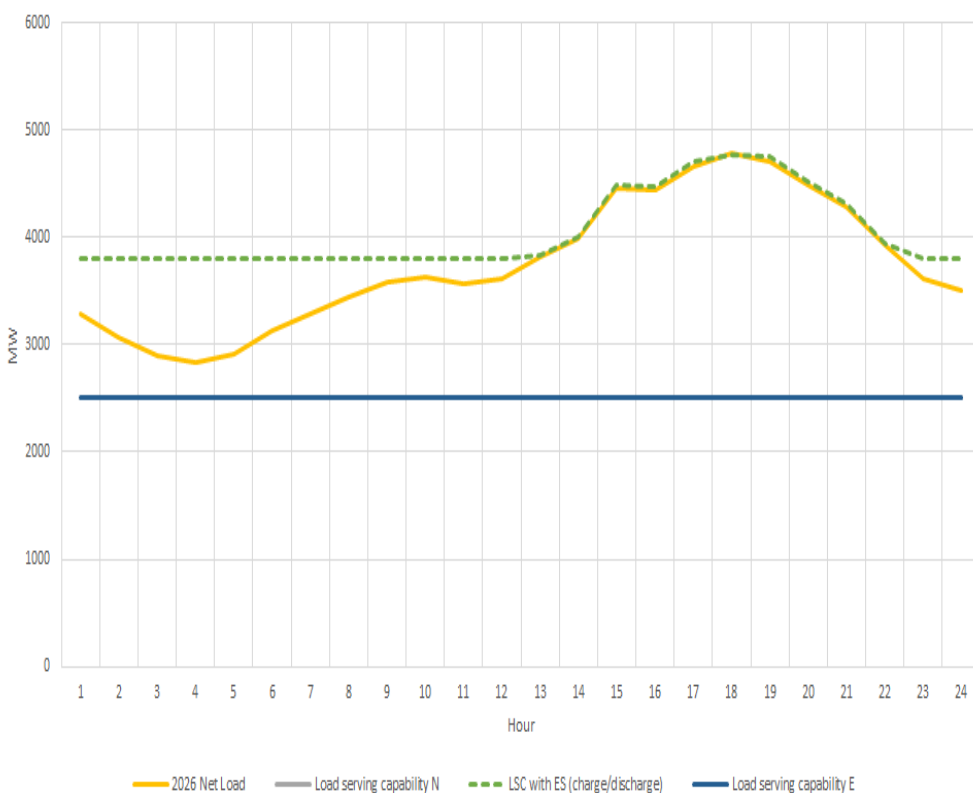
- 2026: The LCR need is lower due to higher dispatch of local resources in the LA Basin to meet its LCR needs. The LA Basin and the San Diego-Imperial Valley areas exhibit some inter-dependent relationship due to strong electrical tie between these two areas.
- 2030: The LCR need is higher due to CEC's higher demand forecast for the San Diego area.

# San Diego Subarea Basin Sub-area Load Shape and Estimated Energy Storage Charging Capability Under Critical Contingency

San Diego Sub-area:

2026 peak day load profile & approx. LSC (transmission + LCR Gen + ES)

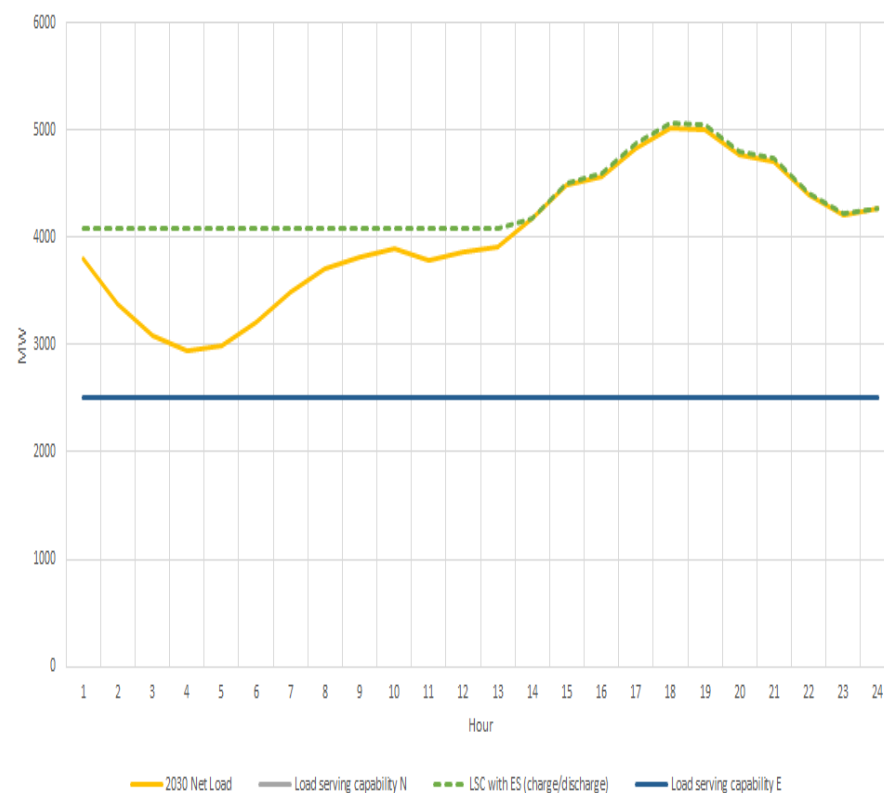
Approx. amount of storage that can be added to this area from charging restriction perspective = 956 MW and 5699 MWh. Approx. max 4-hr storage = 490 MW



San Diego Sub-area:

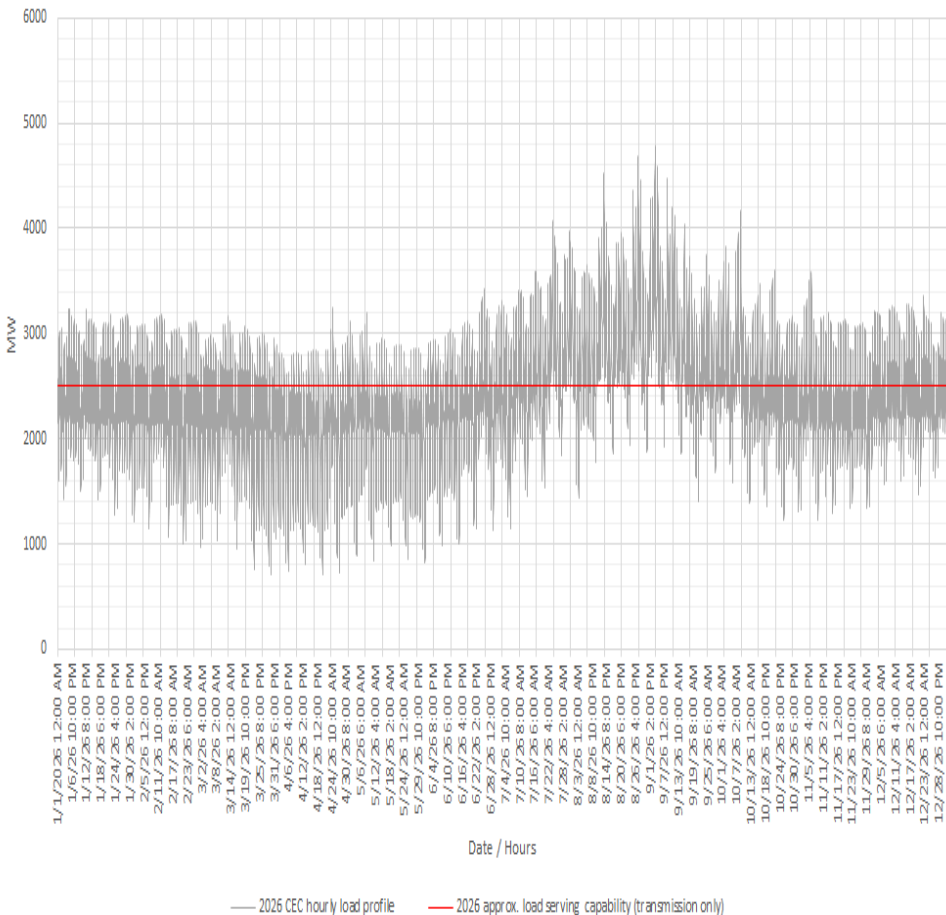
2030 peak day load profile & approx. LSC (transmission + LCR Gen + ES)

Approx. amount of storage that can be added to this area from charging restriction perspective = 1080 MW and 5810 MWh. Approx. max 4-hr storage = 840 MW

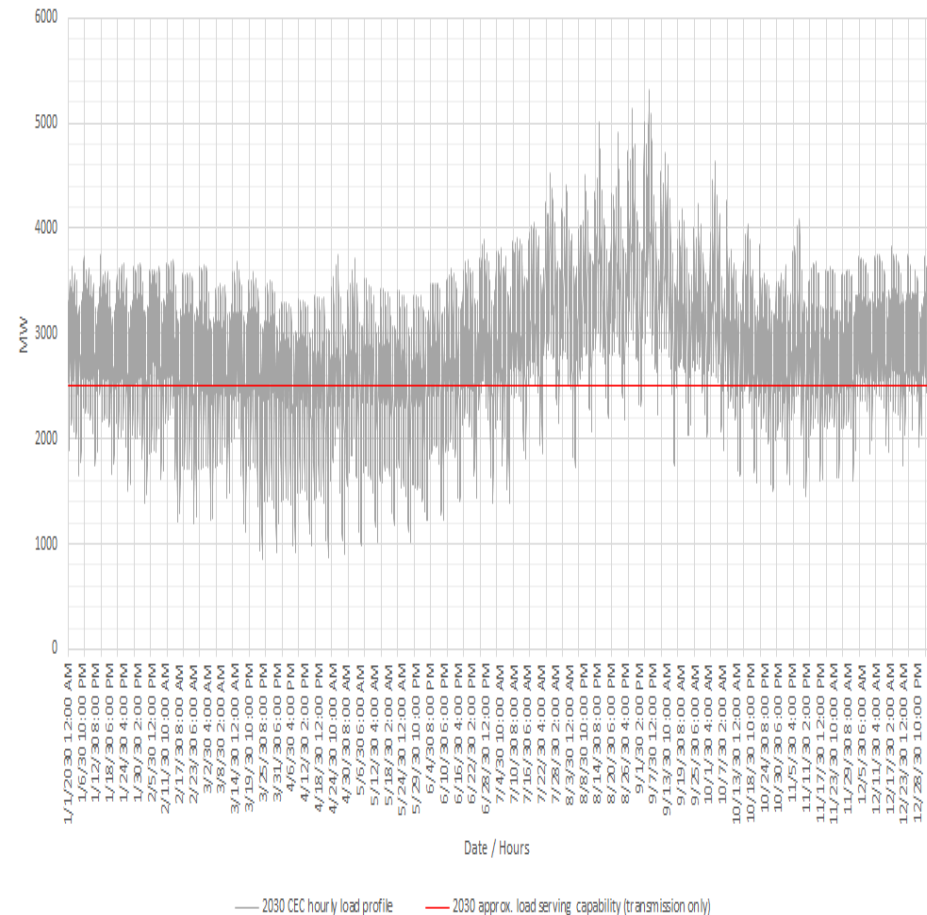


# San Diego Sub-area Annual Load Profile and Load Serving Capability

San Diego Sub-area:  
2026 CEC hourly load profile & approx. load serving capability (transmission only)



San Diego Sub-area:  
2030 CEC hourly load profile & approx. load serving capability (transmission only)



# Overall San Diego – Imperial Valley Area LCR

| Year | Category | Limiting Facility                       | Contingency  | LCR (MW) | 2024 and 2028<br>LCR<br>(MW) |
|------|----------|---|--|----------|------------------------------|
| 2026 | P6       | Remaining Sycamore-Suncrest 230 kV line | ECO-Miguel 500 kV line, system readjustment, followed by one of the Sycamore-Suncrest 230 kV | 2631     | 2709                         |
| 2030 | P6       | Remaining Sycamore-Suncrest 230 kV line | ECO-Miguel 500 kV line, system readjustment, followed by one of the Sycamore-Suncrest 230 kV | 3305     | 3121                         |

## Reasons for the changes in the LCR needs:

- 2026: The LCR need is lower due to higher dispatch of local resources in the LA Basin to meet its LCR needs. The LA Basin and the San Diego-Imperial Valley areas exhibit some inter-dependent relationship due to strong electrical tie between these two areas.
- 2030: The LCR need is higher due to CEC's higher demand forecast for the San Diego area.