This presentation will cover the following topics:

- California Energy Demand (CED) 2023 Overview
- Historical Behind-The-Meter (BTM) Distributed Generation (DG) Updates for the 2023 CED Forecast.
- Historical BTM solar photovoltaic adoption trends
- Historical BTM energy storage adoption trends

Questions and comments are encouraged throughout today’s presentation.
2023 CED Overview
General 2023 CED Updates

- Moody’s projections – May vintage
- DOF population projections – July vintage
  - CEC staff revised household projections based on population projections
- Forecast to 2040
  - Supports CAISO’s Transmission Planning Process, per SB 887
  - Extend to 2050 for long-term demand scenarios
- Managed forecast scenarios
  - One baseline forecast
  - Planning Forecast (AAEE 3 / AAFS 3 / AATE 3)
  - Local Reliability Scenario (AAEE 2 / AAFS 4 / AATE 3)
Key Dates

IEPR Workshops

- Inputs and assumptions – August 15 and 18
- Load modifier results – November 15
- Overall forecast results – December 6
Historical BTM DG Updates
Historical Behind-The-Meter Distributed Generation Updates

• Refreshed historical BTM solar PV and storage cumulative capacity estimates.

• Refinements include:
  • Shifting to a single data source for BTM solar PV and energy storage capacity information.
  • Improving and expanding data cleaning tools
Interconnection Data

• Previously relied upon three data sets to estimate historical cumulative BTM solar and energy storage capacity in California.
  • Historical cumulative BTM energy storage capacity was estimated from a combination of CPUC’s Self Generation Incentive Program (SGIP) and Rule 21 interconnection data.
• Staff transitioned to utility distribution company (UDC) interconnection data collected under California Code of Regulations, Title 20, Division 2, Chapter 3, Section 1304(b) to estimate historical cumulative DG capacity.
  • The data includes a list of all interconnected energy systems located within each UDC’s service territory.
Data Cleaning Improvements

- Each UDC’s interconnection data set may contain unique issues that have to be addressed to estimate historical DG capacity.
  - Previously, staff manually cleaned UDC interconnection data to resolve data problems.
  - For CED 2023, staff developed data cleaning scripts for each UDC to automate cleaning steps and improve the accuracy of our estimates.
  - The following slides highlight how our revised historical data cleaning process has impacted our historical BTM DG cumulative capacity estimates.
Historical BTM Solar Adoption
Historical BTM Solar Adoption: Statewide

- CED 2023 estimates 14,220 MW of BTM solar capacity statewide by end of year 2022.
- Cumulative BTM solar capacity estimate is about 7% lower than CEDU 2022 in 2021.
Solar Charts Notes

• Estimates cover IOU service territories not CEC Planning Areas.
  • Additional charts for each CEC Planning Area are provided in the slide deck appendix.
• CED estimates includes NEM and Rule 21 Non-Export interconnection agreements.
  • DG Stats only includes NEM interconnection agreements.
Historical BTM Solar Adoption: CAISO

- This estimate covers PG&E, SCE, and SDG&E service territories.

<table>
<thead>
<tr>
<th>Year</th>
<th>DG Stats (MW)</th>
<th>CEDU 2022 (MW)</th>
<th>CED 2023 (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>10,551</td>
<td>11,846</td>
<td>10,818</td>
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<tr>
<td>2022</td>
<td>12,626</td>
<td>12,870</td>
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</table>
### Historical BTM Solar Adoption: PG&E Service Territory

<table>
<thead>
<tr>
<th>Year</th>
<th>DG Stats (MW)</th>
<th>CEDU 2022 (MW)</th>
<th>CED 2023 (MW)</th>
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</thead>
<tbody>
<tr>
<td>2021</td>
<td>5,475</td>
<td>6,380</td>
<td>5,633</td>
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<tr>
<td>2022</td>
<td>6,511</td>
<td>6,733</td>
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</table>

![Graph showing solar adoption growth](image-url)
Historical BTM Solar Adoption: SCE Service Territory

<table>
<thead>
<tr>
<th>Year</th>
<th>DG Stats (MW)</th>
<th>CEDU 2022 (MW)</th>
<th>CED 2023 (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>3,497</td>
<td>3,865</td>
<td>3,594</td>
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<tr>
<td>2022</td>
<td>4,276</td>
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<td>4,323</td>
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</table>
Historical BTM Solar Adoption: SDG&E Service Territory

<table>
<thead>
<tr>
<th>Year</th>
<th>DG Stats (MW)</th>
<th>CEDU 2022 (MW)</th>
<th>CED 2023 (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>1,580</td>
<td>1,601</td>
<td>1,591</td>
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<tr>
<td>2022</td>
<td>1,839</td>
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<td>1,814</td>
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</table>
Historical BTM Storage Adoption
Storage Charts Notes

- Previous CED estimates are based off SGIP and Rule 21 interconnection data.
  - CED 2023 estimates are derived from UDC interconnection data.
- CEC staff reached out to IOUs and CPUC to resolve discrepancies shown in the following slides.
  - Staff will provide updated storage estimates as soon as possible.
Historical BTM Storage Adoption: SDG&E Service Territory

<table>
<thead>
<tr>
<th>Year</th>
<th>DG Stats (MW)</th>
<th>CEDU 2022 (MW)</th>
<th>CED 2023 (MW)</th>
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</thead>
<tbody>
<tr>
<td>2021</td>
<td>127</td>
<td>88</td>
<td>126</td>
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<tr>
<td>2022</td>
<td>172</td>
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<td>167</td>
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</table>
Historical BTM Storage Adoption: SDG&E Service Territory by Sector

Residential

Non-Residential

AC Nameplate Capacity (MW)

Calendar Year
Historical BTM Storage Adoption: SCE Service Territory

<table>
<thead>
<tr>
<th>Year</th>
<th>DG Stats (MW)</th>
<th>CEDU 2022 (MW)</th>
<th>CED 2023 (MW)</th>
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<tbody>
<tr>
<td>2021</td>
<td>287</td>
<td>246</td>
<td>335</td>
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<td>2022</td>
<td>367</td>
<td>416</td>
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</table>
Historical BTM Storage Adoption: SCE Service Territory by Sector

Residential

Non-Residential

AC Nameplate Capacity (MW)

Calendar Year


CED 2023  CEDU 2022  DG Stats

CED 2023  CEDU 2022  DG Stats
Historical BTM Storage Adoption: PG&E Service Territory

<table>
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<th>CED 2023 (MW)</th>
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<tbody>
<tr>
<td>2021</td>
<td>262</td>
<td>233</td>
<td>342</td>
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<tr>
<td>2022</td>
<td>385</td>
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<td>505</td>
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</tbody>
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Historical BTM Storage Adoption: PG&E Service Territory by Sector

Residential

Non-Residential

AC Nameplate Capacity (MW)

Calendar Year


CED 2023 CEDU 2022 DG Stats

AC Nameplate Capacity (MW)

Calendar Year


CED 2023 CEDU 2022 DG Stats
Thank You!
Slide Deck Appendix
Historical BTM Solar Adoption: PGE Planning Area
Historical BTM Solar Adoption: SCE Planning Area
Historical BTM Solar Adoption: SDG&E Planning Area
Historical BTM Solar Adoption: LADWP Planning Area
Historical BTM Solar Adoption: NCNC Planning Area

![Graph showing historical BTM solar adoption in the NCNC Planning Area. The x-axis represents calendar years from 2004 to 2022, while the y-axis represents AC nameplate capacity (MW) ranging from 0 to 600. Two lines, CEDU 2022 and CED 2023, illustrate the adoption trend over time.]
Historical BTM Solar Adoption: BUGL Planning Area

![Graph showing historical BTM solar adoption in the BUGL Planning Area. The graph displays the AC Nameplate Capacity (MW) over Calendar Year from 2004 to 2022. Two lines are shown: CEDU 2022 and CED 2023.]}
Historical BTM Solar Adoption: OTHER Planning Area