



California Energy Commission

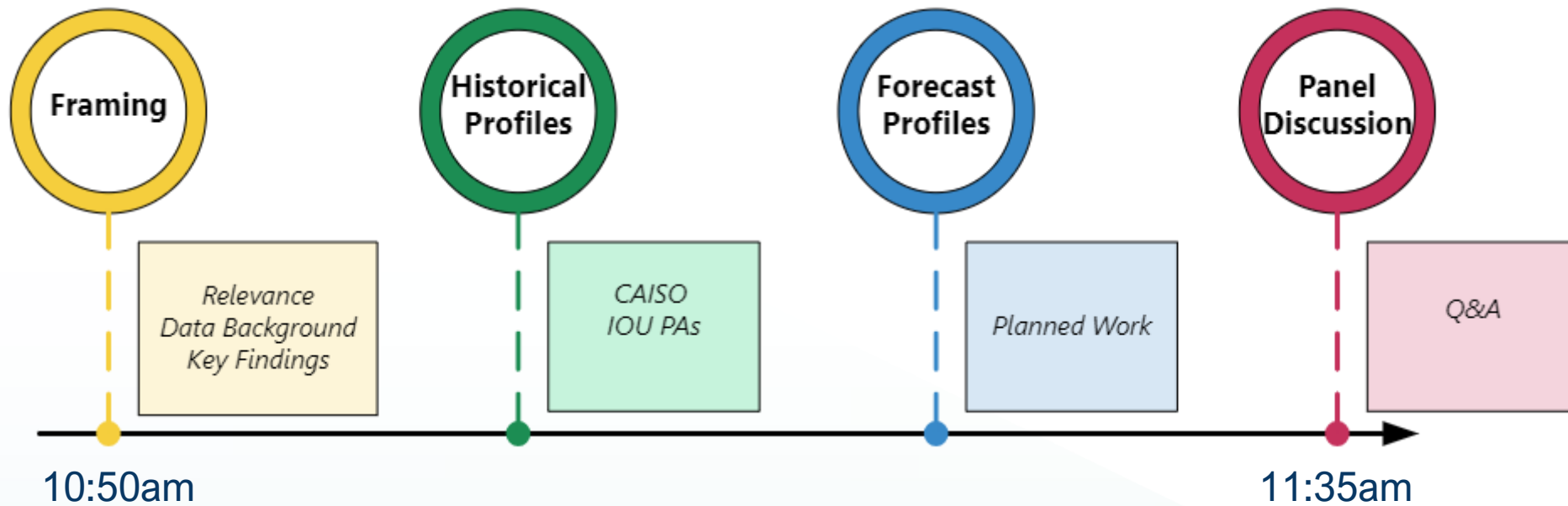
Title: Behind-The-Meter Hourly PV Updates

Presenter: Alex Lonsdale, Distributed Generation Forecast Supervisor

Date: August 21, 2024



Agenda





List of Acronyms and Initialisms

BTM – Behind-the-meter

CA - California

CHP – Combined Heat and Power

DAWG – Demand Analysis Working Group

DG – Distributed Generation

dGen – Distributed Generation Market Demand Model

DER – Distributed Energy Resource

IEPR – Integrated Energy Policy Report

MW – Megawatt

NCNC – Northern California Non-California ISO

NBT – Net Billing Tariff

NEM – Net Energy Metering

PA – Planning Area

POU – Publicly Owned Utility

PV – Photovoltaics

SGIP – Self Generation Incentive Program



Present Updates: 2024 IEPR

- Staff plan to limit hourly updates to BTM PV

| Technology | Planned Updates |
|------------|---|
| PV | Historical and forecast normalized profiles |
| | Historical and forecast capacity factors |

Source: CEC Staff



Relevance

- **BTM PV capacity factors:**
 - Estimate historical BTM PV electric generation
- **Historical BTM PV generation use cases:**
 - Hourly Load Model (HLM)
 - Sector models forecast consumption
 - Utility billing data is sales, and need to add BTM generation to the sales data to estimate consumption



Key Findings: Historical BTM PV Generation

- CED 2024 PV capacity factors are lower than CED 2023
- Implications:
 - **Reduction in BTM PV generation estimates for CED 2024**
 - In September 2022, the average BTM PV capacity factor during hour of peak demand (17) is about 2% points or 260 MW lower than previously estimated
 - HLM and sector models require re-estimation to further assess impacts



Background: PV Profile Data

- **Level setting:** Following slides highlight changes to CEC's historical BTM PV capacity factors
 - **Capacity Factor:** Measures ratio of actual power output to rated capacity
 - Factors are utilized to estimate total historical BTM PV generation
- **Data Procurement:** In 2023, CEC procured a large sample of behind-the-meter (BTM) PV generation data
 - **Spatiotemporal elements:**
 - Date
 - Hour
 - Minutes
 - Customer sector
 - CEC forecast zone
 - **Measurements:**
 - 15-minute average power measured at the AC side of the inverter
 - Total installed inverter AC active power



Historical BTM PV Profiles



CAISO Historical BTM PV Capacity Factors

- Annual capacity factors calculated from new vendor data are 3-4% points lower than CED 2023
- Monthly average capacity factors were calculated from calendar years 2018-2022
 - Monthly average factors from vendor data are 2-5% points lower than CED 2023

| | | Year | | | | |
|-------|-------------|-------|-------|-------|-------|-------|
| pa | source | 2018 | 2019 | 2020 | 2021 | 2022 |
| CAISO | CED 2023 | 21.2% | 20.3% | 20.8% | 21.0% | 21.6% |
| CAISO | Vendor Data | 18.1% | 17.4% | 17.8% | 17.9% | 18.5% |

| | | Month | | | | | | | | | | | |
|-------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| pa | source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| CAISO | CED 2023 | 12.8% | 18.5% | 21.1% | 25.8% | 27.4% | 28.8% | 27.8% | 25.2% | 21.5% | 18.1% | 14.2% | 10.6% |
| CAISO | Vendor Data | 10.9% | 15.7% | 18.0% | 22.0% | 23.4% | 24.6% | 23.7% | 21.5% | 18.3% | 15.5% | 12.2% | 9.1% |

Source: CEC Staff



IOU PA Historical BTM PV Factors

- IOU PA annual capacity factors are consistently lower than last year
- Average reduction in capacity factors:
 - PG&E – 3.3%
 - SCE – 3.0%
 - SDG&E – 2.8%

| Sector: All | | Year | | |
|---------------|-------------|-------|-------|-------|
| Planning Area | Source | 2020 | 2021 | 2022 |
| PGE | CED 2023 | 20.3% | 20.9% | 21.5% |
| PGE | Vendor Data | 17.2% | 17.6% | 18.2% |
| SCE | CED 2023 | 21.1% | 21.3% | 22.0% |
| SCE | Vendor Data | 18.1% | 18.4% | 19.0% |
| SDGE | CED 2023 | 22.0% | 20.9% | 21.0% |
| SDGE | Vendor Data | 19.1% | 18.2% | 18.3% |

Source: CEC Staff



IOU Monthly BTM PV Capacity Factors: PG&E

- Average reduction in seasonal capacity factors:
 - Winter – 2.1%
 - Spring – 4.0%
 - Summer – 4.3%
 - Fall – 2.7%

| Sector: All | | | Month | | | | | | | | | | | |
|---------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| PGE | 2020 | CED 2023 | 11.4% | 19.6% | 18.9% | 24.4% | 27.9% | 29.8% | 28.9% | 24.0% | 18.6% | 15.8% | 13.7% | 11.4% |
| PGE | 2020 | Vendor Data | 9.6% | 16.5% | 15.9% | 20.6% | 23.6% | 25.2% | 24.4% | 20.2% | 15.7% | 13.3% | 11.6% | 9.6% |
| PGE | 2021 | CED 2023 | 11.1% | 17.5% | 22.4% | 27.9% | 30.7% | 30.2% | 27.8% | 24.3% | 21.8% | 16.4% | 12.6% | 8.0% |
| PGE | 2021 | Vendor Data | 9.3% | 14.7% | 18.9% | 23.5% | 25.8% | 25.4% | 23.4% | 20.4% | 18.3% | 13.8% | 10.6% | 6.7% |
| PGE | 2022 | CED 2023 | 12.9% | 18.8% | 21.7% | 27.1% | 30.6% | 30.0% | 28.7% | 26.4% | 21.7% | 18.1% | 14.0% | 8.4% |
| PGE | 2022 | Vendor Data | 10.8% | 15.8% | 18.4% | 23.0% | 25.9% | 25.3% | 24.3% | 22.3% | 18.4% | 15.2% | 11.9% | 7.1% |

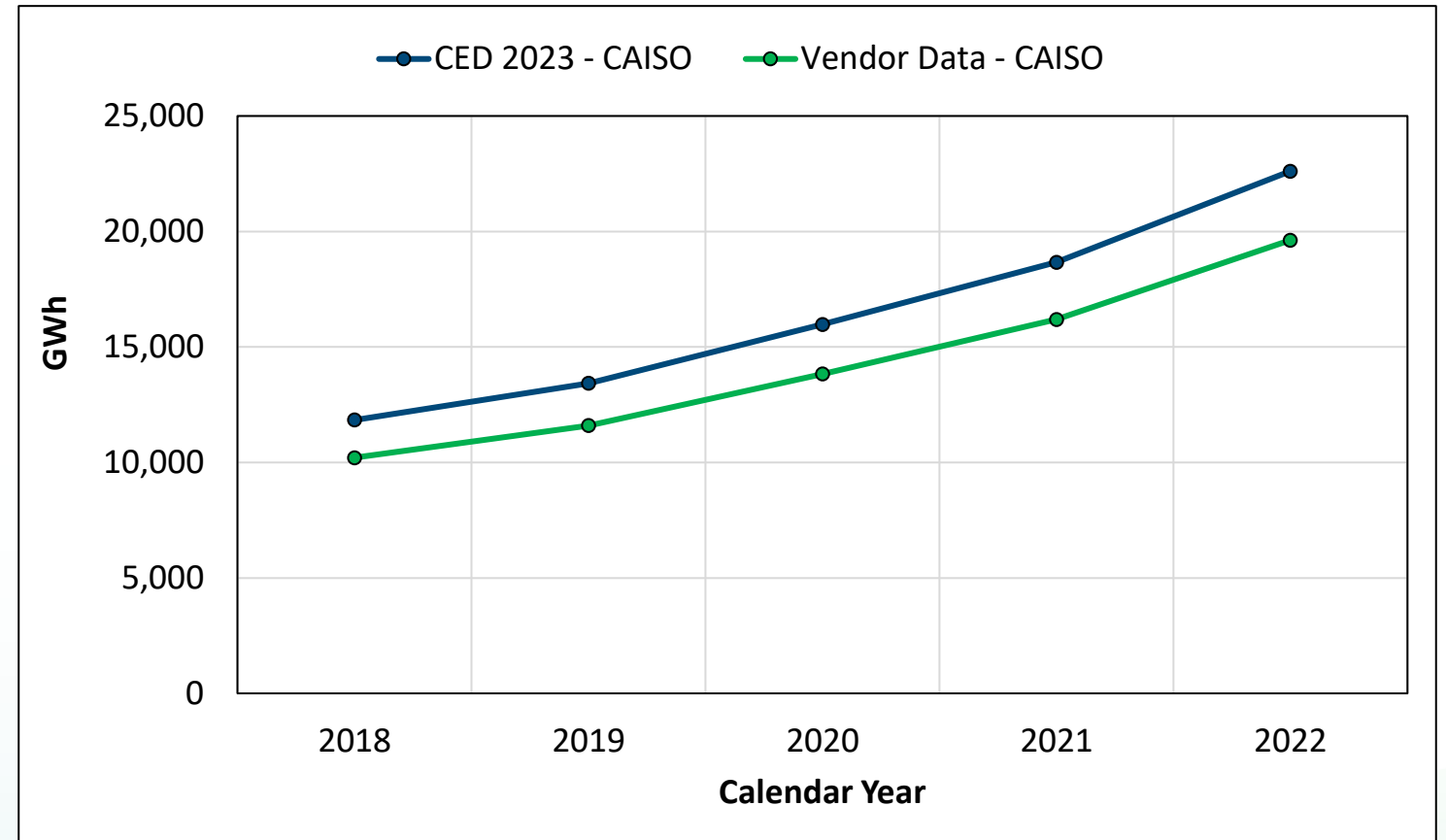
Source: CEC Staff



Annual BTM PV Generation: CAISO

- Vendor capacity factors results in 12-13% reduction in historical BTM PV generation
- Translates to about 3,000 GWh less generation in 2022

| Calendar Year | CED 2023 | Vendor Data |
|---------------|----------|-------------|
| 2018 | 11,841 | 10,206 |
| 2019 | 13,426 | 11,600 |
| 2020 | 15,974 | 13,828 |
| 2021 | 18,667 | 16,191 |
| 2022 | 22,607 | 19,622 |



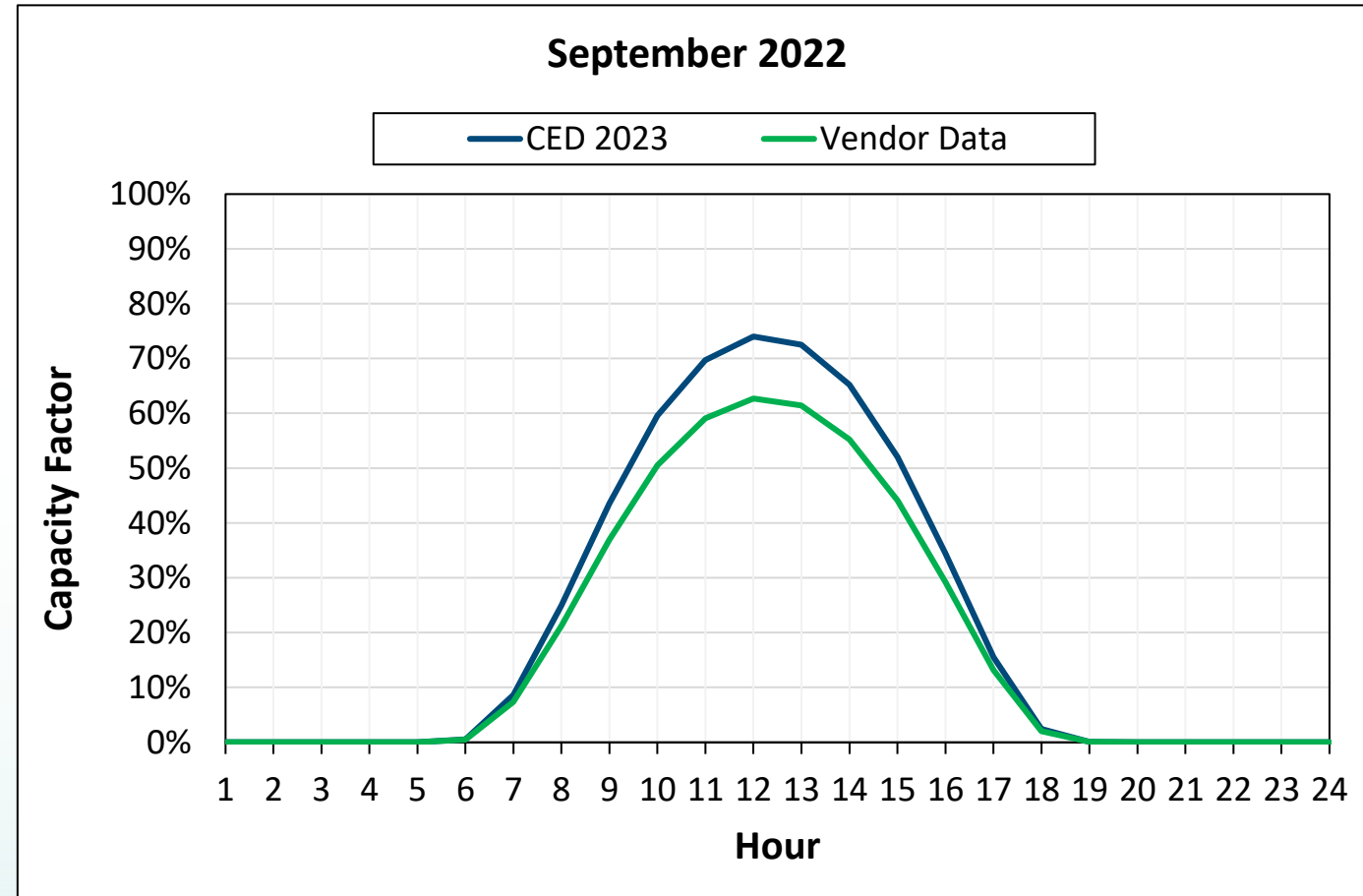
Source: CEC Staff



CAISO Historical Average Hourly BTM PV Capacity Factors

- Vendor data reduces
 - Daily max capacity factor by ~11% points
 - Net peak hour (17) capacity factor by ~2% points

| Hour | Source | |
|------|----------|-------------|
| | CED 2023 | Vendor Data |
| 1 | 0% | 0% |
| 2 | 0% | 0% |
| 3 | 0% | 0% |
| 4 | 0% | 0% |
| 5 | 0% | 0% |
| 6 | 1% | 0% |
| 7 | 9% | 7% |
| 8 | 25% | 21% |
| 9 | 44% | 37% |
| 10 | 60% | 51% |
| 11 | 70% | 59% |
| 12 | 74% | 63% |
| 13 | 73% | 61% |
| 14 | 65% | 55% |
| 15 | 52% | 44% |
| 16 | 34% | 29% |
| 17 | 16% | 13% |
| 18 | 2% | 2% |
| 19 | 0% | 0% |
| 20 | 0% | 0% |
| 21 | 0% | 0% |
| 22 | 0% | 0% |
| 23 | 0% | 0% |
| 24 | 0% | 0% |



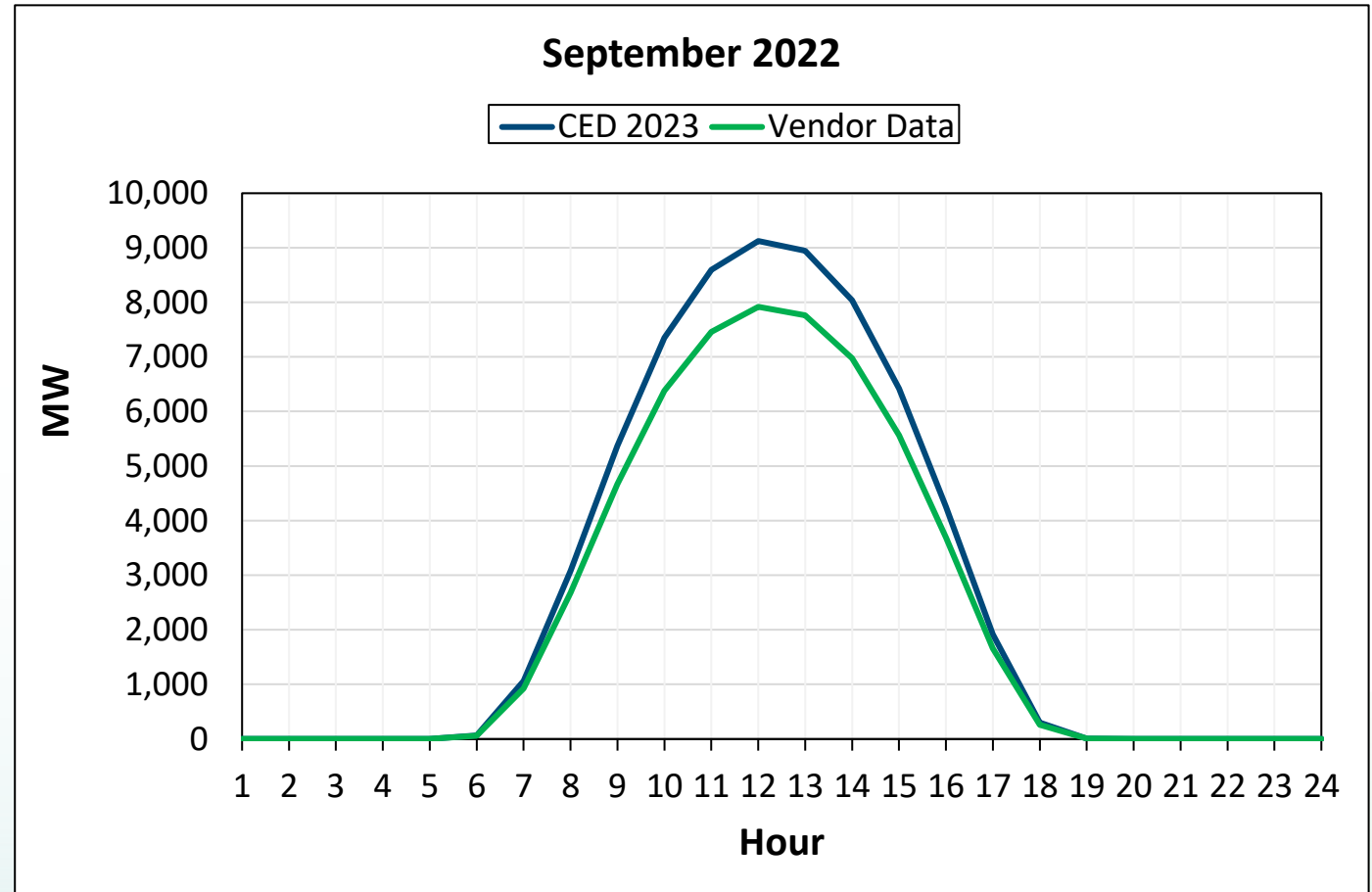
Source: CEC Staff



CAISO Historical Average Hourly BTM PV Generation

- Over 13 GW of BTM PV capacity in 2022
- Hour of peak demand (17) is ~260 MW lower than CED 2023
- Daily maximum generation is ~1,200 MW lower than CED 2023

| Hour | Source | |
|------|----------|-------------|
| | CED 2023 | Vendor Data |
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 2 | 1 |
| 6 | 63 | 55 |
| 7 | 1,063 | 926 |
| 8 | 3,080 | 2,680 |
| 9 | 5,369 | 4,665 |
| 10 | 7,348 | 6,379 |
| 11 | 8,593 | 7,458 |
| 12 | 9,123 | 7,916 |
| 13 | 8,945 | 7,759 |
| 14 | 8,040 | 6,973 |
| 15 | 6,417 | 5,565 |
| 16 | 4,251 | 3,687 |
| 17 | 1,915 | 1,660 |
| 18 | 298 | 257 |
| 19 | 9 | 7 |
| 20 | 3 | 2 |
| 21 | 0 | 0 |
| 22 | 0 | 0 |
| 23 | 0 | 0 |
| 24 | 0 | 0 |

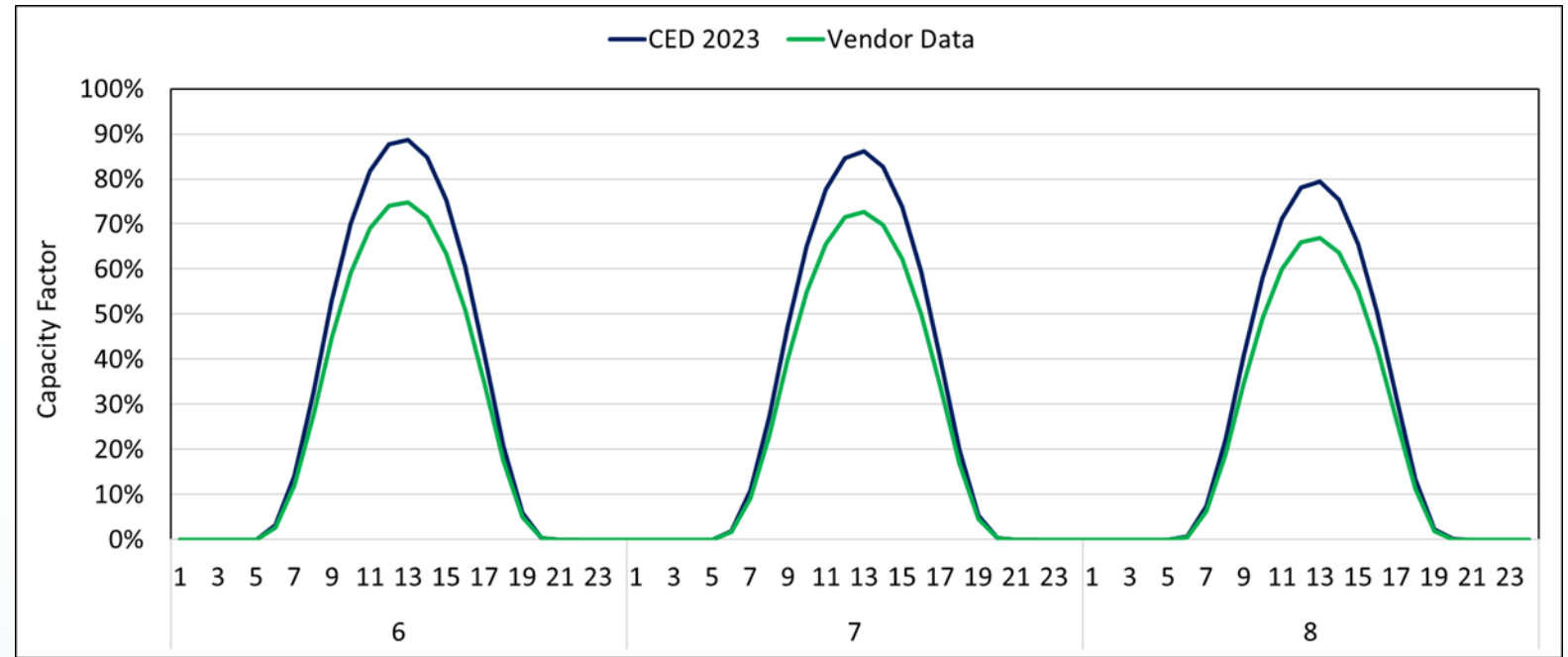


Source: CEC Staff



PG&E Historical Average BTM PV Profiles: Summer Months, 2020-2022

- Averages include 2020-2022 calendar year data
- Vendor data reduces:
 - Daily max capacity factor by 10-12% points
 - Net peak hour (17) capacity factor by 4-5% points



Source: CEC Staff



Forecast BTM PV Profiles



Planned Updates

- Forecast BTM PV profiles methodology remains unchanged
 - Incorporates new PV data
 - Lower generation estimates across PAs
 - Expect less change to hourly shapes
- Staff will present forecast profiles at a fall DAWG meeting



Panel Discussion



Appendix





IOU PA Monthly BTM PV Capacity Factors: SDG&E

- Average seasonal percentage point reduction in monthly capacity factors
 - Winter – 2.0%
 - Spring – 3.2%
 - Summer – 3.4%
 - Fall – 2.4%

| Sector: All | | | Month | | | | | | | | | | | |
|---------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| SDGE | 2020 | CED 2023 | 16.3% | 20.4% | 19.9% | 22.6% | 28.9% | 26.5% | 29.4% | 26.9% | 22.1% | 19.0% | 17.3% | 14.0% |
| SDGE | 2020 | Vendor Data | 14.2% | 17.7% | 17.4% | 19.7% | 25.2% | 23.1% | 25.6% | 23.4% | 19.2% | 16.5% | 15.1% | 12.2% |
| SDGE | 2021 | CED 2023 | 14.6% | 19.1% | 22.8% | 25.0% | 25.5% | 26.7% | 26.2% | 23.8% | 22.0% | 18.3% | 15.8% | 10.6% |
| SDGE | 2021 | Vendor Data | 12.7% | 16.7% | 19.8% | 21.8% | 22.2% | 23.2% | 22.8% | 20.7% | 19.1% | 16.0% | 13.7% | 9.2% |
| SDGE | 2022 | CED 2023 | 14.1% | 19.4% | 23.5% | 26.4% | 26.0% | 28.1% | 25.7% | 24.3% | 20.8% | 16.7% | 15.6% | 11.9% |
| SDGE | 2022 | Vendor Data | 12.3% | 16.9% | 20.5% | 23.0% | 22.6% | 24.4% | 22.4% | 21.1% | 18.1% | 14.6% | 13.6% | 10.4% |

Source: CEC Staff



IOU PA Monthly BTM PV Capacity Factors: SCE

- Average seasonal percentage point reduction in monthly capacity factors
 - Winter – 2.2%
 - Spring – 3.6%
 - Summer – 3.8%
 - Fall – 2.6%

| Sector: All | | | Month | | | | | | | | | | | |
|---------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| SCE | 2020 | CED 2023 | 15.1% | 20.1% | 19.6% | 23.2% | 28.9% | 27.3% | 28.4% | 24.7% | 19.9% | 16.7% | 16.0% | 13.2% |
| SCE | 2020 | Vendor Data | 12.9% | 17.2% | 16.8% | 19.9% | 24.8% | 23.4% | 24.4% | 21.2% | 17.1% | 14.3% | 13.7% | 11.3% |
| SCE | 2021 | CED 2023 | 14.4% | 19.5% | 23.4% | 26.0% | 27.4% | 27.9% | 26.5% | 24.8% | 21.9% | 18.5% | 15.4% | 10.6% |
| SCE | 2021 | Vendor Data | 12.3% | 16.8% | 20.0% | 22.3% | 23.5% | 24.0% | 22.8% | 21.4% | 18.8% | 15.9% | 13.2% | 9.1% |
| SCE | 2022 | CED 2023 | 14.3% | 20.1% | 23.8% | 27.6% | 28.6% | 29.5% | 27.8% | 24.9% | 21.9% | 18.4% | 16.3% | 11.4% |
| SCE | 2022 | Vendor Data | 12.3% | 17.3% | 20.5% | 23.8% | 24.8% | 25.2% | 23.9% | 21.6% | 18.9% | 15.9% | 14.0% | 9.9% |

Source: CEC Staff



IOU PA Annual BTM PV Capacity Factors By Sector

| Sector: Residential | | Year | | |
|---------------------|-------------|-------|-------|-------|
| Planning Area | Source | 2020 | 2021 | 2022 |
| PGE | CED 2023 | 20.6% | 20.1% | 20.7% |
| PGE | Vendor Data | 17.3% | 16.8% | 17.4% |
| SCE | CED 2023 | 21.2% | 21.0% | 21.6% |
| SCE | Vendor Data | 18.3% | 18.2% | 18.7% |
| SDGE | CED 2023 | 22.0% | 20.7% | 20.8% |
| SDGE | Vendor Data | 19.2% | 18.0% | 18.1% |

| Sector: Nonesidential | | Year | | |
|-----------------------|-------------|-------|-------|-------|
| Planning Area | Source | 2020 | 2021 | 2022 |
| PGE | CED 2023 | 20.0% | 22.1% | 22.8% |
| PGE | Vendor Data | 17.0% | 18.6% | 19.4% |
| SCE | CED 2023 | 20.9% | 22.0% | 23.1% |
| SCE | Vendor Data | 17.7% | 18.7% | 19.8% |
| SDGE | CED 2023 | 21.7% | 21.5% | 22.0% |
| SDGE | Vendor Data | 18.9% | 18.7% | 19.2% |

Source: CEC Staff



IOU PA Residential BTM PV Monthly Capacity Factors

| Sector: Residential | | | Month | | | | | | | | | | | |
|---------------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| PGE | 2020 | CED 2023 | 11.4% | 19.8% | 19.1% | 24.6% | 28.1% | 30.2% | 29.3% | 24.3% | 18.9% | 16.1% | 13.9% | 11.5% |
| PGE | 2020 | Vendor Data | 9.6% | 16.6% | 16.0% | 20.7% | 23.6% | 25.4% | 24.6% | 20.4% | 15.9% | 13.5% | 11.7% | 9.7% |
| PGE | 2021 | CED 2023 | 10.7% | 16.7% | 21.5% | 26.8% | 29.5% | 29.0% | 26.7% | 23.3% | 21.1% | 15.7% | 11.9% | 7.7% |
| PGE | 2021 | Vendor Data | 9.0% | 14.0% | 18.1% | 22.5% | 24.8% | 24.4% | 22.4% | 19.6% | 17.7% | 13.2% | 10.0% | 6.4% |
| PGE | 2022 | CED 2023 | 12.2% | 17.8% | 21.1% | 26.1% | 29.3% | 28.7% | 27.8% | 25.5% | 21.0% | 17.3% | 13.4% | 8.1% |
| PGE | 2022 | Vendor Data | 10.3% | 14.9% | 17.7% | 21.9% | 24.6% | 24.1% | 23.4% | 21.4% | 17.6% | 14.5% | 11.3% | 6.8% |

| Sector: Residential | | | Month | | | | | | | | | | | |
|---------------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| SCE | 2020 | CED 2023 | 15.3% | 20.1% | 19.6% | 23.2% | 29.0% | 27.2% | 28.4% | 24.7% | 20.0% | 16.9% | 16.1% | 13.3% |
| SCE | 2020 | Vendor Data | 13.3% | 17.3% | 16.9% | 20.0% | 25.0% | 23.5% | 24.5% | 21.4% | 17.3% | 14.6% | 13.9% | 11.5% |
| SCE | 2021 | CED 2023 | 14.3% | 19.2% | 22.9% | 25.4% | 26.8% | 27.4% | 26.1% | 24.5% | 21.6% | 18.3% | 15.3% | 10.6% |
| SCE | 2021 | Vendor Data | 12.3% | 16.6% | 19.8% | 22.0% | 23.2% | 23.7% | 22.5% | 21.2% | 18.7% | 15.8% | 13.2% | 9.2% |
| SCE | 2022 | CED 2023 | 14.0% | 19.6% | 23.4% | 27.1% | 28.1% | 28.5% | 27.2% | 24.6% | 21.4% | 18.0% | 16.0% | 11.4% |
| SCE | 2022 | Vendor Data | 12.1% | 16.9% | 20.2% | 23.4% | 24.3% | 24.7% | 23.5% | 21.2% | 18.5% | 15.6% | 13.9% | 9.9% |

| Sector: Residential | | | Month | | | | | | | | | | | |
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| SDGE | 2022 | CED 2023 | 14.0% | 19.2% | 23.1% | 25.9% | 25.5% | 27.7% | 25.3% | 23.9% | 20.5% | 16.6% | 15.5% | 11.8% |
| SDGE | 2022 | Vendor Data | 12.2% | 16.7% | 20.1% | 22.6% | 22.2% | 24.1% | 22.0% | 20.8% | 17.9% | 14.5% | 13.5% | 10.3% |

Source: CEC Staff



IOU PA Nonresidential BTM PV Monthly Capacity Factors

| Sector: Nonresidential | | | Month | | | | | | | | | | | |
|------------------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| PGE | 2020 | CED 2023 | 11.3% | 19.3% | 18.5% | 24.0% | 27.6% | 29.3% | 28.4% | 23.5% | 18.1% | 15.3% | 13.5% | 11.2% |
| PGE | 2020 | Vendor Data | 9.6% | 16.4% | 15.8% | 20.4% | 23.6% | 24.9% | 24.1% | 20.0% | 15.4% | 13.0% | 11.6% | 9.6% |
| PGE | 2021 | CED 2023 | 11.6% | 18.5% | 23.7% | 29.4% | 32.2% | 31.8% | 29.4% | 25.6% | 22.7% | 17.5% | 13.6% | 8.6% |
| PGE | 2021 | Vendor Data | 9.8% | 15.6% | 19.9% | 24.9% | 27.2% | 26.8% | 24.8% | 21.6% | 19.1% | 14.8% | 11.4% | 7.2% |
| PGE | 2022 | CED 2023 | 13.8% | 20.2% | 22.7% | 28.7% | 32.5% | 32.0% | 30.1% | 27.7% | 23.0% | 19.3% | 15.0% | 8.8% |
| PGE | 2022 | Vendor Data | 11.6% | 17.0% | 19.3% | 24.6% | 27.8% | 27.2% | 25.7% | 23.6% | 19.5% | 16.3% | 12.8% | 7.5% |

| Sector: Nonresidential | | | Month | | | | | | | | | | | |
|------------------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| SCE | 2020 | CED 2023 | 14.6% | 20.1% | 19.5% | 23.2% | 28.9% | 27.5% | 28.5% | 24.6% | 19.6% | 16.4% | 15.7% | 12.9% |
| SCE | 2020 | Vendor Data | 12.2% | 16.9% | 16.4% | 19.6% | 24.4% | 23.3% | 24.1% | 20.8% | 16.6% | 13.8% | 13.2% | 10.8% |
| SCE | 2021 | CED 2023 | 14.5% | 20.1% | 24.4% | 27.3% | 28.6% | 29.1% | 27.5% | 25.5% | 22.6% | 18.9% | 15.5% | 10.6% |
| SCE | 2021 | Vendor Data | 12.2% | 17.1% | 20.6% | 23.1% | 24.2% | 24.9% | 23.5% | 21.9% | 19.1% | 16.2% | 13.2% | 8.9% |
| SCE | 2022 | CED 2023 | 14.9% | 21.5% | 24.6% | 28.9% | 29.8% | 31.8% | 29.4% | 25.9% | 23.2% | 19.3% | 16.9% | 11.3% |
| SCE | 2022 | Vendor Data | 12.6% | 18.1% | 21.1% | 24.8% | 26.1% | 26.5% | 25.0% | 22.5% | 19.8% | 16.6% | 14.5% | 9.7% |

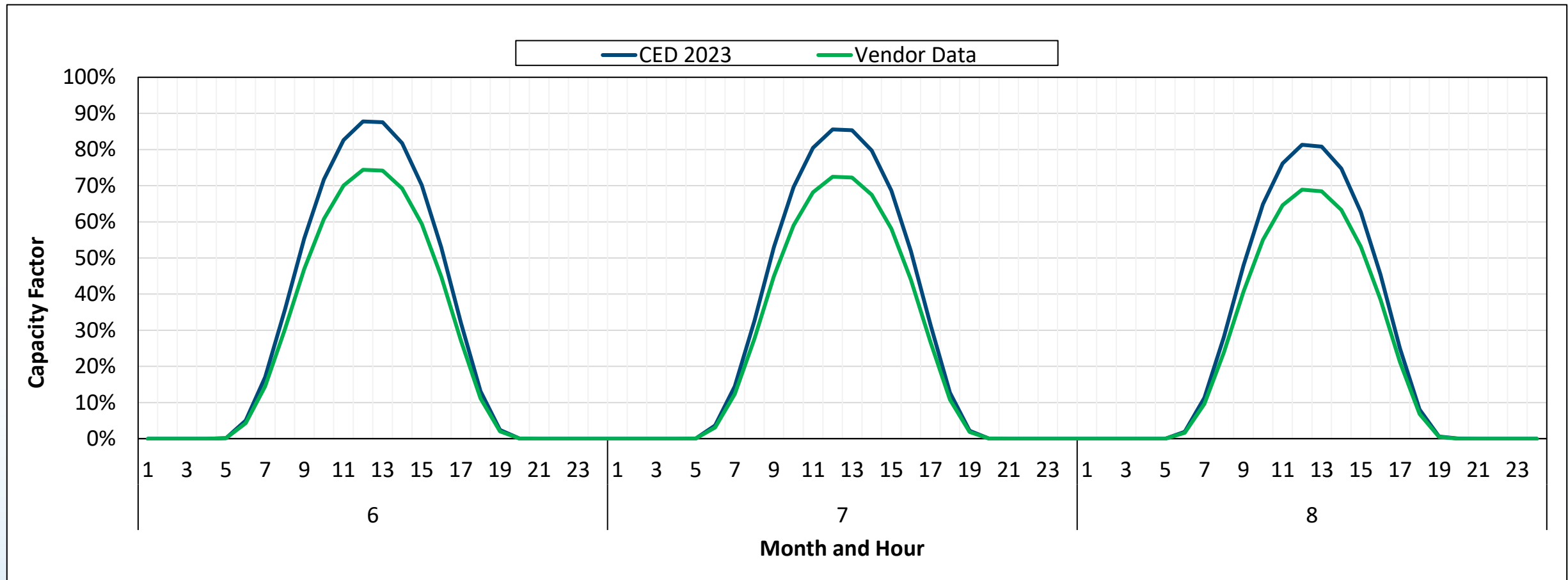
| Sector: Nonresidential | | | Month | | | | | | | | | | | |
|------------------------|------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Planning Area | Year | Source | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| SDGE | 2020 | CED 2023 | 16.1% | 20.1% | 19.7% | 22.4% | 28.5% | 26.1% | 29.0% | 26.6% | 21.9% | 18.7% | 17.1% | 13.9% |
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| SDGE | 2022 | CED 2023 | 14.4% | 20.1% | 24.9% | 28.1% | 27.5% | 29.4% | 27.0% | 25.4% | 21.8% | 17.1% | 16.0% | 12.2% |
| SDGE | 2022 | Vendor Data | 12.6% | 17.5% | 21.7% | 24.5% | 24.0% | 25.6% | 23.5% | 22.1% | 19.0% | 14.9% | 14.0% | 10.7% |

Source: CEC Staff



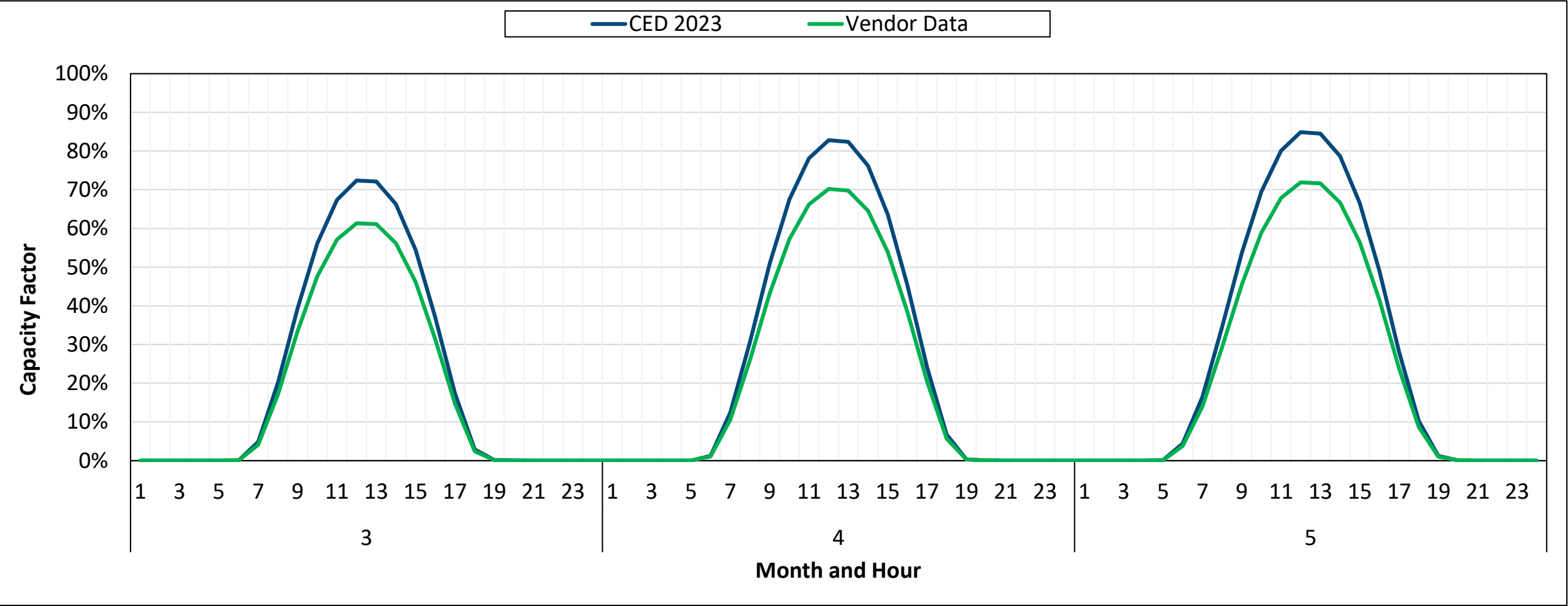
CAISO Historical Average BTM PV Profiles: Summer Months, 2018-2022

- Average summer months
 - Capacity factors during hour of peak demand (17) are about 5% points lower
 - Daily maximum capacity factors from vendor data are approximately 13% points lower



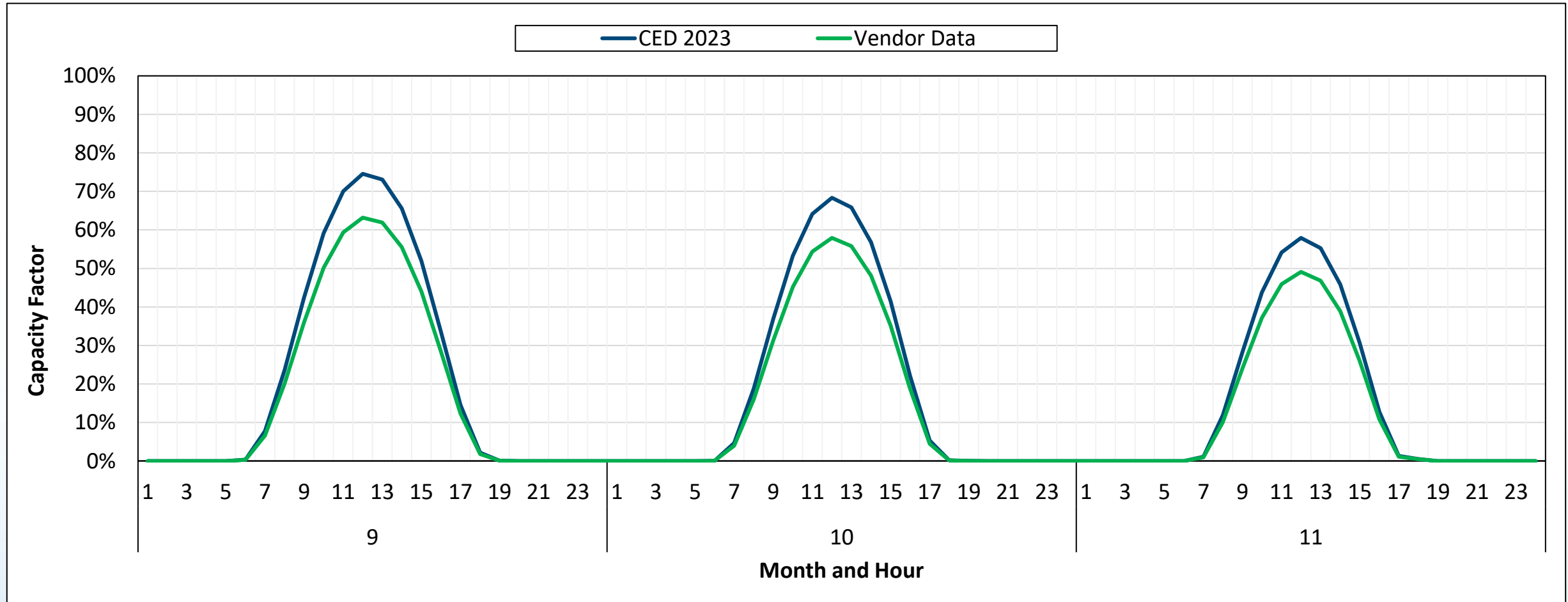


CAISO Historical Average BTM PV Profiles: Spring Months, 2018-2022



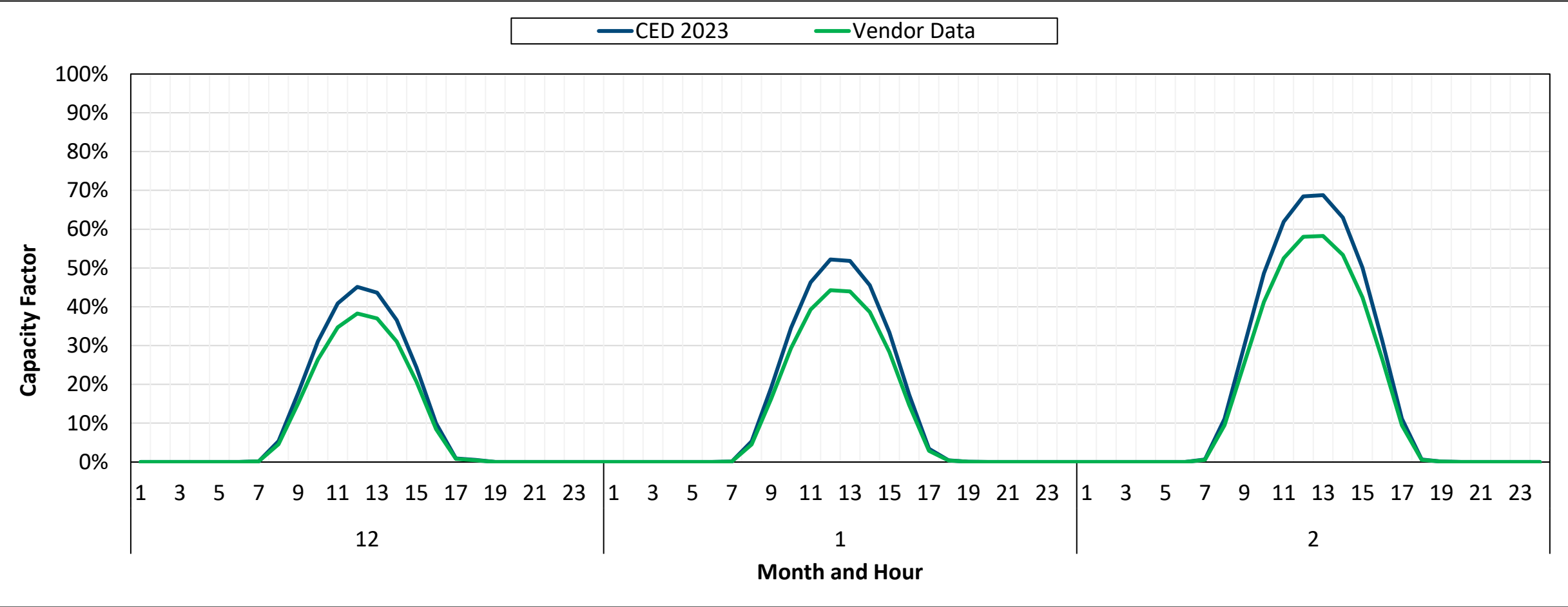


CAISO Historical Average BTM PV Profiles: Fall Months, 2018-2022





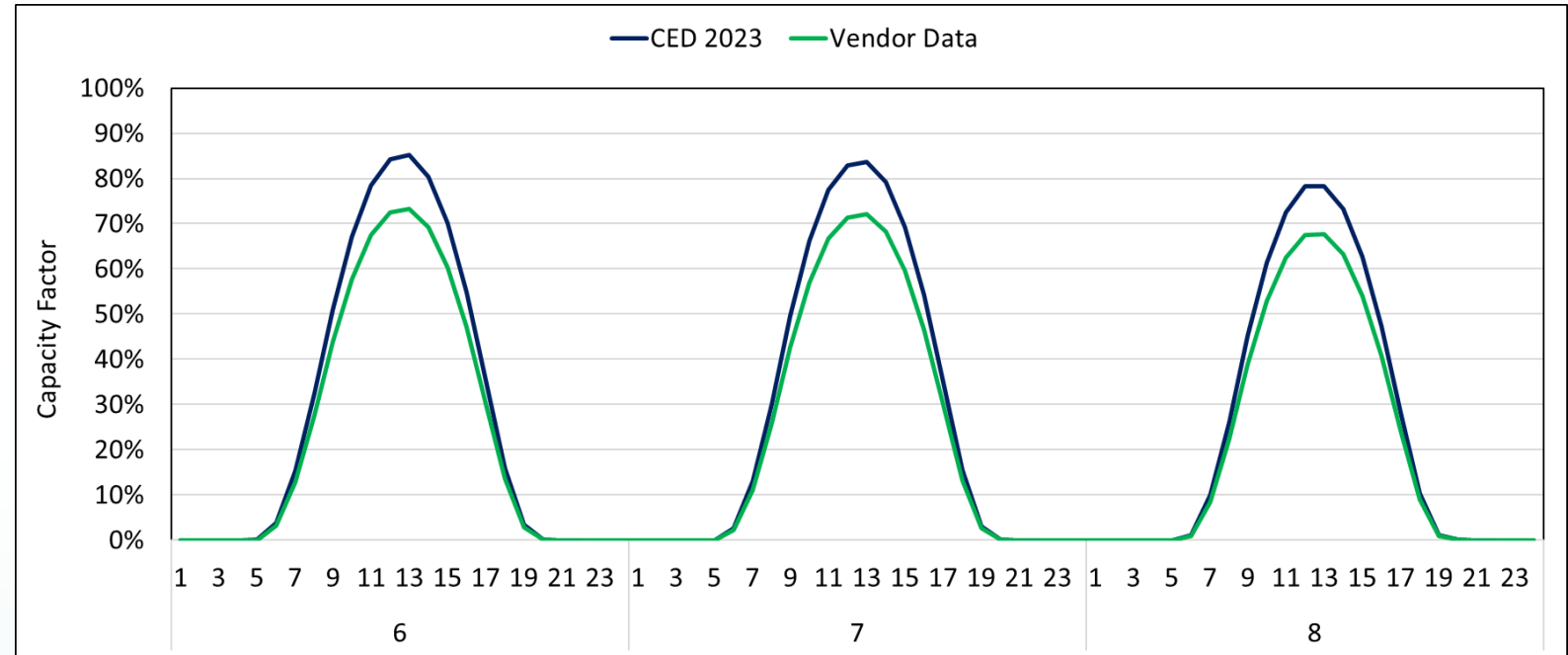
CAISO Historical Average BTM PV Profiles: Winter Months, 2018-2022





SCE Historical Average BTM PV Profiles: Summer Months, 2020-2022

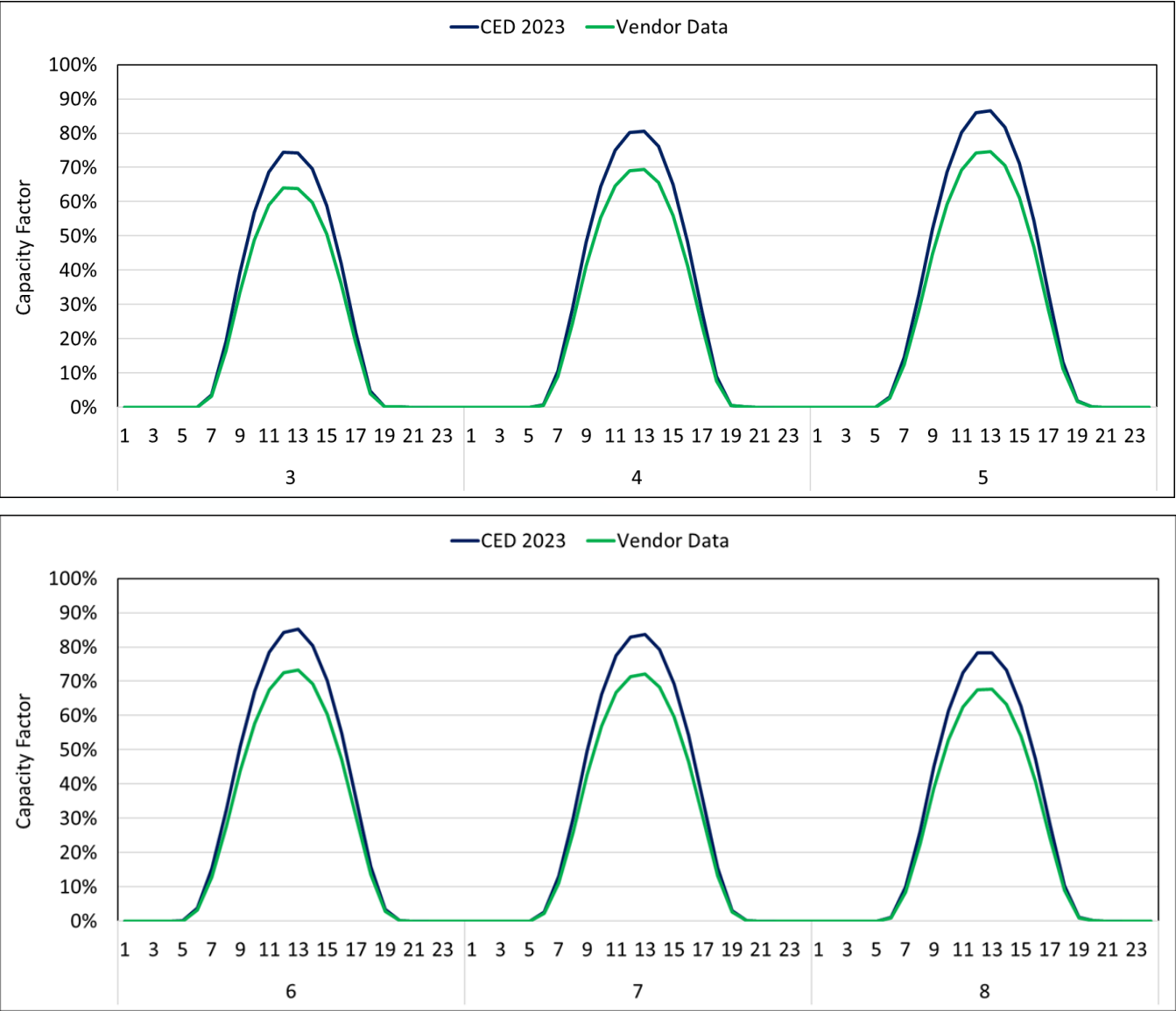
- Averages include 2020-2022 calendar year inverter data
- Vendor data reduces:
 - Daily max capacity factor by ~9-10% points
 - Net peak hour (17) capacity factor by ~5% points



Source: CEC Staff



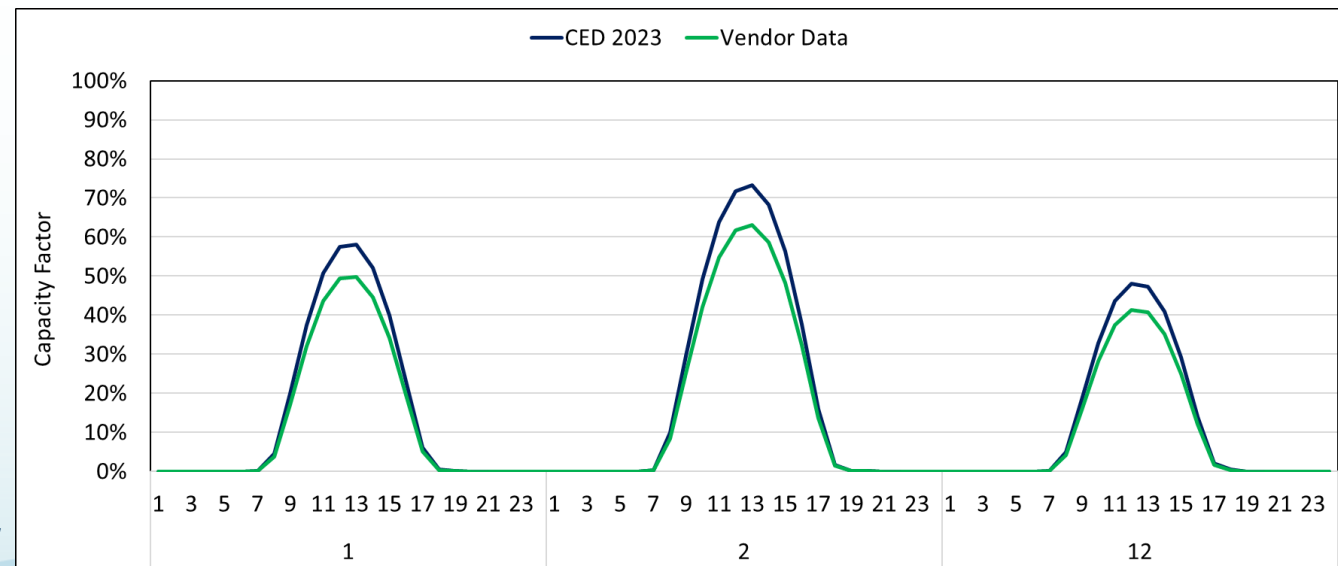
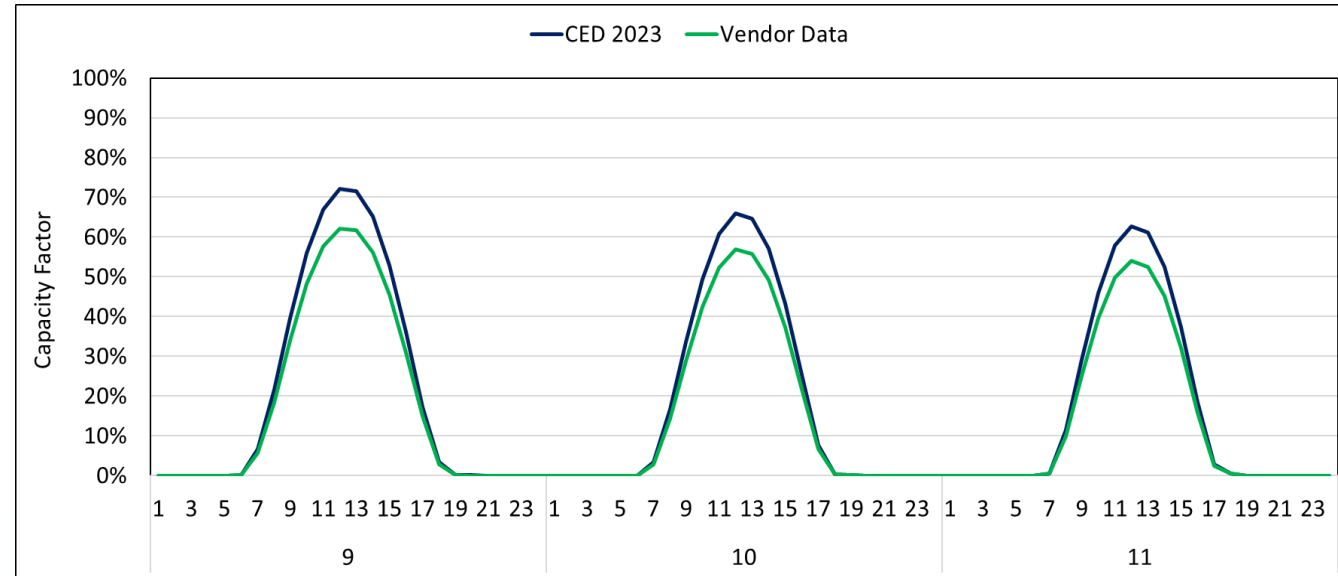
SCE Historical Average BTM PV Profiles: Spring & Summer, 2020-2022



Source: CEC Staff



SCE Historical Average BTM PV Profiles: Fall & Winter, 2020-2022

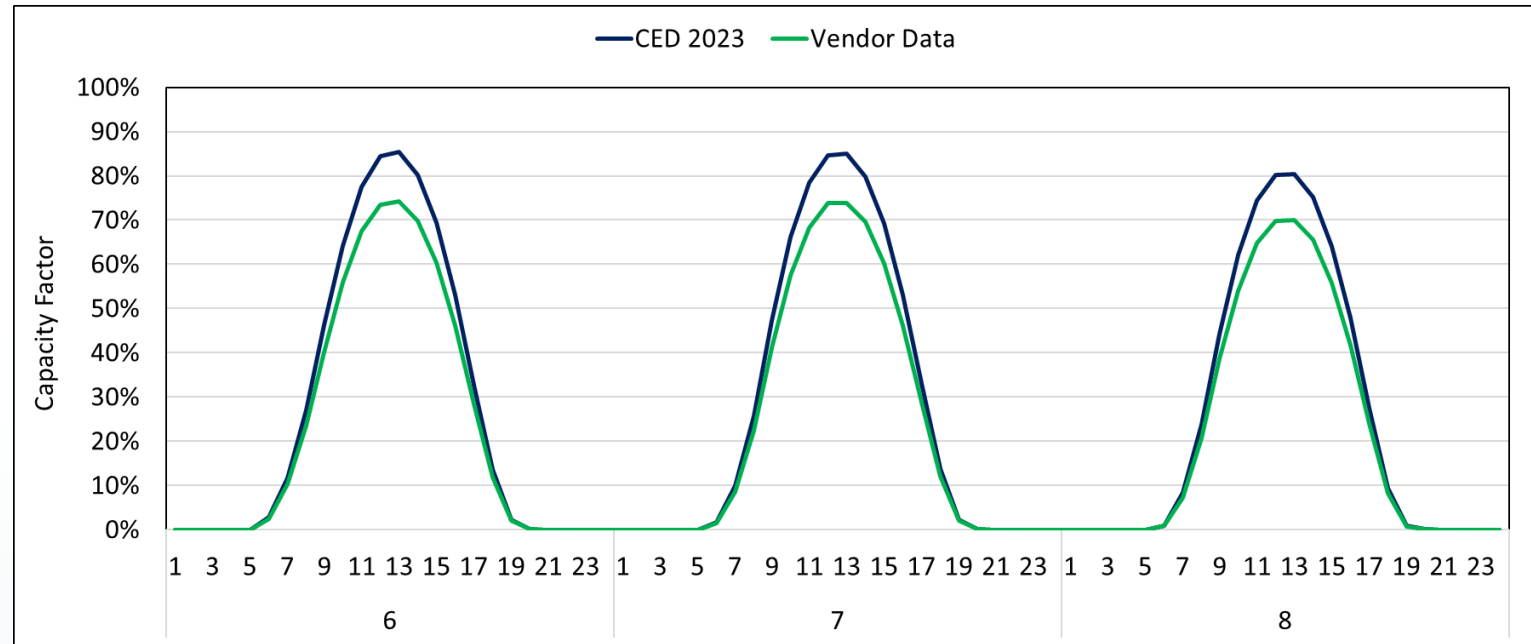


Source: CEC Staff



SDG&E Historical Average BTM PV Profiles: Summer Months, 2020-2022

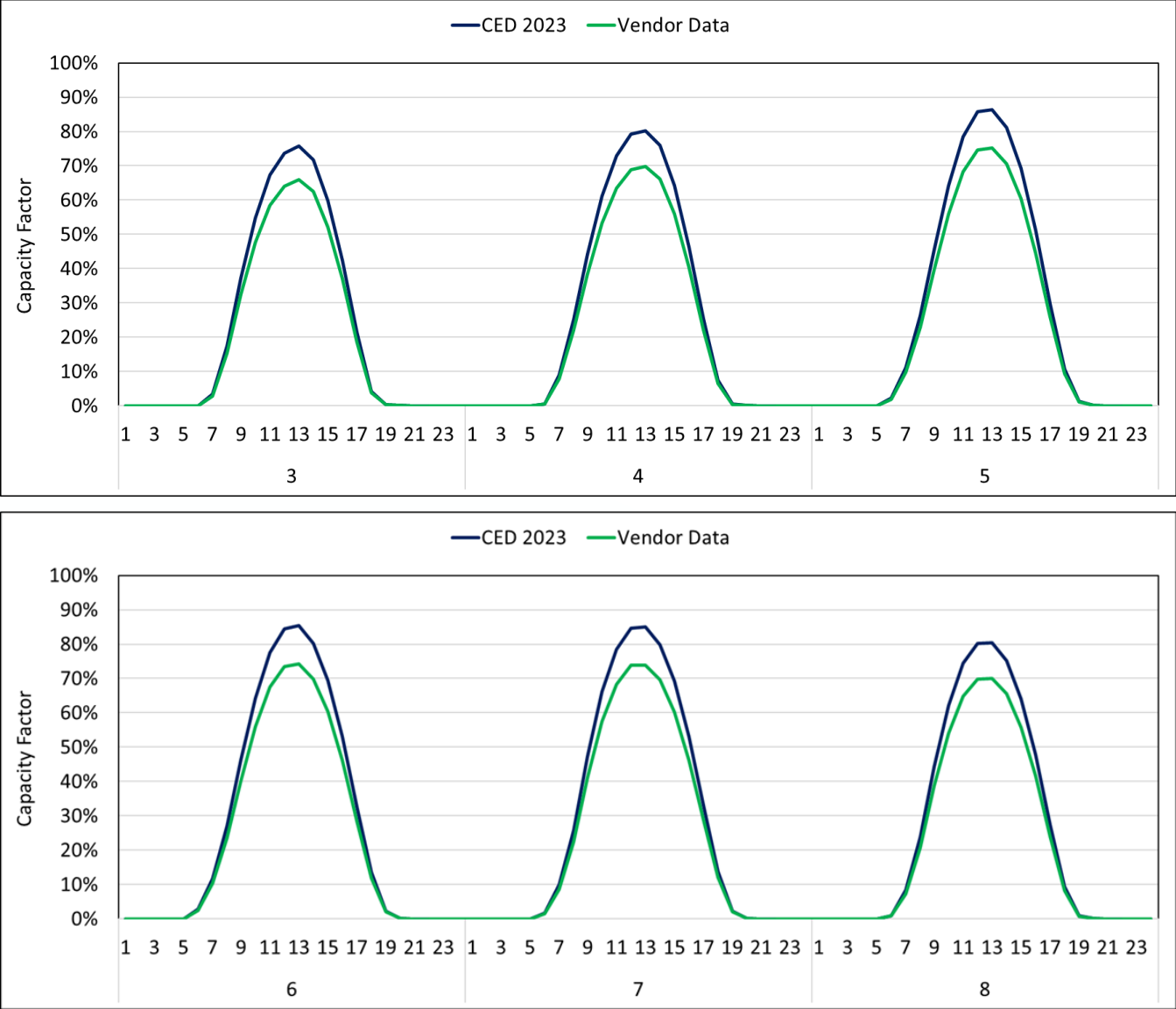
- Averages include 2020-2022 calendar year inverter data
- Vendor data reduces:
 - Daily max capacity factor by ~9-10% points
 - Net peak hour (17) capacity factor by ~4% points



Source: CEC Staff



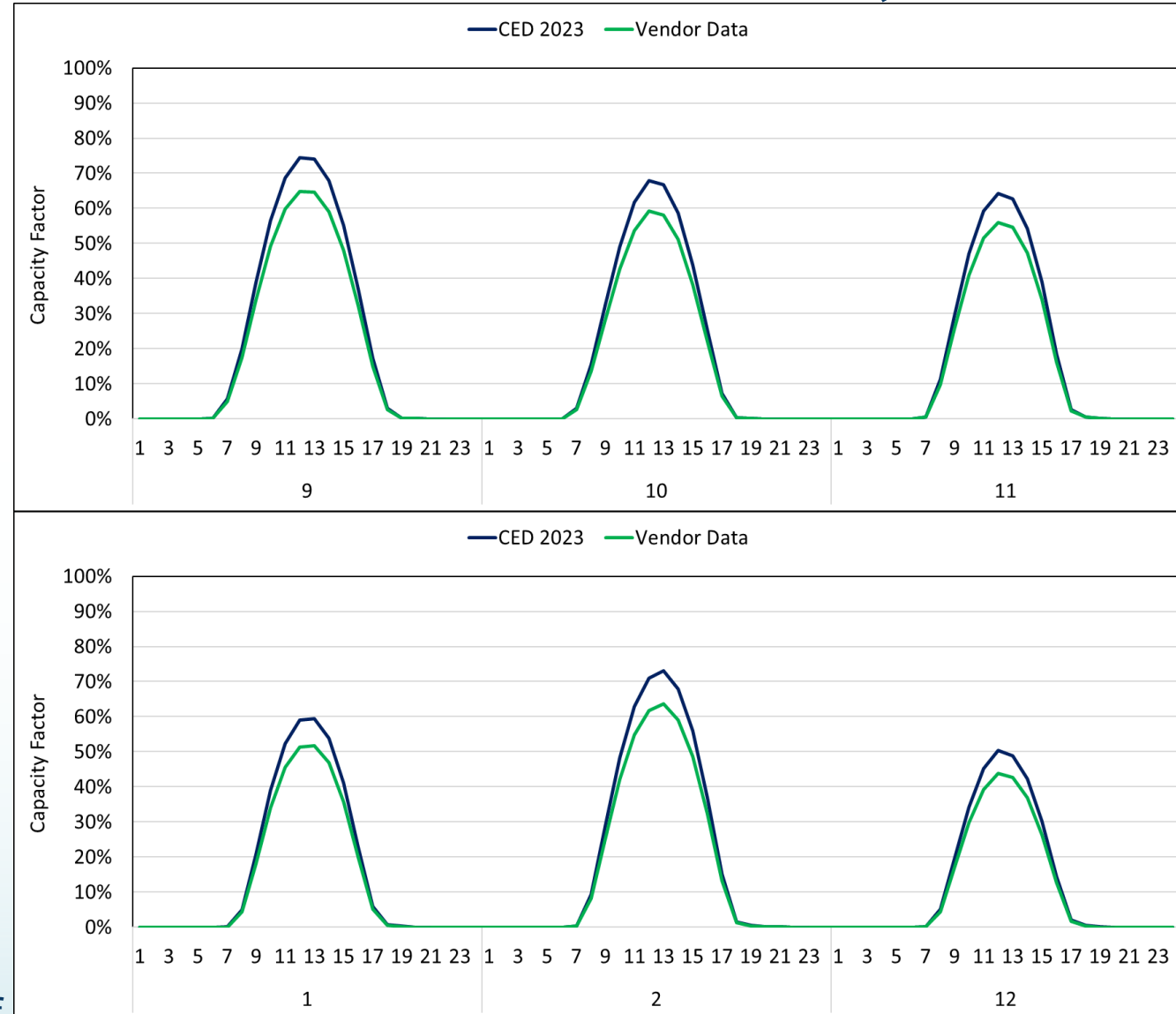
SDG&E Historical Average BTM PV Profiles: Spring & Summer, 2020-2022



Source: CEC Staff



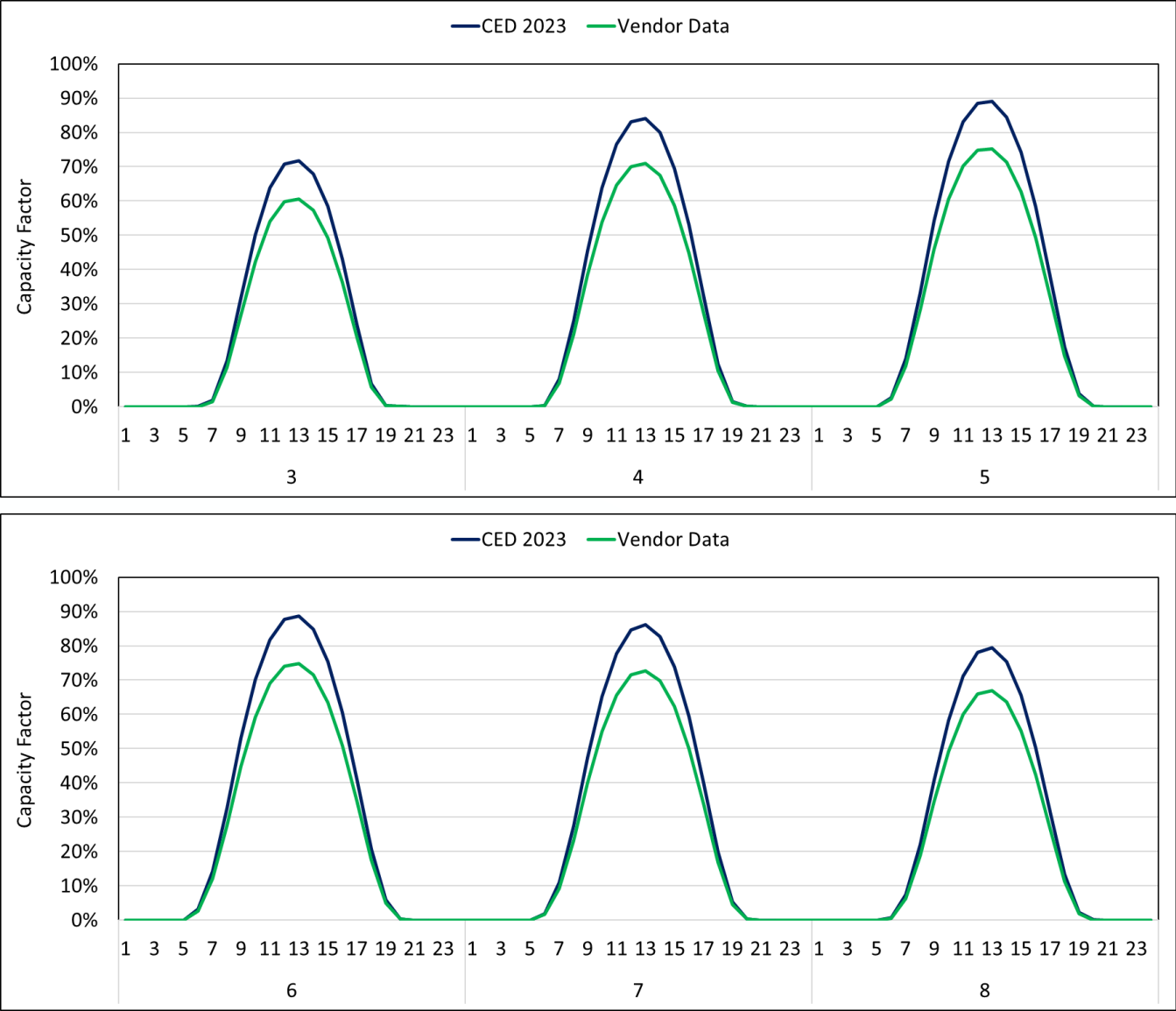
SDG&E Historical Average BTM PV Profiles: Fall & Winter, 2020-2022



Source: CEC Staff



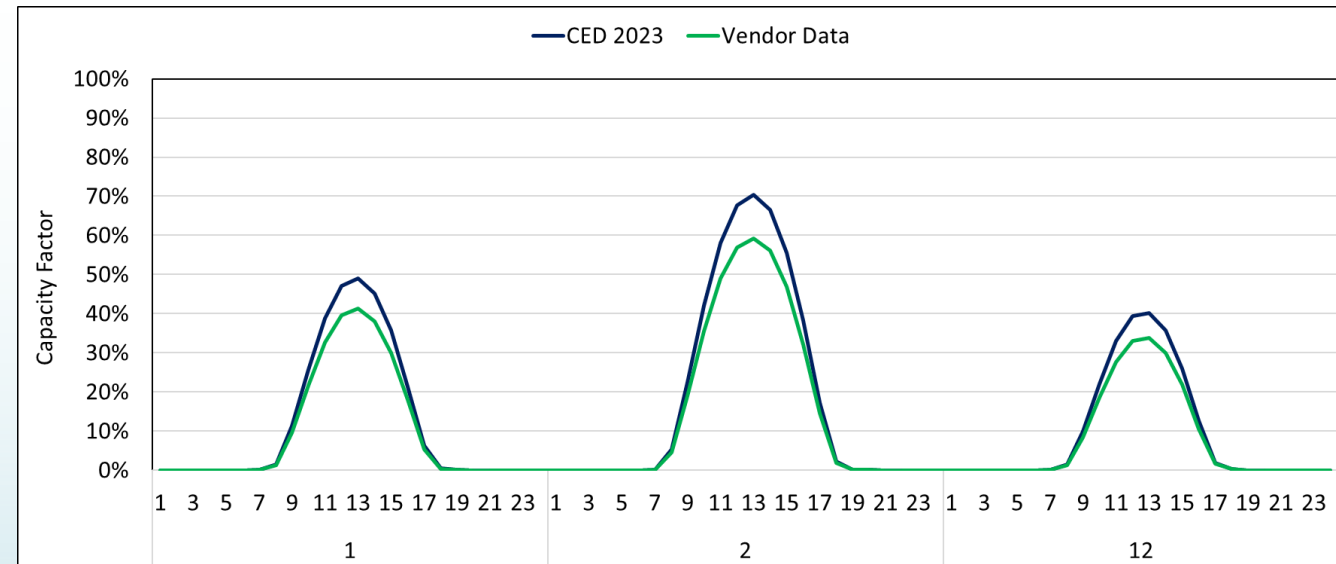
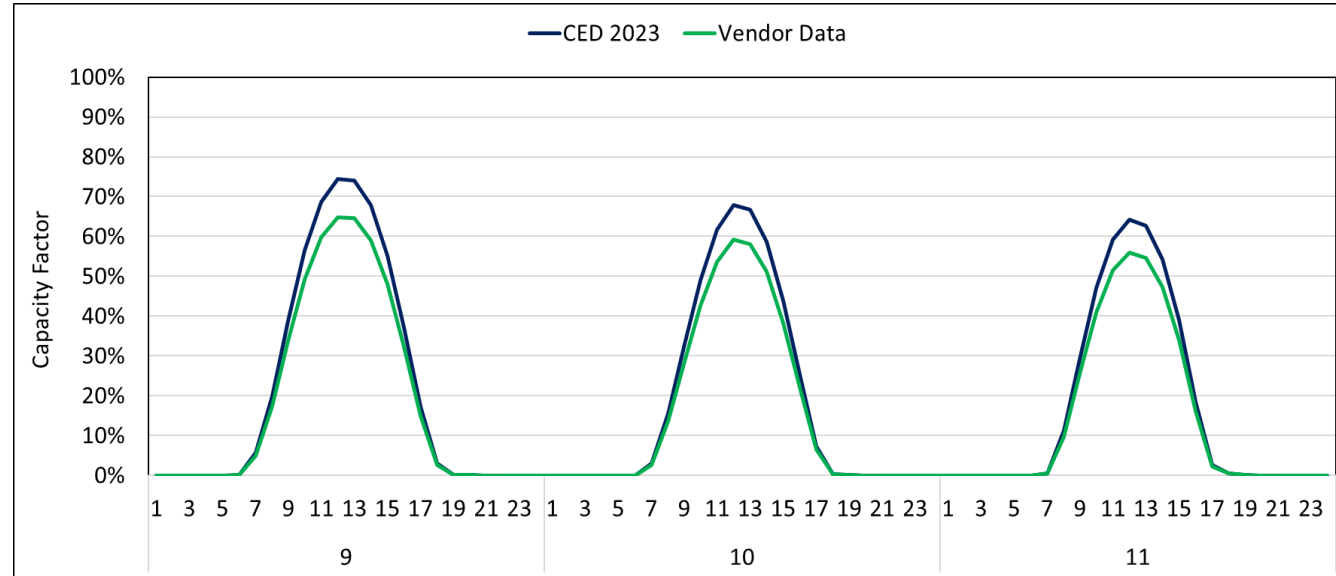
PG&E Historical Average BTM PV Profiles: Spring & Summer, 2020-2022



Source: CEC Staff



PG&E Historical Average BTM PV Profiles: Fall & Winter, 2020-2022



Source: CEC Staff