Data Center Forecast

December 23, 2024

Jenny Chen

Supervisor, Sector Modeling Unit

Feedback after November Workshops

- The data center forecast is too low
  - Does not consider new applications
  - Does not consider long-term growth (beyond what is included in the commercial sector forecast)
  - Does not account for redundancy (i.e., shifting load to a CA data center when a data center in another state is down)
  - PG&E submitted updated data to CEC on Dec 9 that shows substantially more requested capacity since their Sept submission
- Concerns about double-counting

This has been a continually evolving process, as we learn more every day. The data center methodology will be improved next year.

Updated Data From Utilities

- **Incorporated updated data from utilities**
- **For PG&E and SCE, projects were grouped by application status:**
  - SCE projects already undergoing utility transmission and distribution planning
  - **Group 1:** Active applications with completed or to-be completed engineering studies
  - **Group 2:** Active applications prior to initiating engineering studies
  - **Group 3:** Project inquiries

Application Status	PG&E (% total capacity)	SCE (% total capacity)
T&D planning	-	6%
Group 1	63%	9%
Group 2	8%	27%
Group 3	30%	63%

Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

PG&E and SCE Methodology Updates

- **For PG&E and SCE, a confidence level was applied by application status:**
  - **SCE T&D planning**
  - **Group 1:** completed or to-be completed engineering studies
  - **Group 2:** Active applications prior to initiating engineering studies
  - **Group 3:** Project inquiries

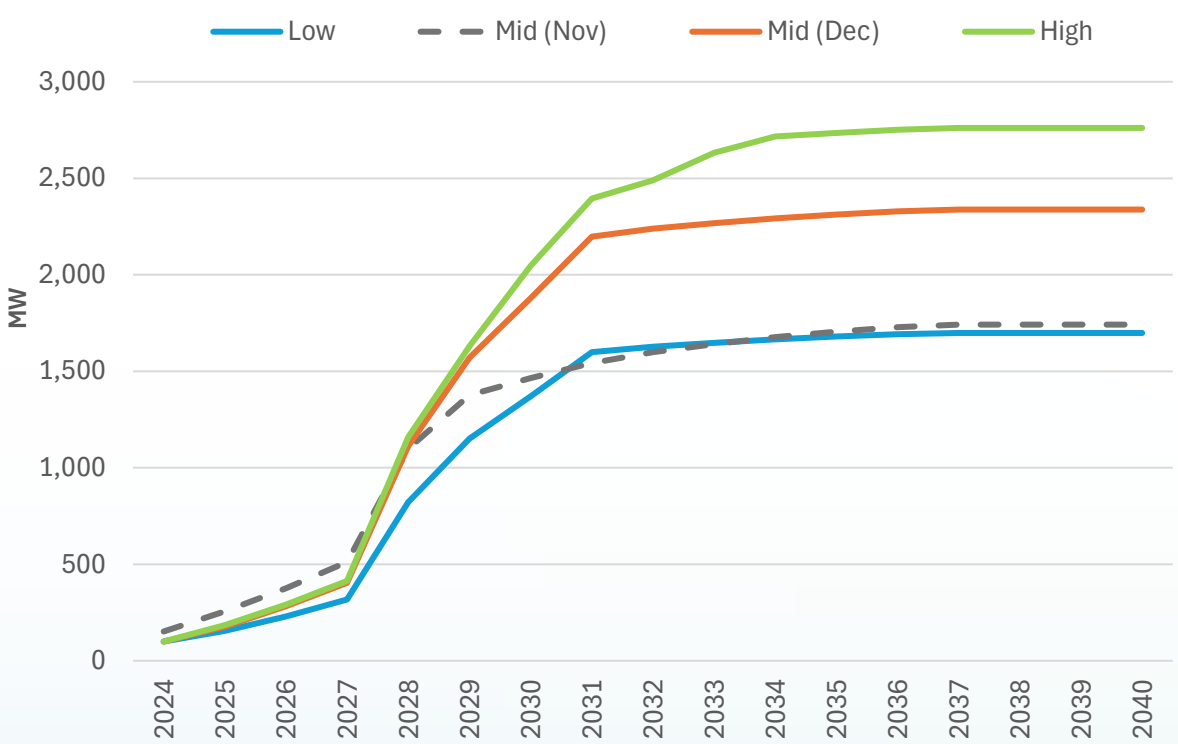
PG&E	Low	Mid	High
Group 1	50%	70%	70%
Group 2	-	-	50%
Group 3	-	-	10%

SCE	Low	Mid	High
T&D planning	100%	100%	100%
Group 1	50%	70%	70%
Group 2	-	50%	50%
Group 3	-	-	10% - 50% per SCE

Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

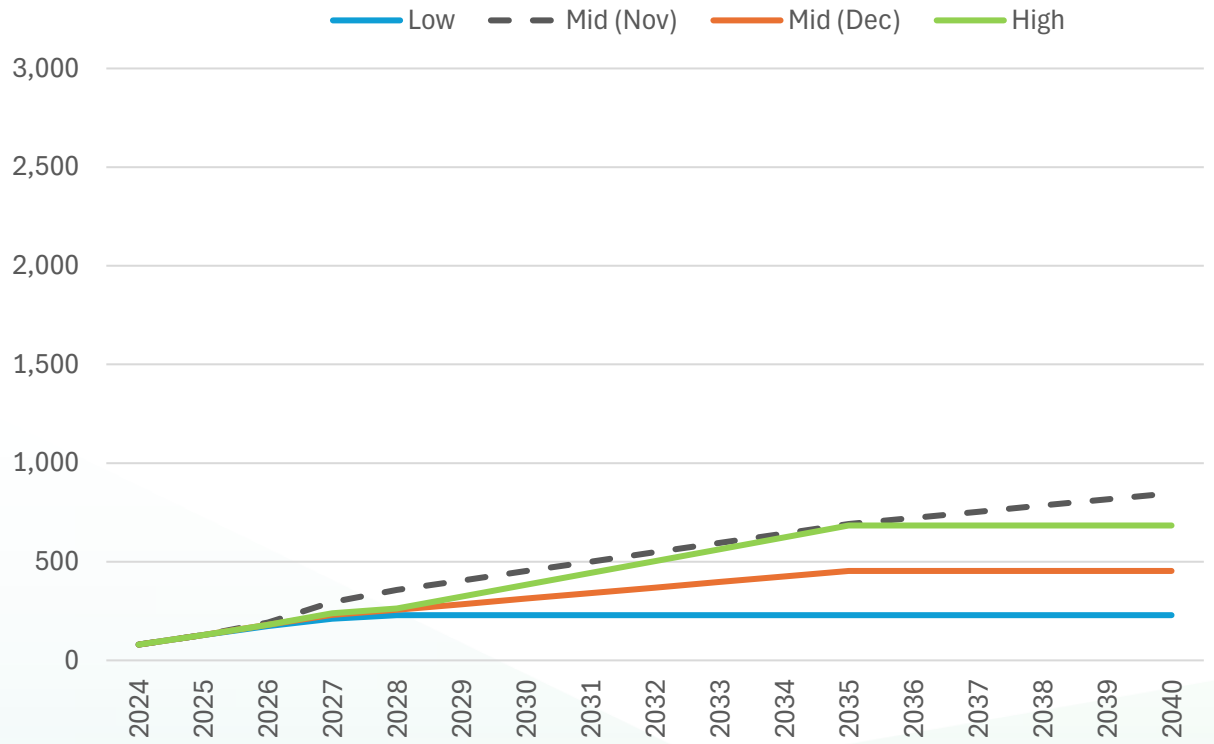
PG&E and SCE Data Center Peak Demand

PG&E



Difference between Mid (Nov) vs Mid (Dec) in 2040: ~ +600 MW

SCE



Difference between Mid (Nov) vs Mid (Dec) in 2040: ~ -394 MW

Source: CEC Staff

Data Center Growth Rate (CAGR)

History (Estimated):

	Palo Alto	SVP
2013 - 2022	**19%**	**18%**

Literature Review of Projected Growth in US Data Center Demand:

	McKinsey (Jan 23)	E3 (July 24)
Through 2030	**10%**	**9-16%**

CEC Forecast for 6 Utilities:

	Low	Mid	High
2024-2030	**15%**	**19%**	**20%**

Mid Case by Utility:

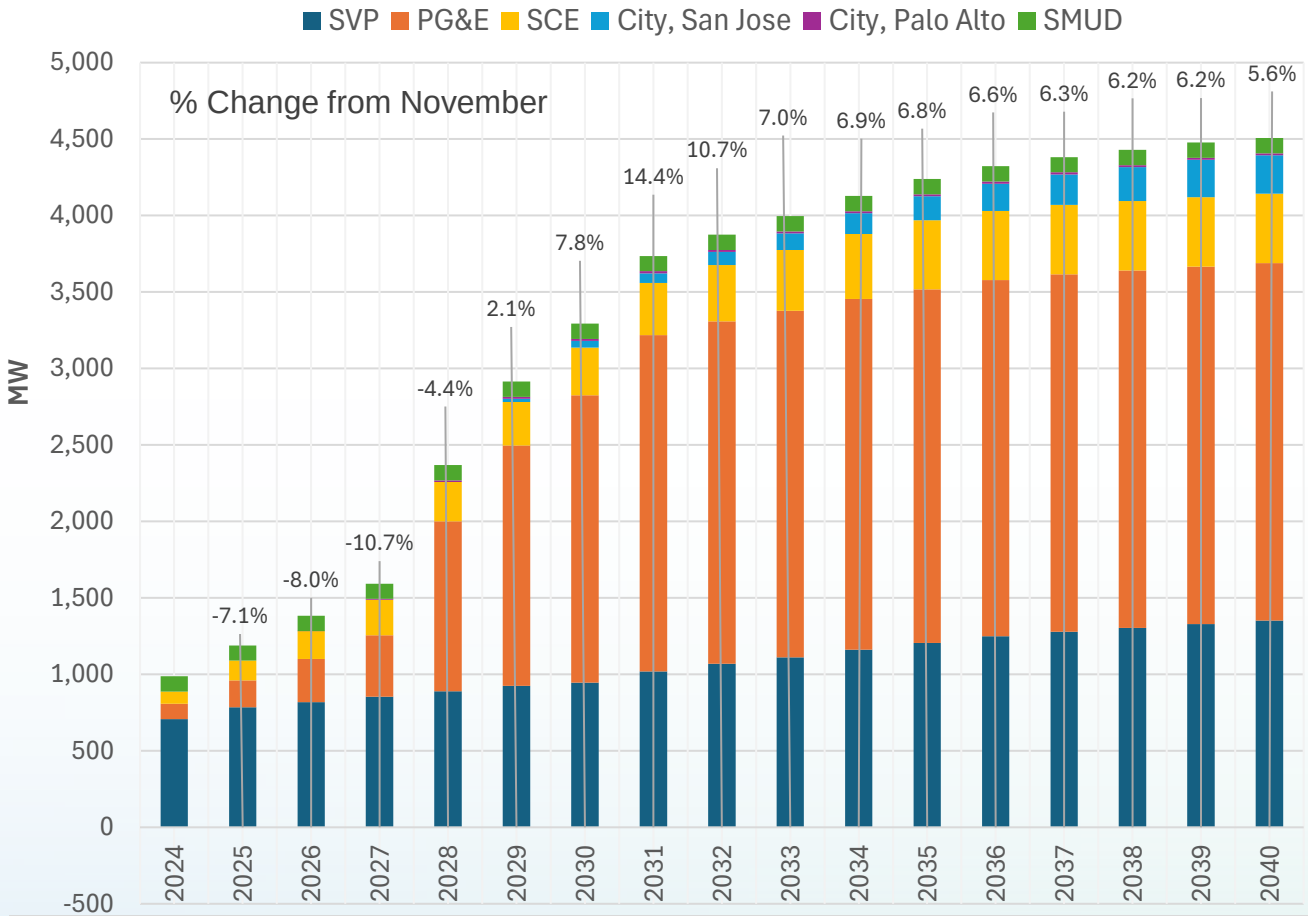
	Palo Alto	PG&E	SMUD	San Jose	SVP	SCE	Total - All Utilities
2024 - 2030	69% (2026-30)	52%	0%	47% (2029-30)	4%	21%	**19%**
2030 - 2040	0%	2%	0%	17%	3%	3%	**3%**

Source: CEC Staff

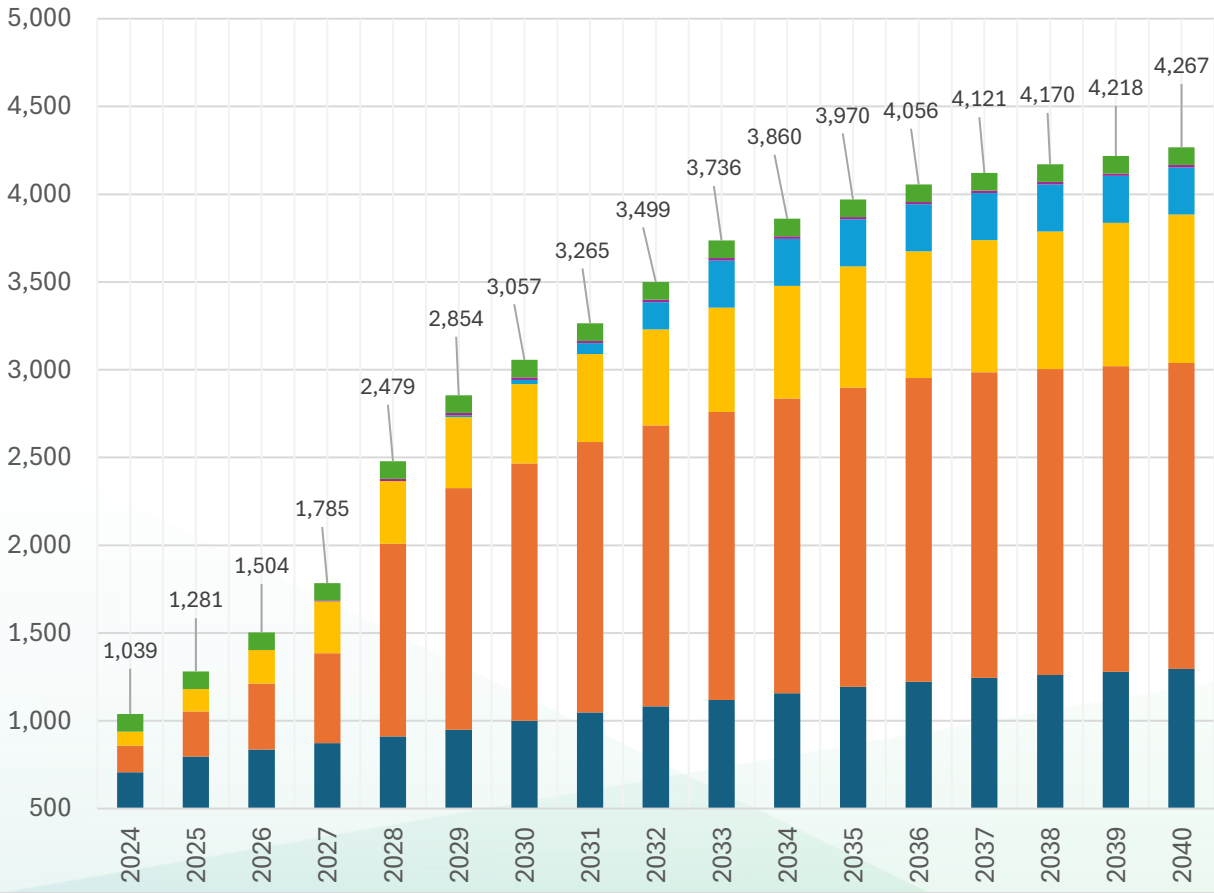
Data Center Peak Demand (MW)

Mid Case (Scenario 1): Dec Update vs. Nov Workshop Results

Mid Case (Scenario 1) December Update:
Annual Average Growth Rate, 2024 – 2030: **~19%**



Scenario 1 November Workshop:
Annual Average Growth Rate, 2024 – 2030: ~**17%**



Total Demand (MW), Scenario 1 (Mid) Dec Update: (2025) ~1,190 **(2026)** ~1,383 **(2040)** ~4,510

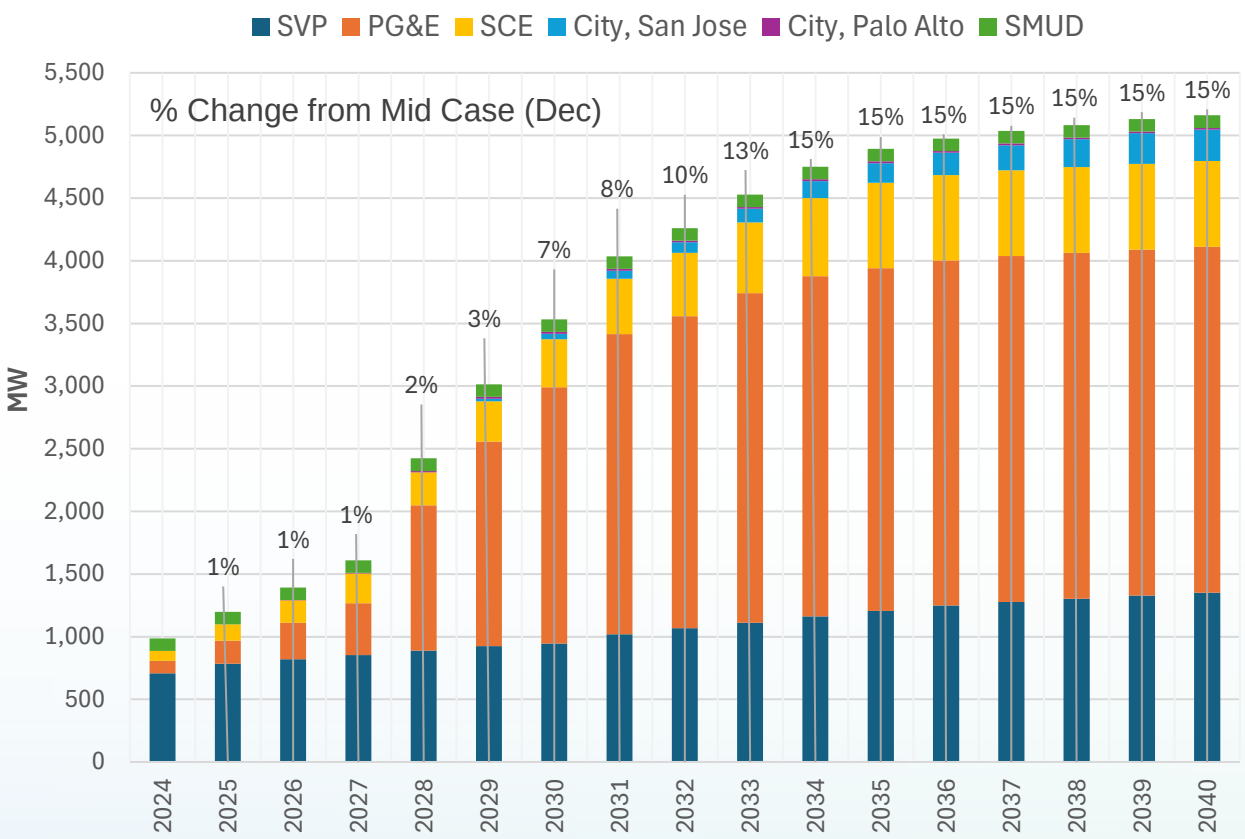
Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

Data Center Peak Demand (MW)

High vs. Mid (Dec Update)

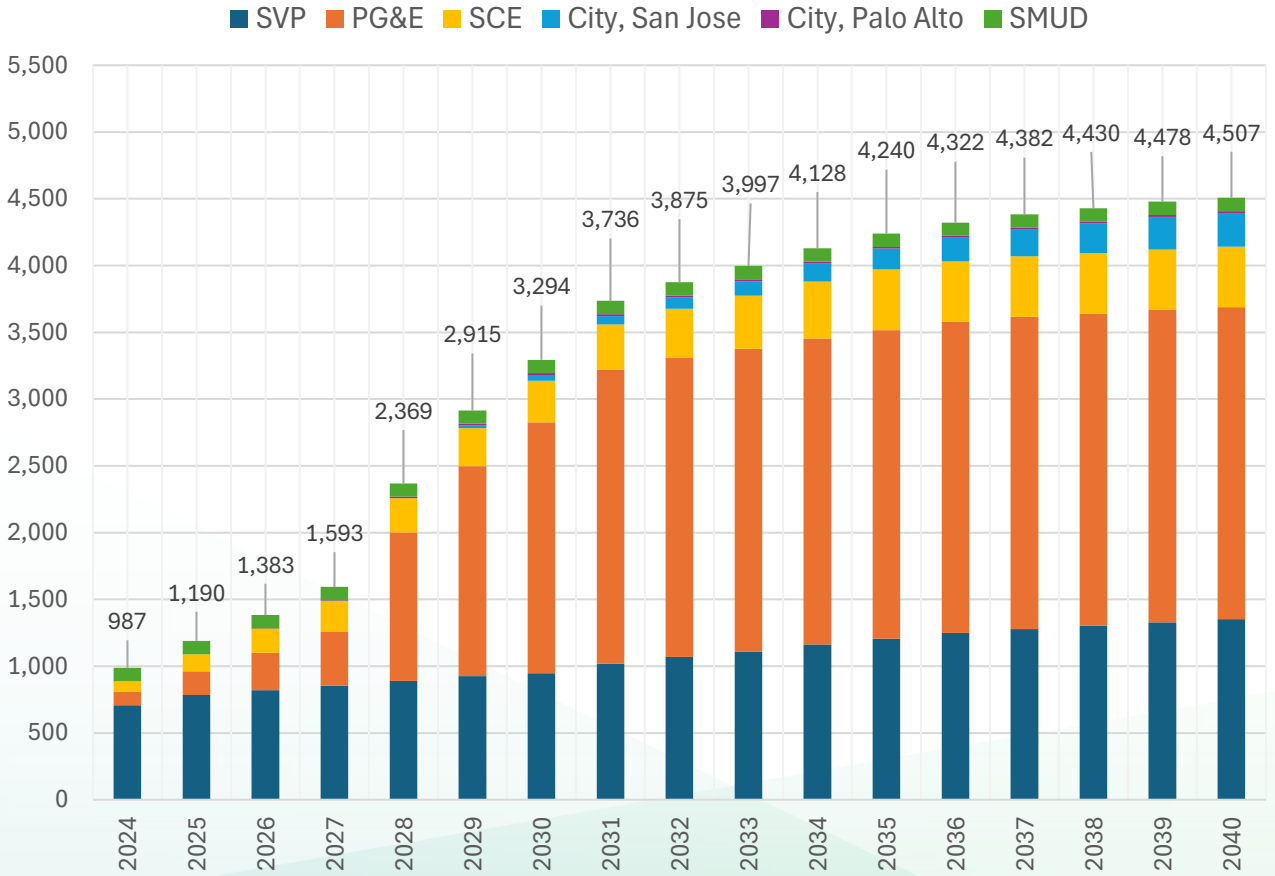
High Case:

Annual Average Growth Rate, 2024 – 2030: ~ **20%**



Mid Case (Scenario 1) December Update:

Annual Average Growth Rate, 2024 – 2030: **~19%**



Scenario 3 High Total Demand (MW): (2025) ~1,200 **(2026)** ~1,400 **(2040)** ~5,160

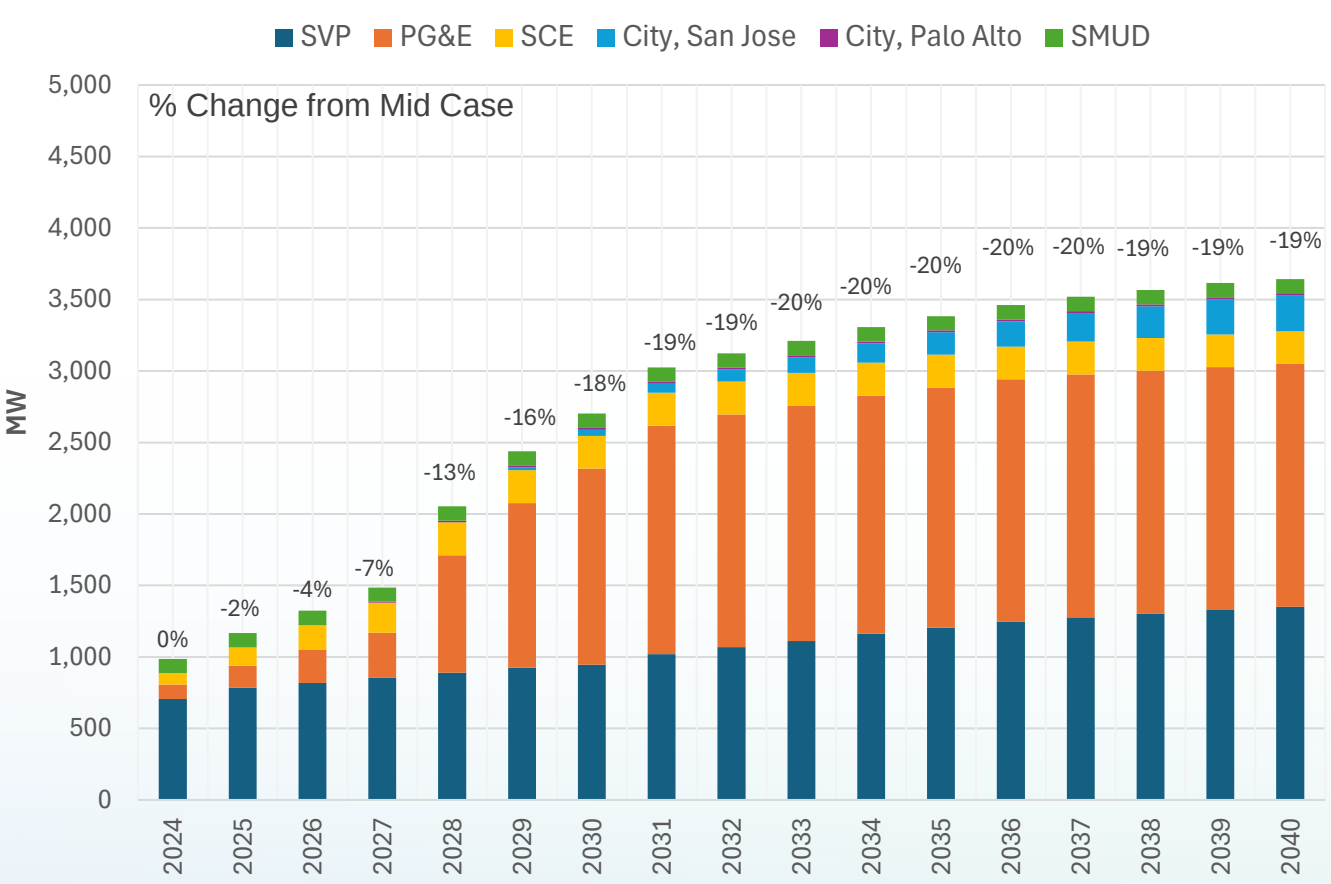
Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

Data Center Peak Demand (MW)

Low vs. Mid (Dec Update)

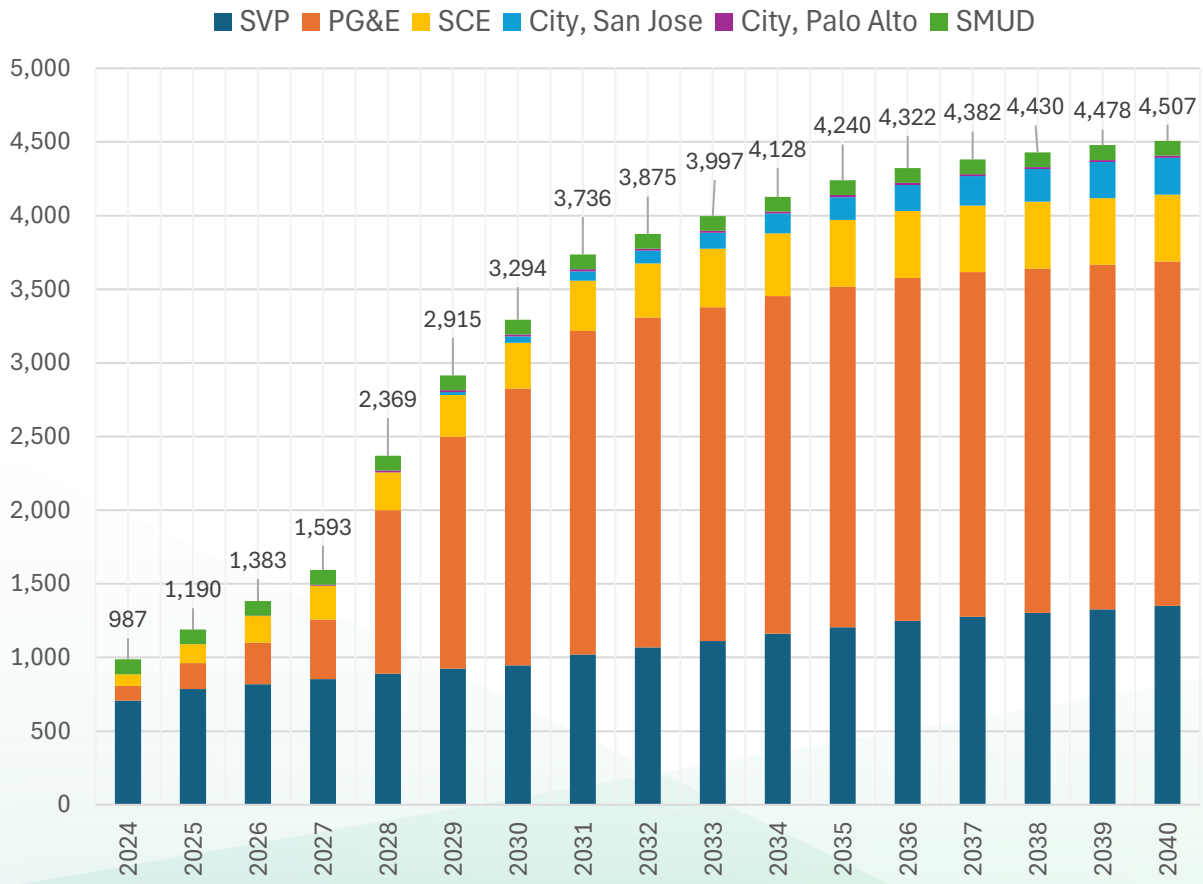
Low Case:

Annual Average Growth Rate, 2024 – 2030: ~ **15%**



Mid Case (Scenario 1) December Update:

Annual Average Growth Rate, 2024 – 2030: **~19%**



Scenario 2 (Low) Total Demand (GW): (2025) ~1,170 **(2026)** ~1,320 **(2040)** ~3,640

Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

Next Steps

1. Use Scenario 1 December Update (Mid case) for Planning Scenario.
2. Consider Scenario 3 (high case) results for Local Reliability Scenario.
3. Allocate forecasted demand by load buses for CAISO.

Thank you

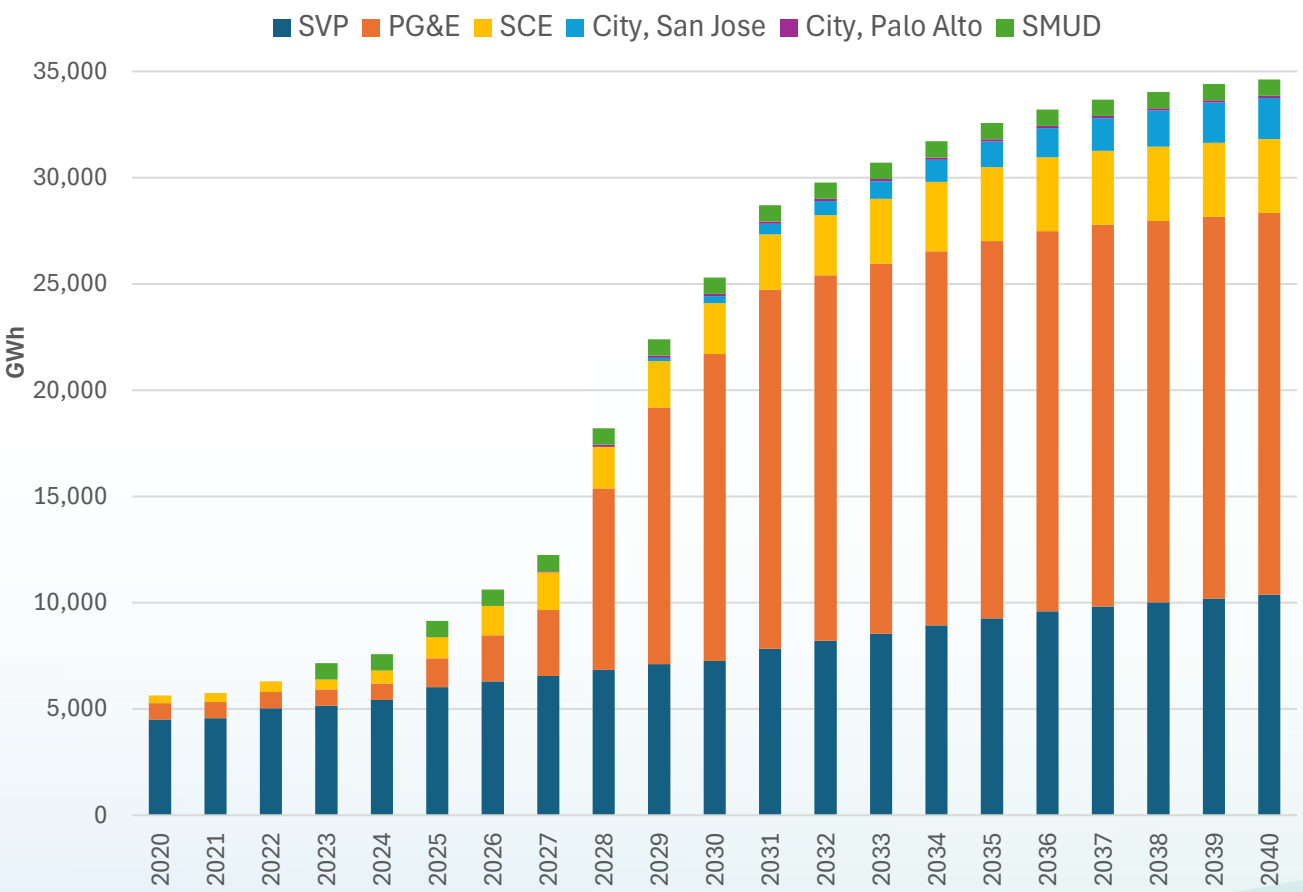
Written Comments or Questions via Email

Jenny Chen (jenny.chen@energy.ca.gov)

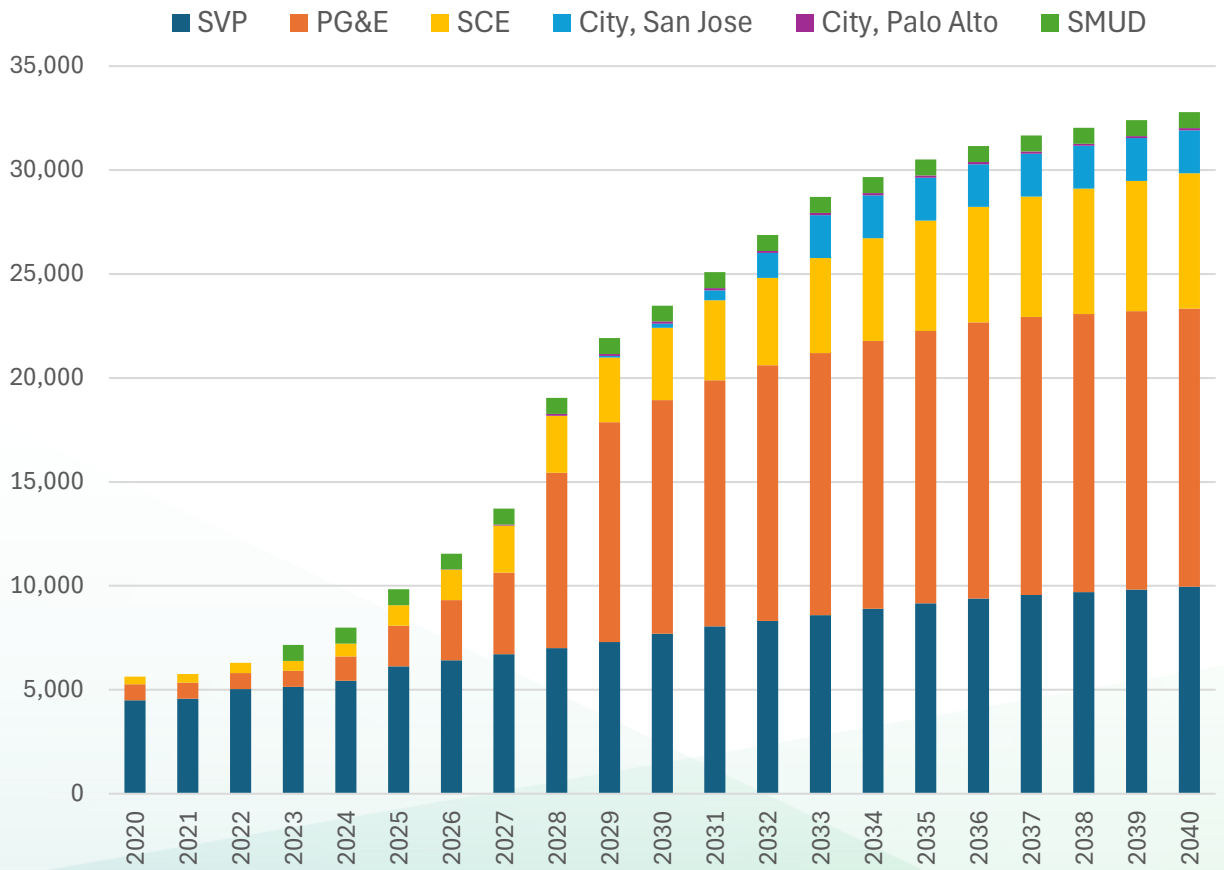
Data Center Consumption (GWh)

Scenario 1 Dec Update vs. Nov Workshop Results

Scenario 1 (Mid) December Update:
Annual Average Growth Rate, 2024 – 2030: **~19%**



Scenario 1 November Workshop:
Annual Average Growth Rate, 2024 – 2030: **~17%**

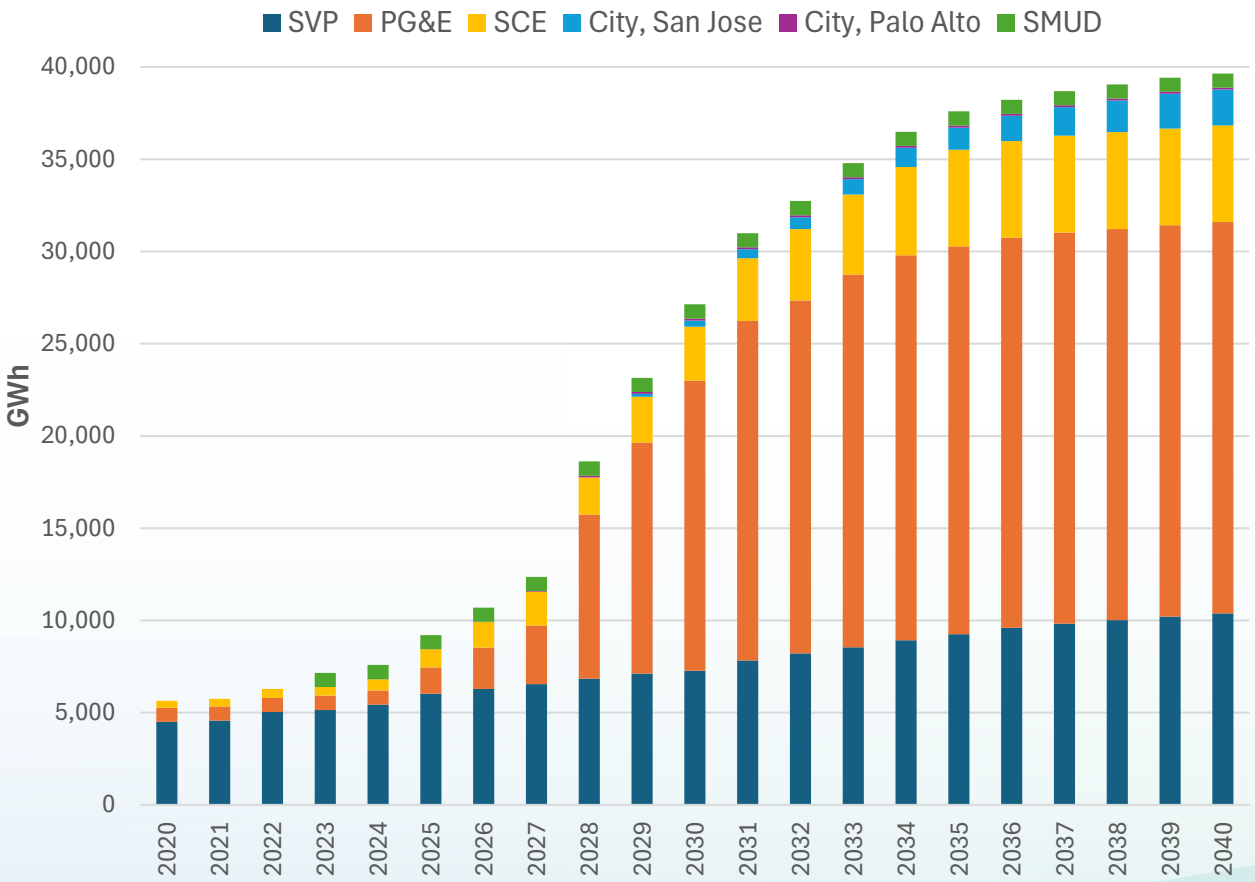


Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

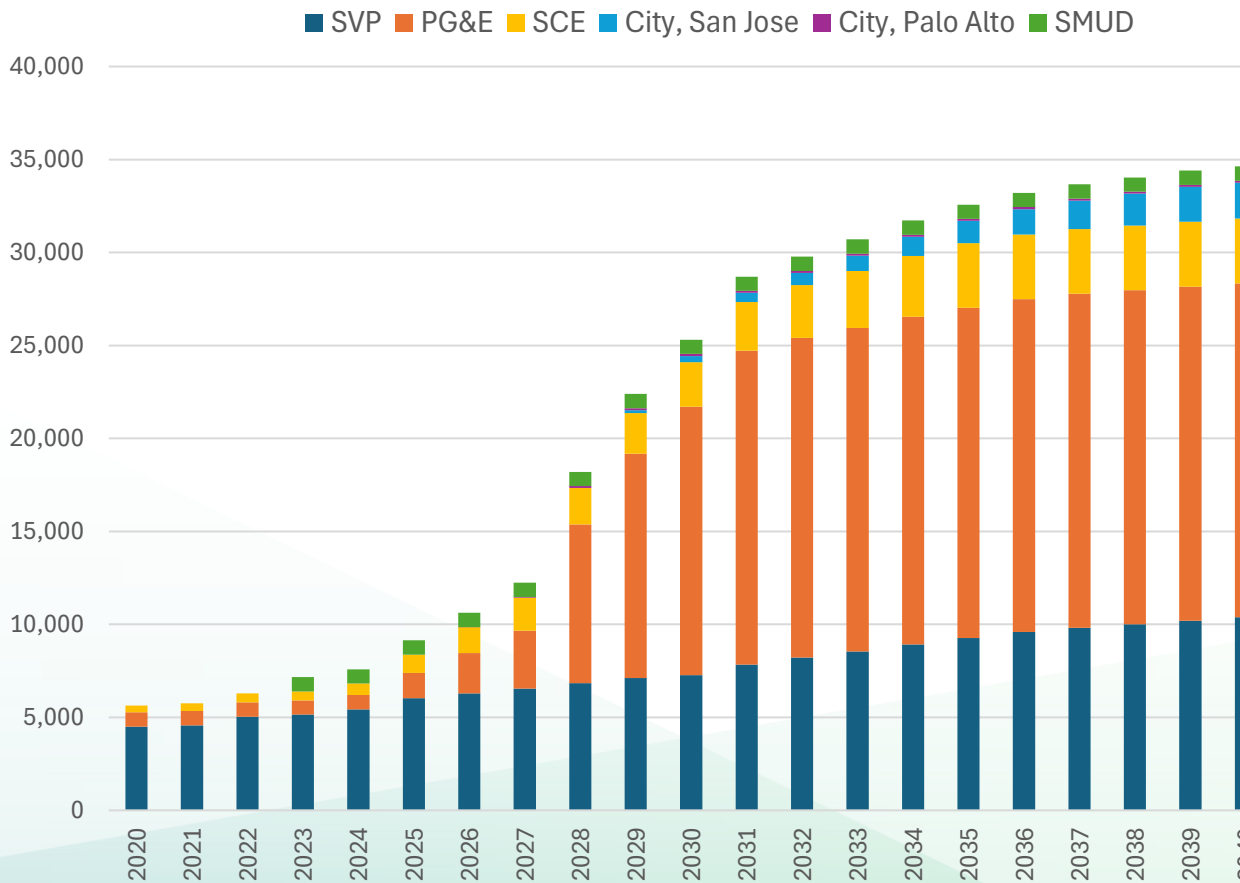
Data Center Consumption (GWh)

Scenario 3 vs. Scenario 1 Dec Update

Scenario 3 (High):
Annual Average Growth Rate, 2024 – 2030: ~ **20%**



Scenario 1 (Mid) December Update:
Annual Average Growth Rate, 2024 – 2030: **~19%**

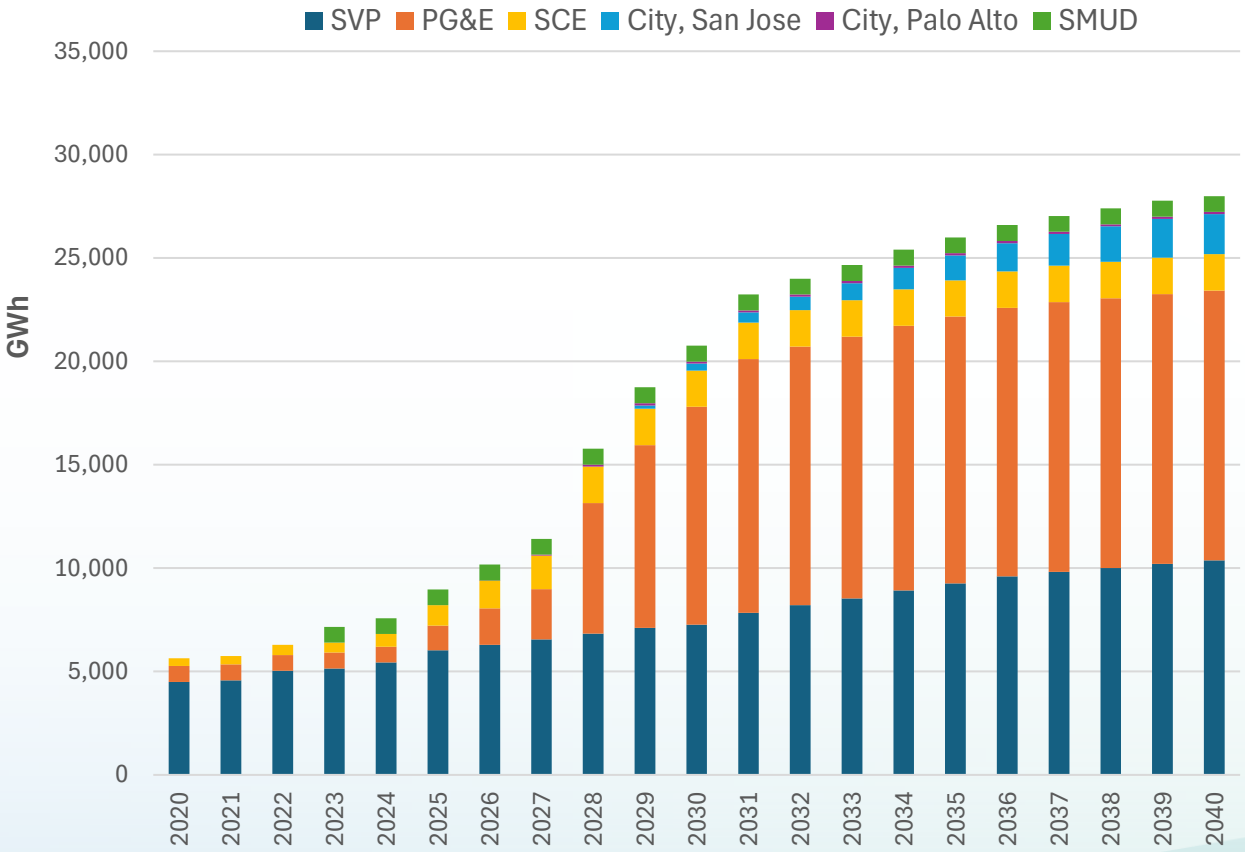


Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

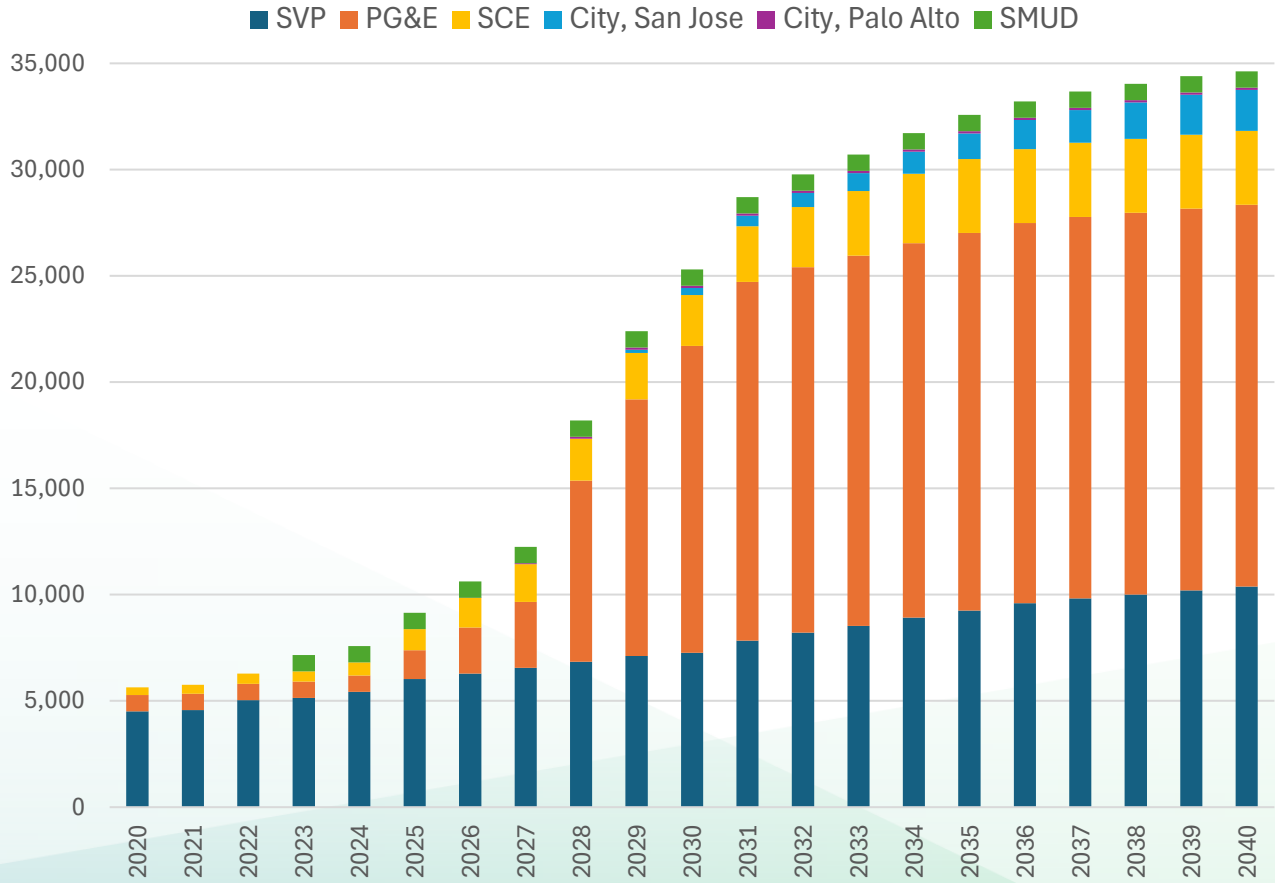
Data Center Consumption (GWh)

Scenario 2 Dec vs. Scenario 1 Dec Update

Scenario 2 (Low):
Annual Average Growth Rate, 2024 – 2030: ~ **15%**



Scenario 1 December Update:
Annual Average Growth Rate, 2024 – 2030: **~19%**



Source: CEC Staff (with data inputs from PG&E, Palo Alto, SVP, San Jose, SCE)

Forecasted Data Center Peak Demand by Year (MW)

PG&E

Year / MW	Low	Mid (Nov)	Mid (Dec)	High
2025	155	256	177	184
2026	230	375	282	291
2027	317	511	404	413
2040	1,699	1,742	2,338	2,761

SCE

Year / MW	Low	Mid (Nov)	Mid (Dec)	High
2025	128	128	128	128
2026	174	191	181	181
2027	211	295	231	238
2040	229	847	453	684

Source: CEC Staff