Behind-the-Meter PV Forecast

2019 Revised Forecast

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California Energy Commission
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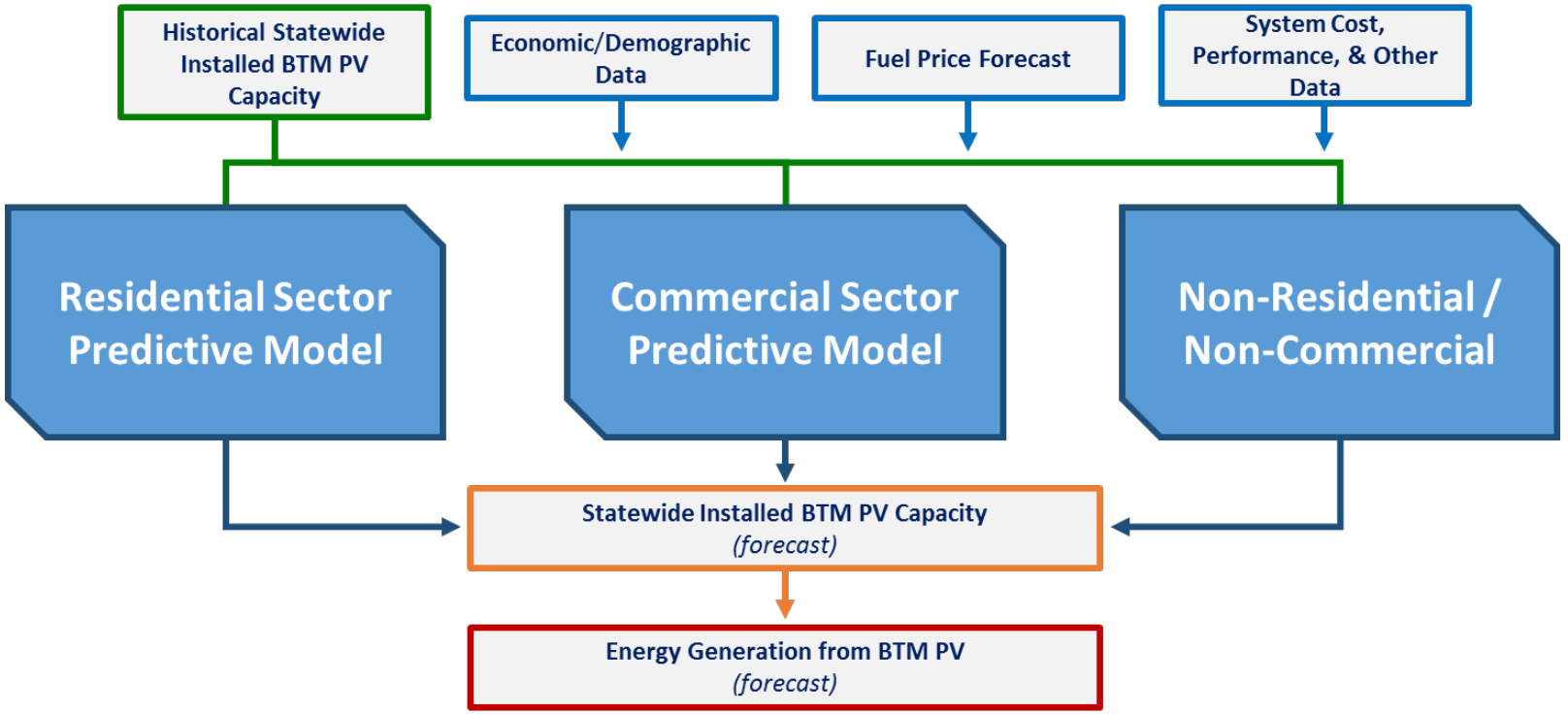
Scenario Definitions

- High = High Electricity Demand Case
  - High economic / demographic growth → high growth in building stock
  - Low electricity rates
  - Low PV adoption
- Low = Low Electricity Demand Case
  - Low economic / demographic growth → low growth in building stock
  - High electricity rates
  - High PV adoption
- Mid = Mid Electricity Demand Case

Energy Commission PV Model



- Residential and commercial models predict PV penetration based on calculated payback / bill savings.

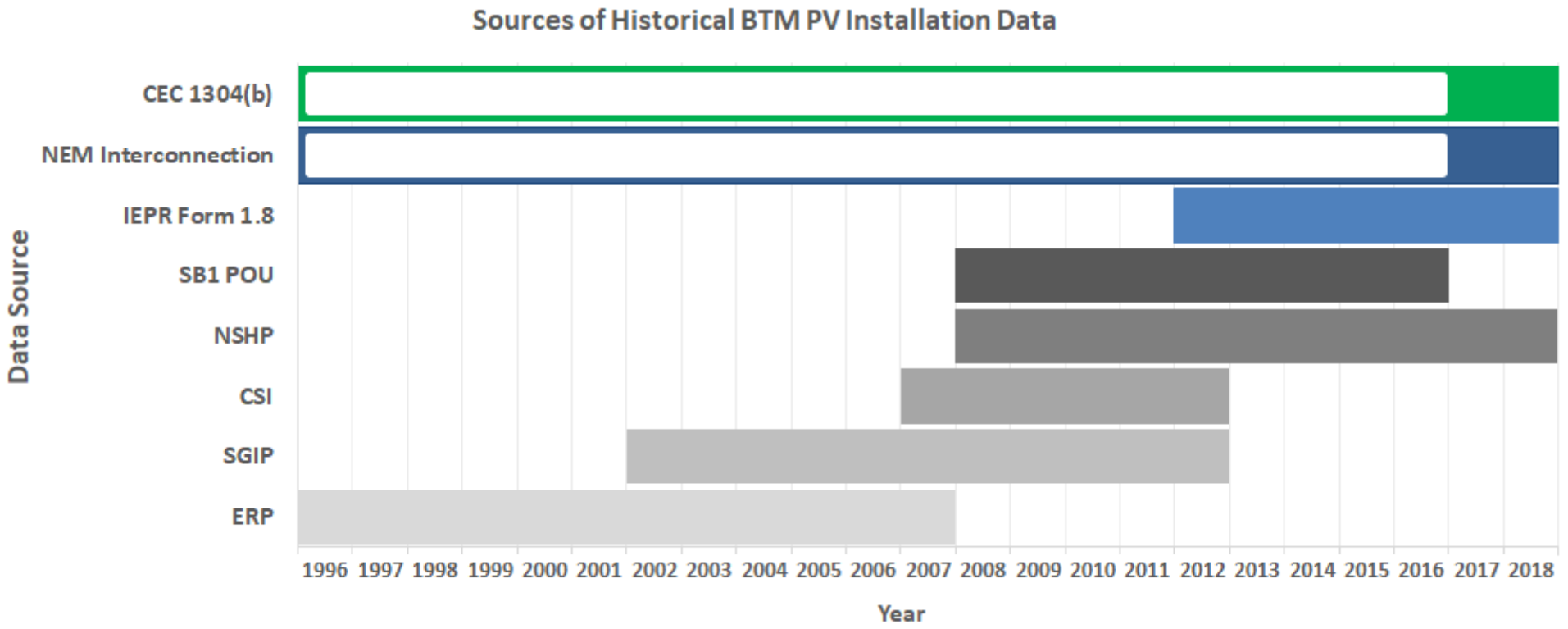
AAPV Included in Baseline PV Forecast

- A review of additional achievable photovoltaic (AAPV)
  - Accounted for PV requirements for new homes (2019 Title 24 standards)
  - Baseline forecast included a market forecast of new homes PV adoptions
  - AAPV = difference between PV adoptions for new homes due to 2019 Title 24 regulations vs. new home PV adoptions already in baseline forecast
- In 2019, AAPV was incorporated into baseline PV forecast
  - Forecast of PV adoption for new homes now based on regulatory compliance
- AAPV assumptions same as previous AAPV Forecasts
  - Expected level of compliance (Low = 90%, Mid = 80%, High = 70%)
  - Average PV system size for new homes
- In this presentation, past PV forecasts restated to include AAPV
  - An “apples” to “apples” comparison

Updates to 2019 Revised PV Forecast

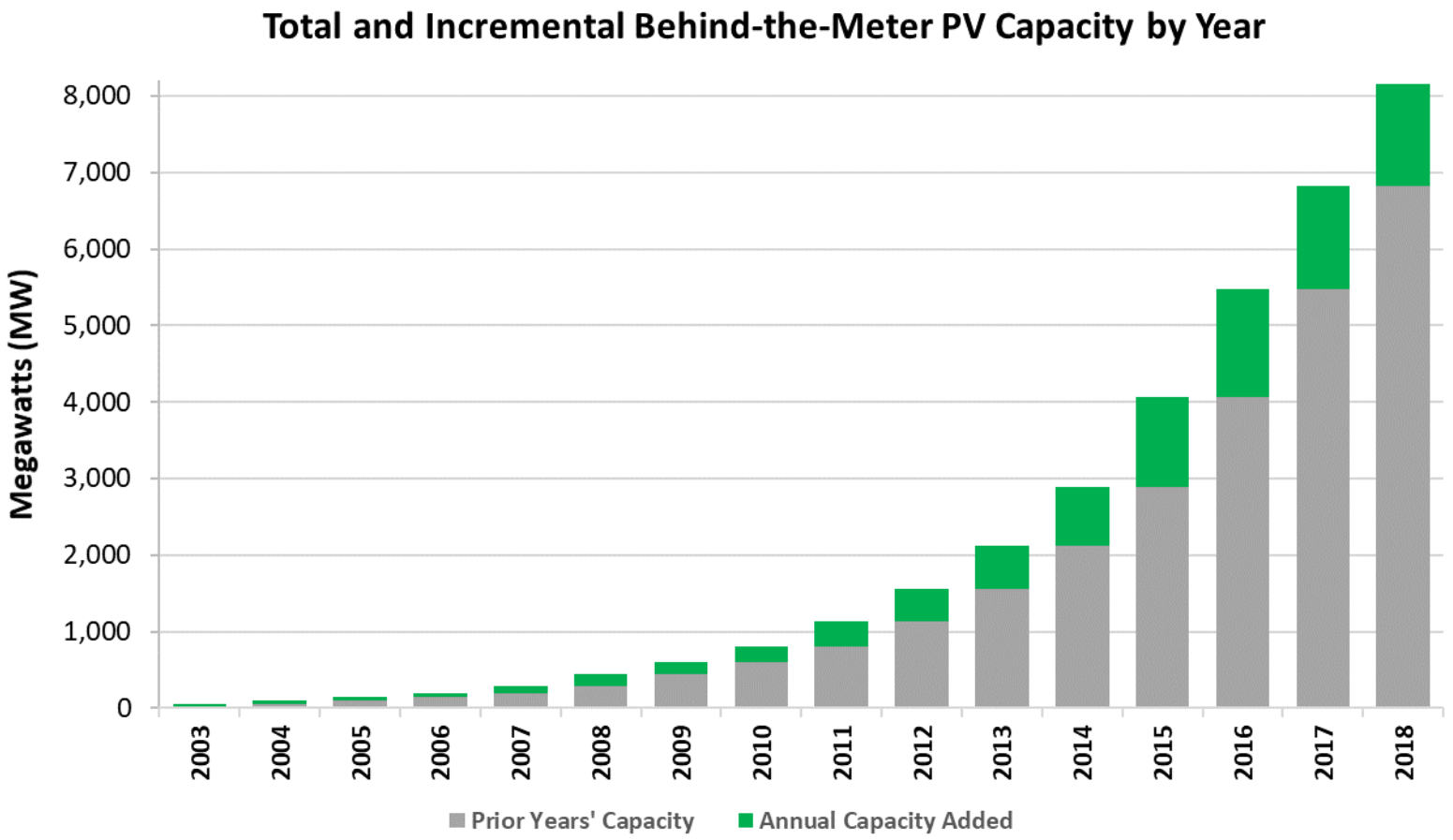
- Demographic / economic data
  - Households
  - Commercial floorspace
  - GSP Deflator
- Forecast of Electricity rates

Solar PV Interconnection Data



Sources: CEC 1304(b) Interconnection Dataset, Net Energy Meeting (NEM) Currently Interconnected Dataset, CEC IEPR Form 1.8, SB1 POU, New Solar Homes Partnership (NSHP), California Solar Initiative (CSI), Self-Generation Incentive Program (SGIP), Emerging Renewables Program (ERP). www.californiadgstats.ca.gov/downloads/

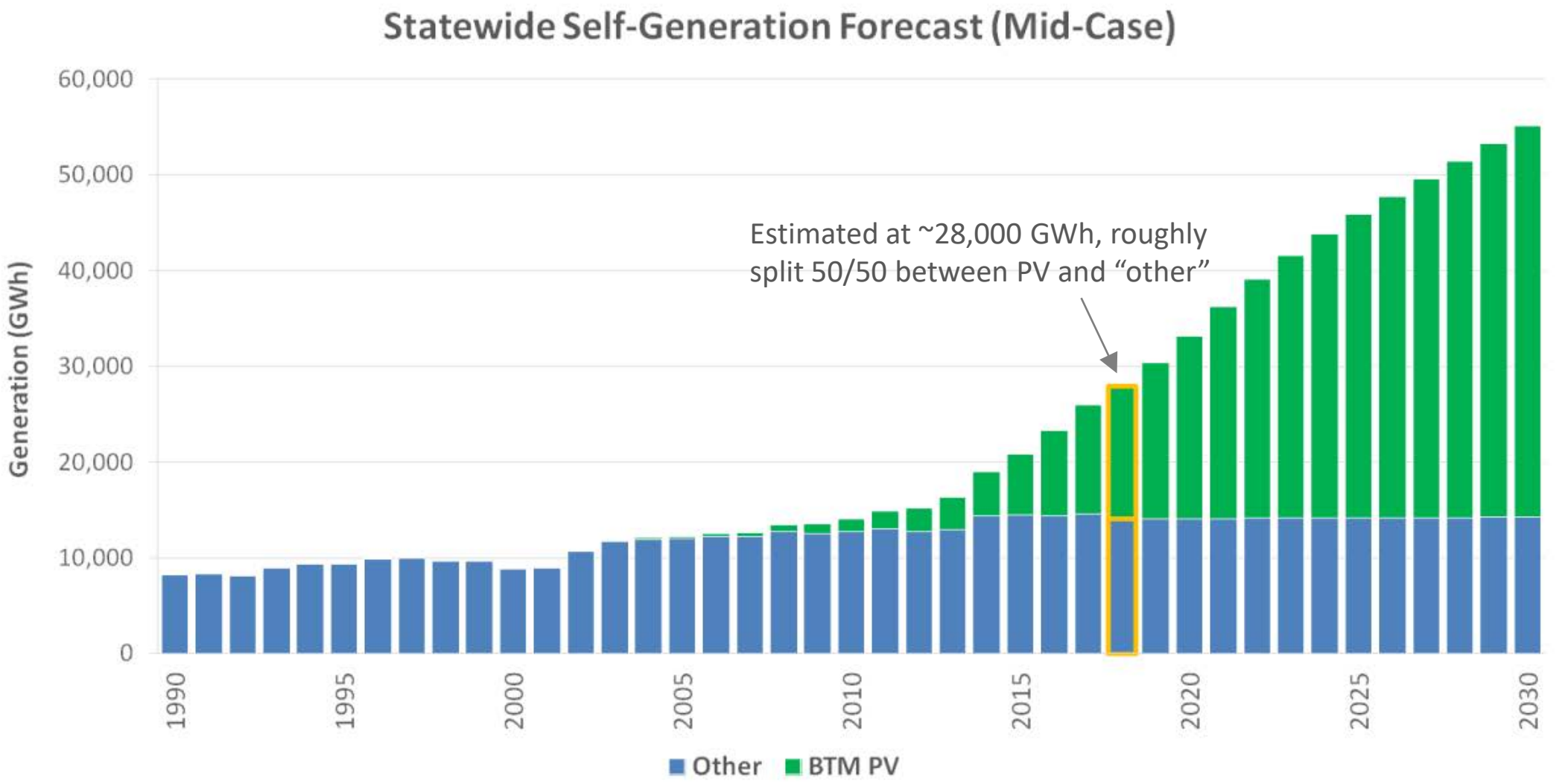
Historical Statewide PV Installations



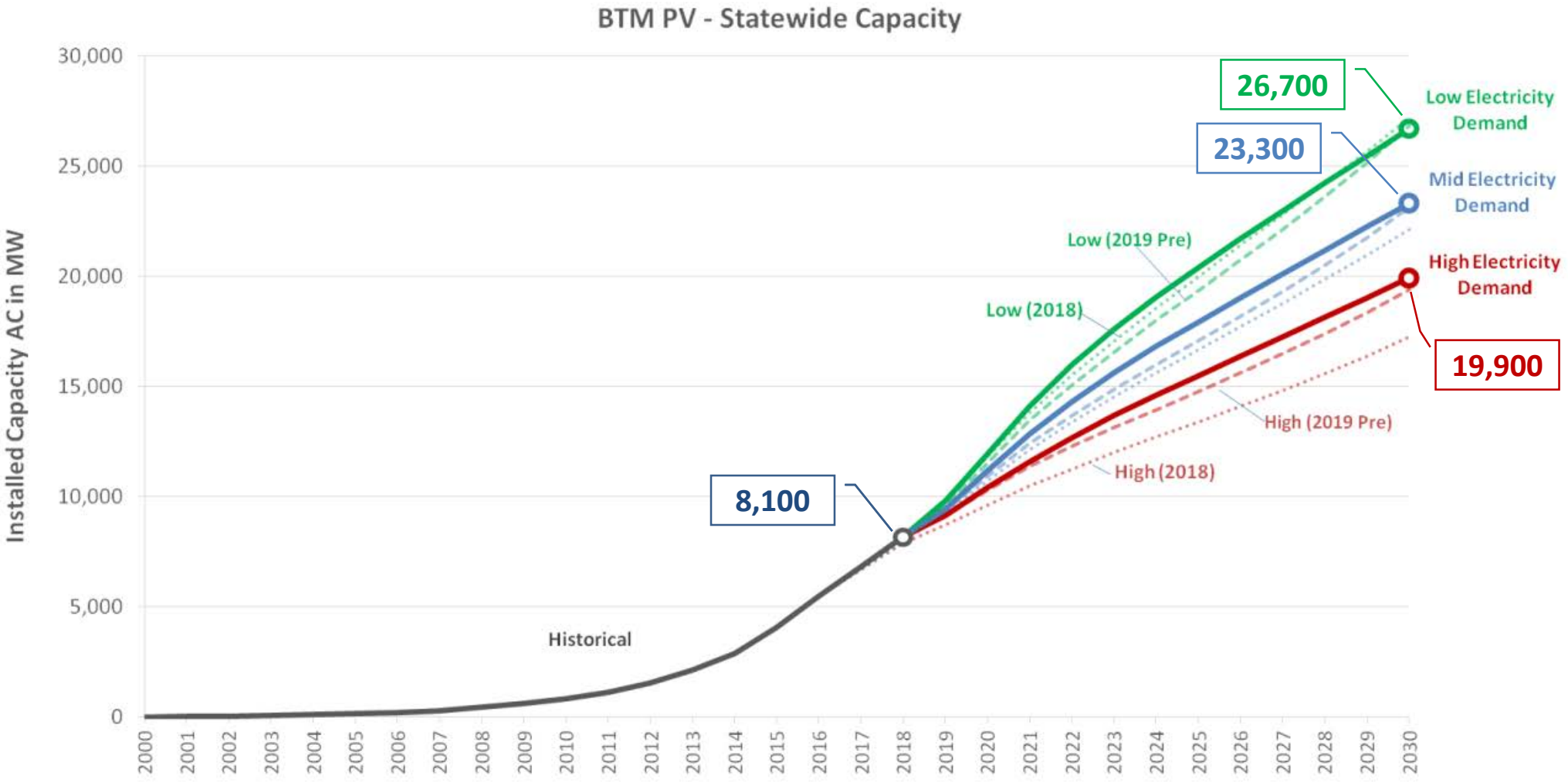
- ~ 8,100 MW total installed capacity
- Maturing PV market
  ~ 1,300-1,400 MW installed annually 2016-18
- Trends in residential and commercial PV

STATEWIDE SELF-GENERATION FORECAST

Self-Generation Forecast



2019 Revised PV Forecast



NOTE: For consistency, 2018 forecast is shown with baseline and AAPV forecast results.

Contribution of Title 24 Standards

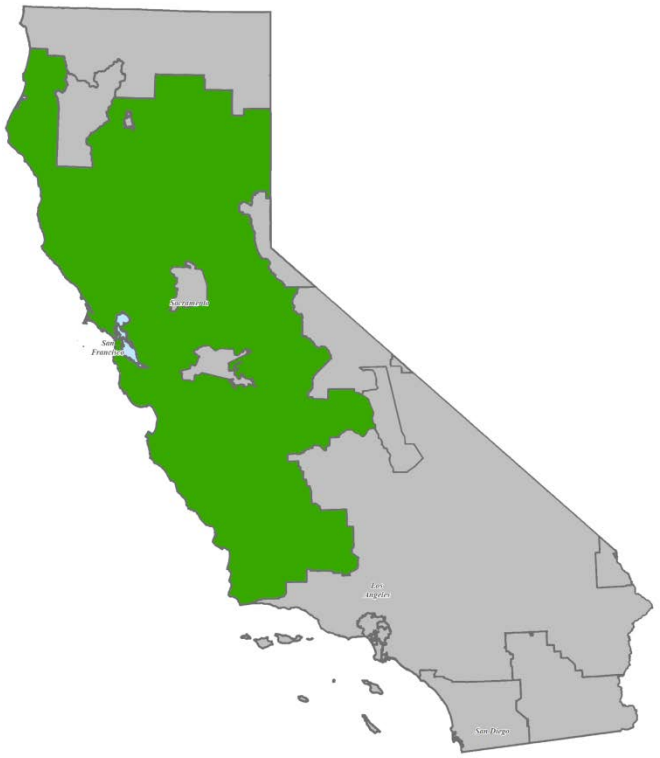
- Contribution of Title 24 building standards to PV adoption in new home construction. (Formerly AAPV forecast)
- Takes effect in 2020.
- Forecast of regulatory compliance.
  - Direct correlation to forecast of new home construction.

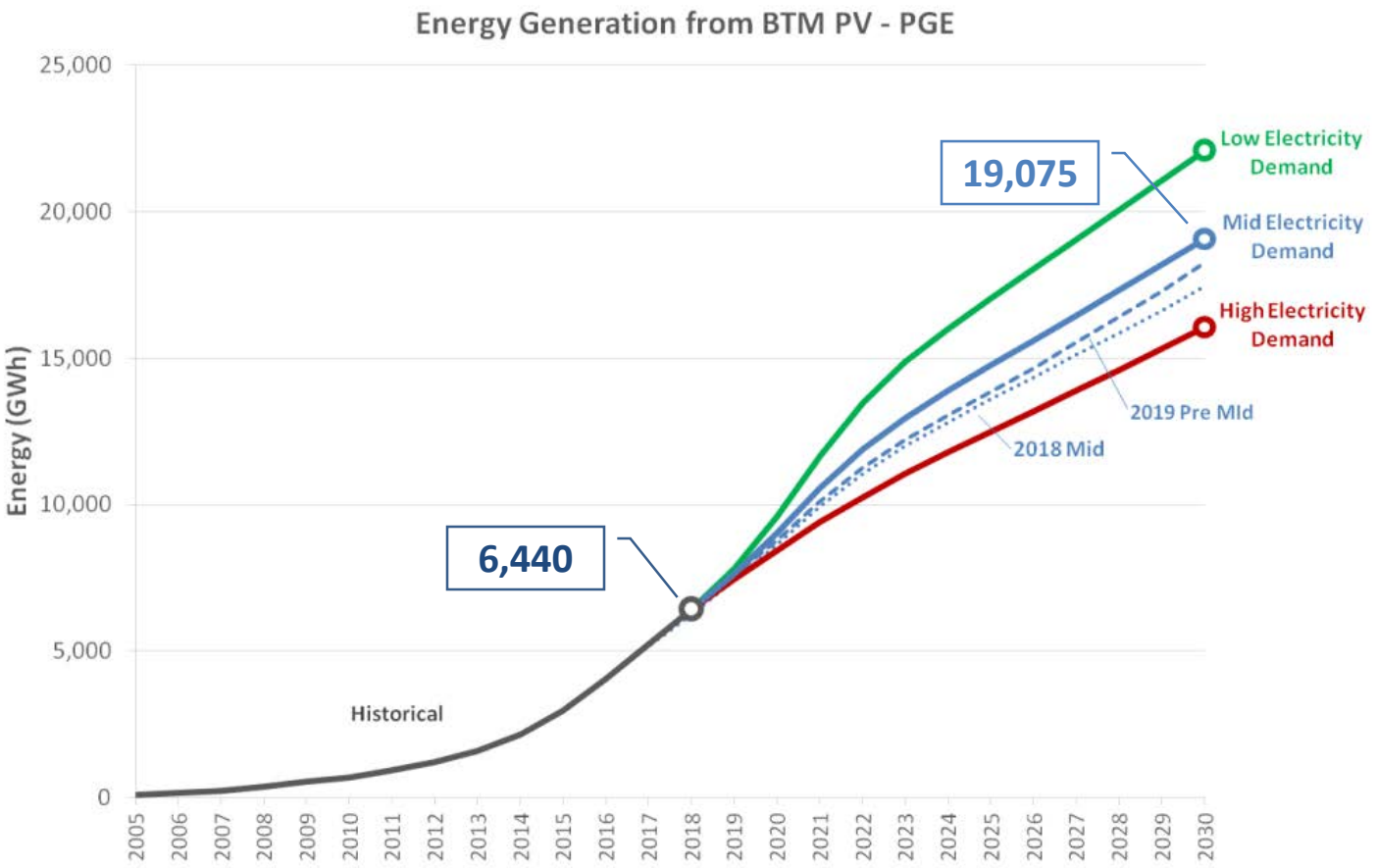
CUMULATIVE CAPACITY in MW by 2030

Scenario	PGE	SCE	SDGE	LADWP	SMUD	OTHER	CED 19 Rev Total	CED 19 Pre Total	*CEDU 18 Total*
High Demand	1,085	960	277	79	183	179	2,763	2,135	*2,290*
Mid Demand	875	840	207	95	178	186	2,380	2,011	*1,949*
Low Demand	665	719	137	111	173	193	1,997	1,887	*1,607*

UTILITY / PLANNING AREA FORECASTs

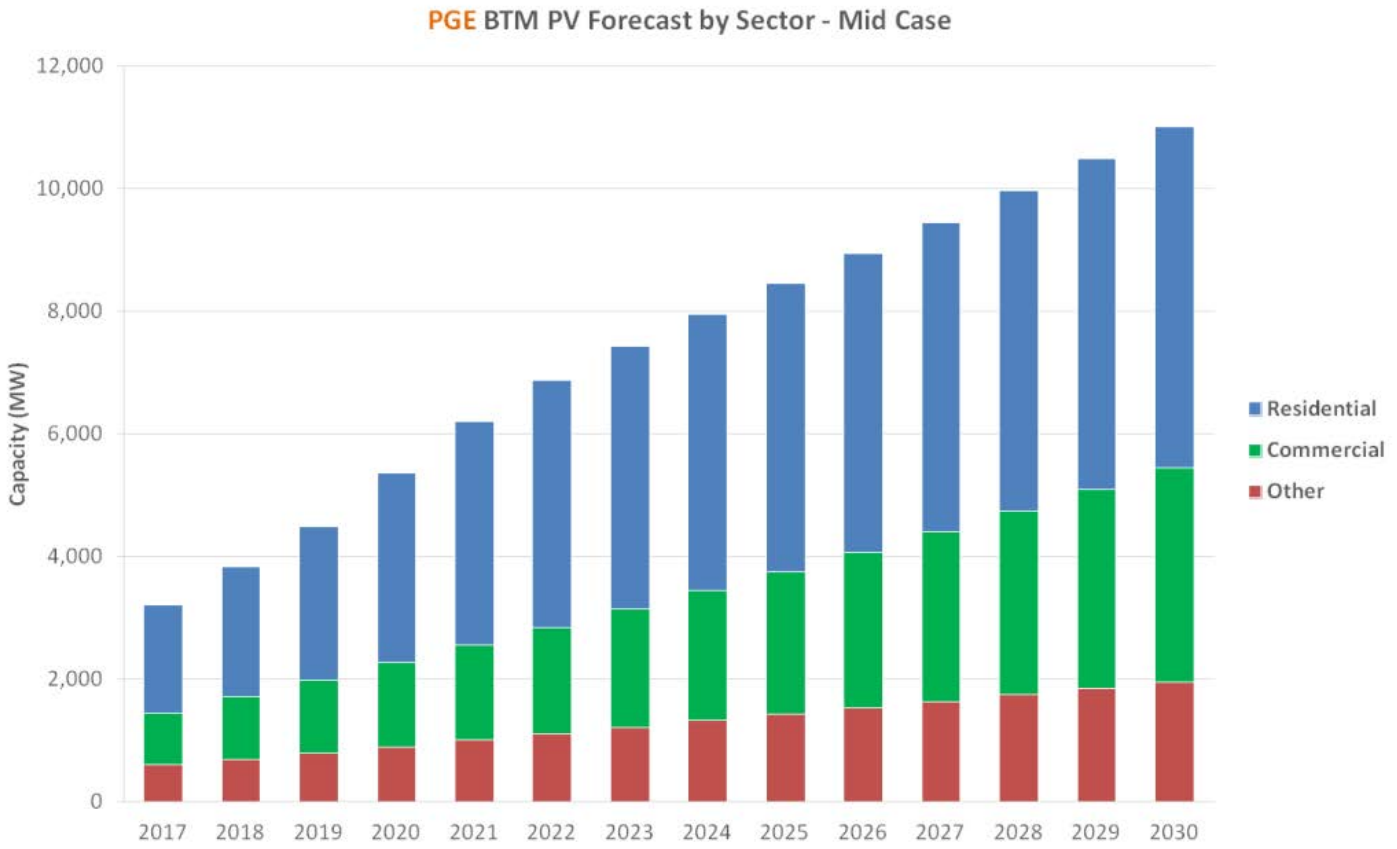
PG&E Baseline Forecast





NOTE: 2018 forecast includes AAPV forecast results.

PG&E Forecast by Sector



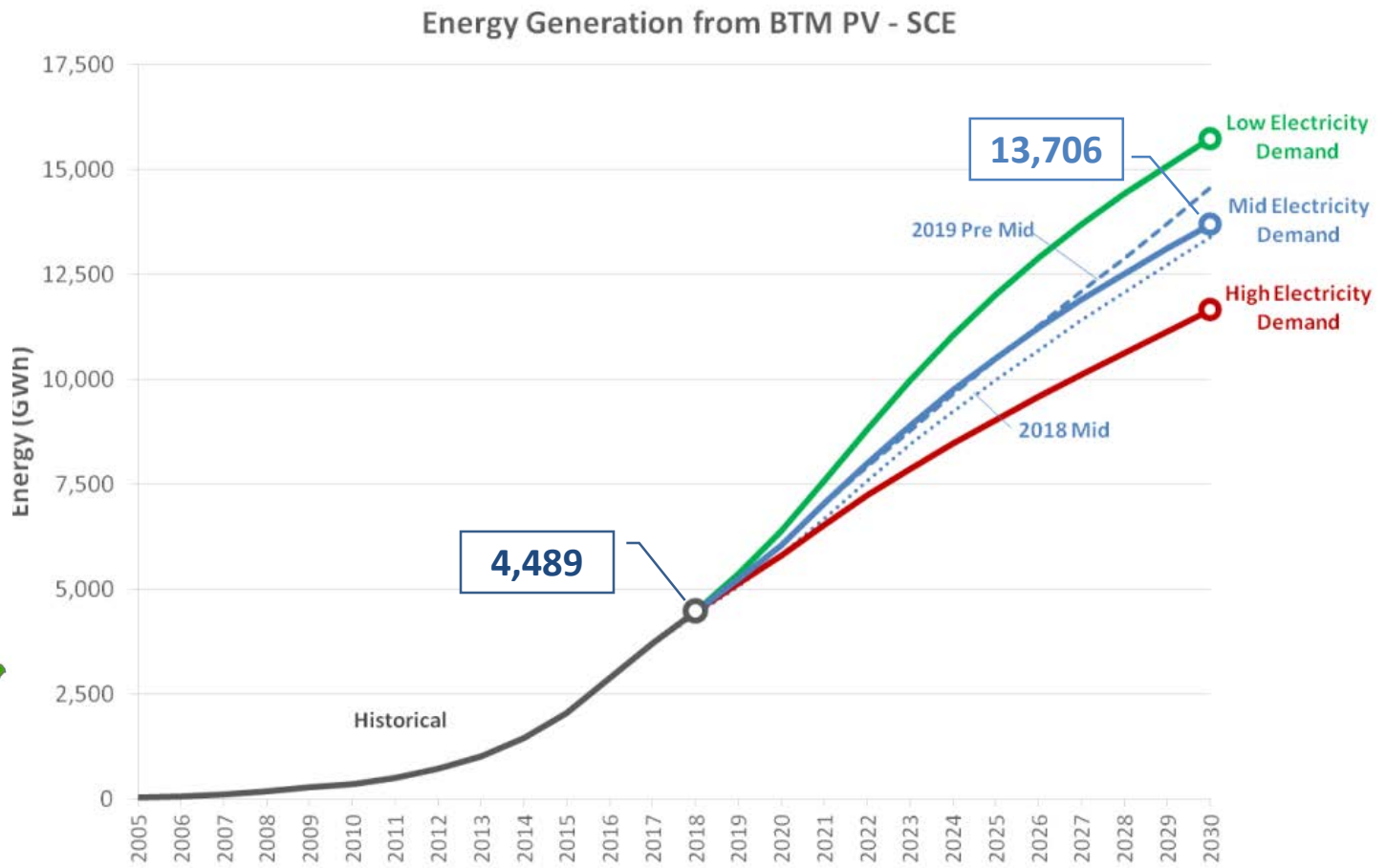
Capacity (MW)

Sector	2018	2030	CAGR
Residential	2,125	5,570	8.4%
Commercial	1,022	3,485	10.8%
Other	690	1,959	9.1%
Total	3,837	11,013	9.2%

Energy (GWh)

Sector	2018	2030	CAGR
Residential	3,562	9,678	8.7%
Commercial	1,696	6,008	11.1%
Other	1,182	3,389	9.2%
Total	6,440	19,075	9.5%

SCE Baseline Forecast



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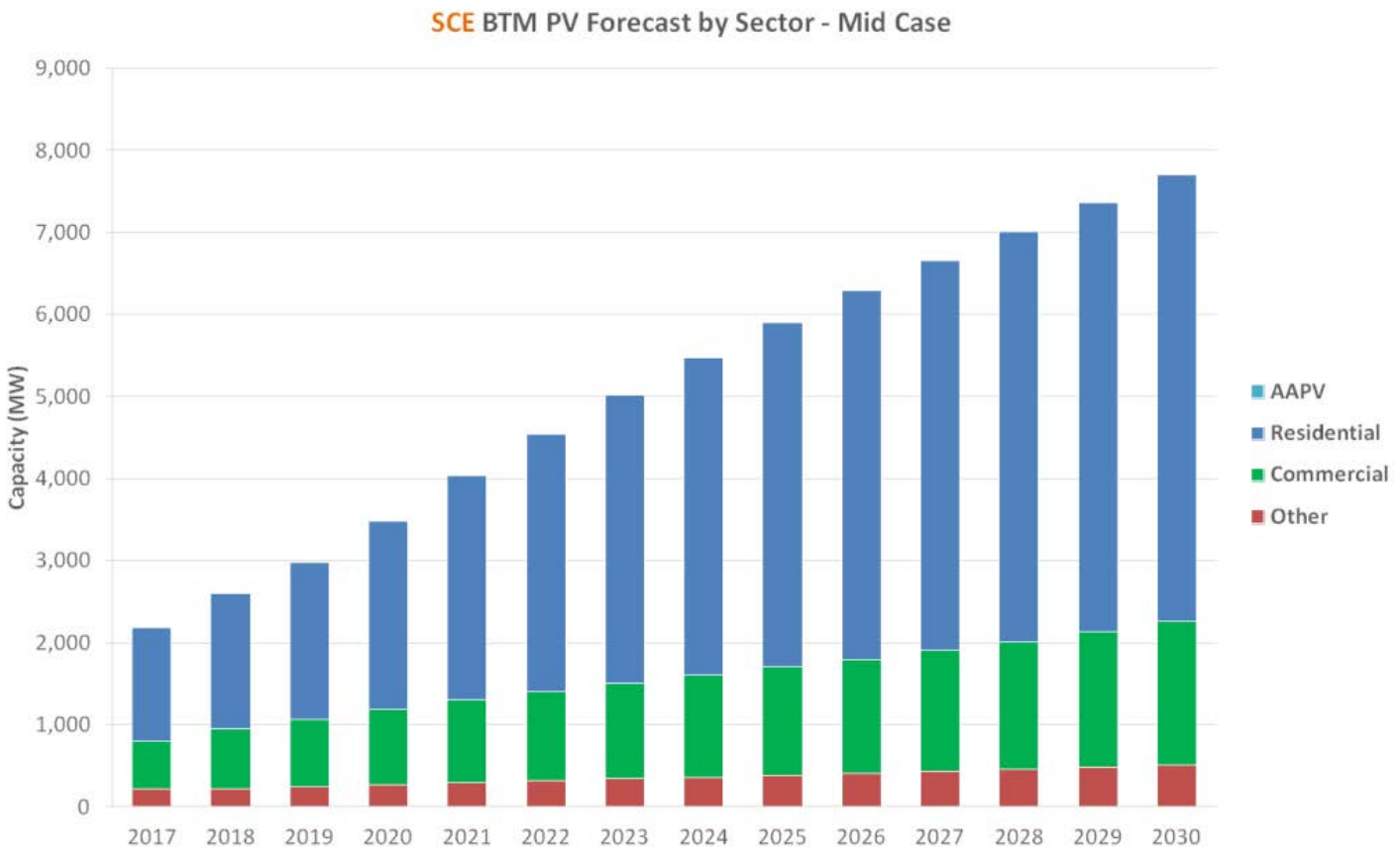


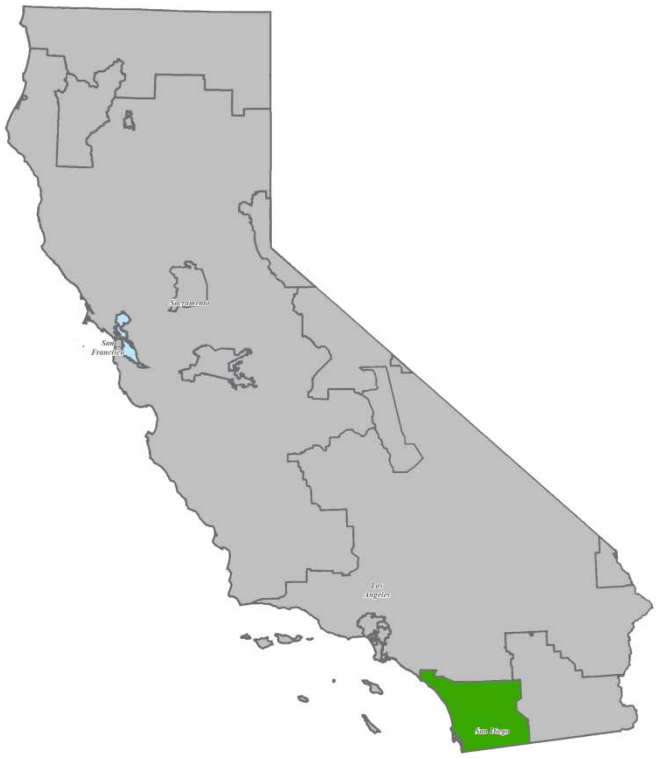
Capacity (MW)

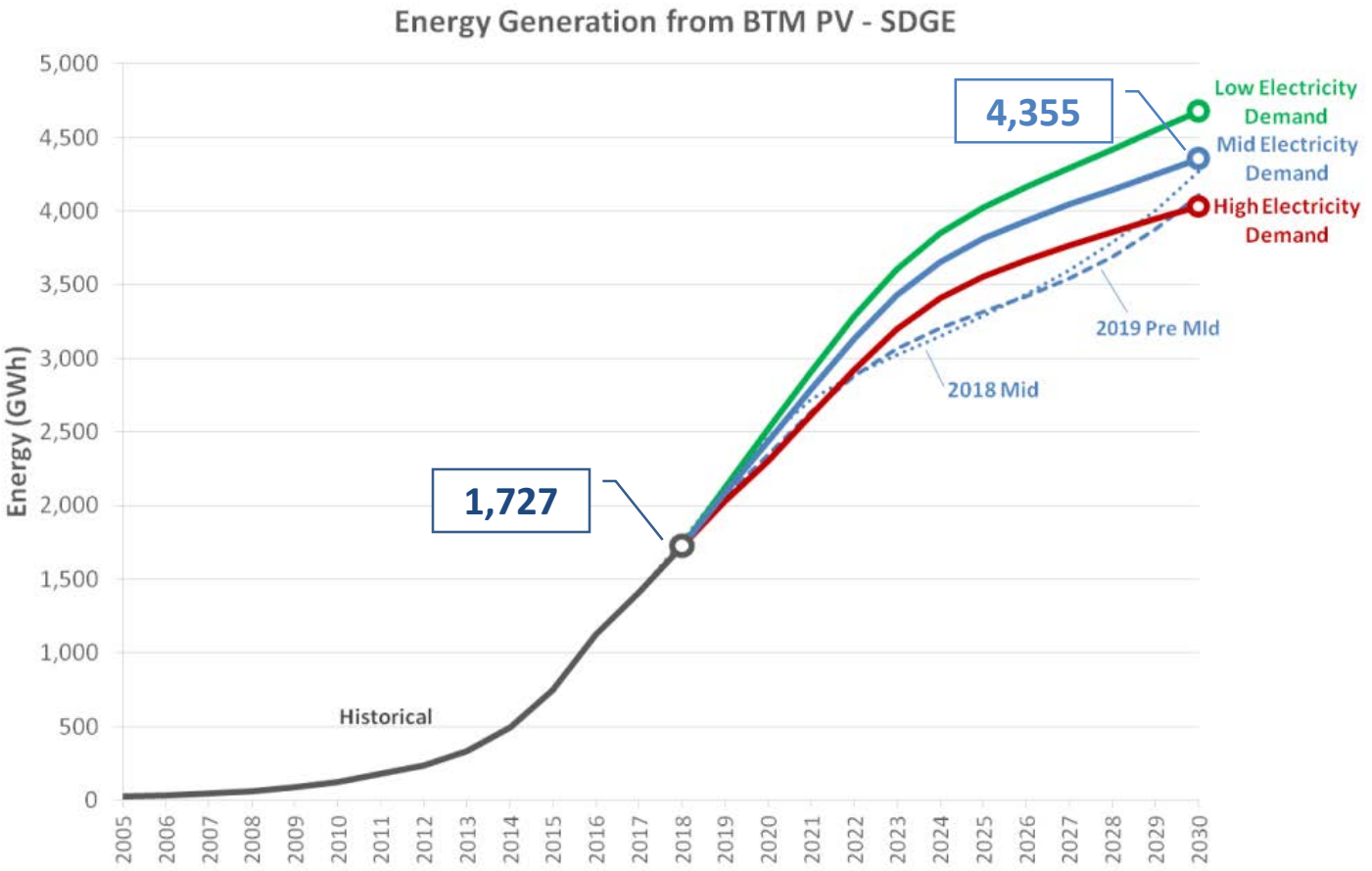
Sector	2018	2030	CAGR
Residential	1,648	5,438	10.5%
Commercial	727	1,756	7.6%
Other	221	504	7.1%
Total	2,596	7,698	9.5%

Energy (GWh)

Sector	2018	2030	CAGR
Residential	2,855	9,714	10.7%
Commercial	1,220	3,093	8.1%
Other	414	899	6.7%
Total	4,489	13,706	9.7%

SDG&E Baseline Forecast





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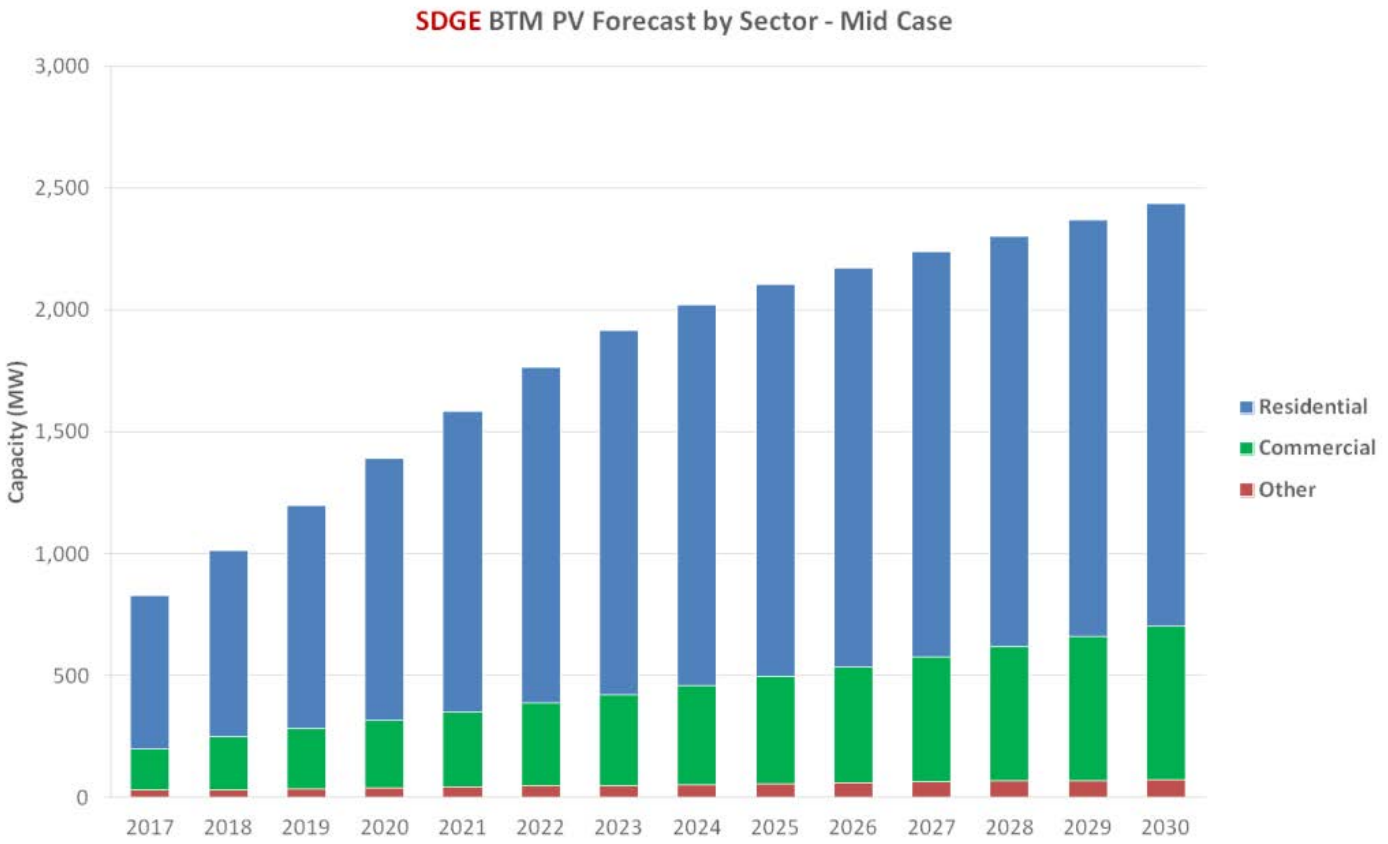
SDG&E Forecast by Sector



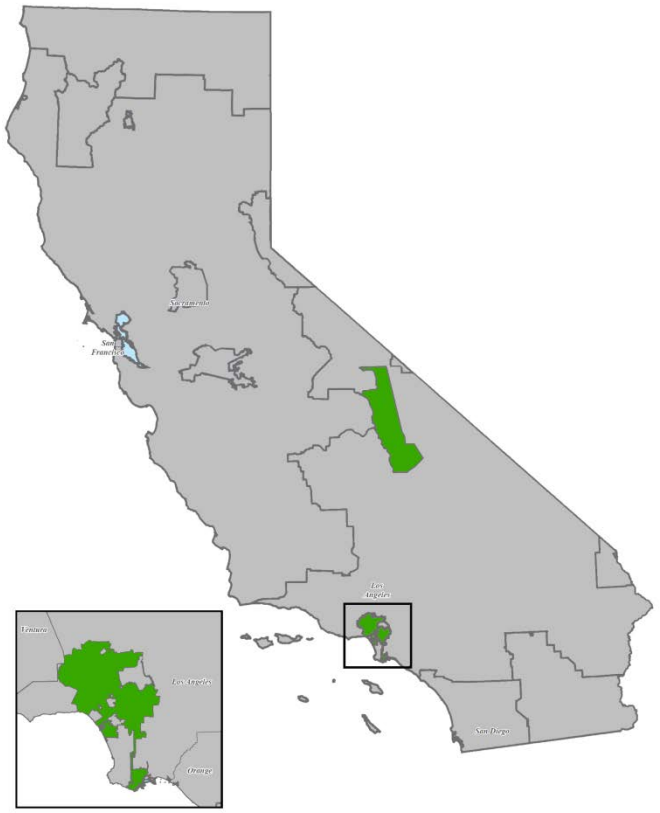
Capacity (MW)

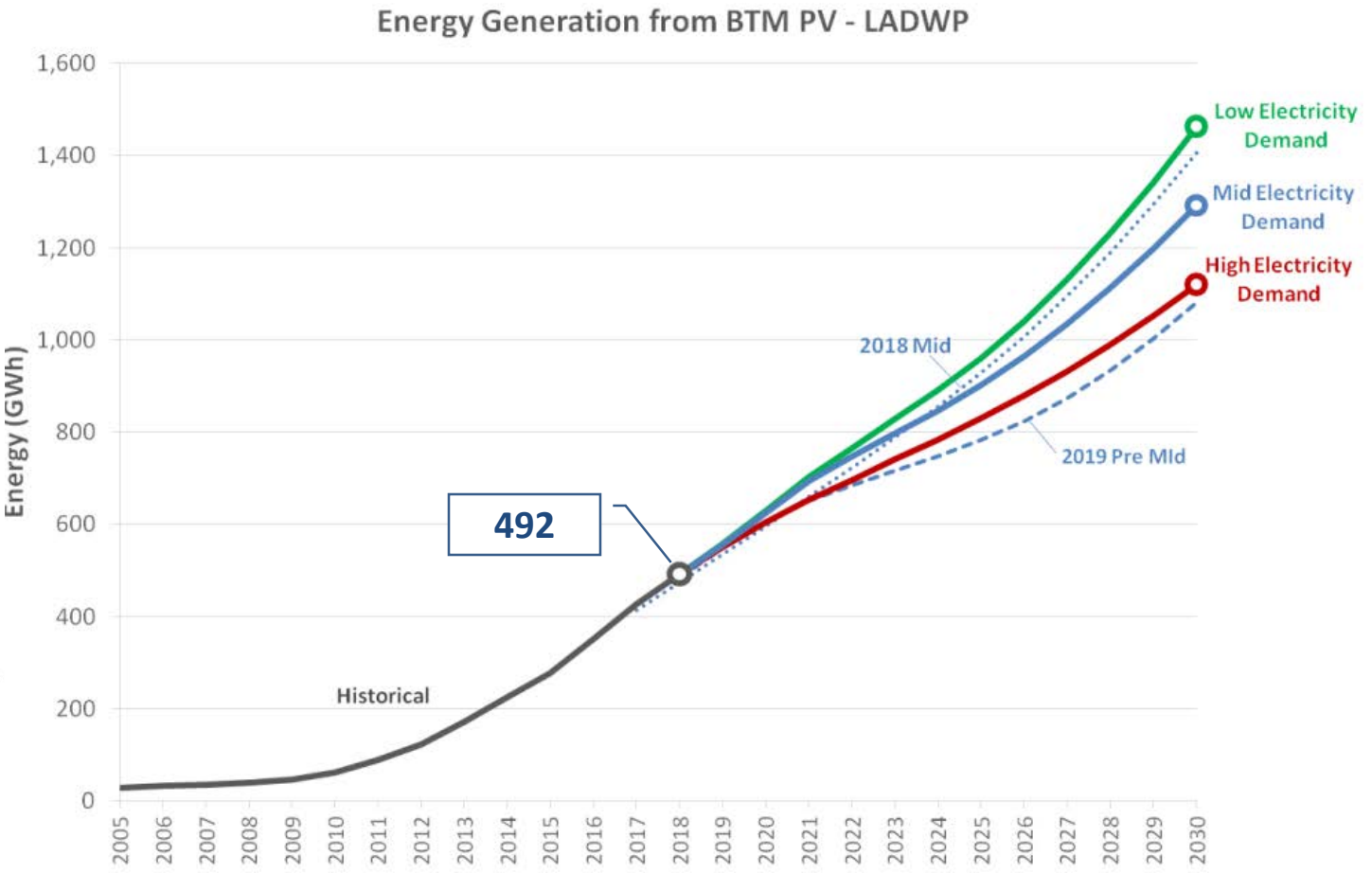
Sector	2018	2030	CAGR
Residential	765	1,732	7.0%
Commercial	219	630	9.2%
Other	32	74	7.3%
Total	1,015	2,436	7.6%

Energy (GWh)

Sector	2018	2030	CAGR
Residential	1,305	3,109	7.5%
Commercial	362	1,115	9.8%
Other	60	131	6.8%
Total	1,727	4,355	8.0%

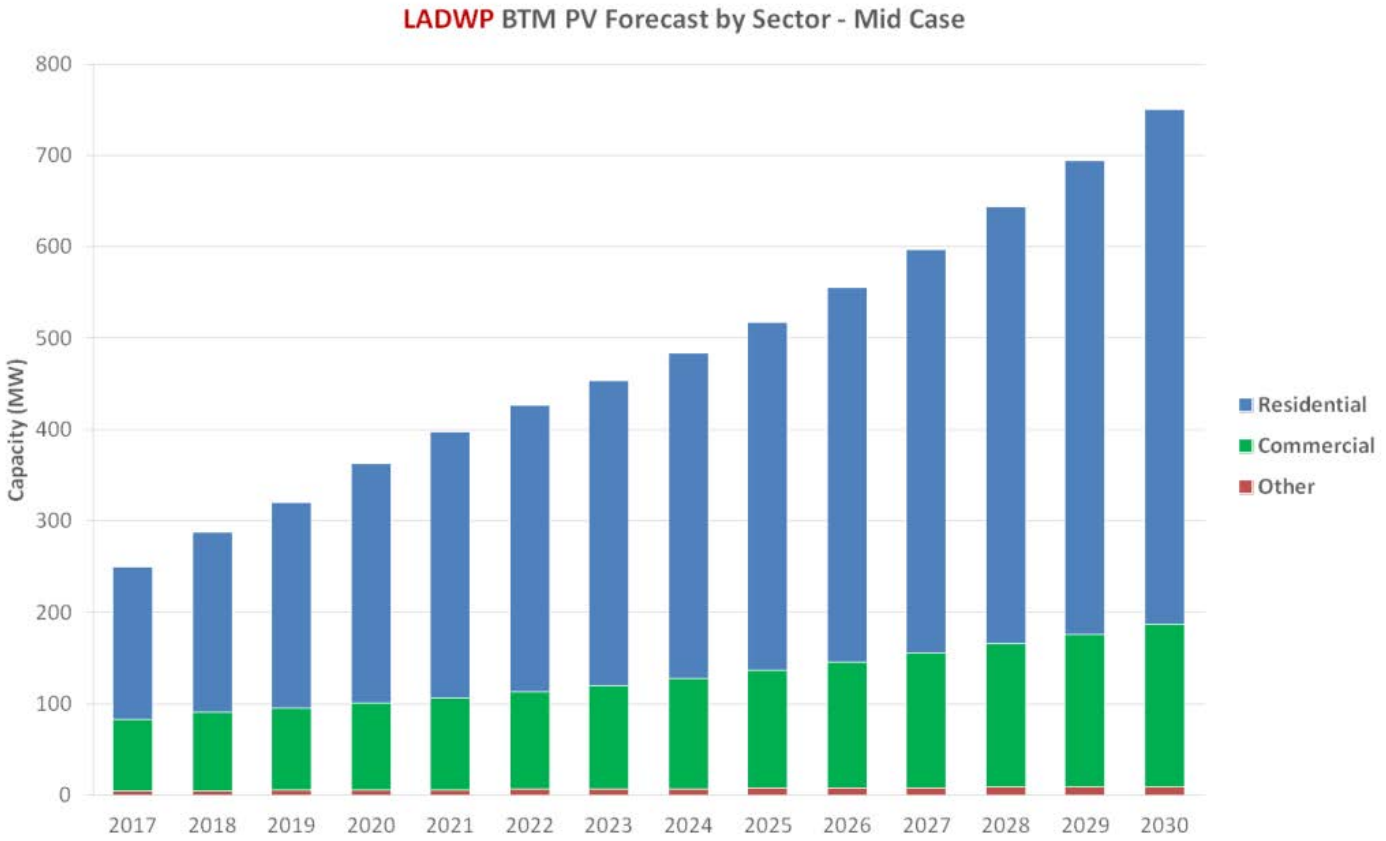
LADWP Baseline Forecast





NOTE: 2018 forecast includes AAPV forecast results.

LADWP Forecast by Sector



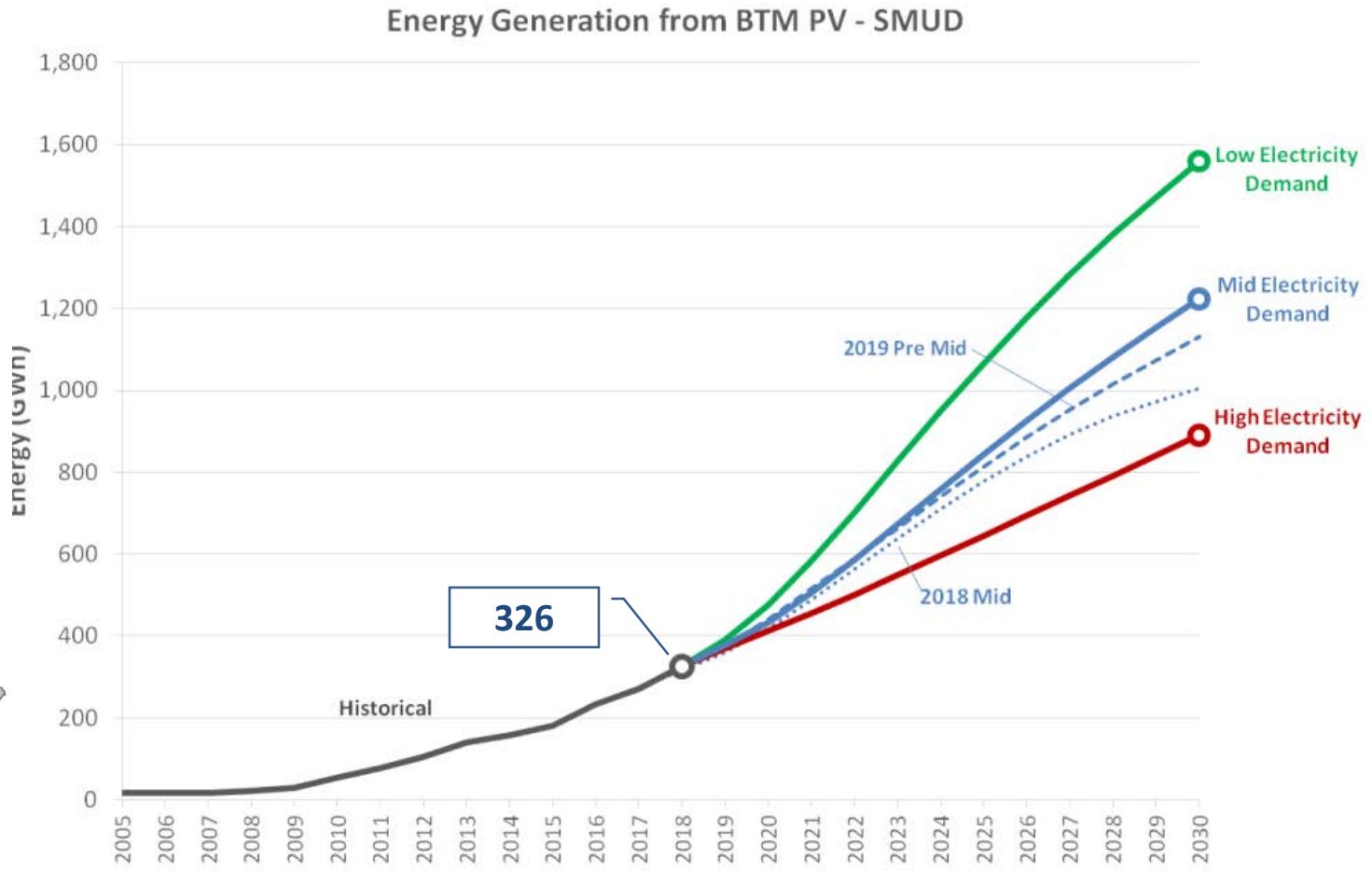
Capacity (MW)

Sector	2018	2030	CAGR
Residential	197	562	9.1%
Commercial	86	178	6.3%
Other	5	9	5.5%
Total	287	750	8.3%

Energy (GWh)

Sector	2018	2030	CAGR
Residential	336	971	9.3%
Commercial	148	305	6.2%
Other	9	16	5.3%
Total	492	1,292	8.4%

SMUD Baseline Forecast



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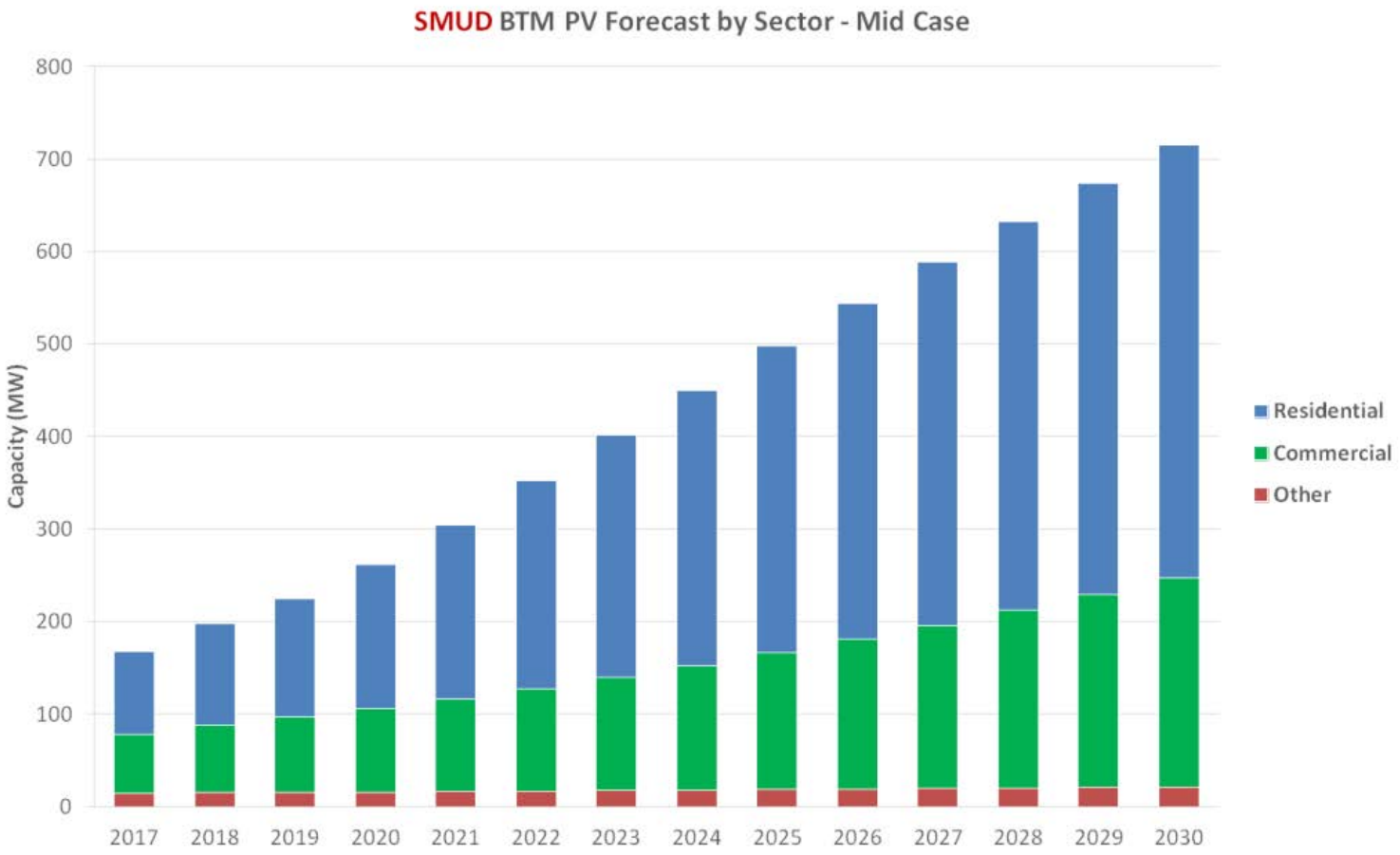
SMUD Forecast by Sector



Capacity (MW)

Sector	2018	2030	CAGR
Residential	109	469	12.9%
Commercial	74	226	9.8%
Other	15	21	3.0%
Total	197	716	11.3%

Energy (GWh)

Sector	2018	2030	CAGR
Residential	180	809	13.4%
Commercial	125	383	9.8%
Other	21	31	3.4%
Total	326	1,224	11.6%