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California Energy Demand Forecast for RETI 2.0

January 29, 2016

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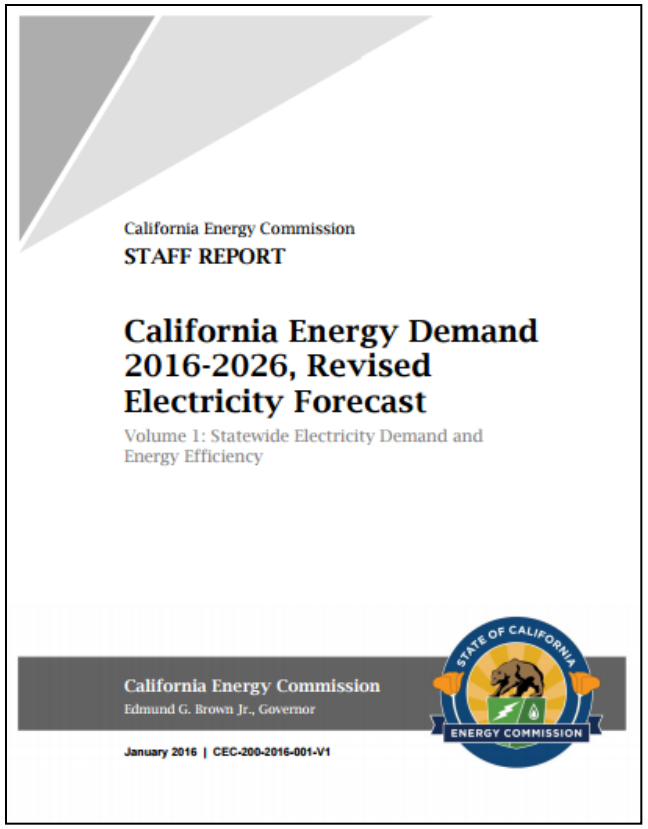
Overview

- California Energy Demand Forecast 2015
- Define RPS Sales
- Estimates for 2030



CED 2015 Forecast Overview

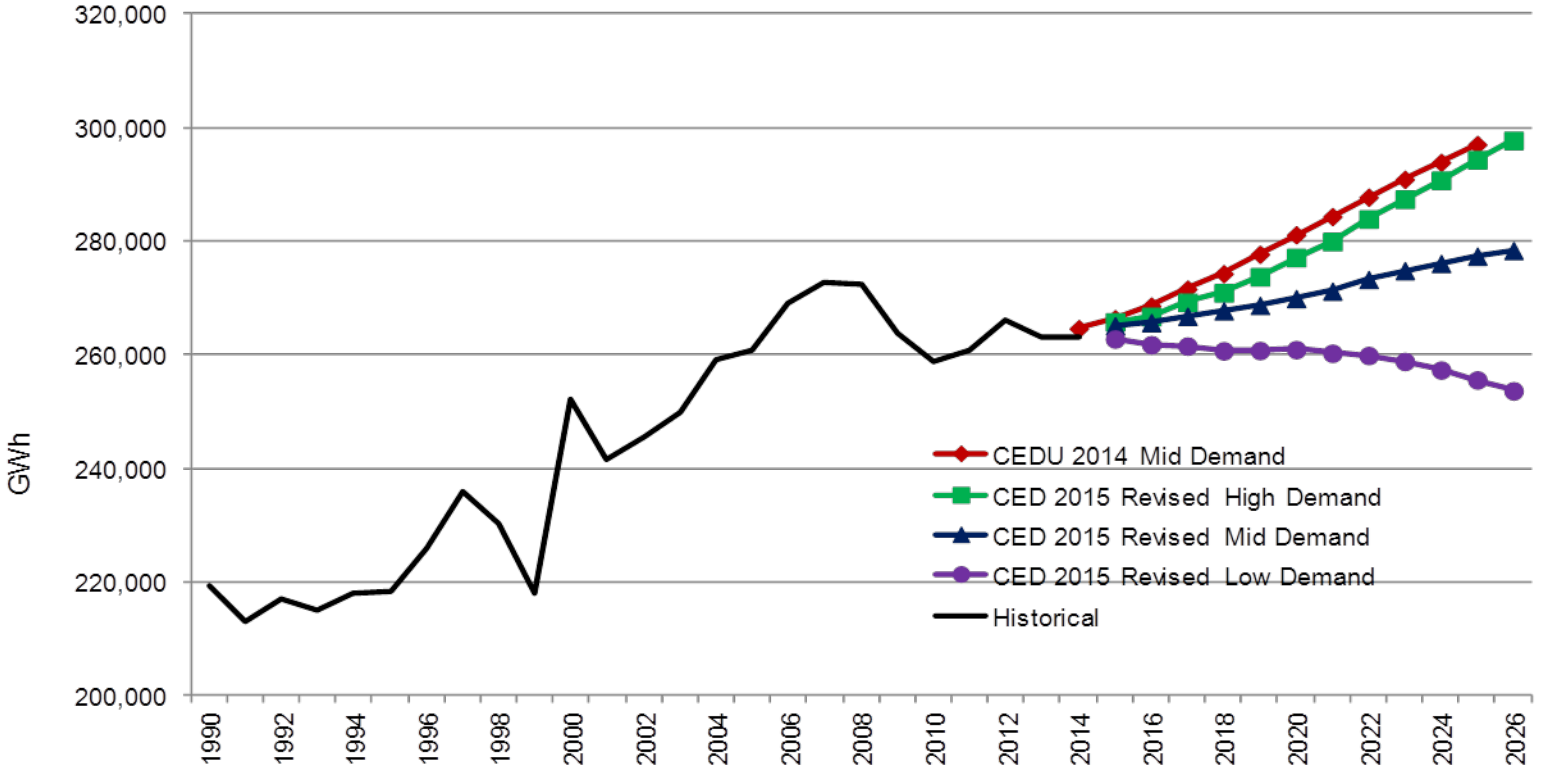
- Forecasting from 2016 to 2026
- High, Mid, and Low Demand Cases with Additional Achievable Energy Efficiency (AAEE)
- Full Report is available at http://www.energy.ca.gov/2015_energypolicy/documents

CED 2015 Forecast Overview

- **High Demand Case:**
  - Higher economic and demographic growth
  - Higher climate change impacts
  - EV high case and less self-generation
  - Lower electricity rates
- **Low Demand Case:**
  - Lower economic and demographic growth
  - No climate change impacts
  - EV low case and more self-generation
  - Higher electricity rates
- **Mid Demand Case:**
  - Assumptions between the high and low demand cases

Statewide Baseline Electricity Sales
No AAEE

Mid Case 20,000 GWh lower vs. CEDU 2014 by 2025

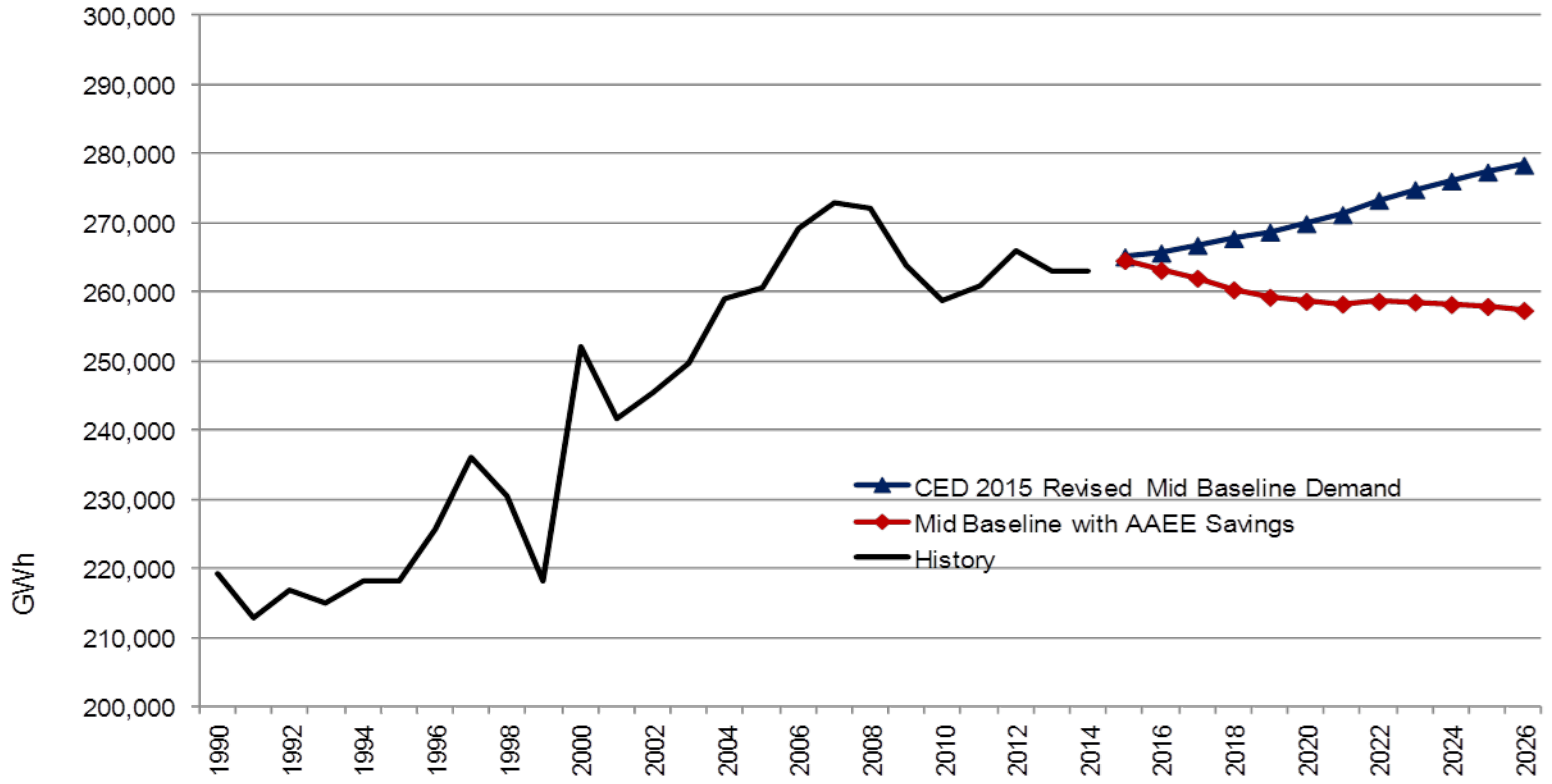


CED 2015 Forecast Overview

- **Additional Achievable Energy Efficiency**
  - **High** Demand Case with **Low** AAEE Savings
  - **Mid** Demand Case with **High** AAEE Savings
  - **Mid** Demand Case with **Mid** AAEE Savings
  - **Mid** Demand Case with **Low** AAEE Savings
  - **Low** Demand Case with **High** AAEE Savings

Mid Baseline Sales with Mid AAEE

~21,000 GWh of Savings by 2026



RPS Eligible Retail Sales

(Statewide Retail Sales) – (Non-Eligible RPS Retail Sales)
= RPS Eligible Retail Sales

- **Non-Eligible RPS Sales**
  - Pumping load
  - Load Serving Entities: Calaveras, Tuolumne, and San Francisco
  - ~11,000 GWh

2030 Extrapolation

- Baseline forecast is straightforward
- Implementing SB 350 EE requirements:
  - Not required until 2017 IEPR
  - How/whether to adjust 2014 CED AAEE for impacts now in the base forecast?
  - In what year is “doubling” accomplished?
  - What average annual growth rate for AAEE?
  - Include POU goals?
  - Feasible and cost-effective constraints?
- Use range of high/low managed forecasts?

RPS Eligible Retail Sales w/AAEE (GWh)

Year	High Demand, Low AAEE	Mid Demand, Mid AAEE	Low Demand, High AAEE
2015	254,417	**253,707**	251,335
2020	257,061	**247,441**	236,893
2030	276,454	**243,081**	205,519
2015-2030	0.56%	**-0.28%**	-1.33%

RPS Eligible Retail Sales w/AAEE (GWh)

Year	High Demand, Low AAEE	Mid Demand, Mid AAEE	Low Demand, High AAEE
2020	257,061	**247,441**	236,893
2030	276,454	**243,081**	205,519
33% RPS 2020	84,830	**81,655**	78,175
50% RPS 2030	138,227	**121,541**	102,760
(2020)-(2030)	53,397	**39,866**	24,585

Mid Case Details

Additional Details (GWh)				
Year	**AAEE**	**Electric Vehicles**	**PV**	**Non – PV Generation**
2015	543	567	6,003	13,230
2020	11,541	2,125	11,345	14,994
2030	29,531	10,828	27,200	16,473
2015-2030	30.52%	21.73%	10.60%	1.47%

Mid Case Details

Additional Details			
Year	Electric Vehicles (Units)	PV Capacity (MW)	Non- PV Generation Capacity (MW)
2015	178,301	3,669	3,179
2020	772,863	7,770	3,719
2030	4,284,647	15,738	4,408
2015-2030	23.61%	16.19%	2.20%

Questions?

Low Case Details

Additional Details (GWh)				
Year	AAEE	Electric Vehicles	PV	Non – PV Generation
2015	633	516	6,022	13,228
2020	13,253	1,376	13,176	14,984
2030	34,672	2,646	38,793	16,441
2015-2030	30.59%	11.52%	13.22%	1.46%

Low Case Details

Additional Details			
Year	**Electric Vehicles (Units)**	**PV Capacity (MW)**	**Non- PV Generation Capacity (MW)**
2015	157,841	3,649	3,179
2020	541,830	6,614	3,721
2030	1,377,516	22,445	4,400
2015-2030	15.54%	12.87%	2.19%

High Case Details

Additional Details (GWh)				
Year	Low AAEE	Electric Vehicles	PV	Non – PV Generation
2015	516	651	5,978	13,228
2020	8,999	2,648	11,345	15,026
2030	22,278	13,465	16,606	16,530
2015-2030	28.53%	22.38%	7.05%	1.50%

High Case Details

Additional Details			
Year	Electric Vehicles (Units)	PV Capacity (MW)	Non- PV Generation Capacity (MW)
2015	204,409	3,624	3,179
2020	922,731	5,579	3,726
2030	5,295,690	9,608	4,423
2015-2030	24.23%	6.72%	2.23%