



Production Cost Data
Subcommittee (PCDS)

2030 ADS _ Validation

September 22, 2020

Jamie Austin,
PCDS Chair

Overview

- Edits in Version 1.4.1 – Tyler Butikofer
 - Approval Items
 - BA Load Changes
- BA missing resources – Proposed fixes
 - Edits by CAISO – Jamie Austin
 - Edits by Northwestern – Colby Johnson
- Tiered Wheeling -
- Transmission Losses
- Update CO2 Prices – Approval Item
- Replacement Heat Rate Curves for CCCTs

2030 ADS PCM V1.4.1 and Beyond

Tyler Butikofer,
WECC

V1.4.1 Changes

- 895 MW of solar was added to PACW from the L&R submittal
- “Remove Losses in Load” flag selected for all load areas
- Unused interfaces were deleted from the case

Other Changes for Future Versions

- Pmin/Pmax in generator table corrected for batteries
- Modeling of PACE Escalante and Enterprise solar projects been corrected
- Combined Cycle heat rates were updated with most recent data
- EPE Balance Nomogram added to balance local generation and load
- Coal prices were corrected to what was provided
- Path 75 Hemingway – Summer Lake west to east limit changed from 99999 to 550
- EPE recently providing EPE PCM generation addition/updates modeling for the 2030 HS ADS case

BA Missing Resources, Proposed Fixes

Jamie Austin,
Colby Johnson

Managing Resource Changes

- Errors were found and as far as missing \ retirement resources were concerned, supplements to the L&R were submitted -
 - PACE – missing RPS Resources
 - LADWP – Intermountain retirements
- Resources missed the target – were in the L&R submittal but did not make the case
 - Colstrip 3 and 4
 - Antelope Nuclear
- CAISO recommended resources, that are missing from the March submittal, however, contribute toward fixing ENS
 - Batteries that are in CEC procurement process for both PG&E and SDGE

Energy not Served

Unserved Load (MWh)					
Scenario	V 1.3.1	V1.3.2 wo\PG&E-SDGE Batteries	V1.3.2 with\PG&E- SDGE Batteries	V1.4 V1.3.2 with Colstrip 3 &4 / Antelope; wo\PG&E- SDGE Batteries	V1.4.1 V1.4.1 with Missing PACW Solar (~900 MW); wo\PG&E-SDGE Batteries
BS_IPCO	8	-	-	-	-
CA_CISO	1,474	792	14	-	-
SW_AZPS	134	67	67	-	-
SW_NVE	66	66	40	-	-
RM_WACM	3	3	-	-	-
SW_TEPC	188	188	188	-	-
NW_NWMT	31	0	-	-	-
System Total	1,905	1,117	309	-	-

Colstrip

- Supplement submittal to the L&R report – Colby Johnson

Adding CAISO Incremental Batteries

Approval Item

Motion

“It is moved to add PG&E missing Batteries to the 2030 ADS PCM. Decrease the PG&E generic battery capacity of 1384 MW by the sum of the total addition in the table below.

- Add CAISO Incremental Batteries for PG&E”

■ PG&E Batteries

ADS PCM 230	Change
BS_10C1374BESS_ADS30	Move to bus 35922, or switch on all gen-ties
BS_11C1454B_ADS30	Move to bus 35643, or switch on all gen-ties
BS_11C1472B_ADS30	Move to bus 30045, or switch on all gen-ties

SDGE Edits

- Remove

- SDGE 3 - Batteries: all 3 batteries are connected to the same bus with gateway storage (252MW) _ Bus #23710.
 - 70MW - Battery;
 - 70MW - Battery;
 - 140 MW - Battery

- Add

Generator Name	Plant ID	Capacity (one hour) MW	Area	Maximum storage (4 hours energy)MWh
New at Miramar	BS-Q1428-BESS	30	CISD	120
New at IV	BS-Q1531_BEES1	116.5	CISD	466
New at IV	BS-Q1531_BEES2	116.5	CISD	466
New at IV	Bs-Q1531_BEES3	116.5	CISD	466

Tiered Wheeling

Jin Zhu,
Tyler Butikofer

Tiered Wheeling Options

- It was discovered that GridView ignores a wheeling interface if its Tariff 1 is zero and it has no monthly limits
- ABB has suggested two ways to get paths tiered wheeling recognized in the simulation:
 1. Set a very small number for first layer tariff/friction, for example set forward tariff 1 to 0.00001.
 2. Set forward/backward penalty and create monthly limit (for example 99999 for upper limit, -99999 for lower limit)

BA Load Changes

Tyler Butikofer

Load Changes

- VEA needs to stay as a stand alone load area under direction of CAISO
 - The L&R does not have any data separated out for VEA
 - Need data (maybe CEC?)
 - Suggested to use hourly profile from 2028 and increase by 1.55%
- WACM's load should have reduced to account for PSCO being moved to PSCO BA. January – April forecast still had CSU included
 - As a result WACM resubmitted loads, for January – April, Peak was reduced by ~1000 MW and Energy was reduced by ~500 GWh each month
 - Hourly profile will be updated and implemented in next version

CEC Demand and Line Loss Projections

Angela Tanghetti
California Energy Commission Staff

CEC Demand Forecast Loss Calculation

- CEC production cost model, PLEXOS, requires demand as an input variable.
- Demand variable in PLEXOS represents Total Energy For Load (also known as Net Energy For Load)
- Total Energy For Load = Consumption + Losses – Self-Generation(BTM PV and Other BTM Generation)

2019 Adopted IEPR Mid Demand Case

- Statewide Losses = 6.9% in 2030. Planning area losses vary by region and shown on the following slide.

FORM 1.2 - STATE Planning Area
California Energy Demand 2020 - 2030 Baseline Forecast - Mid Demand Case
Total Energy to Serve Load (GWh)

Year	Total_Consumption	Losses	Gross_Generation	Other_Self_Generation	PV_Generation	Total_Self_Generation	Total_Energy_for_Load
2017	288,210	22,049	310,259	14,506	11,369	25,875	284,384
2018	282,772	21,402	304,174	14,040	13,831	27,871	276,303
2019	283,426	21,235	304,660	14,048	16,271	30,319	274,341
2020	285,326	21,171	306,496	14,064	19,014	33,078	273,413
2021	288,440	21,167	309,606	14,080	22,105	36,185	273,361
2022	292,118	21,234	313,353	14,094	24,950	39,044	274,195
2023	296,235	21,362	317,597	14,107	27,410	41,518	275,966
2024	300,136	21,506	321,642	14,121	29,608	43,729	277,799
2025	303,778	21,637	325,415	14,134	31,624	45,758	279,542
2026	307,353	21,781	329,135	14,147	33,528	47,676	281,342
2027	310,704	21,905	332,610	14,160	35,375	49,535	282,957
2028	314,237	22,045	336,283	14,173	37,197	51,370	284,794
2029	317,705	22,180	339,885	14,186	39,011	53,197	286,569
2030	321,284	22,324	343,608	14,198	40,828	55,026	288,461

Historic year is 2018.

CEC Demand Forecast California Planning Area Line Loss Projections

Year	BANC	PG&E	LADWP	SCE	SDG&E
2020	6.1%	7.7%	12.4%	6.2%	7.0%
2021	6.1%	7.6%	12.4%	6.2%	6.9%
2022	6.0%	7.5%	12.3%	6.1%	6.7%
2023	6.0%	7.4%	12.3%	6.1%	6.7%
2024	5.9%	7.4%	12.3%	6.0%	6.6%
2025	5.9%	7.3%	12.3%	6.0%	6.6%
2026	5.9%	7.3%	12.3%	5.9%	6.5%
2027	5.8%	7.2%	12.2%	5.9%	6.5%
2028	5.8%	7.2%	12.2%	5.9%	6.5%
2029	5.8%	7.1%	12.2%	5.9%	6.5%
2030	5.8%	7.1%	12.1%	5.8%	6.5%

Source: <https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2019-integrated-energy-policy-report/2019-iepr> see Mid Planning Area Forecast Forms

Scenario Considerations

- If scenario represent an additional demand (aka adding building and/or household consumption, electric vehicles), this consumption plus losses should be added to the production cost models projected demand for this scenario
- If scenario represents a decrement to demand (aka higher levels of BTM PV or AAEE), this consumption plus losses should be subtracted from the production cost models projected demand for this scenario

Update CO2 Prices & AB32 Hurdle Rate

Kevin Harris

CO2 Prices

Motion

“It is moved that the PCDS approves using \$64.293/metric ton CO2 for California supply, in the 2030 ADS PCM dataset. This will be consistent with the CEC 2019 IEPR adjusted for 2020 dollars.”

- ~~This is the California Energy Commission 2019 IEPR price for Tier 1, fixed at the halfway point of Auction Reserve Price; *ceiling price is \$65 (nominal)*, price value in 2021.~~
- ~~A new post-2020 Reserve Tier 1 price fixed at the halfway point of the Auction Reserve Price (floor price) and price ceiling in all years (\$41.40 in 2021).~~
- ~~A new post-2020 Reserve Tier 2 price fixed at the three-quarter point of the Auction Reserve Price and the price ceiling in all years (\$53.2 in 2021).~~
- ~~After 2021, tier prices and the price ceiling escalate annually at 5 percent plus inflation, measured by the all-urban Consumer Price Index (CPI). The Auction Reserve Price, currently \$15.62, escalates at the same rate~~

<http://efiling.energy.ca.gov/GetDocument.aspx?tn=231777>

Update on Replacement Heat Rate Curves for CCCTs

Kevin Harris
Paul Deaver
Jon Jensen

BTM flag in generator table announcement –

Yi Zhang

- ABB has a new release v10.2.94, in which ABB updated the calculation of Spinning Reserve Requirement.
 - This enhancement allows us to consider the load modifiers (such as DG, DR, AAEE, and pumping load) as load in Spinning Reserve Requirement calculation.
 - To use this function, we need to set the BTM flag in the generator table to “YES” for load modifiers.
 - If you don’t use version 10.2.94, this BTM flag change does not impact your simulation



Contact:

Jamie Austin

Chair, PCDS

Jamie.Austin@pacificorp.com