

DOCKETED	
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Description:	Presentation for April 22, 2019, IEPR workshop on Preliminary Natural Gas Price Forecast and Outlook
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Production Cost Model Common Case Input Assumptions and Select Results

2019 Integrated Energy Policy Report California Energy Commission

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California Energy Commission
Date: April 22, 2019





Topics

- IEPR Common Case Overview
- Load Forecast for CA and Rest of WECC
- Significant Retirements / Additions
- Updated Hydro Generation Input
- Natural Gas Price Comparison
- Select Simulation Results
 - Natural Gas Demand for Electric Generation
 - GHG Emissions Projections



Preliminary 2019 IEPR

Common Cases

Common Case	2018 IEPR Update Load Forecast	2018 IEPR Update AAEE	RPS Target
High Energy Consumption	High	Low	60% by 2030
Mid Energy Consumption	Mid	Mid	60% by 2030
Low Energy Consumption	Low	High	60% by 2030



Preliminary 2019 IEPR Load Forecast

- California Loads - IEPR 2018 Update

https://www.energy.ca.gov/2018_energypolicy/documents/

- Rest of WECC Loads –2028 Anchor Dataset

<https://www.wecc.org/SystemStabilityPlanning/Pages/AnchorDataSet.aspx>

- Years 2029 & 2030 load forecast created using average annual growth rate from 2017-2028 applied to 2028 loads



Preliminary 2019 IEPR Load Forecast Development

Revised 2019 IEPR simulations will use the Demand Office hourly profiles for California IOUs.

Hourly Load Profile Update – Mr. Load Shape Tool

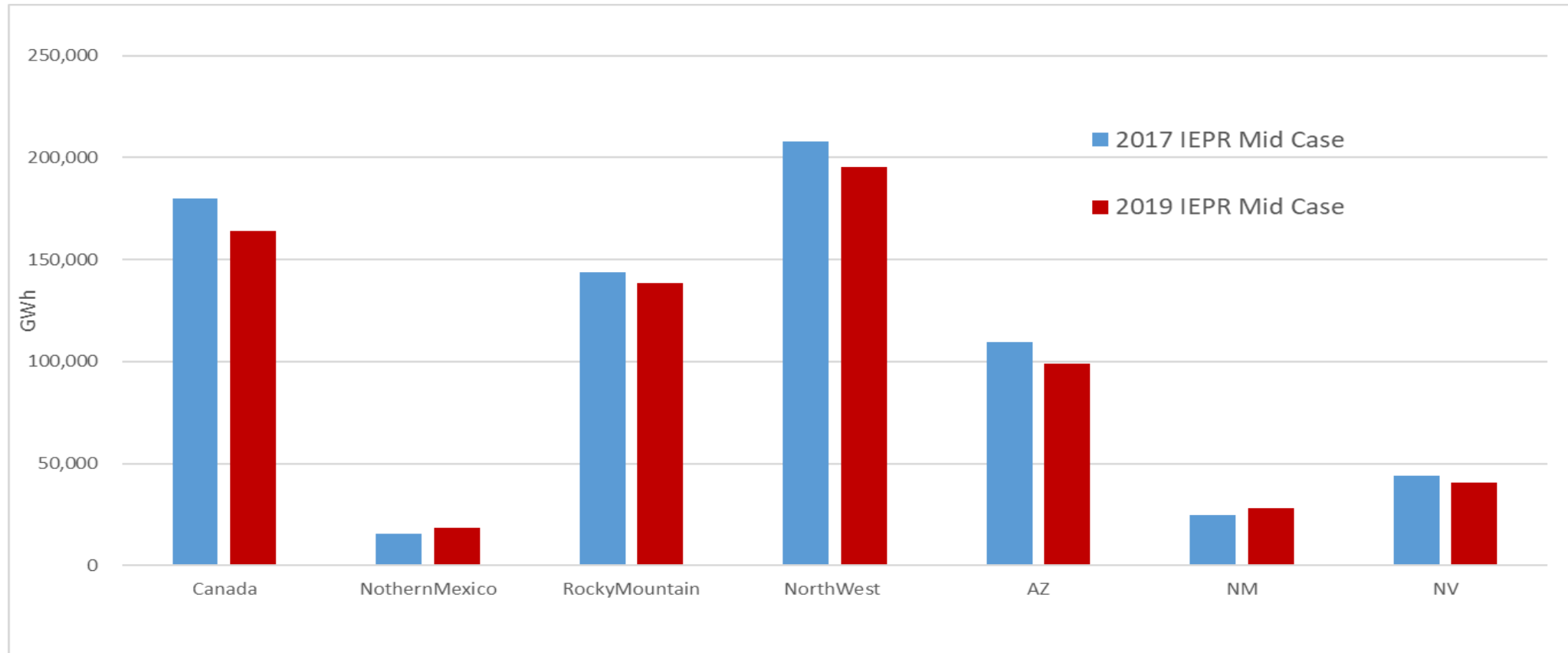
Spreadsheet tool that develops synthetic hourly load profiles based on the most recent 5 years historic loads.

Continue to use the Mr. Load Shape synthetic hourly load profiles for CA non-CAISO and rest of WECC.



2028 Rest of WECC Demand Forecast

Preliminary 2019 IEPR to 2017 IEPR



Sources: AESO and FERC Form 714



Preliminary 2019 IEPR

Retirements / Additions

- CA OTC Compliance Schedule @ https://www.energy.ca.gov/renewables/tracking_progress/documents/once_through_cooling.pdf
- CAISO Retired & Mothball List @ <http://www.caiso.com/Documents/AnnouncedRetirement-MothballListPosted011019.html#search=retired%20and%20mothballed>
- Subscription Database / Trade Press / 40-year “rule” / WECC ADS

Compliance plans are identical across all common cases



CA and WECC Retirements

Type	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
CA NG	3,051	4,820	179	29	239	201	358	383	276	317	638	1,013	11,504
CA Nuclear						1,140	1,140						2,280
CA Coal					22								22
WECC Coal	3,367	1,288	380	2,121	0	1,660	1,545	1,349	1,449	2,171	1,170	370	16,869



Preliminary 2019 IEPR

Retirements / Additions

- CEC Siting Division
- Subscription Database / Trade Press / WECC ADS
- “Generic” Renewable Additions for RPS Requirements
- Recently submitted Publically Owned Utility IRPs



Mid Demand Projected In-State Renewables (for ~70% of RPS req.)

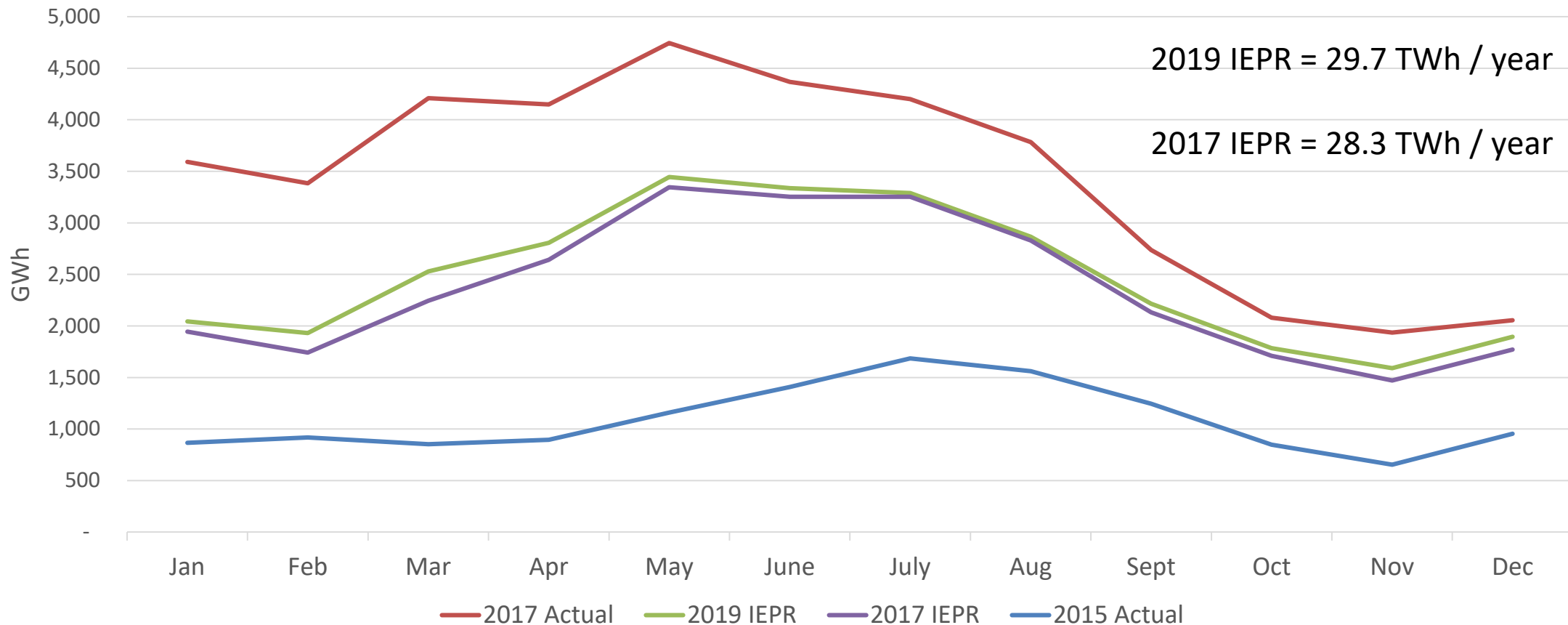
- Capacity by Resource Type (MW)

	2019		2025		2030
Biomass/LFG	1,563		1,708		1,909
Geothermal	1,697		1,867		2,137
Solar	13,593		17,319		22,412
Wind	6,742		8,152		9,158
Total MW	23,595		29,046		35,616

CA 2030 RPS Req: 143,707 GWh

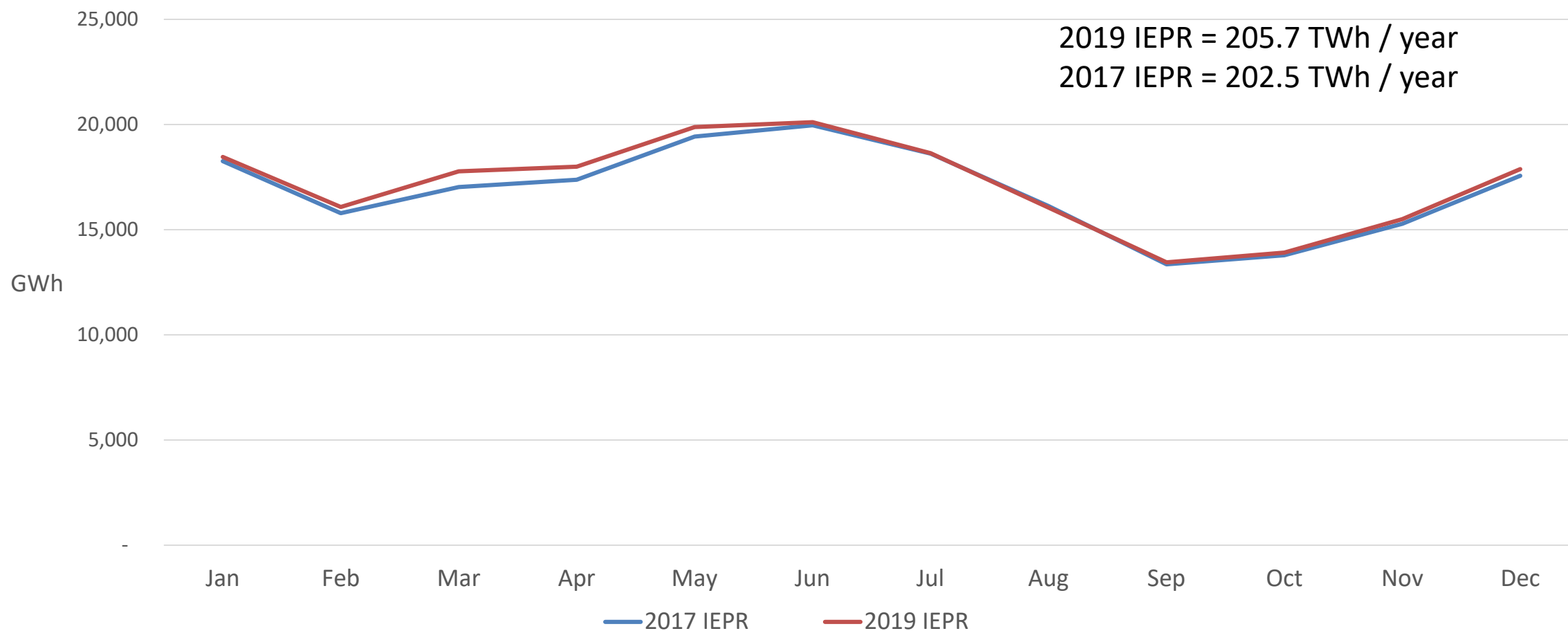


Preliminary 2019 IEPR California Average Monthly Hydroelectric Generation





Rest-of-WECC Monthly Hydro Generation





Select Natural Gas Prices

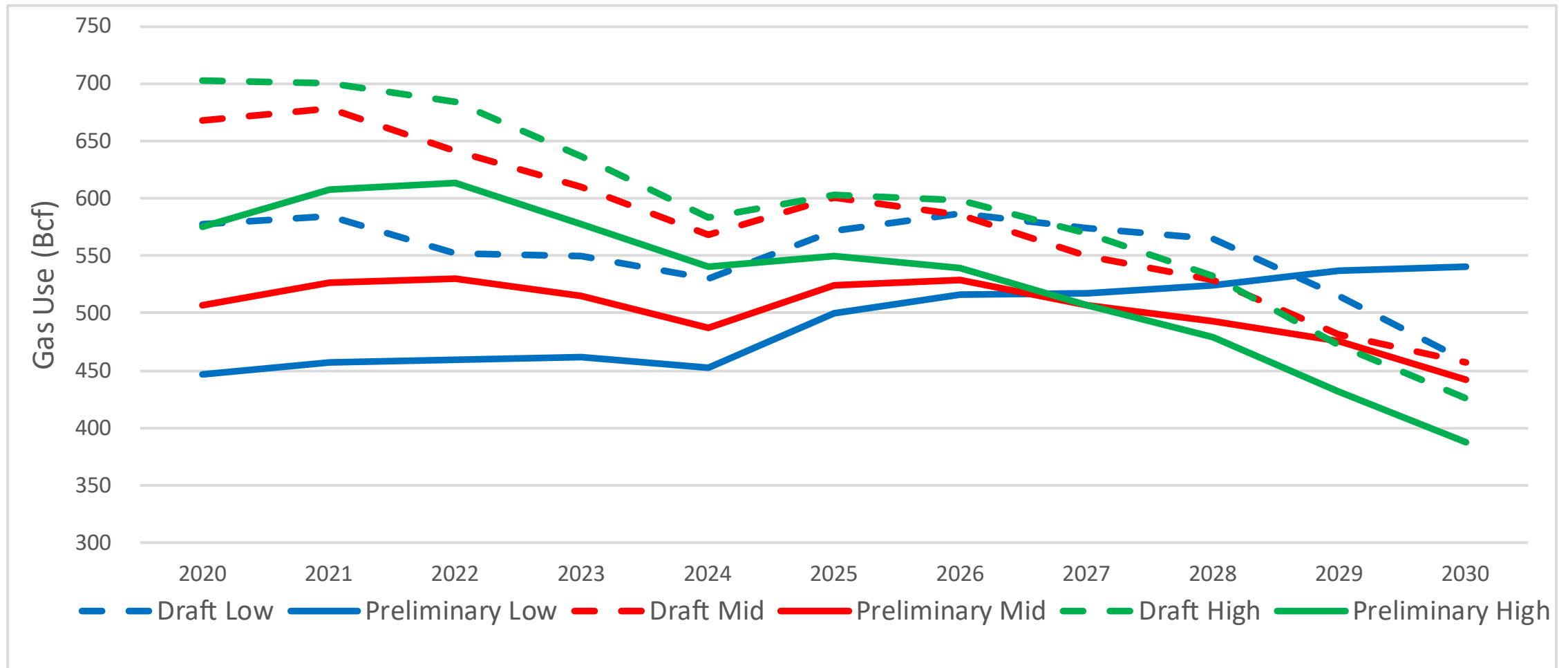
High-Mid-Low 2019 Draft and Preliminary IEPR

Preliminary Prices											
	High Energy Consumption				Mid Energy Consumption				Low Energy Consumption		
Nominal \$/MMBtu	2020	2025	2030		2020	2025	2030		2020	2025	2030
NG Colorado	1.91	1.99	2.23		2.62	2.89	3.23		3.37	3.86	4.32
NG PG&E BB	3.47	3.63	3.90		4.16	4.54	4.94		4.80	5.38	5.87
NG SCG	3.45	3.65	3.94		4.14	4.55	4.98		4.79	5.39	5.91
NG So AZ	1.52	1.60	1.78		2.03	2.27	2.53		2.57	2.99	3.32
NG Washington	2.42	2.69	2.99		2.43	2.71	3.02		2.43	2.71	3.03
Draft Prices (Presented at March 5, 2019 Workshop)											
	High Energy Consumption				Mid Energy Consumption				Low Energy Consumption		
Nominal \$/MMBtu	2020	2025	2030		2020	2025	2030		2020	2025	2030
NG Colorado	2.05	2.35	2.88		3.16	3.76	4.45		5.14	5.89	6.96
NG PG&E BB	2.51	2.91	3.51		3.77	4.44	5.34		5.85	6.85	8.11
NG SCG	2.67	3.06	3.65		3.85	4.51	5.40		6.07	7.08	8.35
NG So AZ	2.02	2.41	3.02		3.24	3.90	4.81		5.42	6.44	7.72
NG Washington	1.76	2.06	3.19		2.67	3.10	4.10		4.33	4.76	5.48
Source: https://www.energy.ca.gov/assessments/ng_burner_tip.html											



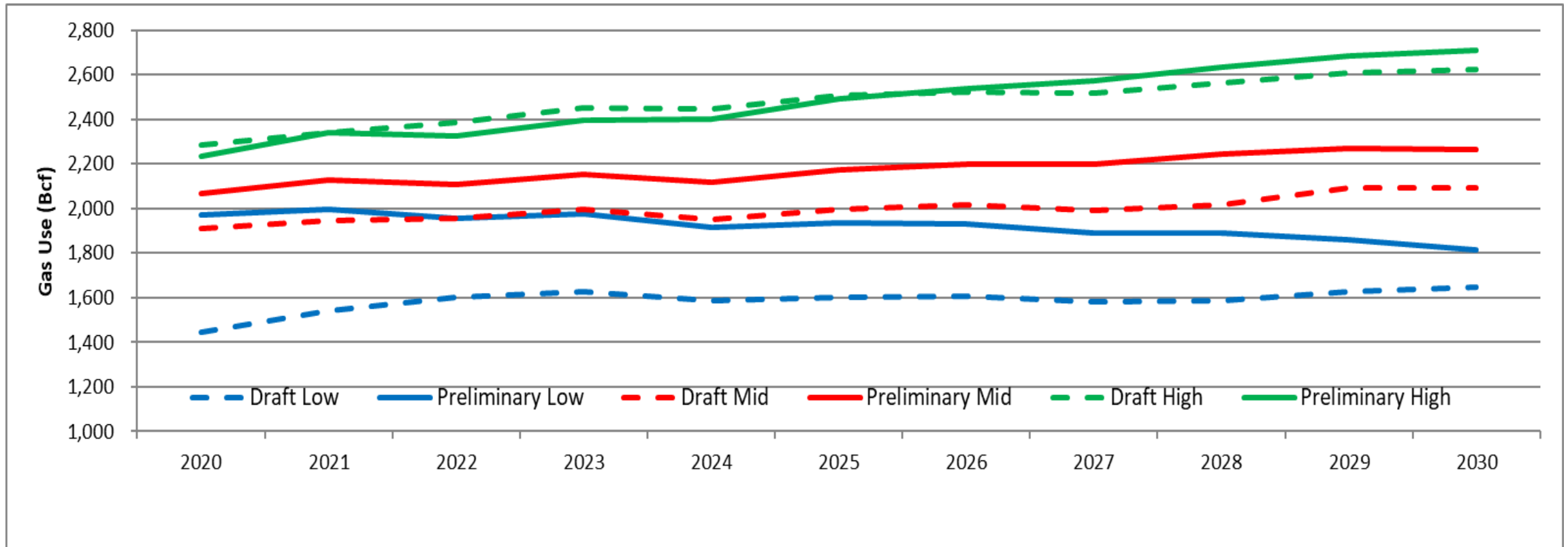
CA Natural Gas Use for Electric Generation

2019 IEPR Draft and Preliminary





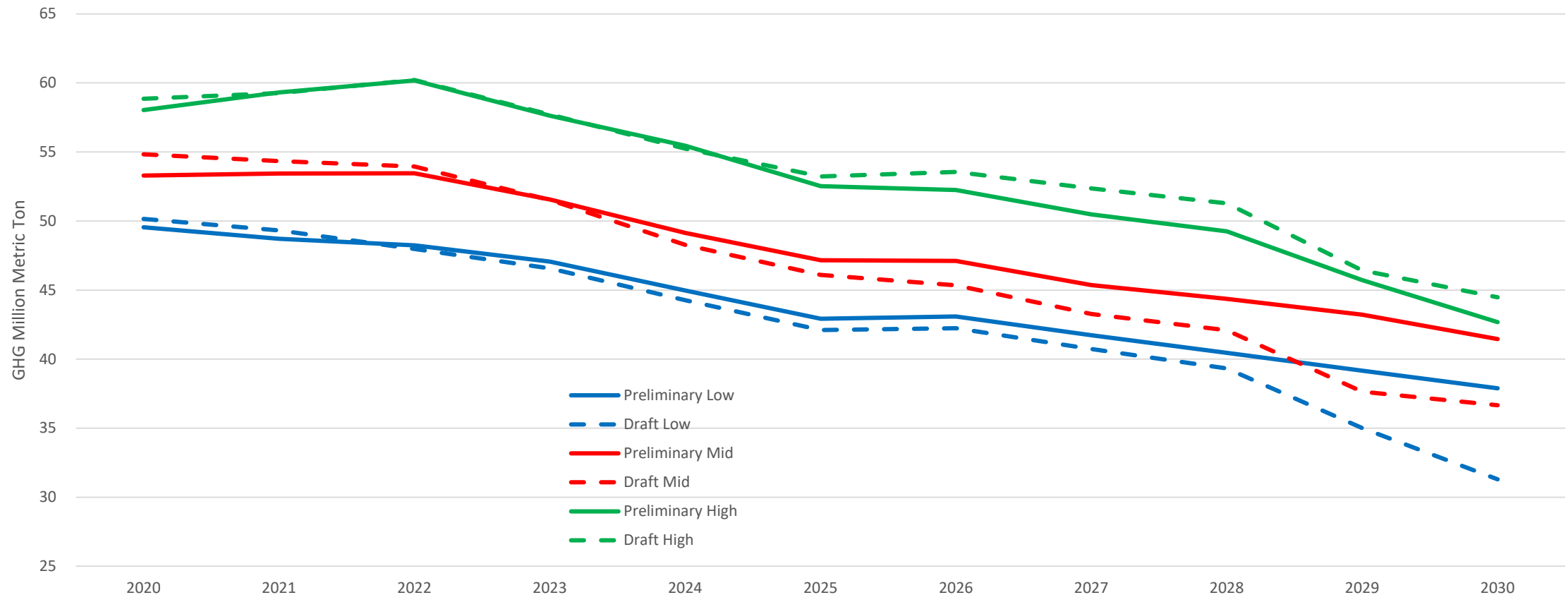
Rest-of-WECC Natural Gas Use for Electric Generation 2019 IEPR Draft and Preliminary





California GHG Emission Projections

Preliminary and Draft 2019 IEPR Common Case



Source: PLEXOS 2019 Preliminary IEPR Results April 16, 2019 SB 100 and SB 350 assumptions. Draft results: https://www.energy.ca.gov/2019_energypolicy/documents/2019-03-04_workshop/2019-03-04_presentations.php



WECC Wide GHG Emissions Preliminary 2019 IEPR Compared to Draft 2019 IEPR

WECC Wide GHG Emissions (Million Metric Ton)			
2019 IEPR Preliminary	2020	2025	2030
Preliminary Low	249	233	213
Preliminary Mid	252	242	230
Preliminary High	249	249	249
2019 IEPR Draft	2020	2025	2030
Draft Low	267	245	223
Draft Mid	245	239	232
Draft High	234	241	247

Preliminary 2019 IEPR Preliminary WECC wide GHG emissions differ from Draft

- ✓ Less near-term variability between Mid, Low and High burner-tip gas price projections
- ✓ Less gas to coal generation switching in both long-run and near-term due to less variation between the coal and gas burner-tip gas price projections
- ✓ Preliminary High Demand case flatter GHG trajectory due to lower near-term burner-tip gas price projections.



Thank You

Questions and Comments:

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