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2022 California Gas Report

Workpapers

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2022 California Gas Report

Workpapers

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Introduction

I. Introduction

The 2022 California Gas Report (CGR) presents a comprehensive outlook for natural gas requirements and supplies for California through the year 2035. This document contains the workpapers for the Northern California portion of the **2022 California Gas Report**. The workpapers detail important forecast assumptions and data that supports the outlook. The forecast assumptions were developed jointly by the California Public Utilities Commission designated respondent utilities – Pacific Gas and Electric Company, San Diego Gas and Electric Company, and the Southern California Gas Company. The joint utilities developed these assumptions to provide a consistent, statewide outlook for natural gas requirements. These workpapers have been prepared by Pacific Gas and Electric Company (PG&E) in compliance with the request by the California Public Utilities Commission dated September 13, 1973.

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Annual Requirements

II. Annual Requirements

A. Introduction to the Gas Demand Forecast Workpapers

PG&E uses econometric models to predict some of its natural gas demand, adjusted for the impact of climate change, energy efficiency and building electrification. Other parts of total demand are forecast by using market information. For the econometric models, the first step is to identify a causal relationship between the variable to be forecast and the variables believed to influence its movements. The choice of explanatory variables is based in economic theory. Once the determinants of energy use are identified, data for the variables are collected and a functional form is specified.

Various formulations are tested to find one that conforms to the theoretical foundation, has sound statistical properties, and produces a reasonable forecast. For the 2022 California Gas Report (CGR), PG&E has utilized maximum likelihood regression models, with time series terms on the residuals to address serial autocorrelation in the residuals, to predict residential, small commercial, large commercial/industrial distribution, industrial transmission demand, and industrial backbone level demand (shown in Section II-B of these workpapers). These models attempt to isolate the effects of slow-moving drivers, such as economics, demographics, and appliance and building shell efficiency, along with fast moving drivers, such as temperature, to produce forecasts of sectoral gas demand. Demand forecast from the econometric models is obtained by simulating the models using forecasts of the exogenous variables.

PLEXOS is a Microsoft Windows-based software package that solves, by iteration, a system of simultaneous equations describing a market with supplies, demands, and transmission routes. PLEXOS has been widely used by the industry to model electric, water, gas, and renewable markets. Marketing information about PLEXOS is available at the vendor's web site, https://www.energyexemplar.com/products/plexos. These two classes of forecasts are then combined with forecasts obtained exogenously (wholesale, Natural Gas Vehicle, inter-departmental, Southwest Exchange Gas Delivery Agreement) to produce the PG&E on-system demand forecast.

The forecast horizon from the econometric model is 2022 through 2035.

Gas demand forecasts under various demand scenarios are presented in Section II.D.

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II.B. Econometric Models

B. Econometric Models

Table 1

Abbreviation	Model(s)	Description
POP_PGE	Residential Customer	Population Growth for the PG&E territory area. (Moody's Analytics (December 2021))
HH_PGE	Residential Customer	Number of households in the PG&E territory. (Moody's Analytics (December 2021))
January-November	Residential Customer, Residential, Small Commercial Customer, Small Commercial, Large Commercial, GNTBB, GNTD, GNTT, GNR1 Interdepartmental	Monthly binary dummy variables to account for seasonality in usage not due to temperature.
Rescounts	Residential Customer, Small Commercial Customer	Total number of active residential customers in the PG&E territory.
Per_customer_usage	Residential	Total residential usage divided by the number of customers.
post78_stationary	Residential	The percentage of households built after 1978 when energy efficiency became more important. This is also used as an energy efficiency index. (Moody's Analytics (December 2021))
Gas_price_res	Residential	Real residential gas rate and commodity costs.
Drought_JAN14	Residential	Binary dummy variable to account for customer behavior change due to the drought.
HDD_1in2	Residential Customer, Residential, Small Commercial Customer, Small Commercial, Large Commercial, GNTD, GNR1 Interdepartmental	Monthly total system composite heating degree days (base temperature 60 degrees F)
HDD_1in10	Residential Customer, Residential, Small Commercial Customer, Small Commercial, Large Commercial, GNTD	Monthly or quarterly total system composite heating degree days (base temperature 60 degrees F). Forecast period represents 1 in 10 cold year conditions.
COVID	Residential Customer, Residential, Small Commercial Customer, Small Commercial, Large Commercial, GNTBB, GNTD, GNTT, GNR1 Interdepartmental	Binary dummy variable to account for customer behavior change due to COVID

Table 1
(continued)

Abbreviation	Model(s)	Description
SmComcounts	Small Commercial Customer	Total number of active small commercial customers in the PG&E territory.
Per_customer_usage	Small Commercial	Total small commercial usage divided by the number of customers.
Percent_ServiceEmployment2	Small Commercial	Percent of service sector employment (finance, information, service level) of total employment. (Moody's Analytics (December 2021))
LC_usage2	Large Commercial	Total usage to large commercial. (Monthly total MDTH)
Gas_price_LrgCom	Large Commercial	Real large commercial gas rate and commodity costs.
Percent_ServiceEmployment	Large Commercial (GNR2), GNTD	Percent of service level sector employment of total employment. (Moody's Analytics (December 2021))
GNTD_usage	GNTD	Total usage to distribution level industrial customers. (Monthly total MDTH)
Gas_price_GNTD_12mo	GNTD	Real industrial distribution gas rate and commodity costs 12 month moving average.
GNTT_USAGE	GNTT	Total usage to transmission level industrial customers. Monthly total MDTH)
GDP_DETAIL_4247_PGE	GNTT	Gross petroleum and petroleum products merchant wholesalers. (Moody's Analytics (December 2021)
Gas_price_GNTT_12mo	GNTT	Real industrial transmission gas rate and commodity costs 12 month moving average.
GNTBB_Counts	GNTBB	Total number of active GNTBB customers in the PG&E territory.
Gas_price_GNTBB_12mo	GNTBB	Real industrial backbone gas rate and commodity costs 12 month moving average.
GNTBB_USAGE	GNTBB	Total usage to backbone level industrial customers. (Monthly total MDTH)
GNR1_Interdepartmental_Usa	GNR1_Interdepartmental	Total usage to GNR1 Interdepartmental. (Monthly total MDTH)

RESIDENTIAL CUSTOMER EQUATION

Residential customer counts are forecast on a model employing historic data from 2010 through 2021. Monthly counts are forecast as a function of households, population, monthly dummy variables, COVID dummy variable, and a first order autoregressive term to correct for any autocorrelation that may be present in the model errors; reducing potential bias in the econometric parameter estimates. The impact of the COVID dummy variable is phased out in mid-2023.

Table 2

Dependent Variable: Res_Counts
Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	1308434	290016	4.51	<.0001
POP_PGE	144.1045	38.5414	3.74	0.0003
HH_PGE	117.326	103.7355	1.13	0.2602
January	1453	786.6115	1.85	0.067
February	-4390	1027	-4.27	<.0001
March	-3498	1167	-3	0.0033
April	-2421	1268	-1.91	0.0583
May	-1572	1328	-1.18	0.2387
June	-5251	1350	-3.89	0.0002
July	-4084	1329	-3.07	0.0026
August	-2553	1266	-2.02	0.0458
September	-3873	1159	-3.34	0.0011
October	-3684	995.1374	-3.7	0.0003
November	-195.6536	737.0521	-0.27	0.7911
COVID	-8151	1991	-4.09	<.0001
AR1	-0.991	0.0132	-74.85	<.0001

SSE	899513172	DFE	128
MSE	7027447	Root MSE	2651
SBC	2745.44044	AIC	2697.92342
MAE	1925.81522	AICC	2702.20689
MAPE	0.04569582	HQC	2717.23166
Log Likelihood	-1332.9617	Transformed Regression R-Square	0.667
Durbin-Watson	1.7463	Total R-Square	0.9991
		Observations	144

RESIDENTIAL DEMAND EQUATION

Residential usage is a forecast on a per customer basis using a model employing historic data from 2006 through 2021. The monthly forecast is a function of housing stock, real residential gas rate and commodity costs, PG&E system composite heating degree days, monthly dummy variables, drought dummy variable, COVID dummy variable, and a first order autoregressive term to correct for any autocorrelation that may be present in the model errors; reducing potential bias in the econometric parameter estimates. The housing stock variable is the proportion of household added after 1978 when building efficiency standards went into effect in California; this reflects the influence of improvements in building shell and appliance efficiencies on residential gas demand over time. The impact of the COVID dummy variable is phased out in mid-2023.

Table 3

Dependent Variable: Per_customer_usage
Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	0.006316	0.000515	12.27	<.0001
HDD_1in2	0.0000132	4.6963E-07	28.18	<.0001
post78_stationary	-0.008272	0.001107	-7.47	<.0001
Gas_price_res	-0.000023	8.3648E-06	-2.75	0.0065
Drought_JAN14	0.0000406	0.0000498	0.82	0.4159
January	0.000517	0.0000551	9.37	<.0001
February	0.00013	0.0000716	1.82	0.0712
March	-0.000469	0.0000932	-5.04	<.0001
April	-0.000768	0.000119	-6.48	<.0001
May	-0.000914	0.000144	-6.36	<.0001
June	-0.000946	0.000158	-6	<.0001
July	-0.000992	0.000163	-6.08	<.0001
August	-0.000996	0.000164	-6.08	<.0001
September	-0.001026	0.00016	-6.43	<.0001
October	-0.001125	0.000141	-7.99	<.0001
November	-0.000703	0.0000875	-8.03	<.0001
COVID	0.000223	0.0000825	2.7	0.0075
AR1	-0.3003	0.075	-4	<.0001

SSE	5.29113E-06	DFE	174
MSE	3.04088E-08	Root MSE	0.0001744
SBC	-2702.5374	AIC	-2761.1723
MAE	0.0001158	AICC	-2757.2185
MAPE	3.04149403	HQC	-2737.4247
Log Likelihood	1398.58613	Transformed Regression R-Square	0.9897
Durbin-Watson	1.9099	Total R-Square	0.9937
		Observations	192

SMALL COMMERCIAL CUSTOMER EQUATION

Small Commercial customer counts are forecast on a model employing historic data from 2006 through 2021. Monthly counts are forecast as a function of residential customer counts, monthly dummy variables, COVID dummy variables, and autoregressive terms to correct for any autocorrelation that may be present in the model errors. The impact of the COVID dummy variable is phased out in mid-2023.

Table 4

Dependent Variable: SmComcounts

Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	-8453	35663	-0.24	<.0001
Rescounts	0.0557	0.005775	9.65	<.0001
January	516.6584	67.7362	7.63	<.0001
February	696.9288	93.4318	7.46	<.0001
March	535.5418	104.6386	5.12	0.0003
April	239.8754	112.5021	2.13	0.8317
May	-349.3973	116.562	-3	<.0001
June	-710.8257	123.9092	-5.74	<.0001
July	-1110	119.6938	-9.28	<.0001
August	-1415	113.4927	-12.47	<.0001
September	-1564	105.3482	-14.85	<.0001
October	-1495	91.2514	-16.38	<.0001
November	-808.6098	64.6283	-12.51	<.0001
COVID	-358.5727	202.8919	-1.77	<.0001
AR1	-0.9992	0.006002	-166.47	<.0001

			151
SSE	12785136.9	DFE	171.80951
MSE	72232	Root MSE	2197.34486
SBC	2762.53477	AIC	2200.54486
MAE	173.765299	AICC	2216.29251
MAPE	0.07721081	HQC	0.9972
Log Likelihood	-1341.8362	Transformed Regression R-Square	

SMALL COMMERCIAL DEMAND EQUATION

Small Commercial usage is a forecast on a per customer basis using a model employing historic data from 2004 through 20212. The monthly forecast is a function of employment index, PG&E system composite heating degree days, monthly dummy variables, COVID dummy variable, and a first order autoregressive term to correct for any autocorrelation that may be present in the model errors; reducing potential bias in the econometric parameter estimates. The employment index variable is the proportion of service sector jobs divided by total jobs in the PG&E territory. The impact of the COVID dummy variable is phased out in mid-2023.

TABLE 5

Dependent Variable: Per_customer_usage
Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	0.0313	0.003343	9.38	<.0001
HDD_1in2	0.0000582	0.00000212	27.46	<.0001
Percent_ServiceEmployment2	-0.0174	0.006205	-2.81	0.0055
January	0.002271	0.000243	9.35	<.0001
February	0.001974	0.00034	5.81	<.0001
March	-0.000928	0.00045	-2.06	0.0404
April	-0.00236	0.000562	-4.2	<.0001
May	-0.003146	0.000671	-4.69	<.0001
June	-0.003914	0.000731	-5.35	<.0001
July	-0.004288	0.000756	-5.67	<.0001
August	-0.003981	0.000755	-5.27	<.0001
September	-0.003409	0.00073	-4.67	<.0001
October	-0.002941	0.000637	-4.62	<.0001
November	-0.001696	0.000382	-4.44	<.0001
COVID	-0.002542	0.000533	-4.77	<.0001
AR1	-0.5518	0.0615	-8.97	<.0001

SSE	0.00015743	DFE	200
MSE	7.87165E-07	Root MSE	0.0008872
SBC	-2353.1174	AIC	-2407.1219
MAE	0.0006014	AICC	-2404.3882
MAPE	2.10948203	HQC	-2385.3039
Log Likelihood	1219.56093	Transformed Regression R-Square	0.9788
Durbin-Watson	2.0059	Total R-Square	0.9913
		Observations	216

LARGE COMMERCIAL DEMAND EQUATION

Large commercial (GNR2) are forecast using a model employing historic data from 2006 through 2021. Monthly usage is modeled as a function of real large commercial gas rate and commodity prices, PG&E system composite heating degree days, employment index, monthly dummy variables, COVID dummy variable, and a first order autoregressive term to correct for autocorrelation that may be present in the model errors; reducing potential bias in the econometric parameter estimates. The employment index variable is the proportion of service sector jobs divided by total jobs in the PG&E territory. The impact of the COVID dummy variable is phased out in mid-2023.

Table 6

Dependent Variable: LC_usage2
Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	1258	173.8124	7.24	<.0001
HDD_1in2	0.4046	0.0781	5.18	<.0001
Gas_price_LrgCom	-2.8861	2.4406	-1.18	0.2386
Percent_ServiceEmployment	-1645	344.338	-4.78	<.0001
January	1.7173	9.0032	0.19	0.849
February	11.8258	12.5723	0.94	0.3482
March	-5.0806	16.6815	-0.3	0.7611
April	21.5618	21.4807	1	0.3169
May	19.2542	25.6232	0.75	0.4534
June	4.896	27.7534	0.18	0.8602
July	3.7158	28.4869	0.13	0.8964
August	75.5507	28.4794	2.65	0.0087
September	149.1041	27.7073	5.38	<.0001
October	128.569	24.3101	5.29	<.0001
November	47.2287	14.4304	3.27	0.0013
COVID	-31.8633	18.9959	-1.68	0.0953
AR1	-0.5886	0.0611	-9.63	<.0001

SSE	169029.808	DFE	175
MSE	965.88462	Root MSE	31.07868
SBC	1936.49949	AIC	1881.12206
MAE	22.6437313	AICC	1884.63931
MAPE	3.7115403	HQC	1903.55033
Log Likelihood	-923.56103	Transformed Regression R-Square	0.6317
Durbin-Watson	1.8817	Total R-Square	0.8217
		Observations	192

GNT DISTRIBUTION-LEVEL DEMAND EQUATION

Distribution level industrial (GNTD) usage is forecast using a model employing historic data from 2004 through 2021. Monthly usage is modeled as a function of real distribution level industrial gas rate and commodity prices, PG&E system composite heating degree days, employment index, monthly dummy variables, COVID dummy variable, and a first order autoregressive term to correct for autocorrelation that may be present in the model errors; reducing potential bias in the econometric parameter estimates. The employment index variable is the proportion of service sector jobs divided by total jobs in the PG&E territory. The impact of the COVID dummy variable is phased out in mid-2023.

Table 7

Dependent Variable: GNTD_USAGE
Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	1413	733.1359	1.93	0.0554
HDD_1in2	2.0069	0.1772	11.32	<.0001
Percent_ServiceEmployment	811.2022	1457	0.56	0.5782
Gas_price_GNTD_12mo	-1.0266	13.4991	-0.08	0.9395
January	90.2253	20.5694	4.39	<.0001
February	-37.4431	29.7433	-1.26	0.2095
March	193.3987	39.6951	4.87	<.0001
April	102.0259	49.3517	2.07	0.04
May	120.8482	58.5207	2.07	0.0402
June	43.8366	63.4644	0.69	0.4905
July	77.4779	65.3455	1.19	0.2372
August	308.0633	64.9112	4.75	<.0001
September	274.7854	62.2617	4.41	<.0001
October	293.7755	53.878	5.45	<.0001
November	53.0964	31.9731	1.66	0.0984
COVID	-66.2612	57.3861	-1.15	0.2496
AR1	-0.7574	0.0464	-16.33	<.0001

SSE	1255166.85	DFE	199
MSE	6307	Root MSE	79.41896
SBC	2577.39382	AIC	2520.01409
MAE	57.8826501	AICC	2523.105
MAPE	2.734004	HQC	2543.19564
Log Likelihood	-1243.007	Transformed Regression R-Square	0.8078
Durbin-Watson	2.111	Total R-Square	0.8907
		Observations	216

GNT TRANSMISSION-LEVEL DEMAND EQUATION

Transmission level industrial (GNTT) usages are forecast using a model which employs historic data from 2003 through 2021. Monthly usages are modeled as a function of Gross Domestic Product for the PG&E area for Petroleum and petroleum products merchant wholesalers, real GNTT gas rate and commodity costs, monthly seasonal dummy variables, COVID dummy variable, and a first and third order autoregressive term to correct for autocorrelation that may be present in the model errors; reducing potential bias in the econometric parameter estimates. The impact of the COVID dummy variable is phased out in mid-2023.

Table 8

Dependent Variable: GNTT_USAGE
Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	13544	4405	3.07	0.0024
GDP_DETAIL_4247_PGE	-0.002435	0.9145	0	0.9979
Gas_price_GNTT_12mo	-118.9269	148.8226	-0.8	0.4251
January	-366.0656	182.8491	-2	0.0466
February	-2004	221.2927	-9.06	<.0001
March	-981.5896	223.3673	-4.39	<.0001
April	-1459	235.1013	-6.21	<.0001
May	-867.0163	244.1002	-3.55	0.0005
June	-1155	245.8108	-4.7	<.0001
July	1241	243.67	5.09	<.0001
August	3848	234.0515	16.44	<.0001
September	3261	221.7983	14.7	<.0001
October	522.9013	217.7876	2.4	0.0172
November	-739.3769	177.2889	-4.17	<.0001
COVID	-444.3124	507.9875	-0.87	0.3828
AR1	-0.6863	0.0539	-12.73	<.0001
AR3	-0.2194	0.0553	-3.97	<.0001

SSE	111380911	DFE	211
MSE	527872	Root MSE	726.54774
SBC	3727.45557	AIC	3669.1567
MAE	557.009804	AICC	3672.07098
MAPE	4.43502757	HQC	3692.67853
		Transformed	
Log Likelihood	-1817.5783	Regression R-Square	0.8272
Durbin-Watson	1.9827	Total R-Square	0.9123
		Observations	228

GNT BACKBONE-LEVEL DEMAND EQUATION

Backbone level industrial (GNTBB) usages are forecast using a model which employs recorded data from 2005 through 2021. Monthly usages are modeled as a function of real GNTBB gas rate and commodity costs, GNTBB customer Count, monthly seasonal dummy variables, COVID dummy variable, and a first order autoregressive term to correct for autocorrelation that may be present in the model errors; reducing potential bias in the econometric parameter estimates. The impact of the COVID dummy variable is phased out in mid-2023.

Table 9

Dependent Variable: GNTBB_USAGE
Method: Maximum Likelihood Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Intercept	-42.5034	41.2006	-1.03	0.3036
Gas_price_GNTBB_12mo	-2.2258	2.3185	-0.96	0.3383
GNTBB_counts	27.4154	6.2209	4.41	<.0001
January	-5.8531	9.8958	-0.59	0.5549
February	-5.9919	11.8512	-0.51	0.6137
March	-13.5452	12.604	-1.07	0.2839
April	-18.1866	12.9616	-1.4	0.1622
May	-15.945	13.0941	-1.22	0.2249
June	-0.9146	13.1353	-0.07	0.9446
July	249.6019	13.0794	19.08	<.0001
August	341.71	12.9202	26.45	<.0001
September	309.681	12.5463	24.68	<.0001
October	111.9261	11.6976	9.57	<.0001
November	-11.7657	9.6447	-1.22	0.224
COVID	6.9939	19.2937	0.36	0.7174
AR1	-0.4732	0.0669	-7.07	<.0001

SSE	219632.106	DFE	188
MSE	1168	Root MSE	34.17976
SBC	2088.51454	AIC	2035.42462
MAE	21.5089547	AICC	2038.33372
MAPE	41.915396	HQC	2056.90046
Log Likelihood	-1001.7123	Transformed Regression R-Square	0.9066
Durbin-Watson	2.0418	Total R-Square	0.9489
		Observations	204

MONTHLY DISAGGREGATION MODELS

The aggregate monthly forecast categories are disaggregated into their component parts with spread factors.

- RESIDENTIAL:
  - RESIDENTIAL IM BUNDLE (RESIMBUN) = RESTOTAL * RESIMBUND%
  - RESIDENTIAL IM TRANSPORT (RESIMTRPT) = RESTOTAL * RESIMTRPT%
  - RESIDENTIAL MM BUNDLE (RESMMBUN) = RESTOTAL * RESMMBUND%
  - RESIDENTIAL MM TRANSPORT (RESMMTRPT) = RESTOTAL * RESMMTRPT%

- SMALL COMMERCIAL:
  - SMALL COMMERCIAL BUNDLE (SMLCOMBUN) = SMLCOMTOT * SMLCOMBUND
  - SMALL COMMERCIAL TRANSPORT (SMLCOMTRPT) = SMLCOMTOT * SMLCOTRPT%

- LARGE COMMERCIAL
  - LARGE COMMERCIAL BUNDLE (LGCOMBUN) = LGCOMTOT * LGCOMBUND%
  - LARGE COMMERCIAL TRANSPORT (LGCOMTRPT) = LGCOMTOT * LGCOTRPT%

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II.C. Forecast of Demand in the Electric Generation Market Segment

C. Forecast of Demand in the Electric Generation Market Segment

DESCRIPTION OF PLEXOS MODEL

PLEXOS is a Microsoft Windows-based software package that solves, by iteration, a system of simultaneous equations describing a market with supplies, demands, and transmission routes. PLEXOS has been widely used by the industry to model electric, water, gas, and renewable markets. Marketing information about PLEXOS is available at the vendor's web site, https://www.energyexemplar.com/products/plexos.

PG&E utilizes a Western Electricity Coordinating Council (WECC) wide PLEXOS model to forecast electric generation throughout California by optimizing power plant dispatch to meet load and operating reserve requirements while minimizing costs and following physical constraints such as along electric transmission pathways. The model is configured into regions with assigned load. Regions consist of one or more node and are connected via transmission lines. Each node contains individual generator resources. In order for the model to run, many detailed assumptions that inform system behavior and economics are required. For this model, PG&E started with a dataset provided by the California Energy Commission (CEC) that was developed for use in the 2019 Integrated Energy and Policy Report (IEPR). Since receiving the dataset in 2020, PG&E has reviewed assumptions and made updates utilizing more relevant information where necessary (e.g., updating to the most current gas commodity prices).

The remaining sections in this workpaper provide details on key assumptions made within various model components.

TIME PERIODS IN MODELING

PLEXOS simulates the electric market on an hourly level, optimizing generation dispatch to meet load and ancillary service requirements in each hour of the forecast horizon. This results in 8,760 hours of simulation in non-leap years and 8,784 hours in leap years (e.g., 2020 and 2024). Although the model runs on an hourly time scale, many inputs are specified in less granular time steps. PLEXOS fills in hourly-level gaps as described in the examples below:

Hourly (e.g., electric load): Electric load is input at the hourly level for each hour of the forecast period. Since this is the time scale at which the model runs, PLEXOS makes no transformation to the data. For the 2022-2035 period, one electric load input would consist of a total of 122,712 data points.

Daily (e.g., scheduled maintenance): Units may be assumed offline for a number of days in PLEXOS. An illustrative example would be a nuclear plant that goes offline for scheduled maintenance on April 1, 2022 and returns to operation 45 days later on May 16, 2022. In this case, the unit would be assumed unavailable to dispatch for every hour starting 4/1/2022 at 12 am through 5/15/2022 at 11 pm and would then return to service on 4/16/2022 at midnight.

Monthly (e.g., gas prices): Gas prices are input on a monthly level which the model then applies to each hour. As an illustrative example, if a gas price of $2.00/Dth was applied on January 1st and a value of $3.00/Dth was applied on February 1st, the model would simulate prices of $2.00/Dth for every hour in January and $3.00/Dth for every hour thereafter.

Annual or Greater (e.g., Unit Additions and Retirements): Some inputs, once specified, are used throughout the forecast horizon. These are typically specified at one point in time and then applied for every hour after. One illustrative example would be the addition of a new solar resource on January 1, 2022. This unit would be turned “on” starting 1/1/2022 at 12 am and assumed on through December 31, 2026 at 11:59 pm unless otherwise specified to retire. Another illustrative example of a unit retirement would be a gas plant retiring on 12/31/2021 at midnight. In this case, the unit would then be off for every hour starting 1/1/2022 at 12 am and remain off through 12/31/2026 at 11:59 pm unless otherwise specified to return to operation. Another example is the treatment of ancillary services. Rather than specify reserve requirements in each hour of the forecast period, these are typically specified as a percent of relevant load. When running a simulation, PLEXOS multiplies the hourly load as specified in the “hourly” description above by the fixed percentage. This creates hourly reserve requirements as a function of load.

When relevant, the time granularity of each key assumption detailed in the remainder of this Workpaper will be specified in the relevant section.

GEOGRAPHICAL AREAS IN MODELING

In PLEXOS, the WECC was modeled as 26 regions, organized by large balancing authorities. Each of these regions contains one or more nodes with associated generators and all but one region is assigned an hourly electric demand (IV-NG is not assigned any electric demand). Those 26 regions are presented in Table 1.

Table 1: Geographic Regions in PLEXOS Model

REGION IN MODEL	GEOGRAPHICAL REGION/ BALANCING AUTHORITY REPRESENTED
AB	Alberta Electric System Operator
BC	British Columbia Hydro Authority
AZPS	Arizona Public Service Company
SRP	Salt River Project
TEPC	Tucson Electric Power Company
WALC	Western Area Power Administration, Lower Colorado Region
BANC	Balancing Authority of Northern California
IID	Imperial Irrigation District
IV-NG	Imperial Valley - North Gila
LADWP	Los Angeles Department of Water & Power
PG&E	California ISO - Pacific Gas & Electric Area
SCE	California ISO - Southern California Edison Area
SDGE	California ISO - San Diego Gas & Electric Area
TIDC	Turlock Irrigation District Control Area
CFE	Comision Federal de Electricidad (Northern Baja)
CO	Public Service Company of Colorado
Idaho	Idaho Power & PacifiCorp Idaho
MT	NorthWestern Energy & Western Area Power Administration, Upper Great Plains West
NM	El Paso Electric Company & Public Service Company of New Mexico
NEVP	Southern Nevada (Nevada Power)
SPPC	Northern Nevada (Sierra Pacific Power)
BPA	Bonneville Power Administration
NW	Avista, PUD No 1 of Chelan County, PUD No 1 of Douglas County, PUD of Grant County, Portland General Energy, Puget Sound Energy, Seattle City Light & Tacoma Power
PACW	PacifiCorp West
PAUT	PacifiCorp East - Utah & Utah Associated Municipal Power Systems
WY	PacifiCorp Wyoming and Western Power Colorado/Missouri

The 56 nodes within the 26 regions and their descriptions are presented in Table 2.

Table 2: Individual Nodes and Corresponding Regions in PLEXOS Model

REGION	NODE IN MODEL	NODE DESCRIPTION
AB	AESO	Alberta Electric System Operator
BC	BCHA	British Columbia Hydro and Power Authority

REGION	NODE IN MODEL	NODE DESCRIPTION
AZPS	APS	Arizona Public Service Co
AZPS	TH_PV	Palo Verde
SRP	SRP	Salt River Project Agricultural Improvement & Power
TEPC	TEPC	Tucson Electric Power Co
WALC	WALC	WAPA - WALC - AZ/California Border Area
BANC	MID	Modesto Irrigation District
BANC	RDNG	Redding Electric Dept
BANC	SMUD	Sacramento Municipal Utilities District
BANC	WAPA_BANC	WAPA - Mid Pacific (CVP)
IID	IID	Imperial Irrigation District
IV-NG	IV-NG	Imperial Valley - North Gila
LADWP	BURB	Burbank Public Service Dept
LADWP	GLEN	Glendale Public Service Dept
LADWP	LDWP	Los Angeles Department of Water and Power
PG&E	DWR-N	Dept of Water Resources - North
PG&E	NCPA_Bay	Northern California Power Agency Bay Area
PG&E	NCPA_Valley	Northern California Power Agency Valley
PG&E	PG&E	Pacific Gas & Electric
PG&E	SVP	Santa Clara Electric Dept
PG&E	WAPA_Valley	WAPA - Mid Pacific (CVP)
SCE	ANHM	Anaheim Public Utilities Dept.
SCE	DWR-S	Dept of Water Resources - South
SCE	MWD	Metropolitan Water District of Southern CA
SCE	PASA	Pasadena Water and Power Dept
SCE	RVSD	Riverside Utilities Dept
SCE	SCE	Southern California Edison
SCE	VERN	Vernon Municipal Light Dept
SCE	VEA	Valley Electric Association
SDGE	SDGE	San Diego Gas & Electric
TIDC	TID	Turlock Irrigation District
CFE	CFE	CFE - North Baja California
CO	PSCO	Public Service of Colorado - East
Idaho	IPFE	Far East Idaho Power
Idaho	IPMV	Mountain Valley Idaho Power
Idaho	IPTV	Treasure Valley Idaho Power
Idaho	PAID	PacifiCorp Idaho
MT	NWMT	Northwestern Energy - Broadview
MT	WAUW	WAPA - WAUW - MT North-Central
NM	EPE	El Paso Electric
NM	PNM	Public Service Co of New Mexico
NEVP	NEVP	Nevada Power Co
NEVP	TH_Mead	Mead/Marketplace Hub
SPPC	SPPC	Sierra Pacific Power Co
BPA	BPA	BPA - Mid Columbia
NW	AVA	Avista
NW	CHPD	PUD No 1 of Chelan County
NW	DOPD	PUD No 1 of Douglas County
NW	GCPD	PUD of Grant County

REGION	NODE IN MODEL	NODE DESCRIPTION
NW	PGE	Portland General Electric
NW	PSEI	Puget Sound Energy
NW	SCL	Seattle City Light
NW	TPWR	Tacoma Public Utilities-Tacoma Power
PACW	PACW	PACW - Lower Columbia
PAUT	PAUT	Utah Associated Municipal Power Systems
WY	WACM	WAPA - Colorado Missouri (Wyoming)
WY	PAWY	PACE - Central Wyoming

ELECTRIC ENERGY DEMAND

For areas within California for the 2022 to 2035 forecast period, PG&E used data from the 2021 IEPR from the CEC. For each PLEXOS region within the CAISO (the three Transmission Access Charge (TAC) Areas), PG&E used hourly managed forecasts using data published on the CEC's webpage. For the 2022 CGR, PG&E used a CEC forecast that utilized the IEPR's "Mid" demand forecast, Additional Achievable Energy Efficiency (AAEE) Scenario 3, and Additional Achievable Fuel Substitution (AAFS) Scenario 2. Since this forecast is not directly available on the IEPR website, PG&E used the "Mid Baseline – AAEE Scenario 3 – AAFS Scenario 3" files[1] for all inputs but AAFS. PG&E extracted AAFS Scenario 2 data from the "Low Baseline – AAEE Scenario 5 – AAFS Scenario 2" files[2] and combined with non-AAFS data from the "Mid" forecast.

For non-CAISO balancing authorities (BA), PG&E began with a file provided by the CEC that reflected annual load to serve for the "Mid Baseline – AAEE Scenario 3 – AAFS Scenario 2". Since the CEC does not publish hourly demand for non-CAISO balancing authorities, PG&E shaped the annual load to serve for each BA using the hourly data for the nearest CAISO TAC area. Table 3 presents the total monthly load to serve by PLEXOS region for balancing areas within California (excluding IV-NG).

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1 Hourly forecast for the non-AAFS data used in the 2022 CGR by TAC Area can be found on the CEC website:

CED 2021 Hourly Forecast - PGE - Mid Baseline - AAEE Scenario 3 - AAFS Scenario 3
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241185

CED 2021 Hourly Forecast - SCE - Mid Baseline - AAEE Scenario 3 - AAFS Scenario 3
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241181

CED 2021 Hourly Forecast - SDGE - Mid Baseline - AAEE Scenario 3 - AAFS Scenario 3
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241177

2 Hourly forecast for the non-AAFS data used in the 2022 CGR by TAC Area can be found on the CEC website:

CED 2021 Hourly Forecast - PGE - Low Baseline - AAEE Scenario 5 - AAFS Scenario 2
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241187

CED 2021 Hourly Forecast - SCE - Low Baseline - AAEE Scenario 5 - AAFS Scenario 2
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241181

CED 2021 Hourly Forecast - PGE - Low Baseline - AAEE Scenario 5 - AAFS Scenario 2
https://efiling.energy.ca.gov/GetDocument.aspx?tn=241177

Table 3: Monthly Managed Load to Serve by California Region, GWh

Month-Year	PG&E	SCE	SDGE	IID	LADWP	BANC	TIDC
Jan-22	8,027	8,226	1,597	339	2,046	1,325	240
Feb-22	7,018	7,208	1,385	288	1,896	1,114	205
Mar-22	7,603	7,972	1,450	295	2,110	1,179	219
Apr-22	7,241	7,757	1,349	271	2,076	1,118	208
May-22	7,988	8,310	1,419	288	2,177	1,268	232
Jun-22	8,942	9,449	1,534	312	2,361	1,540	269
Jul-22	9,886	10,773	1,751	378	2,658	1,760	302
Aug-22	9,831	11,240	1,869	420	2,811	1,748	300
Sep-22	8,955	10,419	1,845	406	2,573	1,521	266
Oct-22	8,078	9,190	1,718	358	2,244	1,282	234
Nov-22	7,653	8,189	1,549	313	1,953	1,198	220
Dec-22	8,469	8,716	1,703	350	2,079	1,355	244
Jan-23	8,225	8,562	1,662	343	2,051	1,341	242
Feb-23	7,189	7,545	1,435	288	1,888	1,120	205
Mar-23	7,772	8,332	1,497	294	2,180	1,181	219
Apr-23	7,407	8,126	1,398	272	2,244	1,124	209
May-23	8,233	8,774	1,480	290	2,315	1,288	234
Jun-23	9,135	9,811	1,565	315	2,470	1,566	273
Jul-23	10,005	11,114	1,782	381	2,698	1,765	303
Aug-23	9,945	11,584	1,900	422	2,833	1,759	302
Sep-23	9,037	10,658	1,863	404	2,599	1,515	265
Oct-23	8,232	9,511	1,749	358	2,228	1,296	235
Nov-23	7,807	8,486	1,580	315	2,080	1,210	222
Dec-23	8,582	8,993	1,731	350	2,112	1,356	244
Jan-24	8,419	8,907	1,700	343	2,087	1,347	242
Feb-24	7,600	8,110	1,519	298	2,012	1,161	213
Mar-24	7,857	8,634	1,533	288	2,208	1,160	215
Apr-24	7,568	8,515	1,446	275	2,270	1,144	211
May-24	8,387	9,202	1,530	292	2,338	1,312	237
Jun-24	9,195	10,433	1,550	315	2,480	1,573	274
Jul-24	10,153	11,847	1,798	392	2,677	1,797	308
Aug-24	10,013	12,141	1,884	424	2,797	1,757	302
Sep-24	9,112	11,300	1,871	401	2,511	1,505	264
Oct-24	8,409	10,217	1,767	355	2,234	1,292	234
Nov-24	7,890	9,094	1,585	315	2,022	1,214	222
Dec-24	8,724	9,673	1,750	351	2,108	1,359	244
Jan-25	8,602	9,559	1,701	347	2,067	1,359	244
Feb-25	7,484	8,421	1,470	293	1,905	1,138	207
Mar-25	8,018	9,251	1,525	297	2,186	1,194	220
Apr-25	7,746	9,236	1,446	275	2,262	1,134	210
May-25	8,503	9,923	1,520	290	2,310	1,291	234
Jun-25	9,342	10,933	1,574	307	2,390	1,511	265
Jul-25	10,313	12,206	1,812	381	2,698	1,809	310
Aug-25	10,132	12,404	1,886	411	2,790	1,765	304
Sep-25	9,227	11,601	1,884	422	2,612	1,583	275
Oct-25	8,442	10,454	1,772	371	2,335	1,335	241
Nov-25	7,982	9,311	1,591	312	2,061	1,199	219
Dec-25	8,830	9,959	1,762	354	2,128	1,387	248

Table 3: Monthly Managed Load to Serve by California Region, GWh

Month-Year	PG&E	SCE	SDGE	IID	LADWP	BANC	TIDC
Jan-26	8,683	9,775	1,707	346	2,084	1,355	243
Feb-26	7,581	8,633	1,478	293	1,935	1,141	207
Mar-26	8,131	9,526	1,534	299	2,261	1,202	221
Apr-26	7,793	9,527	1,452	277	2,322	1,139	210
May-26	8,486	10,139	1,512	290	2,330	1,291	234
Jun-26	9,346	10,903	1,576	312	2,420	1,550	271
Jul-26	10,303	12,197	1,813	387	2,717	1,822	312
Aug-26	10,118	12,402	1,884	415	2,774	1,770	304
Sep-26	9,349	11,695	1,897	422	2,600	1,587	276
Oct-26	8,541	10,495	1,779	369	2,296	1,325	239
Nov-26	8,118	9,388	1,604	314	2,055	1,206	220
Dec-26	8,959	10,019	1,775	357	2,139	1,396	249
Jan-27	8,755	9,805	1,711	344	2,103	1,354	243
Feb-27	7,662	8,697	1,486	294	1,946	1,144	207
Mar-27	8,224	9,674	1,548	301	2,279	1,212	222
Apr-27	7,846	9,772	1,458	278	2,336	1,147	211
May-27	8,536	10,378	1,520	290	2,390	1,294	234
Jun-27	9,353	11,161	1,568	314	2,431	1,575	274
Jul-27	10,339	12,338	1,801	391	2,712	1,835	315
Aug-27	10,241	12,708	1,900	422	2,793	1,792	308
Sep-27	9,444	11,945	1,908	422	2,597	1,587	276
Oct-27	8,615	10,713	1,787	367	2,320	1,316	237
Nov-27	8,214	9,679	1,622	317	2,068	1,223	222
Dec-27	9,044	10,232	1,784	358	2,146	1,401	250
Jan-28	8,872	9,925	1,725	346	2,112	1,365	244
Feb-28	8,017	9,079	1,546	304	2,032	1,188	215
Mar-28	8,285	9,825	1,547	297	2,295	1,200	219
Apr-28	7,823	9,924	1,441	275	2,311	1,141	209
May-28	8,663	10,807	1,530	293	2,401	1,315	236
Jun-28	9,457	11,466	1,567	321	2,467	1,617	280
Jul-28	10,301	12,472	1,798	391	2,689	1,829	314
Aug-28	10,331	12,965	1,920	435	2,822	1,823	312
Sep-28	9,433	12,039	1,899	415	2,562	1,563	272
Oct-28	8,718	10,923	1,801	365	2,294	1,324	237
Nov-28	8,315	9,848	1,630	319	2,063	1,234	223
Dec-28	9,138	10,414	1,793	356	2,150	1,389	247
Jan-29	8,995	10,074	1,744	350	2,174	1,388	246
Feb-29	7,810	8,874	1,502	293	2,007	1,150	207
Mar-29	8,323	9,940	1,543	296	2,321	1,198	218
Apr-29	7,897	10,292	1,444	277	2,318	1,164	211
May-29	8,712	11,221	1,534	295	2,478	1,334	238
Jun-29	9,531	11,877	1,578	322	2,615	1,637	283
Jul-29	10,451	12,677	1,813	398	2,749	1,852	316
Aug-29	10,424	13,118	1,933	438	2,855	1,841	315
Sep-29	9,519	12,097	1,906	411	2,595	1,560	271
Oct-29	8,846	11,062	1,818	368	2,380	1,338	239
Nov-29	8,393	9,927	1,643	321	2,125	1,249	224
Dec-29	9,279	10,504	1,810	358	2,206	1,400	248

Table 3: Monthly Managed Load to Serve by California Region, GWh

Month-Year	PG&E	SCE	SDGE	IID	LADWP	BANC	TIDC
Jan-30	9,107	10,159	1,758	354	2,208	1,401	247
Feb-30	7,899	8,923	1,510	297	2,076	1,172	209
Mar-30	8,367	10,074	1,550	302	2,363	1,222	220
Apr-30	8,003	10,407	1,460	276	2,380	1,153	208
May-30	8,779	11,340	1,541	297	2,526	1,334	237
Jun-30	9,568	11,993	1,581	306	2,530	1,553	269
Jul-30	10,603	12,848	1,833	389	2,779	1,863	317
Aug-30	10,473	13,156	1,926	423	2,865	1,856	316
Sep-30	9,626	12,207	1,925	431	2,735	1,638	282
Oct-30	8,948	11,155	1,832	380	2,501	1,383	244
Nov-30	8,470	9,960	1,647	318	2,197	1,231	220
Dec-30	9,419	10,620	1,829	358	2,266	1,427	251
Jan-31	9,259	10,243	1,773	353	2,267	1,407	246
Feb-31	8,017	9,026	1,525	296	2,142	1,173	207
Mar-31	8,473	10,161	1,565	300	2,413	1,227	219
Apr-31	8,083	10,650	1,470	277	2,451	1,165	208
May-31	8,851	11,386	1,539	292	2,563	1,333	235
Jun-31	9,707	12,158	1,596	313	2,618	1,583	271
Jul-31	10,732	13,076	1,848	392	2,837	1,903	321
Aug-31	10,528	13,204	1,923	424	2,921	1,858	314
Sep-31	9,766	12,443	1,953	437	2,807	1,661	283
Oct-31	9,074	11,302	1,850	381	2,541	1,389	242
Nov-31	8,602	10,067	1,656	318	2,227	1,241	219
Dec-31	9,594	10,806	1,850	362	2,311	1,444	251
Jan-32	9,355	10,345	1,779	351	2,319	1,405	244
Feb-32	8,390	9,453	1,584	305	2,256	1,218	213
Mar-32	8,640	10,387	1,583	301	2,459	1,244	219
Apr-32	8,184	10,816	1,480	277	2,508	1,178	207
May-32	8,869	11,589	1,544	289	2,588	1,334	232
Jun-32	9,798	12,395	1,609	318	2,699	1,647	279
Jul-32	10,756	13,128	1,844	399	2,910	1,924	323
Aug-32	10,676	13,483	1,948	432	2,995	1,882	315
Sep-32	9,880	12,617	1,965	434	2,864	1,661	281
Oct-32	9,119	11,361	1,850	374	2,598	1,366	236
Nov-32	8,761	10,275	1,679	320	2,274	1,265	220
Dec-32	9,748	10,951	1,873	364	2,377	1,454	250
Jan-33	9,496	10,483	1,796	352	2,407	1,418	244
Feb-33	8,227	9,367	1,554	297	2,234	1,192	206
Mar-33	8,757	10,640	1,601	302	2,518	1,257	218
Apr-33	8,240	11,076	1,487	277	2,544	1,190	207
May-33	8,998	11,854	1,565	293	2,646	1,361	234
Jun-33	9,959	12,876	1,630	327	2,805	1,690	282
Jul-33	10,865	13,486	1,854	401	3,016	1,939	322
Aug-33	10,873	13,915	1,979	448	3,117	1,930	320
Sep-33	9,988	12,828	1,976	433	2,970	1,673	279
Oct-33	9,257	11,584	1,863	377	2,695	1,395	237
Nov-33	8,927	10,513	1,698	326	2,404	1,299	221
Dec-33	9,873	11,138	1,879	367	2,486	1,470	250

Table 3: Monthly Managed Load to Serve by California Region, GWh

Month-Year	PG&E	SCE	SDGE	IID	LADWP	BANC	TIDC
Jan-34	9,665	10,746	1,815	357	2,484	1,438	245
Feb-34	8,364	9,593	1,565	298	2,289	1,208	205
Mar-34	8,876	11,049	1,619	303	2,581	1,268	217
Apr-34	8,317	11,362	1,488	278	2,583	1,209	206
May-34	9,167	12,269	1,584	298	2,733	1,395	236
Jun-34	10,118	13,173	1,642	333	2,886	1,731	286
Jul-34	10,993	13,851	1,864	407	3,087	1,943	321
Aug-34	11,032	14,280	1,994	453	3,181	1,946	320
Sep-34	10,055	13,118	1,983	433	3,034	1,679	276
Oct-34	9,411	11,820	1,880	380	2,768	1,424	237
Nov-34	9,102	10,711	1,714	330	2,497	1,324	222
Dec-34	9,979	11,302	1,888	370	2,578	1,483	248
Jan-35	9,839	11,012	1,835	360	2,570	1,461	245
Feb-35	8,491	9,934	1,582	300	2,338	1,217	204
Mar-35	8,981	11,420	1,629	303	2,625	1,273	213
Apr-35	8,475	11,698	1,504	282	2,652	1,240	207
May-35	9,312	12,582	1,592	301	2,815	1,421	236
Jun-35	10,187	13,422	1,638	336	3,035	1,761	286
Jul-35	11,191	14,244	1,883	416	3,214	1,971	323
Aug-35	11,173	14,714	2,008	457	3,270	1,959	321
Sep-35	10,154	13,422	1,990	428	3,075	1,675	274
Oct-35	9,595	12,089	1,902	383	2,851	1,446	237
Nov-35	9,214	10,889	1,723	334	2,574	1,347	222
Dec-35	10,138	11,484	1,902	373	2,658	1,506	247

To create the cold-year forecast, PG&E scaled load for the PG&E region by a monthly factor based on an increase in heating degree days relative to an average year. Table 4 summarizes monthly factors for the 2022 through 2035 forecast period.

Table 4: Cold-Year 1-in-10 Scaling Factor for PG&E Region Load

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	1.010	1.008	1.006	1.003	1.002	1.001	1.001	1.001	1.001	1.002	1.006	1.011
2023	1.010	1.007	1.005	1.003	1.002	1.001	1.001	1.001	1.001	1.002	1.006	1.011
2024	1.010	1.007	1.005	1.003	1.002	1.001	1.001	1.001	1.001	1.002	1.006	1.011
2025	1.010	1.007	1.005	1.003	1.002	1.001	1.001	1.001	1.001	1.002	1.006	1.011
2026	1.010	1.007	1.006	1.003	1.002	1.001	1.001	1.001	1.001	1.002	1.006	1.011
2027	1.010	1.007	1.006	1.003	1.002	1.001	1.001	1.000	1.001	1.002	1.006	1.011
2028	1.010	1.007	1.006	1.003	1.002	1.001	1.000	1.000	1.001	1.002	1.006	1.011
2029	1.010	1.007	1.006	1.003	1.002	1.001	1.000	1.000	1.001	1.002	1.006	1.011
2030	1.010	1.007	1.006	1.003	1.002	1.001	1.000	1.000	1.001	1.002	1.006	1.011
2031	1.010	1.007	1.006	1.003	1.002	1.001	1.000	1.000	1.001	1.002	1.006	1.011
2032	1.010	1.008	1.006	1.003	1.002	1.001	1.000	1.000	1.001	1.002	1.006	1.011
2033	1.010	1.008	1.006	1.003	1.002	1.001	1.000	1.000	1.000	1.002	1.006	1.012
2034	1.011	1.008	1.006	1.004	1.002	1.001	1.000	1.000	1.000	1.002	1.006	1.012
2035	1.011	1.008	1.006	1.004	1.002	1.001	1.000	1.000	1.000	1.003	1.007	1.012

For WECC regions outside California for all years, hourly demand was pre-defined by the CEC in the dataset provided to PG&E. Table 5 and

Table 6 present total monthly demand for the nine most northern regions and nine most south regions respectively.

Table 5: Monthly Managed Load to Serve by Northern WECC Region, GWh

Month-Year	AB	BC	Idaho	MT	BPA	NW	PACW	PAUT	WY
Jan-22	7,830	6,778	2,401	1,175	5,309	8,575	2,130	2,725	3,459
Feb-22	7,011	5,846	1,976	1,025	4,478	7,224	1,811	2,359	3,075
Mar-22	7,583	6,133	1,954	1,056	4,709	7,538	1,887	2,400	3,124
Apr-22	6,980	5,311	1,792	936	4,205	6,584	1,656	2,187	2,843
May-22	6,966	5,073	2,124	951	4,178	6,387	1,665	2,311	2,951
Jun-22	6,858	4,740	2,382	969	4,065	6,119	1,640	2,556	3,156
Jul-22	7,336	5,041	3,066	1,143	4,371	6,736	1,911	3,141	3,699
Aug-22	7,365	5,067	2,820	1,093	4,292	6,790	1,909	3,117	3,588
Sep-22	6,975	4,915	2,189	963	3,795	6,206	1,706	2,541	3,014
Oct-22	7,357	5,478	1,827	985	4,049	6,702	1,731	2,343	2,988
Nov-22	7,520	6,051	2,000	1,044	4,553	7,455	1,871	2,452	3,118
Dec-22	8,092	6,850	2,422	1,198	5,462	8,796	2,211	2,802	3,552
Jan-23	7,878	6,869	2,441	1,186	5,299	8,619	2,134	2,841	3,520
Feb-23	7,037	5,911	2,001	1,032	4,476	7,255	1,816	2,444	3,122
Mar-23	7,598	6,177	1,980	1,061	4,698	7,559	1,892	2,482	3,164
Apr-23	6,991	5,333	1,822	940	4,199	6,592	1,666	2,261	2,875
May-23	7,003	5,120	2,177	961	4,205	6,453	1,695	2,414	3,005
Jun-23	6,887	4,766	2,451	982	4,080	6,168	1,663	2,679	3,236
Jul-23	7,369	5,083	3,116	1,156	4,386	6,795	1,927	3,264	3,779
Aug-23	7,404	5,118	2,857	1,099	4,295	6,825	1,916	3,238	3,655
Sep-23	6,990	4,949	2,200	967	3,799	6,230	1,713	2,610	3,039
Oct-23	7,406	5,558	1,863	996	4,088	6,791	1,760	2,440	3,042
Nov-23	7,569	6,150	2,047	1,057	4,585	7,538	1,890	2,552	3,185
Dec-23	8,119	6,925	2,459	1,210	5,449	8,833	2,206	2,909	3,619
Jan-24	7,928	6,968	2,494	1,203	5,343	8,728	2,145	2,939	3,615
Feb-24	7,366	6,207	2,132	1,082	4,632	7,586	1,893	2,652	3,294
Mar-24	7,714	6,334	2,043	1,083	4,753	7,689	1,921	2,590	3,239
Apr-24	7,114	5,480	1,843	954	4,259	6,749	1,708	2,373	2,933
May-24	7,078	5,173	2,189	967	4,217	6,517	1,713	2,490	3,033
Jun-24	6,895	4,772	2,328	955	4,037	6,115	1,645	2,627	3,154
Jul-24	7,423	5,086	3,163	1,158	4,374	6,763	1,910	3,387	3,850
Aug-24	7,447	5,115	2,945	1,118	4,322	6,882	1,940	3,362	3,744
Sep-24	7,081	4,937	2,342	986	3,831	6,272	1,739	2,820	3,190
Oct-24	7,423	5,509	1,926	997	4,043	6,725	1,766	2,547	3,066
Nov-24	7,556	6,051	1,998	1,041	4,418	7,336	1,840	2,588	3,159
Dec-24	8,198	7,012	2,480	1,210	5,421	8,854	2,207	3,007	3,661
Jan-25	8,017	7,053	2,529	1,213	5,323	8,765	2,145	3,060	3,682
Feb-25	7,187	6,075	2,093	1,056	4,479	7,371	1,836	2,657	3,244
Mar-25	7,785	6,393	2,080	1,092	4,753	7,730	1,934	2,695	3,291
Apr-25	7,183	5,532	1,891	964	4,278	6,804	1,731	2,471	2,984
May-25	7,143	5,220	2,240	978	4,236	6,568	1,738	2,589	3,090
Jun-25	6,987	4,844	2,407	973	4,083	6,215	1,680	2,769	3,246
Jul-25	7,511	5,163	3,223	1,174	4,408	6,864	1,937	3,534	3,944
Aug-25	7,515	5,162	2,977	1,125	4,329	6,915	1,942	3,482	3,813
Sep-25	7,162	5,019	2,378	997	3,871	6,362	1,766	2,925	3,244
Oct-25	7,514	5,604	1,967	1,010	4,088	6,823	1,795	2,651	3,131
Nov-25	7,640	6,144	2,049	1,055	4,457	7,426	1,862	2,697	3,227
Dec-25	8,295	7,125	2,534	1,227	5,437	8,942	2,214	3,143	3,750

Table 5: Monthly Managed Load to Serve by Northern WECC Region, GWh

Month-Year	AB	BC	Idaho	MT	BPA	NW	PACW	PAUT	WY
Jan-26	8,078	7,127	2,562	1,221	5,303	8,787	2,140	3,169	3,741
Feb-26	7,248	6,150	2,127	1,067	4,485	7,418	1,844	2,757	3,303
Mar-26	7,845	6,449	2,113	1,099	4,746	7,764	1,945	2,799	3,336
Apr-26	7,230	5,565	1,932	970	4,279	6,832	1,747	2,563	3,023
May-26	7,179	5,237	2,278	983	4,234	6,583	1,753	2,678	3,130
Jun-26	7,061	4,891	2,487	989	4,110	6,288	1,709	2,915	3,337
Jul-26	7,576	5,215	3,281	1,185	4,422	6,930	1,955	3,679	4,031
Aug-26	7,576	5,201	3,014	1,133	4,332	6,952	1,949	3,613	3,883
Sep-26	7,209	5,064	2,400	1,002	3,883	6,400	1,780	3,015	3,283
Oct-26	7,577	5,663	1,995	1,017	4,103	6,875	1,811	2,742	3,178
Nov-26	7,728	6,256	2,107	1,070	4,501	7,537	1,889	2,821	3,300
Dec-26	8,369	7,215	2,577	1,242	5,434	9,000	2,212	3,266	3,828
Jan-27	8,166	7,211	2,599	1,230	5,286	8,819	2,140	3,289	3,798
Feb-27	7,323	6,218	2,159	1,075	4,484	7,455	1,850	2,859	3,361
Mar-27	7,928	6,508	2,150	1,106	4,746	7,806	1,958	2,910	3,386
Apr-27	7,299	5,594	1,972	976	4,278	6,857	1,763	2,653	3,062
May-27	7,255	5,270	2,320	988	4,241	6,614	1,771	2,777	3,176
Jun-27	7,145	4,918	2,567	1,004	4,130	6,351	1,735	3,064	3,431
Jul-27	7,657	5,251	3,333	1,196	4,428	6,978	1,967	3,816	4,113
Aug-27	7,670	5,255	3,060	1,142	4,344	7,010	1,961	3,763	3,963
Sep-27	7,281	5,108	2,419	1,007	3,891	6,438	1,794	3,105	3,319
Oct-27	7,662	5,717	2,020	1,024	4,118	6,923	1,827	2,832	3,225
Nov-27	7,836	6,377	2,169	1,086	4,548	7,651	1,914	2,953	3,380
Dec-27	8,460	7,309	2,622	1,255	5,431	9,060	2,211	3,395	3,905
Jan-28	8,249	7,303	2,639	1,240	5,272	8,860	2,140	3,418	3,903
Feb-28	7,650	6,500	2,260	1,118	4,633	7,742	1,916	3,061	3,573
Mar-28	7,962	6,514	2,164	1,104	4,710	7,785	1,955	2,988	3,487
Apr-28	7,316	5,560	1,998	974	4,240	6,806	1,761	2,719	3,170
May-28	7,325	5,297	2,381	995	4,258	6,670	1,796	2,904	3,328
Jun-28	7,206	4,913	2,670	1,020	4,130	6,379	1,754	3,233	3,605
Jul-28	7,716	5,262	3,376	1,207	4,420	7,011	1,975	3,949	4,232
Aug-28	7,754	5,301	3,097	1,145	4,336	7,040	1,967	3,917	4,080
Sep-28	7,316	5,124	2,402	1,004	3,867	6,430	1,793	3,149	3,386
Oct-28	7,756	5,804	2,047	1,034	4,148	7,014	1,850	2,936	3,366
Nov-28	7,937	6,501	2,230	1,102	4,592	7,762	1,936	3,076	3,530
Dec-28	8,520	7,371	2,658	1,265	5,408	9,079	2,200	3,515	4,009
Jan-29	8,333	7,433	2,712	1,263	5,321	9,000	2,157	3,565	4,021
Feb-29	7,467	6,365	2,253	1,094	4,475	7,558	1,864	3,104	3,532
Mar-29	8,127	6,765	2,267	1,141	4,810	8,014	1,999	3,163	3,616
Apr-29	7,462	5,776	2,033	999	4,324	7,022	1,811	2,864	3,265
May-29	7,421	5,416	2,405	1,012	4,309	6,812	1,830	3,022	3,388
Jun-29	7,234	4,989	2,547	998	4,131	6,409	1,761	3,175	3,520
Jul-29	7,769	5,283	3,423	1,208	4,424	6,988	1,961	4,086	4,313
Aug-29	7,826	5,368	3,220	1,177	4,411	7,192	2,008	4,090	4,209
Sep-29	7,424	5,142	2,586	1,033	3,935	6,523	1,828	3,433	3,595
Oct-29	7,777	5,761	2,142	1,042	4,131	6,983	1,869	3,090	3,424
Nov-29	7,934	6,399	2,198	1,090	4,457	7,595	1,910	3,145	3,525
Dec-29	8,615	7,472	2,688	1,266	5,379	9,103	2,203	3,634	4,062

Table 5: Monthly Managed Load to Serve by Northern WECC Region, GWh

Month-Year	AB	BC	Idaho	MT	BPA	NW	PACW	PAUT	WY
Jan-30	8,421	7,523	2,753	1,273	5,302	9,038	2,157	3,705	4,095
Feb-30	7,547	6,445	2,291	1,105	4,477	7,605	1,871	3,219	3,596
Mar-30	8,182	6,797	2,296	1,145	4,790	8,019	2,004	3,262	3,656
Apr-30	7,532	5,823	2,085	1,006	4,336	7,075	1,830	2,989	3,319
May-30	7,485	5,450	2,463	1,019	4,319	6,856	1,852	3,136	3,446
Jun-30	7,294	5,007	2,607	1,007	4,140	6,445	1,779	3,309	3,597
Jul-30	7,864	5,356	3,499	1,226	4,452	7,091	1,986	4,269	4,422
Aug-30	7,890	5,390	3,259	1,182	4,405	7,208	2,010	4,237	4,283
Sep-30	7,497	5,200	2,618	1,040	3,952	6,587	1,846	3,553	3,646
Oct-30	7,863	5,842	2,183	1,052	4,162	7,064	1,892	3,208	3,487
Nov-30	8,018	6,485	2,245	1,101	4,473	7,660	1,924	3,261	3,588
Dec-30	8,712	7,578	2,743	1,282	5,388	9,188	2,207	3,789	4,154
Jan-31	8,512	7,614	2,801	1,283	5,290	9,087	2,158	3,862	3,230
Feb-31	7,628	6,533	2,334	1,116	4,481	7,658	1,879	3,351	2,833
Mar-31	8,255	6,843	2,338	1,151	4,779	8,049	2,014	3,395	2,765
Apr-31	7,599	5,855	2,138	1,013	4,341	7,115	1,848	3,111	2,459
May-31	7,547	5,471	2,520	1,026	4,322	6,887	1,871	3,261	2,588
Jun-31	7,386	5,056	2,693	1,022	4,167	6,526	1,805	3,491	2,884
Jul-31	7,950	5,410	3,567	1,239	4,467	7,169	2,005	4,449	3,581
Aug-31	7,958	5,410	3,298	1,187	4,398	7,227	2,011	4,398	3,417
Sep-31	7,571	5,263	2,647	1,046	3,970	6,654	1,865	3,671	2,743
Oct-31	7,955	5,924	2,227	1,062	4,188	7,145	1,913	3,338	2,645
Nov-31	8,111	6,578	2,302	1,115	4,501	7,748	1,941	3,399	2,819
Dec-31	8,816	7,687	2,802	1,296	5,384	9,256	2,208	3,967	3,344
Jan-32	8,574	7,682	2,835	1,289	5,265	9,102	2,152	3,990	3,313
Feb-32	7,957	6,827	2,446	1,163	4,633	7,954	1,948	3,578	2,977
Mar-32	8,309	6,870	2,366	1,152	4,756	8,057	2,019	3,518	2,831
Apr-32	7,623	5,839	2,180	1,012	4,316	7,097	1,855	3,202	2,501
May-32	7,563	5,446	2,572	1,026	4,301	6,872	1,879	3,375	2,618
Jun-32	7,457	5,067	2,814	1,043	4,180	6,588	1,829	3,712	2,877
Jul-32	8,008	5,435	3,618	1,246	4,462	7,214	2,016	4,617	3,648
Aug-32	8,023	5,438	3,333	1,191	4,385	7,252	2,014	4,571	3,493
Sep-32	7,607	5,286	2,654	1,046	3,957	6,664	1,872	3,762	2,857
Oct-32	8,014	5,963	2,237	1,063	4,181	7,171	1,921	3,421	2,652
Nov-32	8,220	6,735	2,377	1,130	4,553	7,885	1,964	3,568	2,826
Dec-32	8,920	7,804	2,859	1,314	5,394	9,349	2,211	4,135	3,392
Jan-33	8,691	7,791	2,889	1,301	5,254	9,153	2,158	4,161	3,369
Feb-33	7,780	6,674	2,411	1,134	4,481	7,747	1,892	3,604	2,929
Mar-33	8,399	6,937	2,415	1,161	4,762	8,114	2,036	3,652	2,860
Apr-33	7,708	5,878	2,236	1,022	4,329	7,145	1,877	3,323	2,526
May-33	7,680	5,521	2,644	1,041	4,343	6,978	1,913	3,535	2,662
Jun-33	7,568	5,126	2,911	1,062	4,214	6,679	1,859	3,901	2,962
Jul-33	8,099	5,483	3,668	1,258	4,477	7,279	2,030	4,781	3,724
Aug-33	8,145	5,529	3,398	1,204	4,418	7,352	2,034	4,772	3,560
Sep-33	7,705	5,362	2,688	1,055	3,987	6,741	1,894	3,878	2,886
Oct-33	8,135	6,068	2,291	1,079	4,229	7,284	1,950	3,563	2,696
Nov-33	8,337	6,862	2,449	1,149	4,593	8,004	1,987	3,732	2,885
Dec-33	9,015	7,908	2,918	1,329	5,388	9,412	2,211	4,305	3,466

Table 5: Monthly Managed Load to Serve by Northern WECC Region, GWh

Month-Year	AB	BC	Idaho	MT	BPA	NW	PACW	PAUT	WY
Jan-34	8,796	7,898	2,942	1,314	5,243	9,207	2,160	4,342	3,425
Feb-34	7,853	6,748	2,448	1,142	4,480	7,789	1,898	3,729	2,971
Mar-34	8,463	6,982	2,456	1,167	4,754	8,149	2,047	3,755	2,880
Apr-34	7,765	5,896	2,281	1,027	4,327	7,166	1,892	3,405	2,538
May-34	7,768	5,574	2,713	1,052	4,368	7,057	1,941	3,668	2,695
Jun-34	7,646	5,153	2,998	1,076	4,229	6,741	1,881	4,087	3,043
Jul-34	8,177	5,521	3,728	1,271	4,488	7,345	2,043	4,984	3,798
Aug-34	8,236	5,587	3,448	1,210	4,424	7,401	2,044	4,980	3,621
Sep-34	7,766	5,398	2,710	1,060	3,994	6,777	1,907	3,976	2,898
Oct-34	8,239	6,164	2,340	1,091	4,264	7,386	1,976	3,686	2,727
Nov-34	8,447	6,982	2,513	1,165	4,623	8,109	2,004	3,881	2,946
Dec-34	9,091	7,986	2,965	1,339	5,373	9,446	2,207	4,469	3,528
Jan-35	8,874	8,029	3,015	1,336	5,287	9,351	2,171	4,487	3,488
Feb-35	7,941	6,839	2,523	1,155	4,477	7,864	1,909	3,901	3,047
Mar-35	8,639	7,244	2,558	1,202	4,830	8,355	2,075	3,971	2,957
Apr-35	7,921	6,111	2,310	1,048	4,384	7,355	1,928	3,593	2,592
May-35	7,871	5,672	2,717	1,061	4,390	7,153	1,963	3,793	2,722
Jun-35	7,675	5,200	2,863	1,048	4,213	6,741	1,888	3,989	3,024
Jul-35	8,243	5,521	3,800	1,274	4,486	7,322	2,038	5,127	3,884
Aug-35	8,312	5,624	3,575	1,241	4,473	7,527	2,071	5,148	3,724
Sep-35	7,872	5,380	2,888	1,082	4,031	6,837	1,930	4,294	2,992
Oct-35	8,258	6,078	2,435	1,094	4,230	7,326	1,989	3,878	2,793
Nov-35	8,460	6,882	2,498	1,155	4,524	7,978	1,995	3,970	2,987
Dec-35	9,167	8,058	2,987	1,337	5,333	9,448	2,203	4,567	3,587

Table 6: Monthly Managed Load to Serve by Southern WECC Region, GWh

Month-Year	AZPS	SRP	TEPC	WALC	NM	CFE	CO	NEVP	SPPC
Jan-22	2,327	2,309	1,201	561	2,009	1,067	3,797	1,892	1,058
Feb-22	1,998	2,057	1,053	528	1,740	986	3,380	1,646	915
Mar-22	2,062	2,166	1,097	597	1,785	1,109	3,448	1,764	941
Apr-22	2,104	2,241	1,095	645	1,726	1,082	3,161	1,767	858
May-22	2,701	2,845	1,302	775	1,995	1,296	3,281	2,222	929
Jun-22	3,315	3,393	1,538	856	2,386	1,474	3,762	2,706	995
Jul-22	4,015	3,976	1,713	895	2,567	1,758	4,277	3,325	1,207
Aug-22	4,004	3,994	1,722	912	2,598	1,794	4,180	3,157	1,168
Sep-22	3,301	3,340	1,471	793	2,140	1,578	3,463	2,559	1,003
Oct-22	2,441	2,448	1,197	666	1,848	1,246	3,292	1,945	900
Nov-22	2,004	2,009	1,090	703	1,796	1,103	3,409	1,733	941
Dec-22	2,298	2,331	1,204	753	2,068	1,084	3,899	1,905	1,114
Jan-23	2,357	2,368	1,218	566	2,063	1,107	3,798	1,909	1,067
Feb-23	2,021	2,086	1,066	541	1,776	1,017	3,360	1,661	922
Mar-23	2,088	2,186	1,113	610	1,821	1,141	3,427	1,782	947
Apr-23	2,135	2,298	1,110	648	1,762	1,112	3,131	1,787	863
May-23	2,765	2,923	1,326	781	2,056	1,348	3,290	2,260	943
Jun-23	3,412	3,493	1,565	853	2,447	1,527	3,770	2,755	1,010
Jul-23	4,078	4,031	1,724	882	2,623	1,808	4,254	3,348	1,219
Aug-23	4,078	4,062	1,734	905	2,647	1,847	4,159	3,180	1,176
Sep-23	3,324	3,363	1,474	789	2,162	1,609	3,408	2,556	1,004
Oct-23	2,453	2,461	1,207	667	1,888	1,278	3,295	1,950	910
Nov-23	2,026	2,050	1,105	706	1,843	1,134	3,413	1,752	953
Dec-23	2,333	2,368	1,221	751	2,116	1,107	3,895	1,922	1,124
Jan-24	2,426	2,476	1,240	610	2,116	1,118	3,811	1,948	1,083
Feb-24	2,122	2,200	1,120	549	1,896	1,076	3,471	1,735	968
Mar-24	2,104	2,226	1,131	606	1,866	1,158	3,441	1,792	964
Apr-24	2,121	2,301	1,114	654	1,787	1,142	3,162	1,779	878
May-24	2,726	2,897	1,309	758	2,047	1,353	3,252	2,213	941
Jun-24	3,237	3,355	1,502	819	2,401	1,505	3,548	2,625	980
Jul-24	4,192	4,154	1,759	893	2,704	1,855	4,294	3,360	1,217
Aug-24	4,141	4,109	1,744	891	2,695	1,897	4,117	3,252	1,198
Sep-24	3,513	3,553	1,530	794	2,276	1,696	3,523	2,673	1,034
Oct-24	2,635	2,664	1,263	694	1,977	1,376	3,285	2,059	932
Nov-24	2,040	2,076	1,113	689	1,835	1,164	3,329	1,751	934
Dec-24	2,324	2,348	1,225	758	2,160	1,164	3,856	1,922	1,121
Jan-25	2,456	2,500	1,258	611	2,169	1,162	3,795	1,964	1,092
Feb-25	2,079	2,171	1,098	546	1,874	1,073	3,355	1,697	944
Mar-25	2,135	2,280	1,152	620	1,914	1,197	3,439	1,816	974
Apr-25	2,170	2,369	1,138	663	1,838	1,183	3,165	1,809	889
May-25	2,783	2,964	1,333	762	2,103	1,397	3,256	2,247	954
Jun-25	3,341	3,442	1,534	819	2,475	1,564	3,590	2,683	1,001
Jul-25	4,271	4,220	1,774	884	2,762	1,916	4,283	3,405	1,233
Aug-25	4,206	4,167	1,756	882	2,747	1,944	4,104	3,259	1,204
Sep-25	3,563	3,598	1,543	790	2,323	1,748	3,513	2,689	1,043
Oct-25	2,647	2,684	1,272	696	2,016	1,404	3,292	2,059	942
Nov-25	2,069	2,135	1,132	696	1,886	1,195	3,328	1,775	949
Dec-25	2,376	2,437	1,249	761	2,222	1,203	3,868	1,954	1,137

Table 6: Monthly Managed Load to Serve by Southern WECC Region, GWh

Month-Year	AZPS	SRP	TEPC	WALC	NM	CFE	CO	NEVP	SPPC
Jan-26	2,477	2,534	1,270	613	2,211	1,193	3,767	1,976	1,100
Feb-26	2,103	2,225	1,113	559	1,916	1,106	3,346	1,714	951
Mar-26	2,163	2,336	1,170	631	1,959	1,238	3,434	1,834	982
Apr-26	2,203	2,420	1,155	669	1,882	1,220	3,154	1,831	896
May-26	2,835	3,032	1,352	765	2,149	1,437	3,237	2,274	961
Jun-26	3,452	3,553	1,567	818	2,551	1,630	3,629	2,743	1,018
Jul-26	4,345	4,284	1,785	872	2,816	1,976	4,253	3,441	1,248
Aug-26	4,278	4,237	1,771	874	2,806	1,998	4,090	3,268	1,210
Sep-26	3,601	3,639	1,550	784	2,359	1,794	3,484	2,697	1,048
Oct-26	2,648	2,697	1,278	695	2,041	1,429	3,276	2,055	945
Nov-26	2,099	2,183	1,152	704	1,945	1,233	3,344	1,797	965
Dec-26	2,417	2,493	1,268	761	2,275	1,234	3,862	1,976	1,149
Jan-27	2,498	2,569	1,284	617	2,258	1,229	3,745	1,989	1,107
Feb-27	2,131	2,271	1,129	572	1,960	1,139	3,338	1,730	959
Mar-27	2,191	2,391	1,187	643	2,005	1,283	3,428	1,854	990
Apr-27	2,239	2,475	1,174	675	1,926	1,256	3,143	1,854	904
May-27	2,892	3,100	1,372	767	2,199	1,485	3,231	2,306	970
Jun-27	3,565	3,664	1,598	817	2,626	1,690	3,668	2,798	1,035
Jul-27	4,407	4,340	1,792	860	2,864	2,032	4,219	3,470	1,260
Aug-27	4,365	4,324	1,790	866	2,871	2,059	4,089	3,288	1,219
Sep-27	3,631	3,672	1,555	778	2,393	1,835	3,446	2,697	1,053
Oct-27	2,650	2,713	1,284	696	2,067	1,451	3,257	2,055	948
Nov-27	2,130	2,221	1,172	711	2,005	1,276	3,354	1,820	981
Dec-27	2,455	2,547	1,286	759	2,329	1,264	3,854	1,997	1,161
Jan-28	2,518	2,676	1,316	620	2,307	1,268	3,728	1,998	1,114
Feb-28	2,227	2,466	1,201	604	2,069	1,216	3,430	1,803	998
Mar-28	2,207	2,498	1,219	656	2,032	1,317	3,391	1,866	990
Apr-28	2,269	2,587	1,208	677	1,956	1,283	3,098	1,870	902
May-28	2,979	3,242	1,420	775	2,277	1,554	3,246	2,360	986
Jun-28	3,712	3,828	1,648	816	2,710	1,761	3,703	2,871	1,054
Jul-28	4,458	4,412	1,804	845	2,908	2,084	4,177	3,487	1,270
Aug-28	4,458	4,440	1,814	861	2,929	2,129	4,080	3,312	1,226
Sep-28	3,614	3,693	1,558	772	2,395	1,854	3,352	2,665	1,047
Oct-28	2,624	2,766	1,304	695	2,095	1,474	3,251	2,038	951
Nov-28	2,143	2,325	1,206	716	2,059	1,309	3,360	1,834	995
Dec-28	2,487	2,653	1,320	754	2,376	1,278	3,829	2,010	1,171
Jan-29	2,609	2,788	1,347	659	2,387	1,298	3,757	2,050	1,134
Feb-29	2,194	2,404	1,183	579	2,067	1,203	3,317	1,767	981
Mar-29	2,257	2,571	1,252	661	2,112	1,353	3,439	1,897	1,019
Apr-29	2,248	2,583	1,217	683	1,990	1,314	3,140	1,867	925
May-29	2,927	3,207	1,405	760	2,270	1,563	3,233	2,311	989
Jun-29	3,493	3,656	1,585	793	2,662	1,734	3,503	2,719	1,027
Jul-29	4,573	4,528	1,841	854	2,998	2,126	4,216	3,486	1,266
Aug-29	4,544	4,509	1,831	851	3,000	2,192	4,073	3,406	1,256
Sep-29	3,857	3,928	1,623	778	2,540	1,964	3,494	2,808	1,087
Oct-29	2,881	3,018	1,378	721	2,214	1,611	3,268	2,189	984
Nov-29	2,185	2,407	1,225	707	2,065	1,355	3,301	1,849	981
Dec-29	2,480	2,688	1,331	761	2,426	1,355	3,795	2,020	1,169

Table 6: Monthly Managed Load to Serve by Southern WECC Region, GWh

Month-Year	AZPS	SRP	TEPC	WALC	NM	CFE	CO	NEVP	SPPC
Jan-30	2,640	2,840	1,364	663	2,444	1,343	3,746	2,065	1,143
Feb-30	2,220	2,464	1,197	590	2,110	1,240	3,306	1,783	989
Mar-30	2,271	2,617	1,268	670	2,149	1,385	3,414	1,911	1,024
Apr-30	2,298	2,659	1,240	691	2,044	1,365	3,138	1,895	935
May-30	2,991	3,285	1,429	762	2,330	1,613	3,228	2,343	1,000
Jun-30	3,582	3,743	1,609	789	2,724	1,790	3,508	2,767	1,039
Jul-30	4,673	4,615	1,858	845	3,069	2,203	4,215	3,532	1,283
Aug-30	4,615	4,572	1,843	843	3,054	2,252	4,047	3,420	1,263
Sep-30	3,901	3,973	1,635	773	2,585	2,014	3,480	2,817	1,093
Oct-30	2,886	3,052	1,385	721	2,254	1,641	3,261	2,184	991
Nov-30	2,203	2,457	1,241	713	2,111	1,391	3,291	1,867	992
Dec-30	2,526	2,758	1,351	762	2,492	1,391	3,797	2,044	1,184
Jan-31	2,671	2,885	1,383	666	2,503	1,389	3,728	2,080	1,154
Feb-31	2,250	2,521	1,216	601	2,160	1,281	3,302	1,802	998
Mar-31	2,297	2,681	1,290	680	2,198	1,430	3,410	1,930	1,031
Apr-31	2,345	2,745	1,264	698	2,096	1,413	3,133	1,920	943
May-31	3,051	3,366	1,453	764	2,389	1,665	3,228	2,374	1,011
Jun-31	3,698	3,860	1,641	786	2,806	1,862	3,535	2,826	1,057
Jul-31	4,761	4,691	1,869	836	3,129	2,275	4,182	3,577	1,298
Aug-31	4,689	4,642	1,857	836	3,112	2,310	4,024	3,425	1,268
Sep-31	3,934	4,012	1,642	769	2,627	2,074	3,454	2,825	1,099
Oct-31	2,893	3,078	1,396	723	2,294	1,674	3,253	2,180	998
Nov-31	2,227	2,502	1,261	717	2,167	1,427	3,285	1,885	1,003
Dec-31	2,574	2,830	1,375	763	2,562	1,439	3,799	2,071	1,198
Jan-32	2,681	2,916	1,394	666	2,542	1,418	3,688	2,087	1,157
Feb-32	2,339	2,652	1,272	631	2,272	1,355	3,398	1,874	1,035
Mar-32	2,315	2,723	1,303	688	2,240	1,482	3,379	1,943	1,034
Apr-32	2,378	2,801	1,282	700	2,139	1,451	3,103	1,940	945
May-32	3,129	3,456	1,477	765	2,439	1,717	3,194	2,412	1,018
Jun-32	3,879	4,028	1,687	786	2,912	1,953	3,602	2,917	1,080
Jul-32	4,812	4,735	1,875	824	3,185	2,347	4,149	3,604	1,310
Aug-32	4,776	4,730	1,876	828	3,183	2,378	4,016	3,425	1,271
Sep-32	3,955	4,040	1,645	762	2,653	2,120	3,394	2,812	1,099
Oct-32	2,840	3,047	1,390	719	2,295	1,676	3,212	2,149	991
Nov-32	2,257	2,558	1,281	725	2,238	1,476	3,302	1,907	1,022
Dec-32	2,615	2,890	1,393	760	2,623	1,476	3,797	2,093	1,215
Jan-33	2,705	2,966	1,415	667	2,604	1,475	3,683	2,105	1,168
Feb-33	2,304	2,628	1,253	627	2,259	1,359	3,279	1,837	1,012
Mar-33	2,351	2,799	1,327	701	2,293	1,533	3,371	1,970	1,045
Apr-33	2,423	2,871	1,307	707	2,190	1,495	3,098	1,969	955
May-33	3,210	3,551	1,508	770	2,517	1,786	3,222	2,459	1,037
Jun-33	4,001	4,137	1,719	784	2,999	2,026	3,630	2,972	1,099
Jul-33	4,881	4,798	1,887	816	3,236	2,402	4,111	3,626	1,320
Aug-33	4,883	4,828	1,898	823	3,262	2,459	4,027	3,458	1,284
Sep-33	3,985	4,078	1,654	759	2,694	2,165	3,359	2,814	1,108
Oct-33	2,855	3,081	1,407	725	2,343	1,718	3,220	2,160	1,002
Nov-33	2,295	2,626	1,307	731	2,308	1,525	3,318	1,936	1,040
Dec-33	2,666	2,967	1,418	762	2,693	1,516	3,789	2,122	1,230

Table 6: Monthly Managed Load to Serve by Southern WECC Region, GWh

Month-Year	AZPS	SRP	TEPC	WALC	NM	CFE	CO	NEVP	SPPC
Jan-34	2,739	3,026	1,435	673	2,671	1,532	3,673	2,124	1,177
Feb-34	2,329	2,694	1,269	638	2,304	1,399	3,264	1,854	1,020
Mar-34	2,380	2,862	1,347	711	2,336	1,575	3,352	1,991	1,052
Apr-34	2,459	2,936	1,326	712	2,235	1,535	3,077	1,991	961
May-34	3,289	3,646	1,535	772	2,592	1,855	3,230	2,501	1,052
Jun-34	4,120	4,257	1,749	780	3,077	2,096	3,648	3,025	1,115
Jul-34	4,956	4,868	1,901	807	3,301	2,469	4,095	3,650	1,332
Aug-34	4,972	4,913	1,912	817	3,322	2,530	4,010	3,483	1,293
Sep-34	4,009	4,109	1,661	756	2,723	2,206	3,318	2,811	1,109
Oct-34	2,864	3,116	1,422	729	2,392	1,760	3,226	2,166	1,013
Nov-34	2,325	2,676	1,328	732	2,373	1,572	3,325	1,959	1,055
Dec-34	2,701	3,018	1,437	762	2,750	1,542	3,773	2,139	1,240
Jan-35	2,836	3,149	1,464	705	2,750	1,553	3,695	2,169	1,196
Feb-35	2,371	2,731	1,292	630	2,379	1,434	3,258	1,874	1,035
Mar-35	2,425	2,931	1,379	716	2,421	1,612	3,395	2,015	1,078
Apr-35	2,423	2,935	1,336	716	2,266	1,566	3,107	1,981	980
May-35	3,205	3,592	1,519	764	2,576	1,859	3,194	2,441	1,047
Jun-35	3,861	4,062	1,689	765	3,016	2,060	3,445	2,863	1,085
Jul-35	5,096	5,001	1,937	809	3,393	2,522	4,113	3,664	1,333
Aug-35	5,063	4,993	1,930	807	3,397	2,600	3,995	3,580	1,322
Sep-35	4,258	4,336	1,717	757	2,871	2,325	3,425	2,950	1,145
Oct-35	3,151	3,386	1,493	742	2,514	1,916	3,228	2,315	1,042
Nov-35	2,355	2,737	1,347	730	2,380	1,621	3,274	1,968	1,043
Dec-35	2,684	3,029	1,449	764	2,793	1,614	3,726	2,141	1,232

LOCAL AREA GENERATION REQUIREMENTS

For non-PG&E regions, modeling constraints were applied to certain local areas and regions in the PLEXOS model using CEC's assumptions[3]. Table 7 summarizes the local requirements for these regions. In some cases, the requirements change from year to year. Each of these is also presented in the table.

Table 7: California, Non-PG&E Regional Generation Requirements as Percent of Regional Demand

Region	Years Effective	% of Local Load to be Served
BANC + TIDC	2022-2035	25%
IID	2022-2035	20%
LADWP	2022-2023	25%
SDGE	2022-2023	10%
SDGE	2024-2035	17%

PG&E assumed two additional generation requirements for specific areas within PG&E's service territory based on historical generation minimum levels. To create these constraints, PG&E analyzed historic monthly generation for the affected areas/generators from Form EIA-923 from January 2015 through December 2020.[4] The minimum generation requirement was selected to be the lowest GWh value over the 6-year period, by month, for each of the twelve months. Table 8 below summarizes these monthly requirements.

Table 8: PG&E Monthly Local Minimum Generation Requirements, GWh

Month	Bay Area	Humboldt
Jan	1,181	22
Feb	652	20
Mar	466	21
Apr	307	24
May	288	22
Jun	544	24
Jul	1,077	36
Aug	1,282	35
Sep	886	29
Oct	855	32
Nov	730	22
Dec	1,112	28

3 Four of these were present in the dataset provided to PG&E by the CEC, requiring some fraction of the demand in these regions to be served by specific generators within each local area.

4 EIA Form 923 Annual data was used for 2015 through 2019https://www.eia.gov/electricity/data/eia923/

NATURAL GAS PRICE FORECAST

The 2022 CGR gas price forecast was developed using a combination of market prices and fundamental long -term forecasts. For the 2022 through 2027 period, the gas prices represent a blend of contract futures prices from the Chicago Mercantile Exchange and S&P Global basis differentials to Henry Hub. For 2030 and beyond, S&P Global fundamental price forecasts were used. The forecasts for 2028 and 2029 reflect a blending of futures prices and fundamental prices.

Estimates of gas transmission and distribution (transportation) charges were added to the commodity prices to produce the monthly “burnertip” gas prices used in PLEXOS.

For California Plants: Commodity prices can be found in Table 9, transportation rates in Table 10, and burnertip prices in Table 11.

For Non-California Plants: Commodity prices can be found in Table 12, transportation rates in Table 13, and burnertip prices in Table 14.

In Table 9 and Table 12, the corresponding burnertip label for each commodity price is provided. Since some commodity prices are used in more than one burnertip, a commodity may be presented more than once in these tables.

Table 9: Monthly Commodity Gas Prices for California Plants, $/Dth

Burnertip	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Commodity	SoCal Brdr Topock	Opal	Malin	SoCal Brdr Topock	SCG CG	PG&E CG	PG&E CG	SCG CG	SCG CG	SCG CG	SCG CG	Opal
Month-Year												
Jan-22	[redacted]											
Feb-22												
Mar-22												
Apr-22												
May-22												
Jun-22												
Jul-22												
Aug-22												
Sep-22												
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Nov-26												
Dec-26												

Table 9: Monthly Commodity Gas Prices for California Plants, $/Dth

Burnertip	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Commodity	SoCal Brdr Topock	Opal	Malin	SoCal Brdr Topock	SCG CG	PG&E CG	PG&E CG	SCG CG	SCG CG	SCG CG	SCG CG	Opal
Month-Year												
Jan-27	[redacted]											
Feb-27												
Mar-27												
Apr-27												
May-27												
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Table 9: Monthly Commodity Gas Prices for California Plants, $/Dth

Burnertip	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Commodity	SoCal Brdr Topock	Opal	Malin	SoCal Brdr Topock	SCG CG	PG&E CG	PG&E CG	SCG CG	SCG CG	SCG CG	SCG CG	Opal
Month-Year												
Jan-32	[redacted]											
Feb-32												
Mar-32												
Apr-32												
May-32												
Jun-32												
Jul-32												
Aug-32												
Sep-32												
Oct-32												
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Feb-35												
Mar-35												
Apr-35												
May-35												
Jun-35												
Jul-35												
Aug-35												
Sep-35												
Oct-35												
Nov-35												
Dec-35												

Table 10: Monthly Transportation Rate for California Plants, $/Dth

Month-Year	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Jan-22	0.00	0.44	0.00	0.11	1.01	0.33	1.52	0.30	0 00	0.41	1.01	0.44
Feb-22	0.00	0.44	0.00	0.10	1.01	0.33	1.52	0.30	0 00	0.35	1.01	0.44
Mar-22	0.00	0.44	0.00	0.10	1.01	0.33	1.52	0.30	0 00	0.34	1.01	0.44
Apr-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.33	1.01	0.44
May-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.33	1.01	0.44
Jun-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.34	1.01	0.44
Jul-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.35	1.01	0.44
Aug-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.36	1.01	0.44
Sep-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.35	1.01	0.44
Oct-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.34	1.01	0.44
Nov-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.35	1.01	0.44
Dec-22	0.00	0.44	0.00	0.10	1.01	0.27	1.45	0.30	0 00	0.36	1.01	0.44
Jan-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.41	1.08	0.44
Feb-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.40	1.08	0.44
Mar-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.38	1.08	0.44
Apr-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.37	1.08	0.44
May-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.36	1.08	0.44
Jun-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.37	1.08	0.44
Jul-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.38	1.08	0.44
Aug-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.38	1.08	0.44
Sep-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.38	1.08	0.44
Oct-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.39	1.08	0.44
Nov-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.39	1.08	0.44
Dec-23	0.00	0.44	0.00	0.10	1.08	0.07	2.31	0.30	0 00	0.40	1.08	0.44
Jan-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.39	1.08	0.44
Feb-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.38	1.08	0.44
Mar-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.38	1.08	0.44
Apr-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.37	1.08	0.44
May-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.37	1.08	0.44
Jun-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.37	1.08	0.44
Jul-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.38	1.08	0.44
Aug-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.38	1.08	0.44
Sep-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.37	1.08	0.44
Oct-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.37	1.08	0.44
Nov-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.37	1.08	0.44
Dec-24	0.00	0.44	0.00	0.10	1.08	0.14	2.48	0.30	0 00	0.38	1.08	0.44
Jan-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.38	1.10	0.44
Feb-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.38	1.10	0.44
Mar-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.37	1.10	0.44
Apr-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.36	1.10	0.44
May-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.36	1.10	0.44
Jun-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.36	1.10	0.44
Jul-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.37	1.10	0.44
Aug-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.37	1.10	0.44
Sep-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.37	1.10	0.44
Oct-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.37	1.10	0.44
Nov-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.37	1.10	0.44
Dec-25	0.00	0.44	0.00	0.10	1.10	0.14	2.63	0.30	0 00	0.38	1.10	0.44
Jan-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.38	1.12	0.44
Feb-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.38	1.12	0.44
Mar-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.37	1.12	0.44
Apr-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.37	1.12	0.44
May-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.36	1.12	0.44
Jun-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.36	1.12	0.44
Jul-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.37	1.12	0.44
Aug-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.37	1.12	0.44
Sep-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.37	1.12	0.44
Oct-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.37	1.12	0.44
Nov-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.37	1.12	0.44
Dec-26	0.00	0.44	0.00	0.10	1.12	0.14	2.78	0.30	0 00	0.38	1.12	0.44

Table 10: Monthly Transportation Rate for California Plants, $/Dth

Month-Year	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Jan-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.38	1.13	0.44
Feb-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.38	1.13	0.44
Mar-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Apr-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
May-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Jun-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Jul-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Aug-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Sep-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Oct-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Nov-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.37	1.13	0.44
Dec-27	0.00	0.44	0.00	0.10	1.13	0.14	2.78	0.30	0 00	0.38	1.13	0.44
Jan-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.38	1.15	0.44
Feb-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.38	1.15	0.44
Mar-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.38	1.15	0.44
Apr-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
May-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
Jun-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
Jul-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
Aug-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
Sep-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
Oct-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
Nov-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.37	1.15	0.44
Dec-28	0.00	0.44	0.00	0.10	1.15	0.14	2.78	0.30	0 00	0.38	1.15	0.44
Jan-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.39	1.17	0.44
Feb-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.39	1.17	0.44
Mar-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.38	1.17	0.44
Apr-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
May-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
Jun-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
Jul-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
Aug-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
Sep-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
Oct-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
Nov-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.37	1.17	0.44
Dec-29	0.00	0.44	0.00	0.10	1.17	0.14	2.78	0.30	0 00	0.38	1.17	0.44
Jan-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.40	1.20	0.44
Feb-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.39	1.20	0.44
Mar-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.39	1.20	0.44
Apr-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.37	1.20	0.44
May-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.37	1.20	0.44
Jun-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.37	1.20	0.44
Jul-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.37	1.20	0.44
Aug-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.38	1.20	0.44
Sep-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.38	1.20	0.44
Oct-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.37	1.20	0.44
Nov-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.38	1.20	0.44
Dec-30	0.00	0.44	0.00	0.10	1.20	0.14	2.78	0.30	0 00	0.38	1.20	0.44
Jan-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.40	1.22	0.44
Feb-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.40	1.22	0.44
Mar-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.39	1.22	0.44
Apr-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
May-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
Jun-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
Jul-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
Aug-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
Sep-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
Oct-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
Nov-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.38	1.22	0.44
Dec-31	0.00	0.44	0.00	0.10	1.22	0.14	2.78	0.30	0 00	0.39	1.22	0.44

Table 10: Monthly Transportation Rate for California Plants, $/Dth

Month-Year	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Jan-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.41	1.24	0.44
Feb-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.40	1.24	0.44
Mar-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.40	1.24	0.44
Apr-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.38	1.24	0.44
May-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.38	1.24	0.44
Jun-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.38	1.24	0.44
Jul-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.38	1.24	0.44
Aug-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.39	1.24	0.44
Sep-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.38	1.24	0.44
Oct-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.38	1.24	0.44
Nov-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.39	1.24	0.44
Dec-32	0.00	0.44	0.00	0.10	1.24	0.14	2.78	0.30	0 00	0.39	1.24	0.44
Jan-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.41	1.26	0.44
Feb-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.41	1.26	0.44
Mar-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.40	1.26	0.44
Apr-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.39	1.26	0.44
May-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.38	1.26	0.44
Jun-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.38	1.26	0.44
Jul-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.39	1.26	0.44
Aug-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.39	1.26	0.44
Sep-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.39	1.26	0.44
Oct-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.38	1.26	0.44
Nov-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.39	1.26	0.44
Dec-33	0.00	0.44	0.00	0.10	1.26	0.14	2.78	0.30	0 00	0.40	1.26	0.44
Jan-34	0.00	0.44	0.00	0.11	1.29	0.14	2.78	0.30	0 00	0.42	1.29	0.44
Feb-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.41	1.29	0.44
Mar-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.40	1.29	0.44
Apr-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
May-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
Jun-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
Jul-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
Aug-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
Sep-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
Oct-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
Nov-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.39	1.29	0.44
Dec-34	0.00	0.44	0.00	0.10	1.29	0.14	2.78	0.30	0 00	0.40	1.29	0.44
Jan-35	0.00	0.44	0.00	0.11	1.31	0.14	2.78	0.30	0 00	0.42	1.31	0.44
Feb-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.41	1.31	0.44
Mar-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.41	1.31	0.44
Apr-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.39	1.31	0.44
May-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.39	1.31	0.44
Jun-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.39	1.31	0.44
Jul-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.39	1.31	0.44
Aug-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.40	1.31	0.44
Sep-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.40	1.31	0.44
Oct-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.39	1.31	0.44
Nov-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.40	1.31	0.44
Dec-35	0.00	0.44	0.00	0.10	1.31	0.14	2.78	0.30	0 00	0.40	1.31	0.44

Table 11: Monthly Burnertip Gas Prices for California Plants, $/Dth

Month-Year	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Jan-22												
Feb-22												
Mar-22												
Apr-22												
May-22												
Jun-22												
Jul-22												
Aug-22												
Sep-22												
Oct-22												
Nov-22												
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Jan-23												
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Nov-25												
Dec-25												
Jan-26												
Feb-26												
Mar-26												
Apr-26												
May-26												
Jun-26												
Jul-26												
Aug-26												
Sep-26												
Oct-26												
Nov-26												
Dec-26												

Table 11: Monthly Burnertip Gas Prices for California Plants, $/Dth

Month-Year	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Jan-27												
Feb-27												
Mar-27												
Apr-27												
May-27												
Jun-27												
Jul-27												
Aug-27												
Sep-27												
Oct-27												
Nov-27												
Dec-27												
Jan-28												
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Mar-28												
Apr-28												
May-28												
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Dec-30												
Jan-31												
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Mar-31												
Apr-31												
May-31												
Jun-31												
Jul-31												
Aug-31												
Sep-31												
Oct-31												
Nov-31												
Dec-31												

Table 11: Monthly Burnertip Gas Prices for California Plants, $/Dth

Month-Year	NG Blythe	NG Kern River	NG Malin	NG Mojave PL	NG Otay Mesa	NG PG&E BB	NG PG&E LT	NG Rosarito CA	NG S Cal Prod	NG SCG	NG SDG&E	NG TEOR Cogen
Jan-32												
Feb-32												
Mar-32												
Apr-32												
May-32												
Jun-32												
Jul-32												
Aug-32												
Sep-32												
Oct-32												
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Apr-35												
May-35												
Jun-35												
Jul-35												
Aug-35												
Sep-35												
Oct-35												
Nov-35												
Dec-35												

Table 12: Monthly Commodity Gas Prices for Non-California Plants, $/Dth

Burner tip	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Commodity	AECO	Westcoast St 2	Cheyenne	Kingsgate	Kingsgate	AECO	Opal	San Juan	Waha	Stanfield	SCGCG	Opal	San Juan	San Juan	Waha	Opal	Sumas	Waha	Opal
Month-Year																			
Jan-22	[redacted]																		
Feb-22																			
Mar-22																			
Apr-22																			
May-22																			
Jun-22																			
Jul-22																			
Aug-22																			
Sep-22																			
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Aug-25																			
Sep-25																			
Oct-25																			
Nov-25																			
Dec-25																			

Table 12: Monthly Commodity Gas Prices for Non-California Plants, $/Dth

Burner tip	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Commodity	AECO	Westcoast St 2	Cheyenne	Kingsgate	Kingsgate	AECO	Opal	San Juan	Waha	Stanfield	SCGCG	Opal	San Juan	San Juan	Waha	Opal	Sumas	Waha	Opal
Month-Year																			
Jan-26	[redacted]																		
Feb-26																			
Mar-26																			
Apr-26																			
May-26																			
Jun-26																			
Jul-26																			
Aug-26																			
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Sep-29																			
Oct-29																			
Nov-29																			
Dec-29																			

Table 12: Monthly Commodity Gas Prices for Non-California Plants, $/Dth

Burner tip	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Commodity	AECO	Westcoast St 2	Cheyenne	Kingsgate	Kingsgate	AECO	Opal	San Juan	Waha	Stanfield	SCGCG	Opal	San Juan	San Juan	Waha	Opal	Sumas	Waha	Opal
Month-Year																			
Jan-30	[redacted]																		
Feb-30																			
Mar-30																			
Apr-30																			
May-30																			
Jun-30																			
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Jan-31																			
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Jun-33																			
Jul-33																			
Aug-33																			
Sep-33																			
Oct-33																			
Nov-33																			
Dec-33																			

Table 12: Monthly Commodity Gas Prices for Non-California Plants, $/Dth

Burner tip	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Commodity	AECO	Westcoast St 2	Cheyenne	Kingsgate	Kingsgate	AECO	Opal	San Juan	Waha	Stanfield	SCGCG	Opal	San Juan	San Juan	Waha	Opal	Sumas	Waha	Opal
Month-Year																			
Jan-34	[redacted]																		
Feb-34																			
Mar-34																			
Apr-34																			
May-34																			
Jun-34																			
Jul-34																			
Aug-34																			
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Jun-35																			
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Aug-35																			
Sep-35																			
Oct-35																			
Nov-35																			
Dec-35																			

Table 13: Monthly Transportation Rate for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-22	0.24	0.28	0.34	0.36	0.00	0.77	0.43	0.58	0.49	0.00	0.30	0.44	0.58	0.58	0.49	0.09	0.44	0.48	0.27
Feb-22	0.24	0.28	0.34	0.36	0.00	0.77	0.40	0.58	0.49	0.00	0.30	0.44	0.58	0.58	0.49	0.06	0.37	0.47	0.23
Mar-22	0.24	0.28	0.34	0.35	0.00	0.77	0.39	0.56	0.48	0.00	0.30	0.44	0.56	0.56	0.48	0.05	0.36	0.46	0.23
Apr-22	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.05	0.35	0.46	0.22
May-22	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.05	0.35	0.46	0.22
Jun-22	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.48	0.00	0.30	0.44	0.56	0.56	0.48	0.05	0.35	0.46	0.22
Jul-22	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.48	0.00	0.30	0.44	0.57	0.57	0.48	0.05	0.36	0.47	0.23
Aug-22	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.48	0.00	0.30	0.44	0.57	0.57	0.48	0.05	0.36	0.47	0.23
Sep-22	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.48	0.00	0.30	0.44	0.56	0.56	0.48	0.05	0.36	0.46	0.22
Oct-22	0.24	0.28	0.33	0.36	0.00	0.77	0.40	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.05	0.36	0.46	0.23
Nov-22	0.24	0.28	0.34	0.36	0.00	0.77	0.40	0.57	0.48	0.00	0.30	0.44	0.57	0.57	0.48	0.06	0.37	0.47	0.24
Dec-22	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.58	0.49	0.00	0.30	0.44	0.58	0.58	0.49	0.06	0.38	0.48	0.24
Jan-23	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.59	0.49	0.00	0.30	0.44	0.59	0.59	0.49	0.06	0.38	0.48	0.24
Feb-23	0.24	0.28	0.33	0.37	0.00	0.77	0.39	0.58	0.49	0.00	0.30	0.44	0.58	0.58	0.49	0.05	0.38	0.47	0.23
Mar-23	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.05	0.36	0.46	0.22
Apr-23	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.52	0.44	0.00	0.30	0.44	0.52	0.52	0.44	0.04	0.34	0.43	0.21
May-23	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.52	0.43	0.00	0.30	0.44	0.52	0.52	0.43	0.03	0.34	0.42	0.21
Jun-23	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.52	0.44	0.00	0.30	0.44	0.52	0.52	0.44	0.04	0.34	0.42	0.21
Jul-23	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.04	0.34	0.43	0.21
Aug-23	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.04	0.35	0.43	0.21
Sep-23	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.04	0.35	0.42	0.21
Oct-23	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.58	0.48	0.00	0.30	0.44	0.58	0.58	0.48	0.06	0.37	0.46	0.24
Nov-23	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.36	0.43	0.22
Dec-23	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.37	0.45	0.22
Jan-24	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.37	0.45	0.22
Feb-24	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.05	0.36	0.45	0.22
Mar-24	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.35	0.44	0.22
Apr-24	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.03	0.34	0.42	0.21
May-24	0.24	0.28	0.32	0.34	0.00	0.77	0.37	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.03	0.34	0.42	0.21
Jun-24	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.03	0.34	0.42	0.21
Jul-24	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.34	0.42	0.21
Aug-24	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.34	0.42	0.21
Sep-24	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.04	0.34	0.42	0.21
Oct-24	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.04	0.34	0.42	0.21
Nov-24	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.53	0.45	0.00	0.30	0.44	0.53	0.53	0.45	0.04	0.36	0.43	0.22
Dec-24	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.36	0.44	0.22
Jan-25	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.36	0.44	0.22
Feb-25	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.36	0.44	0.22
Mar-25	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.35	0.43	0.22
Apr-25	0.24	0.28	0.32	0.34	0.00	0.77	0.37	0.52	0.43	0.00	0.30	0.44	0.52	0.52	0.43	0.03	0.34	0.42	0.21
May-25	0.24	0.28	0.32	0.34	0.00	0.77	0.37	0.52	0.43	0.00	0.30	0.44	0.52	0.52	0.43	0.03	0.34	0.42	0.21
Jun-25	0.24	0.28	0.32	0.34	0.00	0.77	0.37	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.03	0.34	0.42	0.21
Jul-25	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Aug-25	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Sep-25	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Oct-25	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Nov-25	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.04	0.36	0.43	0.21
Dec-25	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.36	0.43	0.22

Table 13: Monthly Transportation Rate for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-26	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.36	0.44	0.22
Feb-26	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.36	0.44	0.22
Mar-26	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.35	0.43	0.22
Apr-26	0.24	0.28	0.32	0.34	0.00	0.77	0.37	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.03	0.34	0.42	0.21
May-26	0.24	0.28	0.32	0.34	0.00	0.77	0.37	0.52	0.43	0.00	0.30	0.44	0.52	0.52	0.43	0.03	0.34	0.42	0.21
Jun-26	0.24	0.28	0.32	0.34	0.00	0.77	0.37	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.03	0.34	0.42	0.21
Jul-26	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Aug-26	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Sep-26	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Oct-26	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
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Jan-27	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.36	0.44	0.22
Feb-27	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.36	0.44	0.22
Mar-27	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.35	0.43	0.22
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May-28	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.43	0.00	0.30	0.44	0.53	0.53	0.43	0.03	0.34	0.42	0.21
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Jan-29	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.36	0.45	0.22
Feb-29	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.36	0.44	0.22
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Apr-29	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
May-29	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.42	0.21
Jun-29	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Jul-29	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Aug-29	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Sep-29	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Oct-29	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Nov-29	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.35	0.43	0.22
Dec-29	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.36	0.43	0.22

Table 13: Monthly Transportation Rate for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-30	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.47	0.00	0.30	0.44	0.57	0.57	0.47	0.05	0.37	0.46	0.23
Feb-30	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.47	0.00	0.30	0.44	0.57	0.57	0.47	0.05	0.37	0.45	0.23
Mar-30	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.36	0.44	0.22
Apr-30	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
May-30	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Jun-30	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Jul-30	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.03	0.34	0.43	0.21
Aug-30	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.03	0.34	0.43	0.21
Sep-30	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.03	0.34	0.43	0.21
Oct-30	0.24	0.28	0.33	0.34	0.00	0.77	0.37	0.53	0.44	0.00	0.30	0.44	0.53	0.53	0.44	0.03	0.34	0.43	0.21
Nov-30	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.36	0.43	0.22
Dec-30	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.36	0.44	0.22
Jan-31	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.58	0.48	0.00	0.30	0.44	0.58	0.58	0.48	0.06	0.37	0.46	0.23
Feb-31	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.47	0.00	0.30	0.44	0.57	0.57	0.47	0.05	0.37	0.46	0.23
Mar-31	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.36	0.45	0.22
Apr-31	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.34	0.43	0.21
May-31	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.54	0.44	0.00	0.30	0.44	0.54	0.54	0.44	0.04	0.34	0.43	0.21
Jun-31	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.34	0.43	0.21
Jul-31	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.35	0.44	0.21
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Sep-31	0.24	0.28	0.33	0.34	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.35	0.44	0.21
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Jan-32	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.59	0.49	0.00	0.30	0.44	0.59	0.59	0.49	0.06	0.38	0.47	0.24
Feb-32	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.58	0.48	0.00	0.30	0.44	0.58	0.58	0.48	0.06	0.37	0.46	0.23
Mar-32	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.47	0.00	0.30	0.44	0.57	0.57	0.47	0.05	0.37	0.46	0.23
Apr-32	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.35	0.44	0.22
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Sep-32	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.35	0.44	0.22
Oct-32	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.54	0.45	0.00	0.30	0.44	0.54	0.54	0.45	0.04	0.35	0.44	0.22
Nov-32	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.36	0.44	0.22
Dec-32	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.37	0.45	0.22
Jan-33	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.59	0.49	0.00	0.30	0.44	0.59	0.59	0.49	0.06	0.38	0.48	0.24
Feb-33	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.58	0.48	0.00	0.30	0.44	0.58	0.58	0.48	0.06	0.37	0.47	0.23
Mar-33	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.47	0.00	0.30	0.44	0.57	0.57	0.47	0.05	0.37	0.46	0.23
Apr-33	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.35	0.44	0.22
May-33	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.35	0.44	0.22
Jun-33	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.45	0.00	0.30	0.44	0.55	0.55	0.45	0.04	0.35	0.44	0.22
Jul-33	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.44	0.22
Aug-33	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.45	0.22
Sep-33	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.44	0.22
Oct-33	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.44	0.22
Nov-33	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.05	0.36	0.44	0.22
Dec-33	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.37	0.45	0.23

Table 13: Monthly Transportation Rate for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-34	0.24	0.28	0.34	0.38	0.00	0.77	0.41	0.60	0.49	0.00	0.30	0.44	0.60	0.60	0.49	0.06	0.38	0.48	0.24
Feb-34	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.59	0.49	0.00	0.30	0.44	0.59	0.59	0.49	0.06	0.38	0.47	0.24
Mar-34	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.58	0.48	0.00	0.30	0.44	0.58	0.58	0.48	0.06	0.37	0.46	0.23
Apr-34	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.45	0.22
May-34	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.44	0.22
Jun-34	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.44	0.22
Jul-34	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.45	0.22
Aug-34	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.04	0.35	0.45	0.22
Sep-34	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.04	0.35	0.45	0.22
Oct-34	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.55	0.46	0.00	0.30	0.44	0.55	0.55	0.46	0.04	0.35	0.45	0.22
Nov-34	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.05	0.36	0.45	0.22
Dec-34	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.47	0.00	0.30	0.44	0.57	0.57	0.47	0.05	0.37	0.46	0.23
Jan-35	0.24	0.28	0.34	0.38	0.00	0.77	0.41	0.61	0.50	0.00	0.30	0.44	0.61	0.61	0.50	0.07	0.39	0.49	0.24
Feb-35	0.24	0.28	0.34	0.37	0.00	0.77	0.41	0.60	0.49	0.00	0.30	0.44	0.60	0.60	0.49	0.06	0.38	0.48	0.24
Mar-35	0.24	0.28	0.34	0.37	0.00	0.77	0.40	0.59	0.48	0.00	0.30	0.44	0.59	0.59	0.48	0.06	0.37	0.47	0.23
Apr-35	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.04	0.35	0.45	0.22
May-35	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.04	0.35	0.45	0.22
Jun-35	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.04	0.35	0.45	0.22
Jul-35	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.04	0.35	0.45	0.22
Aug-35	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.05	0.35	0.45	0.22
Sep-35	0.24	0.28	0.33	0.35	0.00	0.77	0.39	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.04	0.35	0.45	0.22
Oct-35	0.24	0.28	0.33	0.35	0.00	0.77	0.38	0.56	0.46	0.00	0.30	0.44	0.56	0.56	0.46	0.04	0.35	0.45	0.22
Nov-35	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.56	0.47	0.00	0.30	0.44	0.56	0.56	0.47	0.05	0.37	0.45	0.23
Dec-35	0.24	0.28	0.33	0.36	0.00	0.77	0.39	0.57	0.47	0.00	0.30	0.44	0.57	0.57	0.47	0.05	0.37	0.46	0.23

Table 14: Monthly Burnertip Gas Prices for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-22	[redacted]																		
Feb-22																			
Mar-22																			
Apr-22																			
May-22																			
Jun-22																			
Jul-22																			
Aug-22																			
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Jan-25																			
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Apr-25																			
May-25																			
Jun-25																			
Jul-25																			
Aug-25																			
Sep-25																			
Oct-25																			
Nov-25																			
Dec-25																			

Table 14: Monthly Burnertip Gas Prices for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-26	[redacted]																		
Feb-26																			
Mar-26																			
Apr-26																			
May-26																			
Jun-26																			
Jul-26																			
Aug-26																			
Sep-26																			
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Jan-27																			
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Oct-29																			
Nov-29																			
Dec-29																			

Table 14: Monthly Burnertip Gas Prices for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-30																			
Feb-30																			
Mar-30																			
Apr-30																			
May-30																			
Jun-30																			
Jul-30																			
Aug-30																			
Sep-30																			
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Jan-31																			
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Sep-33																			
Oct-33																			
Nov-33																			
Dec-33																			

Table 14: Monthly Burnertip Gas Prices for Non-California Plants, $/Dth

Month-Year	NG Alberta	NG BC	NG Colorado	NG Idaho	NG Kingsgate ID	NG Montana	NG N Nevada	NG No AZ	NG No NM	NG Oregon	NG Rosarito CFE	NG S Nevada	NG So AZ	NG So AZ CA	NG So NM	NG Utah	NG Washington	NG West Texas	NG Wyoming
Jan-34																			
Feb-34																			
Mar-34																			
Apr-34																			
May-34																			
Jun-34																			
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Aug-35																			
Sep-35																			
Oct-35																			
Nov-35																			
Dec-35																			

GREENHOUSE GAS ALLOWANCE PRICES

Greenhouse gas (GHG) allowance prices in California for 2022–2035 are from the CEC's 2021 IEPR mid-case forecast. These are input into PLEXOS at the monthly level and applied to all generators powered by a carbon-emitting fuel in the state. CEC IEPR prices are provided in dollars per metric ton ($/MT) but since PLEXOS requires input in dollars per pound ($/lb), to convert, PG&E multiplied MDS prices by 2,204.6 lb./MT before entering into PLEXOS.[5] Monthly GHG allowance prices for California are presented in Table 15 below.

Table 15: California Greenhouse Gas Allowance Price by Month, $/lb.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113	0.0113
2023	0.0127	0.0127	0.0127	0.0127	0.0127	0.0127	0.0127	0.0127	0.0127	0.0127	0.0127	0.0127
2024	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142
2025	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159	0.0159
2026	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178
2027	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200	0.0200
2028	0.0224	0.0224	0.0224	0.0224	0.0224	0.0224	0.0224	0.0224	0.0224	0.0224	0.0224	0.0224
2029	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251	0.0251
2030	0.0281	0.0281	0.0281	0.0281	0.0281	0.0281	0.0281	0.0281	0.0281	0.0281	0.0281	0.0281
2031	0.0315	0.0315	0.0315	0.0315	0.0315	0.0315	0.0315	0.0315	0.0315	0.0315	0.0315	0.0315
2032	0.0354	0.0354	0.0354	0.0354	0.0354	0.0354	0.0354	0.0354	0.0354	0.0354	0.0354	0.0354
2033	0.0396	0.0396	0.0396	0.0396	0.0396	0.0396	0.0396	0.0396	0.0396	0.0396	0.0396	0.0396
2034	0.0444	0.0444	0.0444	0.0444	0.0444	0.0444	0.0444	0.0444	0.0444	0.0444	0.0444	0.0444
2035	0.0498	0.0498	0.0498	0.0498	0.0498	0.0498	0.0498	0.0498	0.0498	0.0498	0.0498	0.0498

Additionally, the GHG allowance price for Alberta, Canada was pre-defined at the annual level by the CEC in the dataset provided to PG&E and were applied in a similar fashion. Annual GHG allowance prices for Alberta are presented in Table 16 below.

Table 16: Alberta Greenhouse Gas Allowance Price by Year, $/lb.

Year	2022	2023	2024	2025	2026	2027	2028
Alberta	0.0184	0.0187	0.0191	0.0194	0.0198	0.0202	0.0206

Year	2029	2030	2031	2032	2033	2034	2035
Alberta	0.0210	0.0214	0.0218	0.0222	0.0226	0.0231	0.0235

[5] There are 1,000 kg per metric ton and 2.2046 lb. per kg resulting. Multiplying these together yields 2,204.6 lb./MT. https://www.eia.gov/state/seds/sep_use/notes/use_e.pdf

ELECTRIC TRANSMISSION

Electric transmission paths in PLEXOS connect specific nodes and allow electricity to flow between regions in the WECC. Capacity on each line is constrained in both the direction of flow (node A to node B) and flow back (node B to node A). Additionally, many lines include losses as a percent of flow that increase generation requirements and cost when energy flows between regions. Table 17 presents details on in-state transmission lines between California regions and Table 18 presents details on the lines connecting California to its surrounding states, allowing for the import or export of electricity. For these data, PG&E utilizes specifications present in the model provided by the CEC.

Table 17: California Intrastate Lines and Summer Capacity, MW

Line	Node A	Node B	Capacity A to B	Capacity B to A	Loss A to B	Loss B to A
BANC-TID	SMUD	TID	4,664	4,664	0.0%	0.0%
IID-IV (46)	IID	IV-NG	20	225	1.0%	1.0%
IID-LADWP	IID	LDWP	500	500	1.0%	1.0%
IID-SCE (42;46)	IID	SCE	1,500	0	2.0%	2.0%
IV-SDGE	IV-NG	SDGE	3,000	3,000	0.0%	0.0%
LADWP-Burbank	LDWP	BURB	500	500	0.0%	0.0%
LADWP-Glendale	LDWP	GLEN	999	999	0.0%	0.0%
LADWP-SCE (41;60;61)	LDWP	SCE	3,656	2,156	0.5%	0.5%
PG&E_Bay-TID	PG&E	TID	145	60	0.0%	0.0%
PG&E_Valley-SCE (Path 26)	PG&E	SCE	4,000	3,000	1.5%	1.5%
PG&E_Valley-SMUD	PG&E	SMUD	15,453	15,453	0.0%	0.0%
SCE-Anaheim	SCE	ANHM	999	999	0.0%	0.0%
SCE-DWR-South	SCE	DWR-S	999	999	0.0%	0.0%
SCE-MWD	SCE	MWD	999	999	0.0%	0.0%
SCE-Pasadena	SCE	PASA	500	500	0.3%	0.3%
SCE-Riverside	SCE	RVSD	999	999	0.0%	0.0%
SCE-Vernon	SCE	VERN	999	999	0.0%	0.0%
SDG&E-SCE (43)	SDGE	SCE	2,500	2,500	1.5%	1.5%

Table 18: California Import/Export Lines and Summer Capacity, MW

Line	Node A	Node B	Capacity A to B	Capacity B to A	Loss A to B	Loss B to A
BPAT-PG&E (COI 66)	BPA	PG&E	4,800	3,675	2.0%	2.0%
CFE-IV (45)	CFE	IV-NG	400	200	0.5%	0.5%
IPP - LADWP (27)	PAUT	LDWP	3,800	2,600	4.0%	4.0%
LADWP-MEAD (46)	LDWP	TH_Mead	3,823	3,823	3.0%	3.0%
LDWP-BPAT (PDCI 65)	LDWP	BPA	3,100	3,100	0.8%	5.7%
NGILA-WALC	IV-NG	WALC	148	148	1.0%	1.0%
PACW-PG&E_Bay (25)	PACW	PG&E	80	30	3.3%	3.3%
PG&E_Valley-SPPC (24)	PG&E	SPPC	100	5	2.0%	2.0%
PV-NGILA (21 46 49)	TH_PV	IV-NG	1,565	2,000	2.0%	2.0%
PV-SCE (21 46 49)	TH_PV	SCE	3,000	3,200	2.0%	2.0%
SCE-MEAD (46)	SCE	TH_Mead	2,814	2,814	2.0%	2.0%
SDG&E-CFE (45)	SDGE	CFE	200	400	2.0%	2.0%
WALC-IID	WALC	IID	330	330	1.0%	1.0%
WALC-SCE (59)	WALC	SCE	330	330	1.0%	1.0%

Many lines include a price to transmit power between regions. Additionally, California import/export lines include GHG allowance prices when power flows into the state. To incorporate the GHG allowance prices, the CEC GHG allowance prices described above are converted from dollars per pound to dollars per kWh and are added to the price to transmit power. Table 19 below summarizes the emissions price applied to unspecified imports into California by year.

Table 19: GHG Allowance Prices for California Imports, $/kWh

Line	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2035	2022
BPAT-PG&E (COI 66)	5.58	6.37	7.46	8.82	11.01	13.02	14.87	17.15	19.90	20.73	21.53	22.99	23.56	24.81
CFE-IV (45)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
IPP - LADWP (27)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
LADWP-MEAD (46)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
LDWP-BPAT (PDCI 65)	5.58	6.37	7.46	8.82	11.01	13.02	14.87	17.15	19.90	20.73	21.53	22.99	23.56	24.81
NGILA-WALC	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
PACW-PG&E Bay (25)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
PG&E_Valley-SPPC (24)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
PV-NGILA (21 46 49)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
PV-SCE (21 46 49)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
SCE-MEAD (46)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
SDG&E-CFE (45)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
WALC-IID	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02
WALC-SCE (59)	6.97	7.95	9.33	11.02	13.76	16.29	18.60	21.44	24.88	25.93	26.92	28.75	29.46	31.02

Additionally, imports and exports into the CAISO are constrained based on analysis conducted by the CAISO and CPUC. Imports are further constrained during the summer CAISO peak period of 4 pm to 10 pm, July through September. During the peak period, CAISO imports are constrained to 6,000 MW through 2024 and then to 5,000 MW from 2024 through 2035 to account for specified and unspecified imports, consistent with IRP planning assumptions. Outside the peak period, this constraint is relaxed to 10,208 MW, also consistent with IRP planning assumptions Exports are also constrained in all hours of the year. This constraint is assumed to relax over time as increased renewables lead to excess generation during certain hours which can be exported from the CAISO. This limit begins at 3,000 MW in 2022, increases to 3,000 MW in 2022, and increases again to 4,000 MW in 2026 and 5,000 starting in 2030.

Finally, out-of-state transmission lines are also modeled using specifications present in the model provided by the CEC. Table 20 presents the characteristics for each out-of-state line. The model does not assume any transmission losses between out-of-state regions.

Table 20: Out-of-State Lines and Summer Capacity, MW

Line	Node A	Node B	Capacity A to B	Capacity B to A	Loss A to B	Loss B to A
AESO_to_NWMT	AESO	NWMT	325	300	0.0%	0.0%
AZPS_to_PAUT	APS	PAUT	600	600	0.0%	0.0%
AZPS_to_PNM	APS	PNM	2,701	2,701	0.0%	0.0%
AZPS_to_SRP	APS	SRP	36,602	36,602	0.0%	0.0%
AZPS_to_TEPC	APS	TEPC	3,065	3,065	0.0%	0.0%
AZPS_to_WALC	APS	WALC	15,796	15,796	0.0%	0.0%
SRP_to_TEPC	SRP	TEPC	8,365	8,365	0.0%	0.0%
SRP_to_WALC	SRP	WALC	7,412	7,412	0.0%	0.0%
TEPC_to_WALC	TEPC	WALC	2,843	2,843	0.0%	0.0%
BCHA_to_BPA	BCHA	BPA	3,150	3,000	0.0%	0.0%
PSCO_to_WACM	PSCO	WACM	27,552	27,552	0.0%	0.0%
WACM_to_WALC	WACM	WALC	690	690	0.0%	0.0%
WACM_to_WAUW	WACM	WAUW	390	390	0.0%	0.0%
NWMT_to_WAUW	NWMT	WAUW	1,847	1,847	0.0%	0.0%
EPE_to_PNM	EPE	PNM	1,048	1,048	0.0%	0.0%
EPE_to_TEPC	EPE	TEPC	1,048	1,048	0.0%	0.0%
PNM_to_PSCO	PNM	PSCO	359	359	0.0%	0.0%
PNM_to_TEPC	PNM	TEPC	2,002	1,970	0.0%	0.0%
PNM_to_WACM	PNM	WACM	600	600	0.0%	0.0%
PNM_to_WALC	PNM	WALC	1,275	1,275	0.0%	0.0%
NEVP_to_PAUT	NEVP	PAUT	235	440	0.0%	0.0%
NEVP_to_SPPC	NEVP	SPPC	2,873	2,873	0.0%	0.0%
NEVP_to_WALC	NEVP	WALC	7,294	7,294	0.0%	0.0%
SPPC_to_PAUT	SPPC	PAUT	717	717	0.0%	0.0%
PAUT_to_WACM	PAUT	WACM	2,660	650	0.0%	0.0%
PAUT_to_WALC	PAUT	WALC	265	300	0.0%	0.0%
PAWY_to_NWMT	PAWY	NWMT	600	600	0.0%	0.0%
PAWY_to_PAUT	PAWY	PAUT	1,700	1,700	0.0%	0.0%
PAWY_to_WACM	PAWY	WACM	7,791	7,791	0.0%	0.0%
AVA_to_BPA	AVA	BPA	4,800	4,800	0.0%	0.0%
AVA_to_CHPD	AVA	CHPD	92	92	0.0%	0.0%
AVA_to_GCPD	AVA	GCPD	1,143	1,143	0.0%	0.0%
AVA_to_NWMT	AVA	NWMT	382	382	0.0%	0.0%
AVA_to_PACW	AVA	PACW	1,111	1,111	0.0%	0.0%
AVA_to_PGE	AVA	PGE	362	362	0.0%	0.0%

Table 20: Out-of-State Lines and Summer Capacity, MW

Line	Node A	Node B	Capacity A to B	Capacity B to A	Loss A to B	Loss B to A
AVA_to_SCL	AVA	SCL	176	176	0.0%	0.0%
AVA_to_TPWR	AVA	TPWR	477	477	0.0%	0.0%
AVA_to_TREAS VLY	AVA	IPTV	400	400	0.0%	0.0%
BPA_to_CHPD	BPA	CHPD	3,094	3,094	0.0%	0.0%
BPA_to_DOPD	BPA	DOPD	4,413	4,413	0.0%	0.0%
BPA_to_GCPD	BPA	GCPD	6,671	6,671	0.0%	0.0%
BPA_to_IPTV	BPA	IPTV	350	413	0.0%	0.0%
BPA_to_NWMT	BPA	NWMT	968	1,818	0.0%	0.0%
BPA_to_PACW	BPA	PACW	23,435	23,435	0.0%	0.0%
BPA_to_PGE	BPA	PGE	7,575	7,575	0.0%	0.0%
BPA_to_PSEI	BPA	PSEI	10,800	10,800	0.0%	0.0%
BPA_to_SCL	BPA	SCL	9,025	9,025	0.0%	0.0%
BPA_to_SPPC	BPA	SPPC	300	300	0.0%	0.0%
BPA_to_TPWR	BPA	TPWR	5,037	5,037	0.0%	0.0%
CHPD_to_DOPD	CHPD	DOPD	1,044	1,044	0.0%	0.0%
CHPD_to_PSEI	CHPD	PSEI	652	652	0.0%	0.0%
DOPD_to_GCPD	DOPD	GCPD	348	348	0.0%	0.0%
GCPD_to_PACW	GCPD	PACW	609	609	0.0%	0.0%
GCPD_to_PSEI	GCPD	PSEI	1,082	1,082	0.0%	0.0%
PACW_to_IPTV	PACW	IPTV	450	1,587	0.0%	0.0%
PACW_to_PGE	PACW	PGE	3,809	3,809	0.0%	0.0%
PGE_to_IPTV	PGE	IPTV	1,050	1,000	0.0%	0.0%
PSEI_to_SCL	PSEI	SCL	2,112	2,112	0.0%	0.0%
PSEI_to_TPWR	PSEI	TPWR	699	699	0.0%	0.0%
SCL_to_TPWR	SCL	TPWR	158	158	0.0%	0.0%
IPFE to IPMV	IPFE	IPMV	4,450	4,450	0.0%	0.0%
IPFE to PAID	IPFE	PAID	2,250	2,250	0.0%	0.0%
IPFE to PAWY	IPFE	PAWY	1,406	1,406	0.0%	0.0%
IPFE_to_IPTV	IPFE	IPTV	1,646	1,646	0.0%	0.0%
IPFE_to_PAWY	IPFE	PAWY	1,406	1,406	0.0%	0.0%
IPMV_to_IPTV	IPMV	IPTV	4,400	4,400	0.0%	0.0%
IPMV_to_SPPC	IPMV	SPPC	500	360	0.0%	0.0%
PAID_to_NWMT	PAID	NWMT	256	337	0.0%	0.0%
PAID_to_PAUT	PAID	PAUT	2,250	2,250	0.0%	0.0%
PAID_to_PAWY	PAID	PAWY	2,300	4,100	0.0%	0.0%

ELECTRICITY SUPPLY

PLEXOS models most generators at either the plant-level or by individual units within a plant. Installed capacities, unit start and retirement dates, startup costs, heat rates, and other parameters were pre-defined by the CEC in the dataset provided to PG&E.

Table 27 at the end of this section summarizes total installed capacity by PLEXOS region at the end of each year of the forecast period (e.g., the 2026 value represents capacity in December 2026). Details on California regions are provided first, followed by other regions in the WECC.

The remainder of this section provides details on the unique characteristics of each resource class.

Renewable Generation

Solar and wind generation profiles and other assumptions were pre-defined by the CEC in the dataset provided to PG&E. PG&E reviewed these profiles and calibrated the in-state ones to align with historic annual generation in GWh. In addition, for wind generation profiles, PG&E identified that the monthly shape of wind generation fit historic data for 2019 and 2020 better when offset by two months (e.g., the shape for January 2019 was more appropriate for March 2019). Accordingly, PG&E shifted all wind profiles two months.

Other renewable categories include geothermal, biomass, refuse, and small hydro (assumed to be hydroelectric generators with installed capacities less than or equal to 30 MW). For these categories, PG&E utilized assumptions provided by the CEC in the dataset provided to PG&E.

Table 21, Table 22, and Table 22 provide annual generation results from PLEXOS for solar, wind, and other renewable resource classes respectively by region in the model.

Table 21: Solar Generation by Region by Year, GWh

Region	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
PG&E	10,281	11,299	11,570	12,197	11,773	11,798	11,792	12,068	12,190	12,166	12,030	12,273	12,264	12,285
SCE	36,249	44,844	48,570	56,101	57,094	57,557	58,121	61,001	64,040	66,528	69,336	75,741	81,564	86,872
SDGE	316	311	301	310	297	298	297	299	300	295	292	295	296	298
IID	3,004	2,958	2,858	2,949	2,825	2,829	2,826	2,862	2,846	2,879	2,947	3,152	3,338	3,525
LADWP	878	910	920	1,072	1,170	1,388	1,577	1,734	1,856	2,204	2,699	3,592	4,636	5,684
BANC	1,145	1,140	1,113	1,156	1,113	1,169	1,221	1,257	1,290	1,529	1,876	2,513	3,246	3,983
TIDC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AB	271	271	452	543	633	724	725	724	995	995	998	995	995	995
BC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	620	620	621	620	620	620	621	620	620	620	622	620	620	620
MT	36	36	36	36	36	36	36	36	36	36	36	36	36	36
BPA	276	276	276	415	412	425	425	574	653	654	654	652	651	653
NW	33	33	33	33	33	33	33	33	33	33	33	33	33	33
PACW	290	290	290	290	290	290	290	290	290	290	291	290	290	290
PAUT	2,713	2,713	3,410	3,789	3,961	4,141	4,149	4,141	4,722	4,722	4,741	4,722	4,722	4,722
WY	228	228	228	228	228	228	228	228	228	228	228	228	228	228
AZPS	3,398	3,183	4,128	4,480	4,729	4,927	4,981	4,929	5,474	5,428	5,471	5,331	5,214	5,165
SRP	1,375	1,365	1,345	1,363	1,336	1,337	1,338	1,344	1,340	1,336	1,334	1,343	1,344	1,344
TEPC	799	799	799	799	799	799	799	799	799	799	800	799	799	799
WALC	137	137	137	137	137	137	137	137	137	137	137	137	137	137
NM	1,154	1,154	1,156	1,154	1,154	1,154	1,156	1,154	1,154	1,154	1,156	1,154	1,154	1,154
CFE	14	14	13	14	13	13	13	13	13	13	13	13	13	13
CO	1,238	1,863	2,459	2,584	2,584	2,584	2,588	2,584	2,584	2,584	2,589	2,584	2,584	2,584
NEVP	5,636	5,418	5,572	5,823	5,823	6,324	6,358	6,308	6,529	6,444	6,394	6,221	6,088	5,971
SPPC	616	612	604	611	601	601	601	604	603	601	600	604	604	604
IV-NG	2,052	2,020	1,951	2,014	1,929	1,932	1,929	1,954	1,944	1,930	1,914	1,953	1,953	1,954

Table 22: Wind Generation by Region by Year, GWh

Region	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
PG&E	4,632	4,696	4,900	6,981	8,178	8,361	8,473	10,231	12,673	15,324	17,986	18,503	18,496	18,442
SCE	16,425	16,212	16,627	17,183	16,291	16,238	16,243	17,042	17,235	17,571	17,869	17,230	17,147	17,033
SDGE	701	646	1,291	2,416	2,709	2,697	2,693	2,814	2,858	2,902	2,935	2,824	2,828	2,801
IID	920	847	869	892	837	834	834	877	887	937	1,012	1,006	1,004	1,001
LADWP	438	403	414	424	399	397	397	417	422	600	914	1,018	1,018	1,017
BANC	698	643	769	878	827	914	1,064	1,229	1,343	1,557	1,826	1,881	1,877	1,873
TIDC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AB	8,263	8,263	10,821	12,074	13,324	14,588	14,625	14,596	18,374	18,360	18,376	18,341	18,345	18,383
BC	1,473	1,473	1,477	1,475	1,473	1,473	1,477	1,475	1,473	1,473	1,486	1,473	1,473	1,473
Idaho	2,405	2,393	2,394	2,389	2,392	2,392	2,400	2,396	2,394	2,409	2,420	2,410	2,410	2,410
MT	2,326	2,319	2,321	2,315	2,322	2,323	2,328	2,317	2,324	2,320	2,328	2,322	2,326	2,326
BPA	9,589	9,428	9,284	11,055	11,142	11,467	11,533	13,262	14,231	14,284	14,242	14,409	14,384	14,414
NW	3,013	3,008	3,024	2,996	3,015	3,015	3,032	3,004	3,015	3,015	3,036	3,015	3,015	3,015
PACW	2,986	2,976	2,988	2,983	2,993	2,993	3,010	2,983	2,993	2,993	3,014	2,993	2,993	2,993
PAUT	1,391	1,547	1,900	2,117	2,230	2,311	2,315	2,311	2,522	2,522	2,545	2,522	2,522	2,522
WY	7,092	7,092	8,776	10,939	11,822	14,089	14,171	14,740	17,956	17,820	17,779	17,518	17,381	17,228
AZPS	290	290	313	336	335	346	347	347	380	380	382	380	380	380
SRP	225	225	225	225	225	225	225	225	225	225	225	225	225	225
TEPC	236	236	237	236	236	236	237	236	236	236	237	236	236	236
WALC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	5,828	5,766	6,243	7,236	8,031	9,604	9,728	9,689	11,554	11,465	11,389	11,122	10,947	10,767
CFE	948	926	922	915	918	921	927	924	921	914	913	902	894	884
CO	8,867	9,356	9,394	10,213	10,235	11,682	11,729	11,665	11,679	11,681	11,729	11,682	11,682	11,682
NEVP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPPC	359	359	360	362	359	359	360	362	359	359	360	359	359	359
IV-NG	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 23: Other Renewable Generation (including Small Hydro) by Region by Year, GWh

Region	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
PG&E	11,951	13,101	13,231	13,618	13,802	13,767	13,811	13,770	13,684	13,652	13,602	13,520	13,494	13,474
SCE	4,103	4,446	4,441	4,437	4,447	4,450	4,469	4,437	5,100	5,087	5,057	4,971	4,915	4,735
SDGE	236	245	244	243	244	244	245	242	241	240	238	232	228	198
IID	4,411	4,402	4,390	4,387	4,367	4,383	4,400	4,384	4,358	4,359	4,371	4,354	4,346	4,356
LADWP	496	639	420	709	820	798	921	1,192	1,341	1,341	1,347	1,341	1,341	1,341
BANC	225	317	317	317	317	317	317	317	317	317	317	317	317	295
TIDC	12	34	34	34	34	34	34	34	34	34	34	34	34	34
AB	1,772	1,758	1,762	1,757	1,758	1,755	1,759	1,753	1,753	1,753	1,757	1,755	1,754	1,757
BC	5,805	5,947	5,866	5,866	5,537	5,520	5,584	5,528	5,530	5,606	5,634	5,696	5,697	5,752
Idaho	1,651	1,691	1,693	1,690	1,690	1,691	1,692	1,691	1,690	1,691	1,692	1,691	1,690	1,690
MT	414	419	419	419	419	419	419	419	419	419	419	419	419	419
BPA	5,824	6,049	5,928	6,371	6,321	6,548	6,528	7,021	7,075	6,392	6,330	6,387	6,339	6,376
NW	2,427	2,623	2,627	2,623	2,625	2,623	2,628	2,624	2,621	2,622	2,626	2,621	2,620	2,619
PACW	1,145	1,292	1,294	1,292	1,292	1,292	1,294	1,292	1,292	1,292	1,294	1,292	1,292	1,292
PAUT	1,228	1,287	1,545	1,716	1,877	2,036	2,043	2,037	2,274	2,273	2,281	2,274	2,295	2,296
WY	554	543	543	543	543	543	543	543	543	543	543	543	543	543
AZPS	18	23	23	23	23	23	23	23	23	23	23	23	23	23
SRP	267	285	285	285	285	285	285	285	284	285	285	285	284	285
TEPC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WALC	72	96	96	96	96	96	96	96	96	96	96	96	96	96
NM	91	158	159	158	158	158	159	158	158	158	159	158	158	158
CFE	4,191	4,191	4,204	4,191	4,191	4,191	4,204	4,191	4,191	4,191	4,204	4,191	4,191	4,191
CO	371	448	448	448	448	448	448	448	448	447	448	448	448	379
NEVP	56	56	56	56	56	56	56	56	56	56	56	56	56	56
SPPC	5,505	5,495	5,754	6,017	6,384	7,037	7,055	7,044	7,450	7,421	7,418	7,291	7,237	7,196
IV-NG	0	73	82	85	84	84	85	84	84	83	84	84	84	84

Nuclear Power Plants

Three nuclear power plants are modeled within the WECC. Diablo Canyon Nuclear Power Plant (DCPP) within the PG&E region, Columbia Generating Station in the BPA region, and Palo Verde Nuclear Generating Station in the TH_PV region within Arizona. The two most impactful inputs to nuclear power plant behavior are scheduled refueling and maintenance and the retirement of DCPP in 2024 and 2025.

Refueling of nuclear power plants tends to occur on a schedule and last for a number of weeks. In this model, PG&E utilized the planned refueling schedule for DCPP and assumed that channel cleaning occurs approximately 11 months after refueling. Refueling tends to last for over a month while channel cleaning lasts for approximately four days. Refueling schedules for Columbia and Palo Verde were pre-defined by the CEC in the dataset provided to PG&E.

Finally, DCPP is set to retire once its operating licenses expire on 11/2/2024 and 8/26/2025 for Reactor 1 and Reactor 2 respectively.

Table 24 summarizes the refueling schedules for all three plants, channel-cleaning schedules for DCPP, and planned retirement dates for DCPP.

Table 24: Nuclear Outages (Refueling, Channel Cleaning Schedules, and Retirements)

Plant	Unit	Event	Date From	Date To
DCPP	Reactor 1	Refueling	3/27/2022	5/2/2022
		Tunnel Cleaning	3/2/2023	3/6/2023
		Refueling	10/1/2023	10/27/2023
		Retirement	**11/2/2024**	
	Reactor 2	Tunnel Cleaning	3/1/2022	3/5/2022
		Refueling	10/16/2022	11/21/2022
		Tunnel Cleaning	9/21/2023	9/25/2023
		Refueling	4/7/2024	5/3/2024
		Retirement	**8/26/2025**	
Columbia	Reactor	Refueling	5/6/2023	6/25/2023
		Refueling	5/24/2025	6/29/2025
		Refueling	5/8/2027	6/27/2027
		Refueling	5/19/2029	6/24/2029
		Refueling	5/3/2031	6/29/2031
		Refueling	5/21/2033	6/26/2033
		Refueling	5/5/2035	6/24/2035
Palo Verde	Reactor 1	Refueling	3/31/2022	4/30/2022
		Refueling	10/8/2023	11/9/2023
		Refueling	4/1/2025	4/30/2025
		Refueling	10/10/2026	11/12/2026
		Refueling	3/30/2028	4/29/2028
		Refueling	10/12/2029	11/12/2029
	Reactor 2	Refueling	4/3/2023	5/4/2023
		Refueling	10/12/2024	11/12/2024
		Refueling	4/5/2026	5/6/2026
		Refueling	10/10/2027	11/12/2027
		Refueling	4/1/2029	4/30/2029
	Reactor 3	Refueling	10/11/2022	11/12/2022
		Refueling	4/1/2024	4/30/2024
		Refueling	10/9/2025	11/10/2025
		Refueling	3/31/2027	5/1/2027
		Refueling	10/11/2028	11/12/2028
		Refueling	3/30/2030	5/5/2030

Hydroelectric Generation and Pumped Storage

Hydroelectric and pumped storage generator assumptions were pre-defined by the CEC in the dataset provided to PG&E. In general, hydroelectric generation can be defined by three main parameters. The first is installed capacity as listed in the table at the end of this section. The

second is a maximum energy per month that each generator can produce. The third, is minimum hourly flow, which only applies to a subset of generators that need to maintain a certain level of flow for non-energy reasons (e.g., recreational water use). The first and third parameter were specified once while the second varies based on whether “Average Hydroelectric” or “Dry Hydroelectric” assumptions are required.

For the “Average Demand Year” forecast, 2022 was assumed to be “Dry Hydroelectric” and years 2023-2035 were assumed to be “Average Hydroelectric”. 2022 was assumed to be “Dry” in the “Average Demand Year” as observed rainfall in California for Q4 2021 through Q1 2022 was substantially lower than what is observed on average. For the “High Demand Year”, all years were assumed to be “Dry Hydroelectric”.

For “Average Hydroelectric” years, the maximum energy per month is based on a 15-year average from data between 2005 and 2019 as provided in the CEC model.

For “Dry Hydroelectric” years, PG&E averaged historic hydroelectric generation from 2014 and 2015, the two years of lowest generation during the 15-year timeframe analyzed.

Pumped storage facilities are modeled in a different manner from traditional hydroelectric generation. In this case, each generator is assigned a “Head Storage” above the pump-generator and a “Tail Storage” below the pump-generator. Water can then generate energy by flowing from “Head” to “Tail” and consume energy by pumping from “Tail” to “Head” with energy conversion losses as water flows through the pump-generator. Behavior of these facilities does not vary between “Average Hydroelectric” and “Dry” assumptions.

Table 25 summarizes large hydroelectric and pumped storage generation for the “Average Demand Year” forecast by region in PLEXOS. Table 26 summarizes large hydroelectric and pumped storage generation for the “High Demand Year” forecast by region in PLEXOS.

Table 25: Large Hydroelectric and Pumped Storage Generation by Region by Year, GWh (Average Demand Year)

Region	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
PG&E	10,044	17,958	17,951	17,956	17,961	17,957	17,961	17,957	17,948	17,947	17,931	17,925	17,923	17,922
SCE	2,423	4,061	4,061	4,061	4,060	4,060	4,061	4,061	4,061	4,061	4,061	4,059	4,058	4,056
SDGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IID	28	22	22	22	22	22	22	22	22	22	22	22	22	22
LADWP	247	375	375	375	375	375	375	375	375	375	375	375	375	375
BANC	1,058	2,536	2,535	2,536	2,536	2,536	2,535	2,536	2,536	2,536	2,536	2,536	2,536	2,536
TIDC	206	537	537	537	537	537	537	537	537	537	537	537	537	537
AB	1,859	1,949	1,949	1,949	1,951	1,949	1,949	1,949	1,949	1,949	1,951	1,949	1,950	1,949
BC	64,343	60,690	60,695	60,689	65,935	65,894	65,899	65,894	65,894	65,894	65,929	65,894	65,915	65,894
Idaho	5,963	7,156	7,155	7,156	7,156	7,156	7,155	7,156	7,156	7,156	7,155	7,156	7,156	7,156
MT	4,076	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960
BPA	76,379	79,773	79,756	79,773	79,818	79,768	79,752	79,773	79,768	79,773	79,795	79,760	79,774	79,773
NW	37,583	36,365	36,364	36,365	36,398	36,365	36,364	36,365	36,365	36,365	36,390	36,365	36,383	36,365
PACW	2,937	3,568	3,568	3,568	3,571	3,568	3,568	3,568	3,568	3,568	3,571	3,568	3,570	3,568
PAUT	248	327	327	327	327	327	327	327	327	327	327	327	327	327
WY	1,901	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799
AZPS	18	23	23	23	23	23	23	23	23	23	23	23	23	23
SRP	75	145	145	145	145	145	145	145	145	145	145	145	145	145
TEPC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WALC	5,440	6,889	6,888	6,889	6,889	6,889	6,888	6,889	6,889	6,889	6,888	6,889	6,889	6,889
NM	51	118	118	118	118	118	118	118	118	118	118	118	118	118
CFE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	502	833	833	833	833	833	833	833	833	833	833	833	833	833
NEVP	3,609	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656
SPPC	15	57	57	57	57	57	57	57	57	57	57	57	57	57
IV-NG	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 26: Large Hydroelectric and Pumped Storage Generation by Region by Year, GWh (High Demand Year)

Region	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
PG&E	10,044	17,958	17,951	17,956	17,961	17,957	17,961	17,957	17,948	17,947	17,931	17,925	17,923	17,922
SCE	2,423	4,061	4,061	4,061	4,060	4,060	4,061	4,061	4,061	4,061	4,061	4,059	4,058	4,056
SDGE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IID	28	22	22	22	22	22	22	22	22	22	22	22	22	22
LADWP	247	375	375	375	375	375	375	375	375	375	375	375	375	375
BANC	1,058	2,536	2,535	2,536	2,536	2,536	2,535	2,536	2,536	2,536	2,536	2,536	2,536	2,536
TIDC	206	537	537	537	537	537	537	537	537	537	537	537	537	537
AB	1,859	1,949	1,949	1,949	1,951	1,949	1,949	1,949	1,949	1,949	1,951	1,949	1,950	1,949
BC	64,343	60,690	60,695	60,689	65,935	65,894	65,899	65,894	65,894	65,894	65,929	65,894	65,915	65,894
Idaho	5,963	7,156	7,155	7,156	7,156	7,156	7,155	7,156	7,156	7,156	7,155	7,156	7,156	7,156
MT	4,076	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960	3,960
BPA	76,379	79,773	79,756	79,773	79,818	79,768	79,752	79,773	79,768	79,773	79,795	79,760	79,774	79,773
NW	37,583	36,365	36,364	36,365	36,398	36,365	36,364	36,365	36,365	36,365	36,390	36,365	36,383	36,365
PACW	2,937	3,568	3,568	3,568	3,571	3,568	3,568	3,568	3,568	3,568	3,571	3,568	3,570	3,568
PAUT	248	327	327	327	327	327	327	327	327	327	327	327	327	327
WY	1,901	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799	1,799
AZPS	18	23	23	23	23	23	23	23	23	23	23	23	23	23
SRP	75	145	145	145	145	145	145	145	145	145	145	145	145	145
TEPC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WALC	5,440	6,889	6,888	6,889	6,889	6,889	6,888	6,889	6,889	6,889	6,888	6,889	6,889	6,889
NM	51	118	118	118	118	118	118	118	118	118	118	118	118	118
CFE	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	502	833	833	833	833	833	833	833	833	833	833	833	833	833
NEVP	3,609	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656	4,656
SPPC	15	57	57	57	57	57	57	57	57	57	57	57	57	57
IV-NG	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Thermal Power Plants

Installed capacities, unit start and retirement dates, startup costs, heat rates, and other parameters were pre-defined by the CEC in the dataset provided to PG&E. Consistent with the IRP planning process, PG&E did not assume any thermal retirements in addition to those already announced. Table 27 summarizes all thermal plant retirements (including DCPP) from the State Water Resources Control Board (SWRCB) amended compliance schedule from 11/30/2020.

Table 27: Once-Through Cooling Plant Retirements on or after 1/1/2019 (including DCPP)

Generating Facility by Unit	Retirement Date
Diablo Canyon Nuclear Power Plant 1	11/2/2024
Diablo Canyon Nuclear Power Plant 2	8/26/2025
Ormond Beach 1	12/31/2023
Ormond Beach 2	12/31/2023
Alamitos 1	1/1/2020
Alamitos 2	1/1/2020
Alamitos 3	12/31/2023
Alamitos 4	12/31/2023
Alamitos 5	12/31/2023
Alamitos 6	1/1/2020
Alamitos Repower	Online 4/1/2020
Huntington Beach 1	12/31/2020
Huntington Beach 2	12/31/2023
Huntington Beach Repower	Online 3/1/2020
Redondo Beach 5	12/31/2021
Redondo Beach 6	12/31/2021
Redondo Beach 7	10/1/2019
Redondo Beach 8	12/31/2021

For generators outside California, coal power plant retirements were pre-defined by the CEC in the dataset provided to PG&E. In specific cases, PG&E updated retirement dates based on more recent data, accelerating retirement for five units at four plants. Table 28 summarizes the coal retirement updates that PG&E made to the PLEXOS model.

Table 28: Updates Made to WECC Coal Retirement Schedules in CEC PLEXOS Dataset

Generating Plant & Unit	Original Retirement	Update Retirement
Colstrip 1	12/31/2022	1/1/2020
Colstrip 2	12/31/2022	1/1/2020
Nucla 1-4	12/31/2022	9/19/2019
Cholla 4	12/31/2021	12/24/2020
Escalante 1	1/1/2059	8/31/2020

Battery Energy Storage

Battery energy storage (BES) installations are modeled as 4-hour batteries that charge, and discharge based on market pricing conditions. Batteries added to the dataset by PG&E were specified with a round-trip (charge + discharge) efficiency of 85%.

Table 29: Installed Capacity by Region by Resource Class, End of Year (MW)

Region	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
PG&E	Solar	4,343	4,827	4,961	5,041	5,041	5,046	5,051	5,133	5,216	5,216	5,216	5,216	5,216	5,216
	Wind	1,786	1,808	1,836	2,936	3,056	3,094	3,131	3,881	4,631	5,387	6,144	6,150	6,157	6,164
	Other Renewable	3,082	3,092	3,111	3,167	3,187	3,183	3,183	3,183	3,178	3,178	3,178	3,178	3,178	3,177
	Nuclear	2,248	2,248	1,135	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448	6,448
	Pumped Storage	1,619	1,619	1,619	1,619	1,619	1,619	1,619	1,619	1,619	1,619	1,619	1,619	1,619	1,619
	Gas	13,590	13,590	13,590	13,590	13,544	13,285	13,214	12,650	12,568	12,473	12,342	12,342	12,337	12,334
	Other Thermal	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Battery Storage	1,296	1,667	2,503	2,755	2,755	2,848	2,942	2,999	3,056	3,125	3,194	3,537	3,880	4,223
SCE	Solar	14,972	18,606	19,673	22,843	22,843	23,036	23,230	24,620	26,009	27,591	29,173	32,330	35,488	38,645
	Wind	5,329	5,329	5,329	5,414	5,414	5,414	5,414	5,414	5,414	5,414	5,414	5,414	5,414	5,414
	Other Renewable	1,033	1,043	1,063	1,103	1,143	1,163	1,163	1,173	1,313	1,313	1,313	1,313	1,313	1,290
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216	1,216
	Pumped Storage	621	621	621	621	817	1,219	1,621	1,621	1,621	1,621	1,621	1,621	1,621	1,621
	Gas	12,812	12,812	9,917	9,863	9,274	9,257	9,225	9,215	8,994	8,994	8,994	8,944	8,944	8,944
	Other Thermal	91	91	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	3,285	4,878	9,098	10,350	10,350	10,636	10,922	11,023	11,124	11,643	12,162	13,178	14,194	15,210
SDGE	Solar	106	106	106	106	106	106	106	106	106	106	106	106	106	106
	Wind	185	185	487	785	785	785	785	785	785	785	785	785	785	785
	Other Renewable	51	51	51	51	51	51	51	51	51	51	51	51	51	45
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	Gas	2,632	2,612	2,604	2,604	2,604	2,604	2,604	2,604	2,604	2,604	2,604	2,604	2,554	2,554
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	564	749	745	747	747	748	749	749	749	749	749	749	749	749
IID	Solar	1,083	1,083	1,083	1,083	1,083	1,083	1,083	1,083	1,083	1,118	1,153	1,223	1,293	1,363
	Wind	265	265	265	265	265	265	265	265	265	282	299	299	299	299
	Other Renewable	796	806	816	846	876	896	896	906	926	926	926	926	926	926
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	558	438	418	418	398	398	398	373	373	373	373	373	373	373
	Other Thermal	25	25	25	25	25	25	25	25	0	0	0	0	0	0
	Battery Storage	48	47	46	45	44	43	42	42	41	54	67	97	127	157
LADWP	Solar	286	328	324	396	432	536	581	630	675	859	1,043	1,410	1,777	2,144
	Wind	135	135	135	135	135	135	135	135	135	223	311	312	312	313
	Other Renewable	110	117	87	126	141	138	154	191	211	211	211	211	211	211
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	235	235	235	235	235	235	235	235	235	235	235	235	235	235
	Pumped Storage	1,670	1,670	1,670	1,670	1,670	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669	1,669
	Gas	3,959	3,959	3,904	3,904	3,904	3,904	3,835	3,835	3,212	3,212	3,212	3,212	3,212	3,212
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	197	221	245	269	269	269	269	269	268	337	405	563	721	879
BANC	Solar	473	478	483	485	488	524	540	545	569	729	888	1,207	1,525	1,844
	Wind	229	229	294	294	295	349	399	425	462	538	615	615	616	617
	Other Renewable	97	97	97	97	97	97	97	97	97	97	97	97	97	94
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252	1,252
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687
	Other Thermal	122	122	122	122	122	122	122	122	61	0	0	0	0	0
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 29: Installed Capacity by Region by Resource Class, End of Year (MW)

Region	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
TIDC	Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other Renewable	14	14	14	14	14	14	14	14	14	14	14	14	14	14
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	203	203	203	203	203	203	203	203	203	203	203	203	203	203
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	517	517	517	517	517	517	517	517	517	517	517	517	517	517
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AB	Solar	136	136	227	273	318	364	364	364	500	500	500	500	500	500
	Wind	2,672	2,672	3,490	3,900	4,309	4,718	4,718	4,718	5,945	5,945	5,945	5,945	5,945	5,945
	Other Renewable	579	579	579	579	579	579	579	579	579	579	579	579	579	579
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	759	759	759	759	759	759	759	759	759	759	759	759	759	759
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	10,238	10,328	11,038	11,038	11,243	14,148	15,478	16,684	17,439	17,439	17,439	17,439	17,401	17,401
	Other Thermal	5,190	5,190	5,190	5,190	5,031	4,319	2,771	1,201	0	0	0	0	0	0
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BC	Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Wind	606	606	606	606	606	606	606	606	606	606	606	606	606	606
	Other Renewable	1,567	1,567	1,567	1,567	1,567	1,567	1,567	1,567	1,567	1,567	1,567	1,567	1,567	1,567
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	13,880	13,880	13,880	13,880	14,980	14,980	14,980	14,980	14,980	14,980	14,980	14,980	14,980	14,980
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	458	412	412	412	412	412	412	412	412	412	412	412	412	412
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Idaho	Solar	305	305	305	305	305	305	305	305	305	305	305	305	305	305
	Wind	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001
	Other Renewable	379	379	379	379	379	379	379	379	379	379	379	379	379	379
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176	2,176
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	811	811	811	811	811	811	811	811	811	811	811	811	811	811
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MT	Solar	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	Wind	750	750	750	750	750	750	750	750	750	750	750	750	750	750
	Other Renewable	97	97	97	97	97	97	97	97	97	97	97	97	97	97
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	990	990	990	990	990	990	990	990	990	990	990	990	990	990
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	204	204	204	204	204	204	204	204	204	204	204	204	204	204
	Other Thermal	1,812	1,812	1,812	1,812	1,812	1,812	1,812	1,812	1,812	1,812	1,812	1,812	1,812	1,812
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BPA	Solar	139	139	139	209	209	214	214	289	329	329	329	329	329	329
	Wind	4,094	4,189	4,140	4,890	4,890	4,980	4,980	5,780	6,245	6,245	6,245	6,245	6,245	6,245
	Other Renewable	1,084	1,084	1,154	1,149	1,149	1,169	1,169	1,229	1,212	1,090	1,090	1,090	1,090	1,090
	Nuclear	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146	1,146
	Large Hydro	20,229	20,229	20,229	20,229	20,229	20,229	20,229	20,229	20,229	20,229	20,229	20,229	20,229	20,229
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	5,484	5,484	5,484	5,484	5,484	5,484	5,484	5,484	5,484	5,484	5,484	5,484	4,978	4,978
	Other Thermal	703	703	703	703	0	0	0	0	0	0	0	0	0	0
	Battery Storage	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Table 29: Installed Capacity by Region by Resource Class, End of Year (MW)

Region	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
NW	Solar	17	17	17	17	17	17	17	17	17	17	17	17	17	17
	Wind	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260
	Other Renewable	490	490	490	490	490	490	490	490	490	490	490	490	490	490
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085	8,085
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	1,610	1,610	1,610	1,610	1,610	1,610	1,543	1,543	1,543	1,318	1,318	1,318	1,318	1,318
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	2	2	2	2	2	2	2	2	2	2	2	2	2	2
PACW	Solar	148	148	148	148	148	148	148	148	148	148	148	148	148	148
	Wind	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260
	Other Renewable	290	290	290	290	290	290	290	290	290	290	290	290	290	290
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	832	832	832	832	832	832	832	832	832	832	832	832	832	832
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	1,093	1,093	1,093	1,093	1,093	1,093	1,093	1,093	1,093	1,093	1,093	1,093	1,093	1,093
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAUT	Solar	1,354	1,354	1,699	1,891	1,977	2,067	2,067	2,067	2,357	2,357	2,357	2,357	2,357	2,357
	Wind	628	698	857	957	1,008	1,045	1,045	1,045	1,141	1,141	1,141	1,141	1,141	1,141
	Other Renewable	295	295	327	349	369	389	389	389	419	419	419	419	419	419
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	33	33	33	33	33	33	33	33	33	33	33	33	33	33
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	2,603	2,603	2,603	3,443	3,443	3,443	3,443	3,443	3,208	3,208	3,208	3,208	3,208	3,208
	Other Thermal	4,579	4,579	4,579	2,779	2,779	2,779	2,779	2,779	2,779	2,779	2,779	2,779	2,779	2,779
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WY	Solar	101	101	101	101	101	101	101	101	101	101	101	101	101	101
	Wind	2,361	2,361	2,907	3,679	3,953	4,725	4,725	4,975	6,043	6,043	6,043	6,043	6,043	6,043
	Other Renewable	212	212	212	212	212	212	212	212	212	212	212	212	212	212
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	646	646	646	646	646	646	646	646	646	646	646	646	646	646
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	1,068	1,068	1,068	1,068	1,068	1,018	993	968	968	968	968	968	968	968
	Other Thermal	7,306	7,306	7,306	7,306	7,306	6,878	6,116	6,116	6,116	5,746	5,746	5,667	5,667	5,667
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AZPS	Solar	1,372	1,372	1,914	2,076	2,196	2,266	2,266	2,266	2,556	2,556	2,556	2,556	2,556	2,556
	Wind	128	128	138	148	148	153	153	153	168	168	168	168	168	168
	Other Renewable	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Nuclear	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946	3,946
	Large Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	8,074	7,895	7,895	7,895	7,895	7,895	7,895	7,895	7,895	7,895	7,895	7,895	7,895	7,895
	Other Thermal	1,964	1,964	1,964	1,964	1,583	1,583	1,583	1,583	1,583	1,583	1,583	1,583	1,583	1,583
	Battery Storage	6	6	6	6	6	6	6	6	6	6	6	6	6	6
SRP	Solar	575	575	575	575	575	575	575	575	575	575	575	575	575	575
	Wind	99	99	99	99	99	99	99	99	99	99	99	99	99	99
	Other Renewable	52	52	52	52	52	52	52	52	52	52	52	52	52	52
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	76	76	76	76	76	76	76	76	76	76	76	76	76	76
	Pumped Storage	651	651	651	651	651	651	651	651	651	651	651	651	651	651
	Gas	3,169	3,045	2,881	2,794	2,794	2,794	2,794	2,794	2,794	2,794	2,794	2,794	2,485	2,382
	Other Thermal	785	785	785	785	785	785	785	785	785	785	785	785	785	785
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 29: Installed Capacity by Region by Resource Class, End of Year (MW)

Region	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
TEPC	Solar	327	327	327	327	327	327	327	327	327	327	327	327	327	327
	Wind	90	90	90	90	90	90	90	90	90	90	90	90	90	90
	Other Renewable	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	329	329	329	329	329	329	329	329	329	329	329	329	329	329
	Other Thermal	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618
	Battery Storage	50	50	50	50	50	50	50	50	50	50	50	50	50	50
WALC	Solar	59	59	59	59	59	59	59	59	59	59	59	59	59	59
	Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other Renewable	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	1,703	1,703	1,703	1,703	1,703	1,703	1,703	1,703	1,703	1,703	1,703	1,703	1,703	1,703
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	1,512	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430
	Other Thermal	240	240	240	175	175	175	175	175	175	175	175	175	175	175
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	Solar	501	501	501	501	501	501	501	501	501	501	501	501	501	501
	Wind	2,048	2,048	2,233	2,623	2,908	3,508	3,508	3,508	4,278	4,278	4,278	4,278	4,278	4,278
	Other Renewable	56	56	56	56	56	56	56	56	56	56	56	56	56	56
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	2,952	2,814	2,814	2,814	2,814	2,814	2,814	2,814	3,310	3,310	3,310	3,310	3,310	3,083
	Other Thermal	848	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CFE	Solar	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	Wind	465	465	465	465	465	465	465	465	465	465	465	465	465	465
	Other Renewable	570	570	570	570	570	570	570	570	570	570	570	570	570	570
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	3,970	3,970	4,085	4,085	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200
	Other Thermal	333	333	333	333	333	333	333	333	333	306	306	306	306	306
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	Solar	548	998	1,145	1,145	1,145	1,145	1,145	1,145	1,145	1,145	1,145	1,145	1,145	1,145
	Wind	3,049	3,218	3,218	3,518	3,518	4,018	4,018	4,018	4,018	4,018	4,018	4,018	4,018	4,018
	Other Renewable	117	117	117	117	117	117	117	117	117	117	117	117	117	102
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	184	184	184	184	184	184	184	184	184	184	184	184	184	184
	Pumped Storage	831	831	831	831	831	831	831	831	831	831	831	831	831	831
	Gas	5,994	5,977	5,977	5,977	5,977	5,958	5,958	5,958	5,958	5,958	5,958	5,958	5,958	5,958
	Other Thermal	2,669	2,344	2,344	2,344	2,009	2,009	2,009	2,009	2,009	2,009	2,009	2,009	2,009	2,009
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEVP	Solar	2,513	2,513	2,623	2,733	2,733	2,953	2,953	2,953	3,063	3,063	3,063	3,063	3,063	3,063
	Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other Renewable	11	11	11	11	11	11	11	11	11	11	11	11	11	11
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	5,823	5,823	5,823	5,823	5,747	5,525	5,525	5,525	5,525	5,525	5,525	5,525	5,525	5,525
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 29: Installed Capacity by Region by Resource Class, End of Year (MW)

Region	Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
SPPC	Solar	285	285	285	285	285	285	285	285	285	285	285	285	285	285
	Wind	150	150	150	150	150	150	150	150	150	150	150	150	150	150
	Other Renewable	875	875	911	947	999	1,085	1,085	1,085	1,145	1,145	1,145	1,145	1,145	1,145
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,201	1,093
	Other Thermal	467	467	467	467	200	200	200	200	200	200	200	200	200	200
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IV-NG	Solar	681	681	681	681	681	681	681	681	681	681	681	681	681	681
	Wind	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other Renewable	0	10	20	50	80	100	100	110	130	130	130	130	130	130
	Nuclear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Large Hydro	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pumped Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gas	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014	1,014
	Other Thermal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Battery Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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III. Forecast Tables

III. Forecast Tables

Please see the spreadsheet available at

https://www.pge.com/pipeline/library/regulatory/cgr/index.page