

Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case
Application: A.22-05-____
Exhibit No: SDG&E-39-WP

WORKPAPERS TO
PREPARED DIRECT TESTIMONY
OF SCOTT WILDER
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

MAY 2022



San Diego Gas and Electric: Gas Customer Forecast Model

SDG&E uses regression equations to produce its forecasts of residential and core commercial/industrial (C&I) gas meters. San Diego County housing starts are the primary driver in the residential meter forecast. The core C&I sector is driven by San Diego County nonfarm employment. Meter forecasts for the relatively small numbers of natural gas vehicle facilities, noncore C&I, and electric generation are provided by SDG&E experts in those three sectors. The forecasts for residential and for core C&I meters use historical quarterly data from 1991 through 2021; the forecast for new gas meter-sets uses historical annual data from 2006 through 2021.

VARIABLE DEFINITIONS

ABRTUNS_SD	Total housing starts, annualized, San Diego County
EEASD	Total nonfarm employment, San Diego County
METCCISD	Core commercial/industrial meters (equal to total meters less residential, NGV, noncore C&I, and EG)
METEGSD	Electric Generation meters
METNCCISD	Noncore commercial/industrial
METNGVSD	Natural gas vehicle facility meters
METRESSD	Residential meters
METTOTSD	Total meters
NEWSETSSD	New gas meter-sets
SEASON2	Seasonal dummy variable: 2nd quarter each year=1, =0 otherwise
SEASON3	Seasonal dummy variable: 3rd quarter each year=1, =0 otherwise
SEASON4	Seasonal dummy variable: 4th quarter each year=1, =0 otherwise

EQUATIONS (In the regression equations, t-values are in parentheses.)

METCCISD

Cochrane-Orcutt

QUARTERLY data for 127 periods from 1990Q2 to 2021Q4

$$\ln(\text{metccisd}) = 0.03531 * \ln(\text{eeasd}) + 9.8482 - 0.00104 * \text{SEASON}_2$$

(2.55980) (48.9653) (2.63189)

$$- 0.00338 * \text{SEASON}_3 - 0.00398 * \text{SEASON}_4$$

(7.54937) (9.24698)

Sum Sq	0.0008	Std Err	0.0025	LHS Mean	10.2786
R Sq	0.9963	R Bar Sq	0.9961	F	5,121 6451.34
D.W.(1)	1.3919	D.W.(4)	0.7953		

$$\text{AR}_0 = + 0.98960 * \text{AR}_1$$

(158.818)

METCCISD=exp(??) + 10.61
10.61 is an addfactor. It is the 2021Q4 difference between actual metccisd and equation-predicted metccisd. This difference is applied to all quarters in the forecast period.

METRESSD

Cochrane-Orcutt

QUARTERLY data for 128 periods from 1990Q1 to 2021Q4

$$\text{diff}(\text{metressd}) = 0.05703 * \text{abrtuns_sd} + 0.04714 * \text{abrtuns_sd}[-1]$$

(3.13738) (2.59296)

$$+ 0.04043 * \text{abrtuns_sd}[-2] - 532.036 * \text{season2} - 550.327 * \text{season3} + 804.412$$

2.31579) (6.38516) (6.74379) (3.04483)

Sum Sq	2E+07	Std Err	453.943	LHS Mean	1897.82
R Sq	0.7830	R Bar Sq	0.7723	F	6,121 72.7839
D.W.(1)	1.9429	D.W.(4)	1.1780		

$$\text{AR}_0 = + 0.63132 * \text{AR}_1$$

(8.25052)

METRESSD=metressd[-1]+(??) + (-797.45)
(-797.45) is an addfactor. It is the 2021Q4 difference between actual metressd and equation-predicted metressd. This difference is applied to all quarters in the forecast period.

SDG&E
2024 GRC - APP
Gas Customer Forecast

NEWSETSSD

Ordinary Least Squares

ANNUAL data for 16 periods from 2006 to 2021

$$\text{newsetssd} = \frac{1.02309}{(6.45196)} * \text{diff}(\text{mettotssd}) + \frac{296.569}{(0.33729)}$$

Sum Sq	1E+07	Std Err	934.310	LHS Mean	5765.81
R Sq	0.7483	R Bar Sq	0.7304	F	1, 14 41.6278
D.W.(1)	1.4943	D.W.(2)	1.5733		

NEWSETSD=(??) + (-1531.12)

(-1531.12) is an addfactor. It is the year 2021 difference between actual annual newsetssd and equation-predicted newsetssd. This difference is applied to all years in the forecast period.

DATA

2024 General Rate Case
SDG&E Gas Meter Forecast
Recorded data through 2021

YEAR	Residential	Core Commerical & Industrial	Natural Gas Vehicle	Noncore Commerical & Industrial	Electric Generation	Total	New Gas Meter Sets
1990	641,196	27,492	34	7	110	668,838	#N/A
1991	650,391	27,617	34	8	83	678,133	#N/A
1992	657,167	27,521	34	5	65	684,793	#N/A
1993	661,051	27,443	34	5	67	688,601	#N/A
1994	665,462	27,354	34	4	64	692,919	#N/A
1995	672,106	27,252	34	6	49	699,446	#N/A
1996	680,192	27,259	34	6	45	707,535	#N/A
1997	690,287	27,443	34	6	45	717,816	#N/A
1998	702,513	27,624	34	14	42	730,227	#N/A
1999	715,319	28,016	34	17	45	743,431	#N/A
2000	727,547	28,564	34	24	45	756,214	#N/A
2001	739,874	28,932	34	24	48	768,912	#N/A
2002	753,182	29,223	34	34	56	782,530	#N/A
2003	765,256	29,474	34	45	58	794,866	#N/A
2004	775,938	29,686	34	48	65	805,771	#N/A
2005	788,196	29,768	34	50	69	818,117	#N/A
2006	798,253	29,680	34	50	72	828,089	10,921
2007	805,013	29,861	34	51	69	835,029	7,669
2008	808,545	30,154	34	52	69	838,853	4,933
2009	812,174	30,115	34	55	64	842,442	4,745
2010	817,006	30,143	34	58	65	847,305	3,856
2011	821,874	30,109	34	57	61	852,135	4,367
2012	826,574	30,085	34	58	64	856,816	4,706
2013	831,811	30,022	34	52	67	861,985	4,440
2014	835,745	30,011	34	48	67	865,904	3,817
2015	839,988	29,986	34	48	69	870,125	5,687
2016	845,278	30,020	34	50	80	875,462	5,648
2017	850,136	30,079	36	49	94	880,393	6,836
2018	855,716	30,127	37	47	97	886,025	6,701
2019	861,502	30,246	37	46	99	891,929	6,398
2020	867,407	30,168	35	50	103	897,762	6,740
2021	873,304	30,163	33	51	98	903,650	4,789
2022	880,418	30,319	34	50	96	910,917	6,201
2023	888,738	30,378	37	50	96	919,298	7,340
2024	896,990	30,424	37	50	96	927,597	7,256

SDG&E
2024 GRC - APP
Gas Customer Forecast

Model Quarterly Data

Quarter	ABRTUNS_SD	EEASD	METRESSD	METCCISD	METNGVSD	METNCCISD	METEGSD	METTOTS
199001	27758	967100	637217	27519	34	7	115	664892
199002	15545	978867	640212	27532	34	7	115	667899
199003	11903	978067	642430	27432	34	7	111	670014
199004	9905	987667	644924	27483	34	7	100	672548
199101	12187	977100	647289	27709	34	8	95	675135
199102	10164	981933	649621	27660	34	8	95	677419
199103	6156	974467	651226	27564	34	8	77	678909
199104	5663	975433	653428	27533	34	7	66	681068
199201	9488	958633	655733	27684	34	7	65	683523
199202	6838	968267	656837	27595	34	7	66	684539
199203	6094	959233	657472	27410	34	5	66	684987
199204	3707	964567	658628	27397	34	2	65	686125
199301	4327	953567	660281	27646	34	2	65	688028
199302	5839	960967	660913	27531	34	7	69	688554
199303	5469	958300	660698	27322	34	8	68	688131
199304	7426	967400	662313	27274	34	3	67	689691
199401	7613	955067	663823	27493	34	4	65	691420
199402	7028	965533	664808	27431	34	4	65	692342
199403	6591	965433	665737	27244	34	5	63	693083
199404	7063	976733	667480	27247	34	5	64	694830
199501	6363	967900	669949	27389	34	5	61	697439
199502	7656	988367	671255	27313	34	5	45	698652
199503	6586	992167	672376	27205	34	6	46	699667
199504	6284	1005767	674842	27102	34	6	44	702028
199601	6903	996967	677184	27322	34	7	43	704590
199602	7141	1015533	678899	27301	34	7	44	706285
199603	7018	1017200	680909	27197	34	5	45	708190
199604	7096	1032200	683775	27215	34	4	47	711075
199701	8858	1034967	686543	27453	34	4	47	714081
199702	9734	1062033	688725	27473	34	5	46	716283
199703	10365	1070367	691219	27406	34	7	45	718711
199704	14840	1085767	694662	27440	34	9	44	722188
199801	11409	1085233	698299	27670	34	11	43	726057
199802	12275	1112733	700965	27642	34	13	42	728696
199803	13468	1119833	703596	27575	34	15	41	731261
199804	10581	1142900	707193	27608	34	17	41	734893
199901	15320	1135167	711015	27857	34	18	39	738962
199902	15830	1160033	713907	28008	34	17	47	742013
199903	15918	1160767	716445	28052	34	17	48	744596
199904	13929	1184067	719907	28146	34	17	47	748152
200001	13960	1180067	723252	28424	34	16	46	751772
200002	15632	1200833	725885	28572	34	24	41	754555
200003	13630	1196900	728615	28564	34	26	46	757285
200004	13148	1221767	732437	28696	34	30	49	761246
200101	15928	1211633	735706	28905	34	29	49	764724
200102	15328	1230600	738207	28900	34	23	43	767207
200103	13834	1220000	740975	28915	34	21	48	769993
200104	13190	1236800	744608	29007	34	24	52	773725
200201	15283	1222867	748114	29166	34	23	53	777390
200202	12979	1244200	751464	29208	34	35	54	780796
200203	11440	1230100	755058	29211	34	38	58	784399
200204	12883	1251500	758093	29306	34	41	61	787535
200301	17416	1234067	761029	29441	34	43	56	790603
200302	16594	1249833	763740	29454	34	45	56	793330
200303	14768	1247067	766658	29460	34	45	59	796255
200304	15741	1263200	769595	29540	34	45	61	799276
200401	15613	1250567	771943	29682	34	48	64	801771
200402	15255	1270833	774156	29738	34	49	65	804042
200403	14892	1271100	776944	29662	34	48	64	806752
200404	11674	1288500	780709	29663	34	48	65	810519
200501	16846	1274633	784093	29776	34	50	66	814019
200502	14273	1296633	786830	29770	34	49	66	816749
200503	12398	1294333	789278	29758	34	50	71	819190
200504	7852	1307400	792585	29768	34	51	72	822510
200601	10076	1298200	795523	29843	34	51	73	825524
200602	9219	1315700	797502	29721	34	51	73	827380
200603	7317	1314133	798823	29570	34	50	72	828548
200604	7520	1327133	801163	29585	34	50	71	830903
200701	7005	1310100	803418	29760	34	51	71	833334
200702	7630	1324867	804392	29850	34	51	68	834395

SDG&E
2024 GRC - APP
Gas Customer Forecast

Quarter	ABRTUNS_SD	EEASD	METRESSD	METCCISD	METNGVSD	METNCCISD	METEGSD	METTOTSD
200703	6019	1324400	805455	29869	34	51	69	835478
200704	4485	1329933	806788	29966	34	51	69	836909
200801	5207	1312833	807675	30095	34	50	70	837924
200802	7018	1322900	807979	30186	34	52	69	838321
200803	4737	1313900	808587	30170	34	52	69	838912
200804	3263	1308633	809938	30164	34	52	66	840254
200901	1864	1265433	810763	30188	34	53	64	841101
200902	4572	1255633	811153	30117	34	53	64	841421
200903	2026	1231067	812577	30081	34	56	64	842812
200904	2285	1243600	814203	30073	34	58	63	844432
201001	4162	1221333	815292	30069	34	58	64	845517
201002	3271	1247100	816471	30143	34	58	65	846771
201003	3353	1241833	817527	30206	34	58	65	847889
201004	2596	1251600	818736	30153	34	57	65	849044
201101	4014	1239667	819644	30131	34	57	61	849927
201102	6463	1250533	821163	30127	34	57	61	851442
201103	5176	1247133	822795	30108	34	57	60	853054
201104	5461	1263700	823894	30070	34	58	61	854117
201201	3719	1252967	824746	30110	34	58	64	855013
201202	6299	1287233	825641	30129	34	58	65	855926
201203	6475	1284533	827261	30079	34	59	63	857497
201204	4472	1306367	828648	30024	34	59	64	858829
201301	6211	1296200	829951	30055	34	58	65	860164
201302	7798	1314833	831314	30036	34	56	66	861506
201303	5718	1313267	832435	29988	34	47	67	862571
201304	9836	1339633	833544	30008	34	47	68	863701
201401	8332	1323700	834550	30060	34	47	68	864760
201402	7006	1342367	835353	30039	34	47	67	865540
201403	8068	1343767	836064	29980	34	48	65	866190
201404	6493	1368933	837012	29965	34	48	67	867126
201501	6749	1358667	837918	29997	34	47	69	868064
201502	10603	1379633	839343	30001	34	46	68	869493
201503	8737	1388200	840529	29975	34	49	69	870655
201504	8334	1412700	842161	29972	34	50	69	872286
201601	9374	1398433	843324	30020	34	50	75	873502
201602	9752	1420333	844322	30005	34	50	79	874491
201603	8839	1424533	846037	30023	34	50	81	876224
201604	10834	1447067	847429	30033	34	49	84	877629
201701	6746	1431800	848432	30062	35	49	91	878668
201702	7554	1452100	849392	30070	35	49	93	879638
201703	9379	1449633	850389	30072	36	49	95	880641
201704	10531	1475567	852331	30112	37	49	97	882627
201801	13455	1467667	853719	30152	38	48	97	884054
201802	11262	1482867	855028	30131	37	48	96	885340
201803	7986	1478367	856238	30131	37	48	99	886552
201804	5999	1500033	857879	30096	37	45	99	888156
201901	5510	1487200	859547	30212	37	45	98	889938
201902	8277	1502700	860891	30240	37	45	99	891312
201903	6907	1499733	861816	30234	36	46	99	892232
201904	7662	1523067	863755	30297	36	47	100	894235
202001	7607	1506600	865001	30323	35	47	102	895508
202002	6123	1295567	866608	30180	34	50	103	896975
202003	7209	1349667	868071	30093	35	50	103	898352
202004	8603	1389200	869949	30076	34	51	103	900214
202101	11219	1374467	871589	30085	34	52	101	901861
202102	8564	1402500	872385	30164	33	51	98	902731
202103	9020	1409467	873947	30186	33	49	97	904312
202104	10740	1450624	875297	30218	33	50	96	905695
202201	10704	1449305	877558	30347	33	50	96	908084
202202	10923	1476265	879376	30345	34	50	96	909900
202203	10890	1479324	881189	30285	35	50	96	911654
202204	10664	1511231	883550	30298	35	50	96	914029
202301	10669	1498959	885902	30419	36	50	96	916504
202302	10650	1511081	887713	30405	37	50	96	918301
202303	10561	1507153	889501	30340	37	50	96	920024
202304	10569	1529991	891836	30347	37	50	96	922365
202401	10609	1514595	894170	30465	37	50	96	924818
202402	10542	1528755	895971	30452	37	50	96	926606
202403	10500	1525543	897749	30387	37	50	96	928319
202404	10423	1548045	900069	30393	37	50	96	930645