NRRD Workshop III

May 9, 2024

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Agenda

I. Review/Complete Workshop II Content
   - A. System Load and Time-of-Use Period Analysis
   - B. Bill Impact Results – Standard vs. Existing TOD
   - C. Rate Design Discussion – Policy and Practice

II. Metering and Billing System Research
   - A. Interval Meters and Meter Programs
   - B. Billing Operations and Changes

III. First Study Rate Design
   - A. Billing Unit Calculations and Discussion
   - B. Rate Design Calculations and Discussion

Review of Workshop II

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System Load and TOU Periods

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1a	5179	5150	5155	5191	5287	5493	5775	5916	5859	5774	5682	5586	5484	5411	5359	5382	5536	5807	5826	5783	5717	5578	5376	5232
1b	5135	5122	5144	5197	5326	5579	5913	6050	5952	5799	5661	5535	5450	5402	5370	5382	5501	5731	5777	5732	5663	5514	5308	5166
2a	5280	5275	5293	5339	5448	5659	5946	6062	6010	5936	5856	5775	5691	5622	5572	5579	5676	5887	5984	5936	5858	5723	5531	5408
2b	4951	4940	4969	5018	5139	5365	5647	5712	5594	5443	5323	5206	5111	5040	4983	4975	5045	5228	5365	5339	5277	5163	4988	4870
3a	4335	4316	4338	4388	4519	4777	5110	5173	5058	4946	4855	4748	4650	4565	4470	4431	4479	4608	4788	4835	4812	4704	4531	4389
3b	3699	3676	3686	3732	3851	4087	4428	4573	4491	4398	4320	4246	4187	4132	4064	4017	4013	4038	4065	4166	4158	4048	3882	3742
4a	3509	3484	3502	3553	3675	3925	4266	4371	4283	4186	4102	4024	3995	3993	3994	4006	4045	4082	4055	4077	4089	3943	3738	3568
4b	3198	3149	3156	3185	3309	3564	3900	4010	3960	3916	3900	3895	3903	3940	3972	3997	4022	4022	3950	3906	3910	3735	3473	3251
5a	3421	3218	3089	3031	3066	3273	3597	3813	3935	4125	4364	4592	4823	5037	5201	5347	5441	5423	5256	4998	4843	4564	4153	3749
5b	3699	3454	3280	3189	3196	3345	3631	3954	4222	4517	4845	5146	5405	5631	5802	5928	5980	5938	5760	5454	5218	4935	4507	4075
6a	4398	4123	3926	3791	3753	3830	4031	4388	4752	5151	5573	5943	6252	6519	6725	6871	6935	6887	6694	6354	6028	5721	5264	4821
6b	4635	4356	4144	4014	3968	4014	4187	4511	4862	5239	5634	6005	6326	6609	6822	6943	6986	6934	6728	6425	6104	5827	5407	4994
7a	4804	4520	4308	4174	4141	4243	4438	4807	5198	5638	6083	6475	6801	7058	7209	7287	7291	7200	7003	6679	6342	6059	5597	5158
7b	4902	4624	4415	4252	4185	4241	4381	4710	5105	5552	6043	6478	6833	7109	7295	7412	7453	7389	7170	6826	6502	6197	5724	5278
8a	4473	4233	4045	3922	3908	4029	4235	4504	4838	5236	5680	6080	6417	6687	6840	6923	6918	6823	6563	6213	5957	5631	5189	4787
8b	4391	4156	3975	3873	3867	4014	4290	4524	4799	5170	5594	5986	6320	6567	6702	6752	6760	6699	6462	6123	5890	5518	5086	4697
9a	4020	3789	3622	3526	3521	3667	3963	4165	4399	4710	5081	5463	5809	6110	6306	6440	6488	6375	6077	5781	5520	5146	4721	4326
9b	4117	3859	3678	3570	3565	3738	4061	4239	4482	4843	5292	5746	6164	6495	6698	6803	6832	6699	6363	6090	5770	5358	4889	4452
10a	3539	3351	3232	3170	3202	3396	3771	3953	4061	4234	4481	4715	4951	5142	5278	5371	5393	5280	5089	4969	4730	4436	4092	3763
10b	3266	3225	3233	3269	3392	3657	4063	4248	4209	4123	4067	4006	3972	3958	3928	3913	3937	3981	4064	4041	3948	3793	3592	3424
11a	4132	4109	4126	4179	4310	4574	4903	4972	4880	4753	4626	4515	4422	4375	4342	4370	4526	4778	4785	4754	4694	4559	4377	4234
11b	4167	4143	4163	4215	4345	4601	4928	5010	4878	4733	4616	4507	4420	4369	4332	4356	4535	4769	4784	4744	4685	4556	4370	4232
12a	4394	4352	4356	4396	4521	4773	5120	5222	5111	4977	4866	4756	4676	4621	4593	4634	4840	5081	5103	5080	5038	4896	4685	4505
12b	5100	5059	5054	5095	5187	5375	5611	5738	5712	5619	5520	5438	5351	5301	5271	5317	5511	5764	5768	5733	5682	5568	5391	5256

5916
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1a	737	766	761	725	629	422	141	0	56	141	234	330	432	505	557	534	380	109	90	133	199	338	540	684
1b	914	927	905	853	724	471	136	0	98	251	388	514	599	647	679	667	548	319	273	317	386	536	741	884
2a	782	787	768	723	613	403	116	0	52	126	206	287	371	439	490	482	386	174	78	125	203	339	530	654
2b	761	772	743	694	574	348	65	0	118	270	389	507	601	673	730	737	667	484	347	374	436	549	724	843
3a	838	857	835	785	654	396	63	0	116	227	318	425	523	608	704	742	694	565	385	338	361	469	642	784
3b	874	898	888	841	723	487	145	0	82	176	253	328	387	441	510	556	561	535	508	408	415	525	691	831
4a	862	887	869	819	696	446	105	0	88	185	269	347	376	379	377	366	326	289	316	294	282	428	634	803
4b	824	873	866	837	713	458	122	12	62	106	122	127	119	82	50	25	0	0	72	116	112	287	549	771
5a	2020	2223	2352	2409	2375	2168	1843	1628	1505	1316	1076	849	617	403	240	93	0	18	184	442	598	877	1287	1692
5b	2281	2525	2699	2791	2783	2634	2348	2026	1758	1463	1134	833	575	348	177	52	0	41	220	526	762	1045	1472	1904
6a	2537	2813	3009	3144	3182	3105	2904	2547	2183	1784	1362	993	684	416	210	64	0	48	241	581	907	1215	1671	2114
6b	2351	2630	2842	2972	3018	2972	2799	2475	2124	1747	1352	981	660	377	164	43	0	52	258	562	882	1159	1580	1992
7a	2486	2770	2983	3116	3150	3047	2853	2484	2093	1652	1207	816	490	232	82	4	0	91	287	612	949	1232	1694	2133
7b	2551	2830	3038	3201	3269	3212	3073	2744	2349	1901	1410	975	620	344	158	41	0	64	283	627	951	1256	1729	2176
8a	2450	2691	2878	3001	3015	2895	2688	2419	2085	1687	1243	843	506	237	83	0	6	101	360	711	966	1293	1735	2136
8b	2369	2604	2785	2887	2893	2746	2470	2236	1961	1590	1166	774	440	193	58	8	0	61	297	637	870	1242	1674	2062
9a	2468	2699	2866	2962	2967	2821	2525	2323	2089	1778	1407	1025	679	378	182	48	0	113	411	707	968	1342	1767	2162
9b	2715	2972	3153	3262	3267	3094	2771	2593	2350	1989	1540	1085	667	337	134	29	0	133	469	741	1062	1474	1943	2380
10a	1854	2042	2161	2222	2191	1996	1622	1439	1332	1159	911	678	441	250	115	21	0	113	303	424	663	956	1301	1629
10b	981	1023	1015	979	856	590	185	0	39	124	180	242	275	290	319	335	311	266	183	207	300	455	656	824
11a	840	863	846	792	662	398	69	0	92	219	346	457	550	597	630	602	446	194	186	218	278	413	595	738
11b	843	867	847	795	665	409	82	0	132	276	394	503	590	641	678	654	475	241	226	266	325	454	639	778
12a	828	870	866	827	702	449	102	0	111	246	356	466	546	601	630	589	382	142	119	142	184	326	538	717
12b	668	709	714	673	581	393	156	30	56	149	247	329	416	467	496	451	257	4	0	35	86	200	377	512

Upper Bound of the 95% Empirical Rule – the 97.5th percentile.

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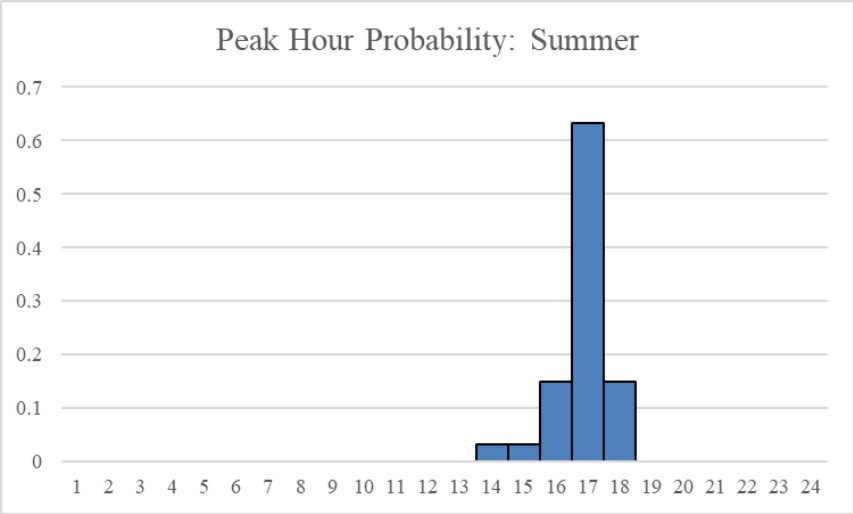
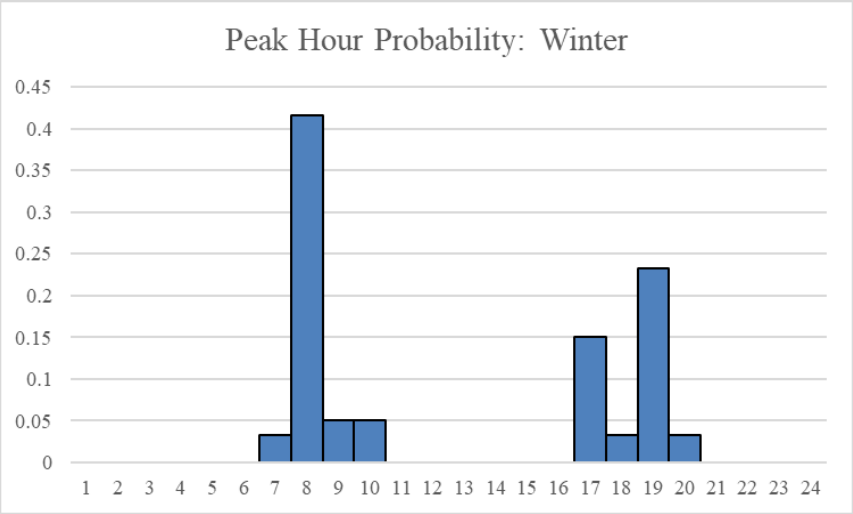
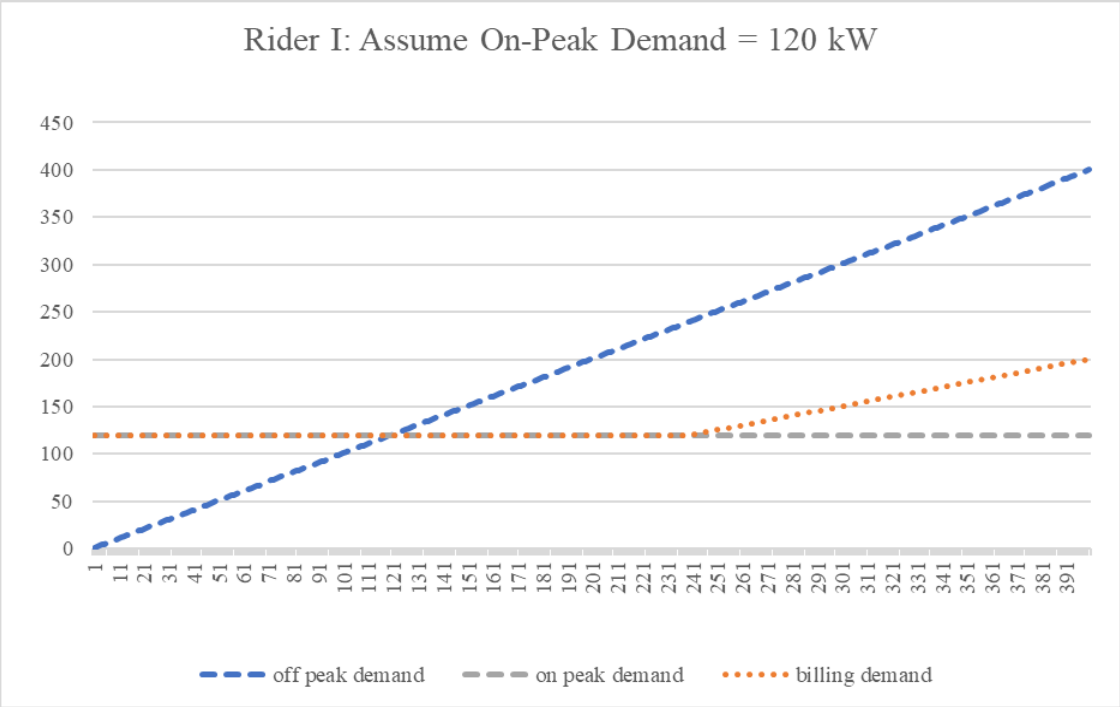
Peak Day-Peak Hour Analysis





Peak-Hour Probability, X = 10, Y = 6, N = 60

Rider I: Off Peak Demand Rider Illustrated



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Rider I: Off Peak Demand Rider Results

Month	SGS Rider I	SGS Customer	LGS Rider I	LGS Customer	SPS Rider I	SPS Customers	LPS Rider I	LPS Customers
Aug-2022	1,345	84,613	32	5,912	5	372	0	63
Sep-2022	1,526	84,613	36	5,912	6	372	0	63
Oct-2022	2,708	84,613	75	5,912	4	372	0	63
Nov-2022	1,762	84,613	50	5,912	4	372	0	63
Dec-2022	1,216	84,613	25	5,912	2	372	0	63
Jan-2023	1,304	84,613	31	5,912	2	372	0	63
Feb-2023	1,659	84,613	26	5,912	3	372	0	63
Mar-2023	1,811	84,613	41	5,912	4	372	0	63
Apr-2023	3,516	84,613	68	5,912	7	372	0	63
May-2023	2,034	84,613	53	5,912	5	372	0	63
Jun-2023	1,358	84,613	25	5,912	8	372	1	63
Jul-2023	1,549	84,613	31	5,912	6	372	0	63
Total	21,788	1,015,356	493	70,944	56	4,464	1	756
Percent	SGS	2.15%	LGS	0.69%	SPS	1.25%	LPS	0.13%

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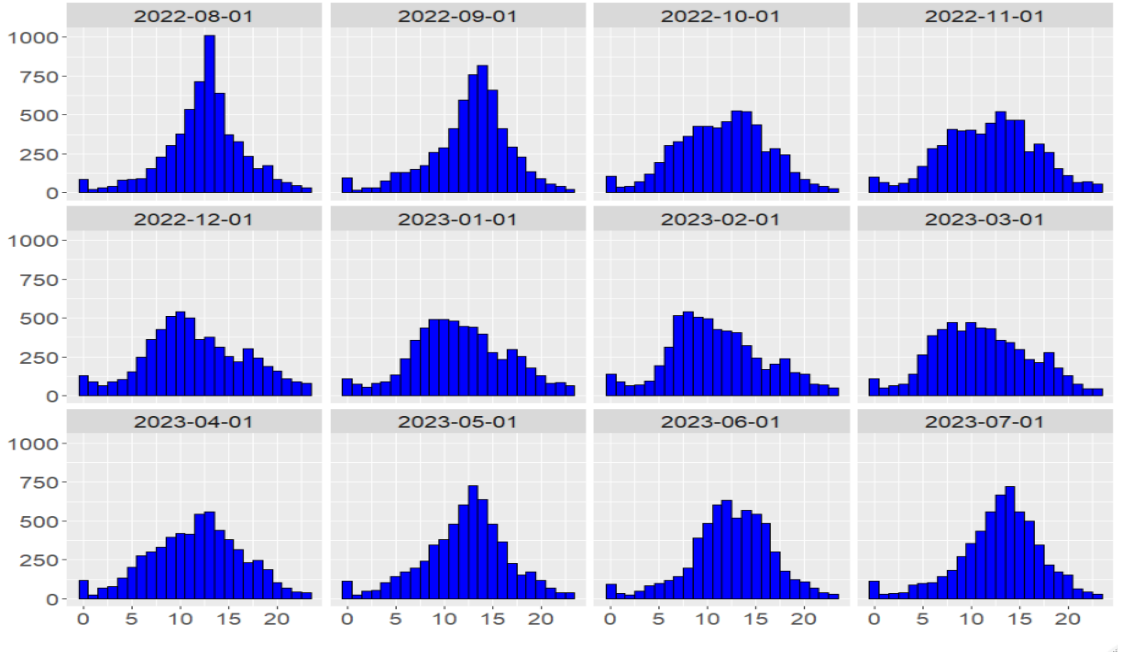
Individual Customer Non-Coincident Peak Hours



Counts of LGS Customer-Peak-Hour by Month

The Hours-Use Rate Bill Calculations

	SGS Total Bill	LGS Total Bill	SPS Total Bill	LPS Total Bill	SGS Customers	LGS Customers	SPS Customers	LPS Customers	SGS Average Bill	LGS Average Bill	SPS Average Bill	LPS Average Bill
Aug-2022	20,310,146	37,294,802	14,620,111	24,157,334	84,613	5,912	372	63	240	6,308	39,301	383,450
Sep-2022	15,899,659	33,631,544	13,399,853	23,591,457	84,613	5,912	372	63	188	5,689	36,021	374,468
Oct-2022	9,909,073	17,577,767	7,327,337	15,086,870	84,613	5,912	372	63	117	2,973	19,697	239,474
Nov-2022	10,514,396	17,576,712	7,151,512	14,482,869	84,613	5,912	372	63	124	2,973	19,224	229,887
Dec-2022	12,021,219	18,618,777	7,308,676	13,801,813	84,613	5,912	372	63	142	3,149	19,647	219,076
Jan-2023	11,535,157	18,260,898	7,344,412	13,964,294	84,613	5,912	372	63	136	3,089	19,743	221,655
Feb-2023	10,355,986	16,942,948	6,824,154	12,271,108	84,613	5,912	372	63	122	2,866	18,344	194,779
Mar-2023	10,824,937	17,893,581	7,375,161	13,536,941	84,613	5,912	372	63	128	3,027	19,826	214,872
Apr-2023	9,611,015	17,014,397	7,184,702	14,321,525	84,613	5,912	372	63	114	2,878	19,314	227,326
May-2023	10,907,851	18,659,843	7,706,097	15,475,588	84,613	5,912	372	63	129	3,156	20,715	245,644
Jun-2023	18,042,073	34,512,297	13,668,905	24,028,062	84,613	5,912	372	63	213	5,838	36,744	381,398
Jul-2023	20,131,288	36,316,296	14,154,300	24,255,727	84,613	5,912	372	63	238	6,143	38,049	385,012

Sample Total	160,062,800	284,299,863	114,065,220	208,973,586
ER20220337	303,667,136	558,502,401	234,345,107	206,741,985
Rate Increase	1.055	1.055	1.055	1.02
Post 0337 Total	320,368,828	589,220,033	247,234,088	210,876,825

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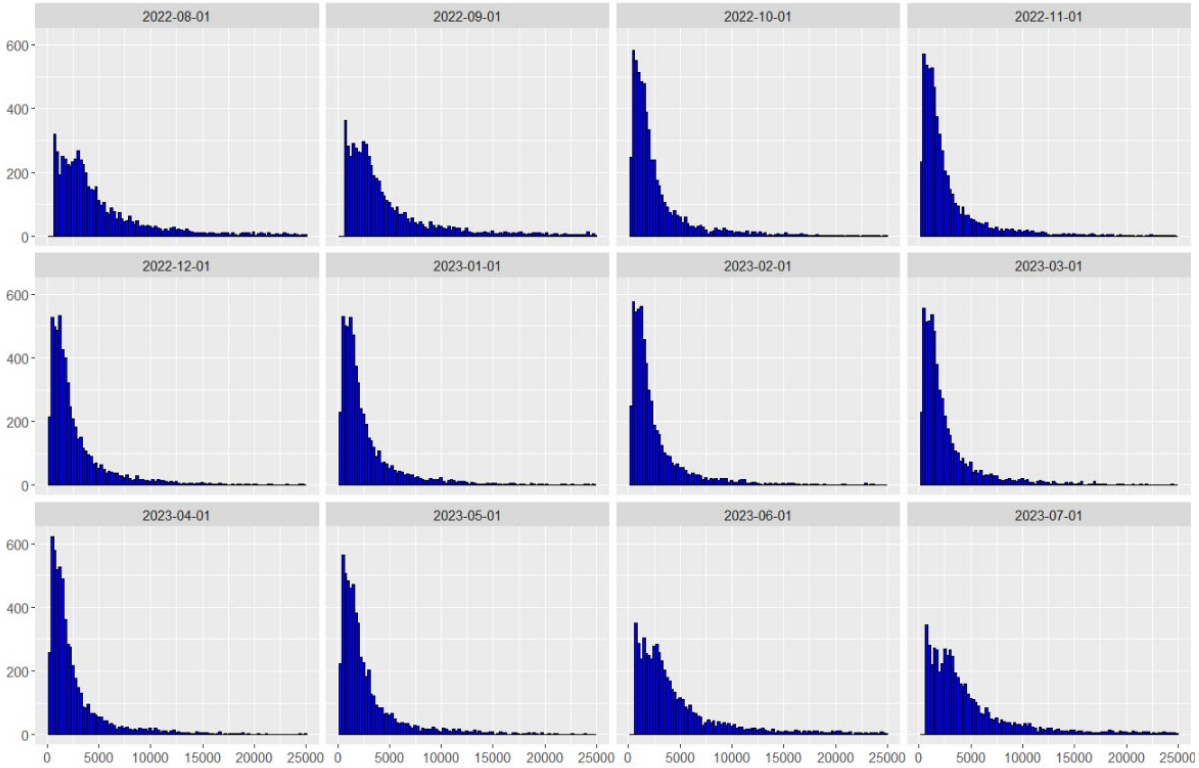
LGS Customer Bills under Hours-Use Rates



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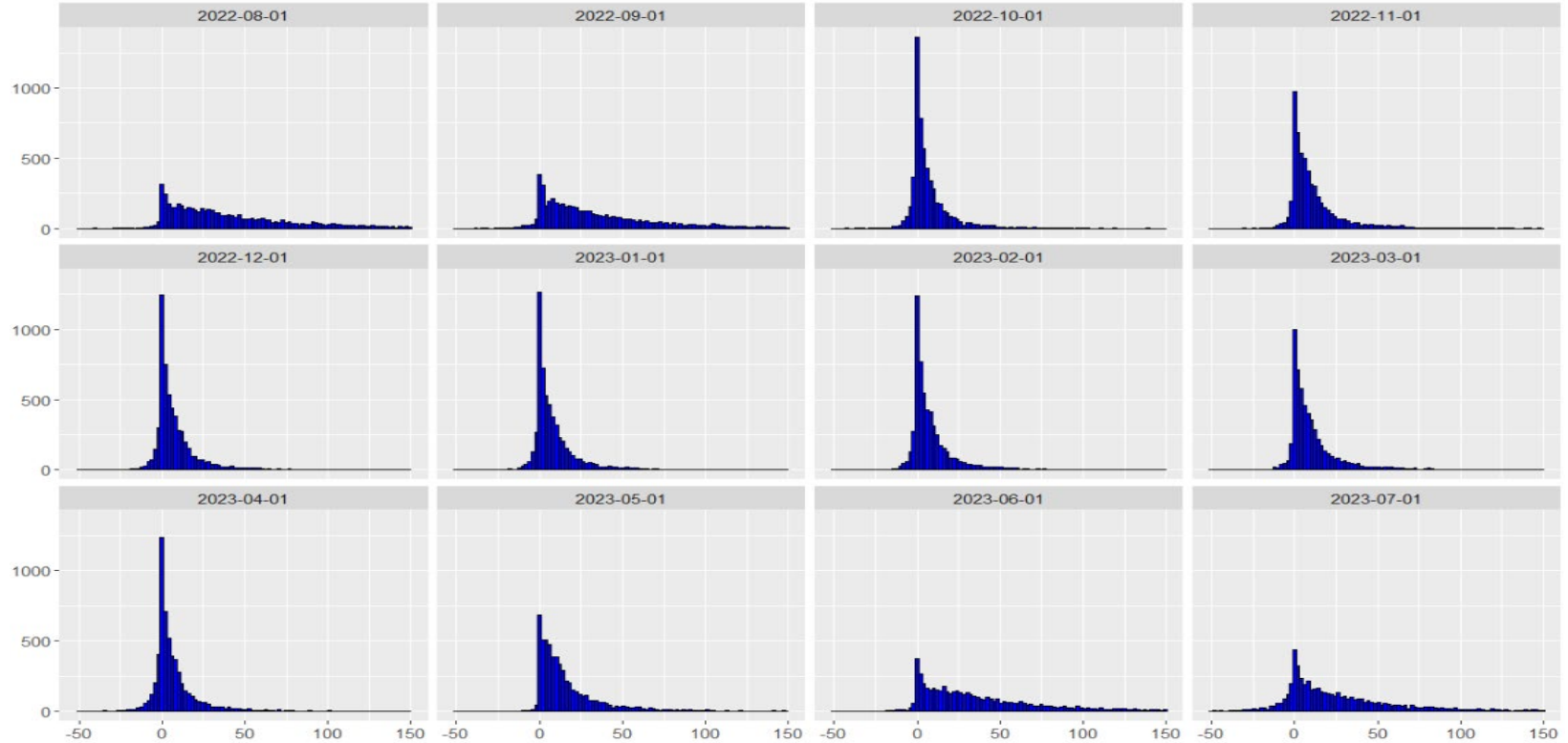
Existing Time-of-Day Adjustments Bill Impact

	SGS Average Bill	LGS Average Bill	SPS Average Bill	LPS Average Bill	SGS Average TOD Bill	LGS Average TOD Bill	SPS Average TOD Bill	LPS Average TOD Bill	SGS Average Impact	LGS Average Impact	SPS Average Impact	LPS Average Impact
Aug-2022	240	6,308	39,301	383,450	252	6,372	39,485	384,712	12	64	184	1,262
Sep-2022	188	5,689	36,021	374,468	199	5,742	36,171	375,774	11	53	150	1,307
Oct-2022	117	2,973	19,697	239,474	118	2,982	19,695	238,790	1	9	-2	-684
Nov-2022	124	2,973	19,224	229,887	130	2,987	19,263	229,838	6	14	39	-49
Dec-2022	142	3,149	19,647	219,076	153	3,159	19,662	218,580	11	10	15	-496
Jan-2023	136	3,089	19,743	221,655	146	3,100	19,764	221,287	9	11	21	-368
Feb-2023	122	2,866	18,344	194,779	129	2,876	18,367	194,575	6	10	23	-204
Mar-2023	128	3,027	19,826	214,872	135	3,040	19,871	215,154	7	14	45	282
Apr-2023	114	2,878	19,314	227,326	115	2,886	19,312	226,707	1	8	-2	-619
May-2023	129	3,156	20,715	245,644	138	3,176	20,776	245,654	9	20	60	9
Jun-2023	213	5,838	36,744	381,398	226	5,896	36,915	382,723	13	59	171	1,326
Jul-2023	238	6,143	38,049	385,012	246	6,180	38,092	385,005	8	37	43	-6

Existing Time-of-Day Adjustments Bill Impact



LGS Customer Bill Impacts

Rate Design Discussion – Policy and Practice

Rate Design Discussion

1. High Level Policy Question
2. Customer Class Definitions
3. Potential Study-Rate Bill Impact Study
4. Evergy Kansas's Alternative to Hours-Use Rate Design
5. Staff Rate Design Testimony
6. Elements of Alternative Rate Designs Survey

High Level Policy Question

Do we imagine the elimination and replacement of the existing hours-use rate (and associated TOD adjustment) or the addition of alternative rates and customer choice?

Customer Class Definitions

- **Small General Service (2M):** Secondary voltage and summer max kW less than 100. Approximately 155,000 customers.
- **Large General Service (3M):** Secondary voltage and summer max kW greater than 100. Approximately 10,600 customers.
- **Small Primary Service (4M):** Primary voltage. Approximately 667 customers.
- **Large Primary Service (11M):** Primary voltage and min monthly billing demand of 5000 kW. Approximately 63 customers.

Customer Class Definitions

Small General Service (2M) and Large General Service (3M)

- High Level Question: Should these classes be combined or further divided? Should the dividing line change?
- Classes. What are they good for?
- Is coincidence/diversity more important, the farther the cost is from a customer's service, e.g. distribution substation, generation plant?
- Class NCP vs. Customer NCP statistics. What's the deal with that? What about CP?

Customer Class Definitions

- **Small Primary Service (4M) and Large Primary Service (11M)**

- Customers served at subtransmission and transmission voltages exist within these otherwise primary service classes. Voltage based breakouts of costs and charges associated with these service voltages are possible.

- Otherwise, similar questions and considerations discussed on the previous slide apply here.

Potential Bill Impact Studies

Potential Three-Part Rate Designs Bill Impact Studies:

'Partial' Demand Rate: Revenue neutral shift of all energy revenue to a single energy charge.

'Full' Demand Rate: Revenue neutral shift of all energy revenue over the 3rd block price to demand charge.

* The designs aren't intended to represent rate design proposals, but rather provide an analytical tool for understanding the impacts of specific design directions (bookends), e.g. reducing the scale of declining block and shifting energy charges to demand charges.

Evergy Kansas Metro – Hours-Use Alternative*

Rate Class	Kansas Metro
Large General Service	- Flat Summer/Winter demand charges - Summer/Winter On and Off-Peak energy charges
Medium General Service	- Flat Summer/Winter demand charges - Summer/Winter On and Off-Peak energy charges
Small General Service	- No demand charge - Summer/Winter On and Off-Peak energy charges

* Existing Customer and Facilities Charge remain unchanged. The charges here replace the existing demand and variable declining block energy charge.

Direct Testimony of M. Miller Docket in No. 23-EKCE-775-RTS

Evergy Kansas Metro – Hours Use Alternative

Proposed Rates		SGS	MGS	LGS
Customer Charge: customer pays charge per month		0 – 24 kW: $18.76 > 25 kW: $49.04	$52.05	0 – 999 kW: $111.25 >1000 kW: $760.90
Facilities Charge: per kW of Facilities Demand		25 kW+: $2.890	$3.038	$3.222
Demand Charge: per kW of Billing Demand	Summer	-	$13.035	$12.375
	Winter	-	$2.586	$2.112
Energy Charge: per kWh of monthly usage	Summer Peak	$0.2922	$0.1052	$0.0903
	Summer Off-Peak	$0.1252	$0.0595	$0.0485
	Winter Peak	$0.0902	$0.0557	$0.0478
	Winter Off-Peak	$0.0592	$0.0489	$0.0409

Direct Testimony of M. Miller Docket in No. 23-EKCE-775-RTS

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Staff Rate Design Discussion

1. Customer and facilities charges related to customer annual NCP to recover customer-related costs and the cost of customer-specific infrastructure, with related determinants.

2. CP demand charges to collect remaining distribution and transmission costs, with related determinants. Staff suggests that CP periods of 12:01 pm – 8:00 pm are appropriate for the months May, June, July, August, September, and October, and that CP periods of 6:01 am – 10:00 am, and 4:00 pm – 8:00 pm are reasonable periods for the initial study of appropriate determinants and charges, subject to refinement.

MPSC Staff Rate Design Discussion

3. ToU-based energy charges and determinants, where the differential of such charges is approximated to the difference in the average DA LMP across the time periods, but also recovers the costs of variable and stable revenue requirement production. Staff suggests that the time periods outlined below, subject to refinement, are reasonable periods for the initial study of appropriate determinants and charges, subject to refinement. In particular, Staff recommends the study and potential introduction of shoulder seasons to replace a portion of the existing "winter" season of 8 months.

	Off Peak	Regular	On Peak
Summer	12 -9 AM	All Other	1 - 9 PM
NonSummer	11 PM - 6 AM	All Other	7-9 AM, 5-9 PM

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Direct Testimony of S.L.K Lange Docket in ER-2022-0337

Hours-Use Alternatives: Which Quadrant?

	Flat Energy	TOU Energy
Full Demand		
Partial Demand		

Types of Demand Charges – Not Mutually Exclusive

Billing Unit Type	Thumbs	Seasonal Differentiation	Applicable Hours
Monthly Non-Coincident Peak			
Monthly On Peak			
Annual Max or Other Demand Rachet			

Number of TOU Energy Charges

Number	Hands
1	
2	
3	
4	
> 4	

TOU Periods

Charge	Seasonally Differentiated	Hours
Energy		
Demand		

Types of Cost

Costs

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Relationship between Charges and Cost

Charge	Costs Reflected
Max Annual Demand Rachet	
NCP Demand	
On Peak Demand	
Off Peak Energy	
Intermediate Peak Energy	
On Peak Energy	

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Metering and Billing System Research

Interval Meters and Meter Programs

What is a meter program?

Meter Program Reading Type Decode	CC RDG TYPE DESCRIPTION	MDMS CIM 2.0	MDMS RDG_TYPE DESCRIPTION	Reading Use
KWH-15 minute		0.0.2.4.1.1.12.0.0.0.0.0.0.0.0.3.72.0	FifteenMinute DeltaData Forward ElectricitySecondaryMetered Energy (kWh)	Interval
KVARH IN-15 minute		0.0.2.4.1.1.12.0.0.0.0.0.0.0.0.3.73.0	FifteenMinute DeltaData Forward ElectricitySecondaryMetered Energy (kVArh)	Interval
KWH OUT-15 minute		0.0.2.4.19.1.12.0.0.0.0.0.0.0.0.3.72.0	FifteenMinute DeltaData Reverse ElectricitySecondaryMetered Energy (kWh)	Interval
KVARH OUT-15 minute		0.0.2.4.19.1.12.0.0.0.0.0.0.0.0.3.73.0	FifteenMinute DeltaData Reverse ElectricitySecondaryMetered Energy (kVArh)	Interval
KWH	Energy-kWh	0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.72.0	BulkQuantity Forward ElectricitySecondaryMetered Energy (kWh)	Dial
On Pk KWH	Energy-Time of Use-kWh Rate A	0.0.0.9.1.1.12.0.0.0.0.1.0.0.0.3.72.0	Summation Forward ElectricitySecondaryMetered Energy TOU A (kWh)	Dial
On Pk KW	Demand-kW-Time of Use-Previous Max kW A	0.8.15.6.1.1.8.0.0.0.0.1.0.0.0.3.38.0	Indicating Present Max Forward Active Demand TOU Rate A (kW)	Dial
Off PK KW	Demand-kW-Time of Use-Previous Max kW B	0.8.15.6.1.1.8.0.0.0.0.2.0.0.0.3.38.0	Indicating Present Max Forward Active Demand TOU Rate B (kW)	Dial
KWH OUT	Energy--Negative kWh/Rcvd only	0.0.0.1.19.1.12.0.0.0.0.0.0.0.0.3.72.0	BulkQuantity Reverse ElectricitySecondaryMetered Energy (kWh)	Dial
KVARH IN	Reactive KVARh Del-6180	0.0.0.1.1.1.12.0.0.0.0.0.0.0.0.3.73.0	BulkQuantity Forward ElectricitySecondaryMetered Energy (kVArh)	Dial
KVARH OUT	Reactive KVARh Rcvd-6162	0.0.0.1.19.1.12.0.0.0.0.0.0.0.0.3.73.0	BulkQuantity Reverse ElectricitySecondaryMetered Energy (kVArh)	Dial

Billing Operations and Changes

The Study Rate conversation led to questions about rate change implementation. Specifically, we asked ourselves, what are the requirements to implement:

1. Changes to the existing TOD rate parameters.

2. Creation of ‘new’ TOU rates.

    What is the significance of meter programs?

    What is the prebilling process (summarization of billing determinants)?

    What are the implications of AMI rollout?

    What are the implications interval versus dial readings?

    What are the implications for seasonal proration?

First Study Rate Design

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Outline of Study Rate Work

1. Last Workshop
2. Email Conversations
3. First Billing Unit Run and Rate Design
4. Rate Design Meeting
5. Second Billing Unit Run
6. Rate Design and Analysis

Study Rate Output

1. Monthly Customer Level Billing Units
2. Monthly Class Level Billing Units
3. Seasonal Class Level Billing Units
4. Class Level Rate Designs
5. Example Bill Impact Analysis – LGS Customers

Customer and Class Billing Units

For all Classes

Summer Off Peak kWh
Summer Intermediate Peak kWh
Summer On Peak kWh
Summer On Peak Max kWh
Winter Off Peak kWh
Winter On Peak kWh
Winter On Peak Max kWh
Winter Morning Peak Max kWh
Winter Evening Peak Max kWh

Versions of billing units with and without on peak weekend hours were produced.

Customer and Class Billing Units

For SGS

Summer kWh
Winter Base kWh
Winter Seasonal kWh
Max kWh

For LGS & SPS

Summer Block 1 kWh
Summer Block 2 kWh
Summer Block 3 kWh
Winter Block 1 kWh
Winter Block 2 kWh
Winter Block 3 kWh
Billing Demand
Base Demand
Total Billing Demand

Winter block kWh produced with and without seasonal energy.

For LPS

Summer kWh
Winter kWh
Max kWh

Study Rate – Time Of Use Periods

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1a	5179	5150	5155	5191	5287	5493	5775	5916	5859	5774	5682	5586	5484	5411	5359	5382	5536	5807	5826	5783	5717	5578	5376	5232
1b	5135	5122	5144	5197	5326	5579	5913	6050	5952	5799	5661	5535	5450	5402	5370	5382	5501	5731	5777	5732	5663	5514	5308	5166
2a	5280	5275	5293	5339	5448	5659	5946	6062	6010	5936	5856	5775	5691	5622	5572	5579	5676	5887	5984	5936	5858	5723	5531	5408
2b	4951	4940	4969	5018	5139	5365	5647	5712	5594	5443	5323	5206	5111	5040	4983	4975	5045	5228	5365	5339	5277	5163	4988	4870
3a	4335	4316	4338	4388	4519	4777	5110	5173	5058	4946	4855	4748	4650	4565	4470	4431	4479	4608	4788	4835	4812	4704	4531	4389
3b	3699	3676	3686	3732	3851	4087	4428	4573	4491	4398	4320	4246	4187	4132	4064	4017	4013	4038	4065	4166	4158	4048	3882	3742
4a	3509	3484	3502	3553	3675	3925	4266	4371	4283	4186	4102	4024	3995	3993	3994	4006	4045	4082	4055	4077	4089	3943	3738	3568
4b	3198	3149	3156	3185	3309	3564	3900	4010	3960	3916	3900	3895	3903	3940	3972	3997	4022	4022	3950	3906	3910	3735	3473	3251
5a	3421	3218	3089	3031	3066	3273	3597	3813	3935	4125	4364	4592	4823	5037	5201	5347	5441	5423	5256	4998	4843	4564	4153	3749
5b	3699	3454	3280	3189	3196	3345	3631	3954	4222	4517	4845	5146	5405	5631	5802	5928	5980	5938	5760	5454	5218	4935	4507	4075
6a	4398	4123	3926	3791	3753	3830	4031	4388	4752	5151	5573	5943	6252	6519	6725	6871	6935	6887	6694	6354	6028	5721	5264	4821
6b	4635	4356	4144	4014	3968	4014	4187	4511	4862	5239	5634	6005	6326	6609	6822	6943	6986	6934	6728	6425	6104	5827	5407	4994
7a	4804	4520	4308	4174	4141	4243	4438	4807	5198	5638	6083	6475	6801	7058	7209	7287	7291	7200	7003	6679	6342	6059	5597	5158
7b	4902	4624	4415	4252	4185	4241	4381	4710	5105	5552	6043	6478	6833	7109	7295	7412	7453	7389	7170	6826	6502	6197	5724	5278
8a	4473	4233	4045	3922	3908	4029	4235	4504	4838	5236	5680	6080	6417	6687	6840	6923	6918	6823	6563	6213	5957	5631	5189	4787
8b	4391	4156	3975	3873	3867	4014	4290	4524	4799	5170	5594	5986	6320	6567	6702	6752	6760	6699	6462	6123	5890	5518	5086	4697
9a	4020	3789	3622	3526	3521	3667	3963	4165	4399	4710	5081	5463	5809	6110	6306	6440	6488	6375	6077	5781	5520	5146	4721	4326
9b	4117	3859	3678	3570	3565	3738	4061	4239	4482	4843	5292	5746	6164	6495	6698	6803	6832	6699	6363	6090	5770	5358	4889	4452
10a	3539	3351	3232	3170	3202	3396	3771	3953	4061	4234	4481	4715	4951	5142	5278	5371	5393	5280	5089	4969	4730	4436	4092	3763
10b	3266	3225	3233	3269	3392	3657	4063	4248	4209	4123	4067	4006	3972	3958	3928	3913	3937	3981	4064	4041	3948	3793	3592	3424
11a	4132	4109	4126	4179	4310	4574	4903	4972	4880	4753	4626	4515	4422	4375	4342	4370	4526	4778	4785	4754	4694	4559	4377	4234
11b	4167	4143	4163	4215	4345	4601	4928	5010	4878	4733	4616	4507	4420	4369	4332	4356	4535	4769	4784	4744	4685	4556	4370	4232
12a	4394	4352	4356	4396	4521	4773	5120	5222	5111	4977	4866	4756	4676	4621	4593	4634	4840	5081	5103	5080	5038	4896	4685	4505
12b	5100	5059	5054	5095	5187	5375	5611	5738	5712	5619	5520	5438	5351	5301	5271	5317	5511	5764	5768	5733	5682	5568	5391	5256

1a	5916
1b	6050
2a	6062
2b	5712
3a	5173
3b	4573
4a	4371
4b	4022
5a	5441
5b	5980
6a	6935
6b	6986
7a	7291
7b	7453
8a	6923
8b	6760
9a	6488
9b	6832
10a	5393
10b	4248
11a	4972
11b	5010
12a	5222
12b	5768

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1a	737	766	761	725	629	422	141	0	56	141	234	330	432	505	557	534	380	109	90	133	199	338	540	684
1b	914	927	905	853	724	471	136	0	98	251	388	514	599	647	679	667	548	319	273	317	386	536	741	884
2a	782	787	768	723	613	403	116	0	52	126	206	287	371	439	490	482	386	174	78	125	203	339	530	654
2b	761	772	743	694	574	348	65	0	118	270	389	507	601	673	730	737	667	484	347	374	436	549	724	843
3a	838	857	835	785	654	396	63	0	116	227	318	425	523	608	704	742	694	565	385	338	361	469	642	784
3b	874	898	888	841	723	487	145	0	82	176	253	328	387	441	510	556	561	535	508	408	415	525	691	831
4a	862	887	869	819	696	446	105	0	88	185	269	347	376	379	377	366	326	289	316	294	282	428	634	803
4b	824	873	866	837	713	458	122	12	62	106	122	127	119	82	50	25	0	0	72	116	112	287	549	771
5a	2020	2223	2352	2409	2375	2168	1843	1628	1505	1316	1076	849	617	403	240	93	0	18	184	442	598	877	1287	1692
5b	2281	2525	2699	2791	2783	2634	2348	2026	1758	1463	1134	833	575	348	177	52	0	41	220	526	762	1045	1472	1904
6a	2537	2813	3009	3144	3182	3105	2904	2547	2183	1784	1362	993	684	416	210	64	0	48	241	581	907	1215	1671	2114
6b	2351	2630	2842	2972	3018	2972	2799	2475	2124	1747	1352	981	660	377	164	43	0	52	258	562	882	1159	1580	1992
7a	2486	2770	2983	3116	3150	3047	2853	2484	2093	1652	1207	816	490	232	82	4	0	91	287	612	949	1232	1694	2133
7b	2551	2830	3038	3201	3269	3212	3073	2744	2349	1901	1410	975	620	344	158	41	0	64	283	627	951	1256	1729	2176
8a	2450	2691	2878	3001	3015	2895	2688	2419	2085	1687	1243	843	506	237	83	0	6	101	360	711	966	1293	1735	2136
8b	2369	2604	2785	2887	2893	2746	2470	2236	1961	1590	1166	774	440	193	58	8	0	61	297	637	870	1242	1674	2062
9a	2468	2699	2866	2962	2967	2821	2525	2323	2089	1778	1407	1025	679	378	182	48	0	113	411	707	968	1342	1767	2162
9b	2715	2972	3153	3262	3267	3094	2771	2593	2350	1989	1540	1085	667	337	134	29	0	133	469	741	1062	1474	1943	2380
10a	1854	2042	2161	2222	2191	1996	1622	1439	1332	1159	911	678	441	250	115	21	0	113	303	424	663	956	1301	1629
10b	981	1023	1015	979	856	590	185	0	39	124	180	242	275	290	319	335	311	266	183	207	300	455	656	824
11a	840	863	846	792	662	398	69	0	92	219	346	457	550	597	630	602	446	194	186	218	278	413	595	738
11b	843	867	847	795	665	409	82	0	132	276	394	503	590	641	678	654	475	241	226	266	325	454	639	778
12a	828	870	866	827	702	449	102	0	111	246	356	466	546	601	630	589	382	142	119	142	184	326	538	717
12b	668	709	714	673	581	393	156	30	56	149	247	329	416	467	496	451	257	4	0	35	86	200	377	512

Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Summer	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2
Winter	4	4	4	4	4	4	5	5	5	5	4	4	4	4	4	4	4	5	5	5	5	5	4	4

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Study Rate – LPS Billing Units and Rate Design

Season	Peak	kWh	Rate	Revenue
Summer	sMid	699,850,184	0	-
Summer	sOff	309,358,538	-0.01	(3,093,585)
Summer	sOn	272,003,793	0.01	2,720,037
Total		1,281,212,517		(373,547)
Net Rev/Total kWh		(0.00029)		

Type		Rate		Revenue
flat energy rate		0.0364		46,636,135
new flat rate		0.0367		
new Mid Peak rate		0.0367		25,678,593
new Off Peak rate		0.0267		8,257,261
new On Peak rate		0.0467		12,700,280
Total				46,636,135

Season	Peak	kWh	Rate	Revenue
Winter	wOff	1,380,899,217	-0.01	(13,808,992)
Winter	wOn	835,905,206	0.01	8,359,052
Total		2,216,804,423		(5,449,940)
Net Rev/Total kWh		(0.002458)		

Type		Rate		Revenue
flat energy rate		0.0333		73,819,587
new flat rate		0.0358		
new Off Peak rate		0.0258		35,569,846
new On Peak rate		0.0458		38,249,740
Total				73,819,587

Study Rate – LGS Billing Units

	Billing Unit	First Iteration	Second Iteration
Summer	Intermediate kWh	801,548,407	730,627,021
	Off Peak kWh	258,770,881	258,770,881
	On Peak kWh	217,522,802	288,444,188
	Block 1 kWh	496,285,359	496,285,359
	Block 2 kWh	545,468,427	545,468,427
	Block 3 kWh	236,088,304	236,088,304
	Billing kW	4,056,654	4,056,654

Winter	Off Peak kWh	1,546,717,111	1,334,297,872
	On Peak kWh	628,825,340	841,244,580
	Block 1 kWh	763,270,950	873,345,705
	Block 2 kWh	821,881,012	929,362,653
	Block 3 kWh	342,375,997	372,834,093
	Seasonal kWh	248,014,492	0
	Billing kW	7,548,712	7,548,712

Study Rate – LGS Rate Design

		Standard Rates	Study TOU Rates 1	Study TOU Rates 2	Study TOU Rates 3	Study TOU Rates 2.2	Study TOU Rates 3.2
Summer	Off Peak kWh		-0.01	-0.01	-0.01	-0.01	-0.01
	On Peak kWh		0.01	0.01	0.01	0.01	0.01
	Block 1 kWh	0.1112	0.1068	0.1116	0.1115	0.1109	0.1110
	Block 2 kWh	0.0836	0.0836	0.0839	0.0839	0.0834	0.0834
	Block 3 kWh	0.0563	0.0673	0.0565	0.0566	0.0562	0.0561
	Billing Demand	6.19	6.19	6.19	6.19	6.19	6.19
Winter	Off Peak kWh		-0.01	-0.01	-0.01	-0.01	-0.01
	On Peak kWh		0.01	0.01	0.01	0.01	0.01
	Block 1 kWh	0.0698	0.0616	0.0751	0.0740	0.0701	0.0700
	Block 2 kWh	0.0519	0.0519	0.0559	0.0561	0.0521	0.0521
	Block 3 kWh	0.0409	0.0861	0.0440	0.0451	0.0411	0.0411
	Seasonal kWh	0.0408	0.0408	0.0439	0.0450	0.0000	0.0000
	Billing kW	2.3	2.3	2.3	2.3	2.3	2.3

Diff Levels	0.0179	0.0097	0.0193	0.0179
	0.011	-0.0342	0.0118	0.011

Diff Proportions	1.71	0.72	1.71	1.64
	1.27	0.60	1.27	1.24

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Study Rate – LGS Rate Design 3.2

		Standard Rates	Study TOU Rates 3.2
Summer	Off Peak kWh		-0.01
	On Peak kWh		0.01
	Block 1 kWh	0.1112	0.1110
	Block 2 kWh	0.0836	0.0834
	Block 3 kWh	0.0563	0.0561
	Billing kW	6.19	6.19
Winter	Off Peak kWh		-0.01
	On Peak kWh		0.01
	Block 1 kWh	0.0698	0.0700
	Block 2 kWh	0.0519	0.0521
	Block 3 kWh	0.0409	0.0411
	Seasonal kWh	0.0408	0.0000
	Billing kW	2.3	2.3
Diff Levels		0.0179	0.0179
		0.011	0.011
Diff Proportions		1.71	1.70
		1.27	1.27

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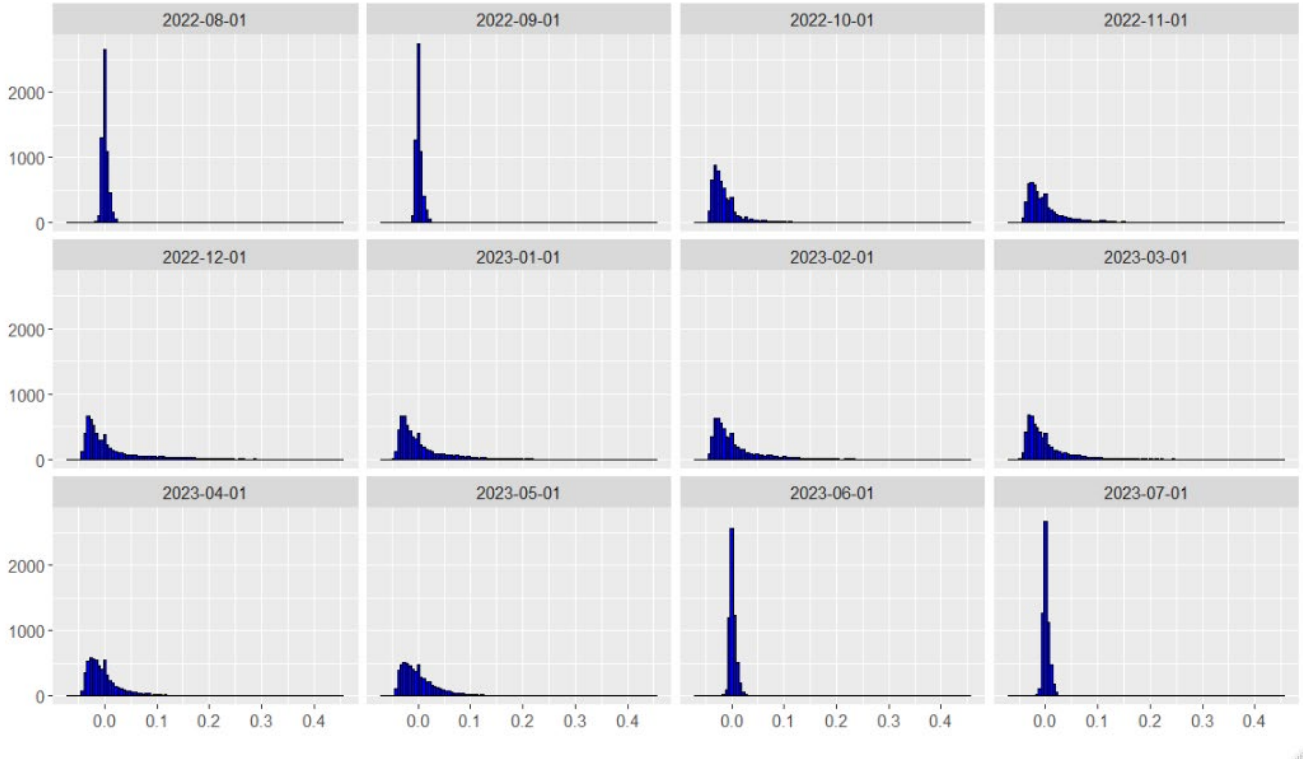
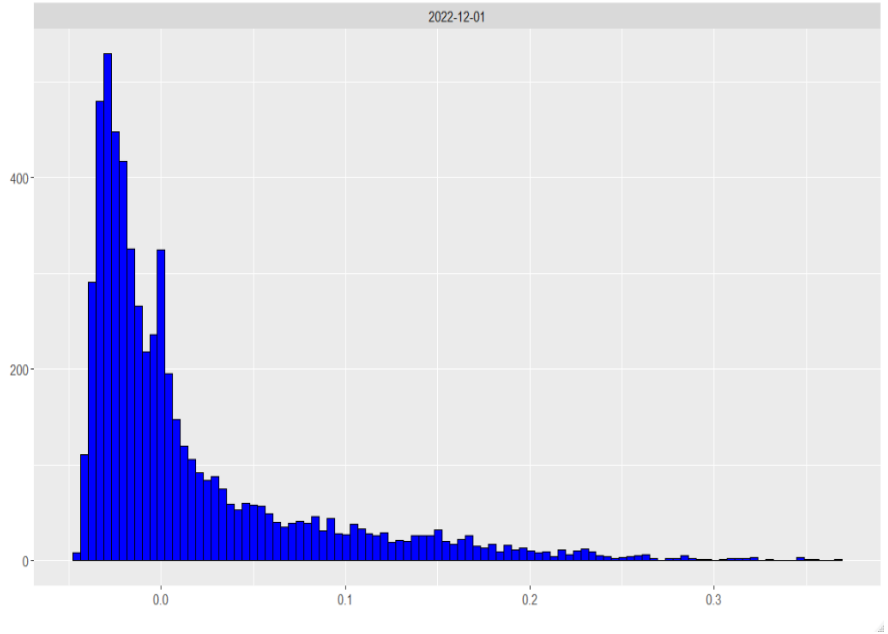
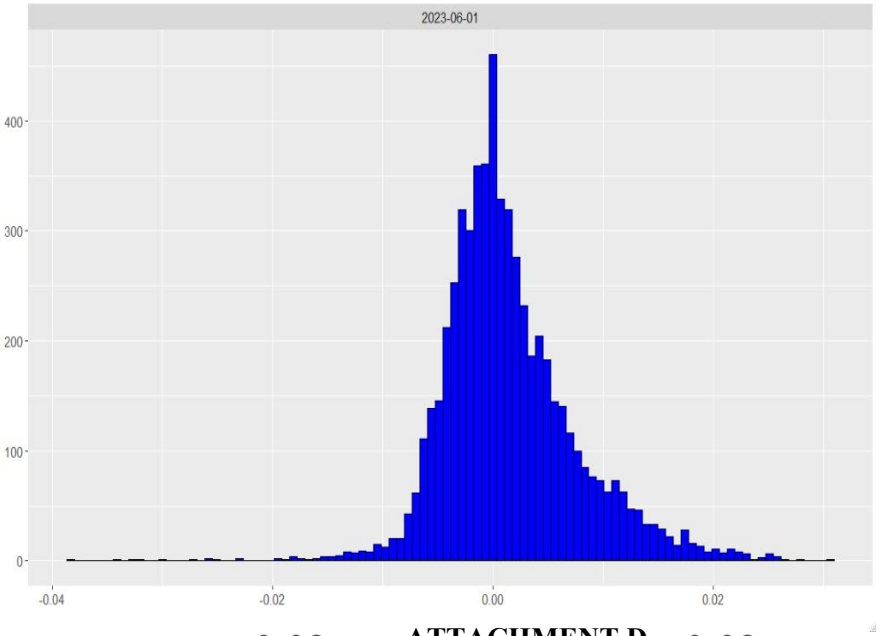
Study Rate – LGS Bill Impacts (%)



Study Rate – LGS Bill Impacts (%)



0 0.1 0.2 0.3



-0.02 0.02

Study Rate – Time of Use Periods

		Study Rate																						
	Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	Summer	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2
	Winter	4	4	4	4	4	4	5	5	5	5	4	4	4	4	4	4	4	5	5	5	5	5	4	4
		Smart Savers																						
Weekday	Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	Summer	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	2	2	2	1	1
	Winter	4	4	4	4	4	4	6	6	5	5	5	5	5	5	5	5	5	5	6	6	5	5	4	4
Weekend	Hour Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	Summer	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
	Winter	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4

Is there a benefit to having the same number of periods in each season?
Is there a benefit to having periods with similar numbers of hours in each season?
Is there a benefit to having the same/different periods across different classes?

Study Rate – Weekends!

Should weekends include on-peak hours?

Is there any data or analysis that could inform the choice?

Wrap up and next steps

Thank you!