



Station Service Rates

CDS
11/30/2023

Current Methodology:

- **12-month rolling average of off-peak RTO LMP**

Alternative Methodologies:

- **3-month** rolling average of off-peak RTO LMP
- 12-month rolling average of off-peak **zonal LMP**
- **3-month** rolling average of off-peak **zonal LMP**
- Use only **Hours Ending 2-6** instead of all off-peak hours

- Station Service rates are calculated by taking the average of off-peak **RTO** LMPs from the previous **12-month** period.
- Data from any particular date will be included in the average of four quarters.

12-Month Rolling Average		
Quarter	Reporting Month	Calculation Period
Q1 2023	December 2022	December 2021 - November 2022
Q2 2023	March 2023	March 2022 - February 2023
Q3 2023	June 2023	June 2022 - May 2023
Q4 2023	September 2023	September 2022 - August 2023



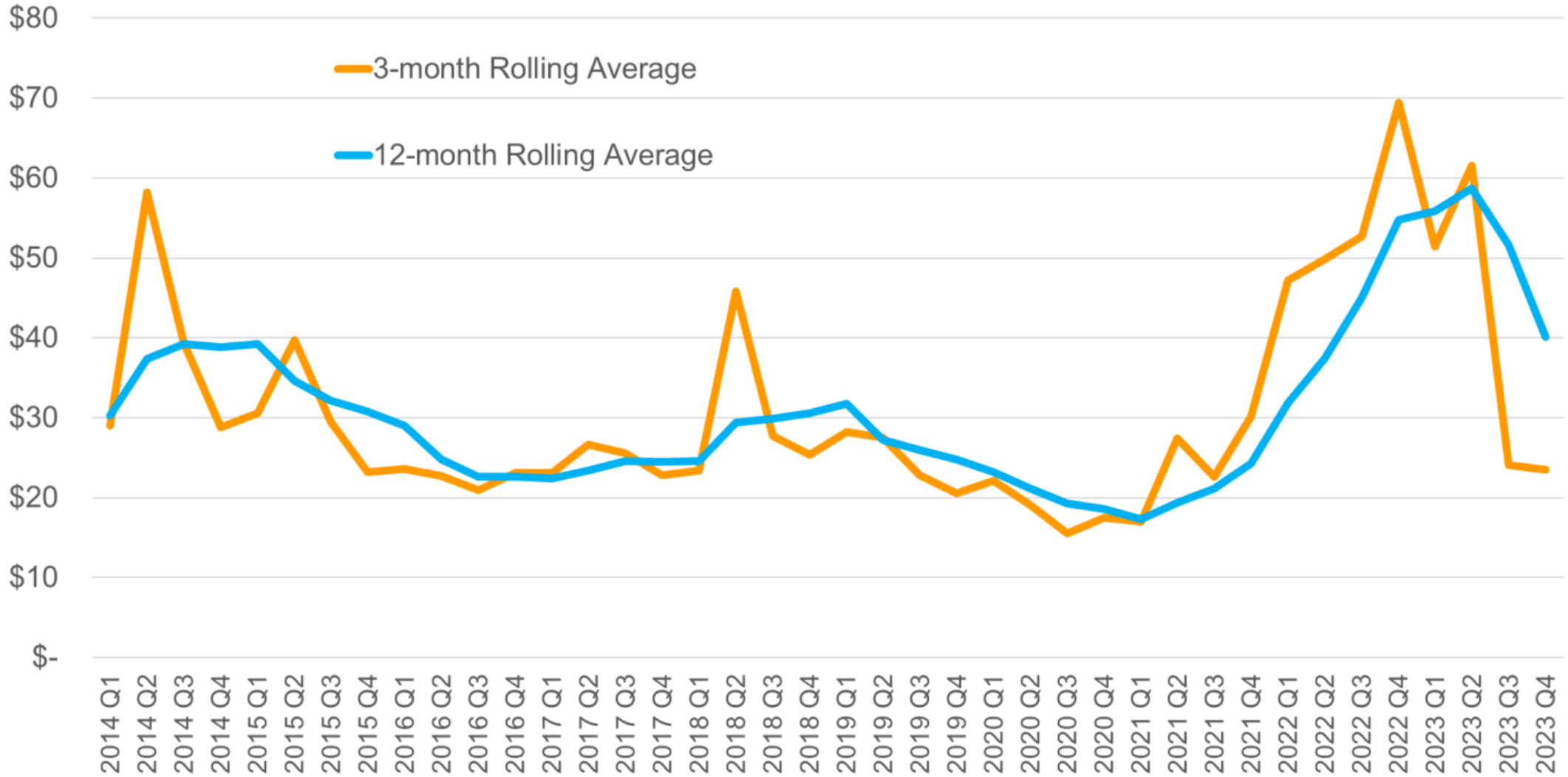


Station Service Rate Calculation – 3-month Rolling Average

- Station Service rates would be calculated by taking the average of off-peak **RTO** LMPs from the previous **3-month** period.
- Data from any particular date will be included in the average of only one quarter.

3-Month Rolling Average		
Quarter	Reporting Month	Calculation Period
Q1 2023	December 2022	September 2022 - November 2022
Q2 2023	March 2023	December 2022 - February 2023
Q3 2023	June 2023	March 2023 - May 2023
Q4 2023	September 2023	June 2023 - August 2023





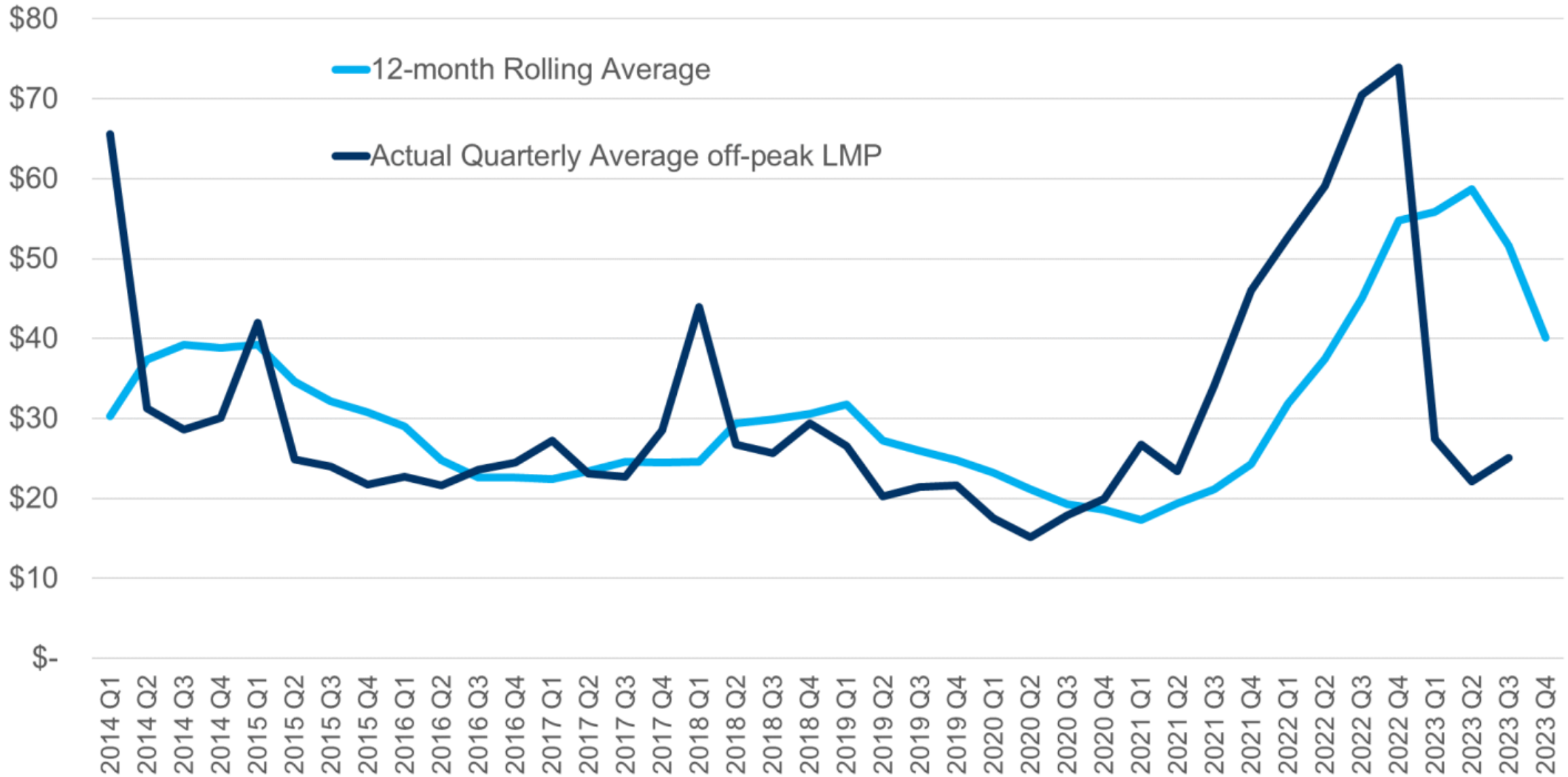


RTO Station Service Rates

Quarter	Actual Quarterly Average off-peak LMP	3-month Rolling Average	12-month Rolling Average (current methodology)	Quarter	Actual Quarterly Average off-peak LMP	3-month Rolling Average	12-month Rolling Average (current methodology)
2014 Q1	\$ 65.56	\$ 29.00	\$ 30.26	2019 Q1	\$ 26.58	\$ 28.27	\$ 31.79
2014 Q2	\$ 31.22	\$ 58.23	\$ 37.35	2019 Q2	\$ 20.22	\$ 27.53	\$ 27.22
2014 Q3	\$ 28.60	\$ 39.29	\$ 39.27	2019 Q3	\$ 21.39	\$ 22.81	\$ 26.00
2014 Q4	\$ 30.09	\$ 28.83	\$ 38.84	2019 Q4	\$ 21.61	\$ 20.55	\$ 24.79
2015 Q1	\$ 41.96	\$ 30.59	\$ 39.24	2020 Q1	\$ 17.53	\$ 22.10	\$ 23.25
2015 Q2	\$ 24.90	\$ 39.77	\$ 34.62	2020 Q2	\$ 15.14	\$ 19.05	\$ 21.13
2015 Q3	\$ 23.96	\$ 29.50	\$ 32.17	2020 Q3	\$ 17.87	\$ 15.53	\$ 19.31
2015 Q4	\$ 21.78	\$ 23.17	\$ 30.76	2020 Q4	\$ 19.97	\$ 17.49	\$ 18.54
2016 Q1	\$ 22.69	\$ 23.62	\$ 29.01	2021 Q1	\$ 26.71	\$ 16.99	\$ 17.26
2016 Q2	\$ 21.60	\$ 22.72	\$ 24.75	2021 Q2	\$ 23.37	\$ 27.43	\$ 19.36
2016 Q3	\$ 23.63	\$ 20.94	\$ 22.61	2021 Q3	\$ 34.15	\$ 22.57	\$ 21.12
2016 Q4	\$ 24.50	\$ 23.09	\$ 22.59	2021 Q4	\$ 46.00	\$ 30.22	\$ 24.30
2017 Q1	\$ 27.24	\$ 23.11	\$ 22.46	2022 Q1	\$ 52.72	\$ 47.16	\$ 31.85
2017 Q2	\$ 23.12	\$ 26.62	\$ 23.44	2022 Q2	\$ 59.12	\$ 49.90	\$ 37.46
2017 Q3	\$ 22.72	\$ 25.53	\$ 24.59	2022 Q3	\$ 70.52	\$ 52.68	\$ 44.99
2017 Q4	\$ 28.52	\$ 22.78	\$ 24.51	2022 Q4	\$ 73.98	\$ 69.38	\$ 54.78
2018 Q1	\$ 43.96	\$ 23.41	\$ 24.59	2023 Q1	\$ 27.45	\$ 51.41	\$ 55.84
2018 Q2	\$ 26.76	\$ 45.82	\$ 29.38	2023 Q2	\$ 22.11	\$ 61.54	\$ 58.75
2018 Q3	\$ 25.70	\$ 27.68	\$ 29.92	2023 Q3	\$ 25.11	\$ 24.04	\$ 51.59
2018 Q4	\$ 29.39	\$ 25.39	\$ 30.57	2023 Q4		\$ 23.52	\$ 40.13
				10-year Average	\$ 31.01	\$ 30.98	\$ 31.01
				5-year Average	\$ 32.71	\$ 32.51	\$ 32.47
				Standard Deviation	\$ 14.56	\$ 13.12	\$ 10.47
				5-year Standard Deviation	\$ 13.44	\$ 15.96	\$ 13.51

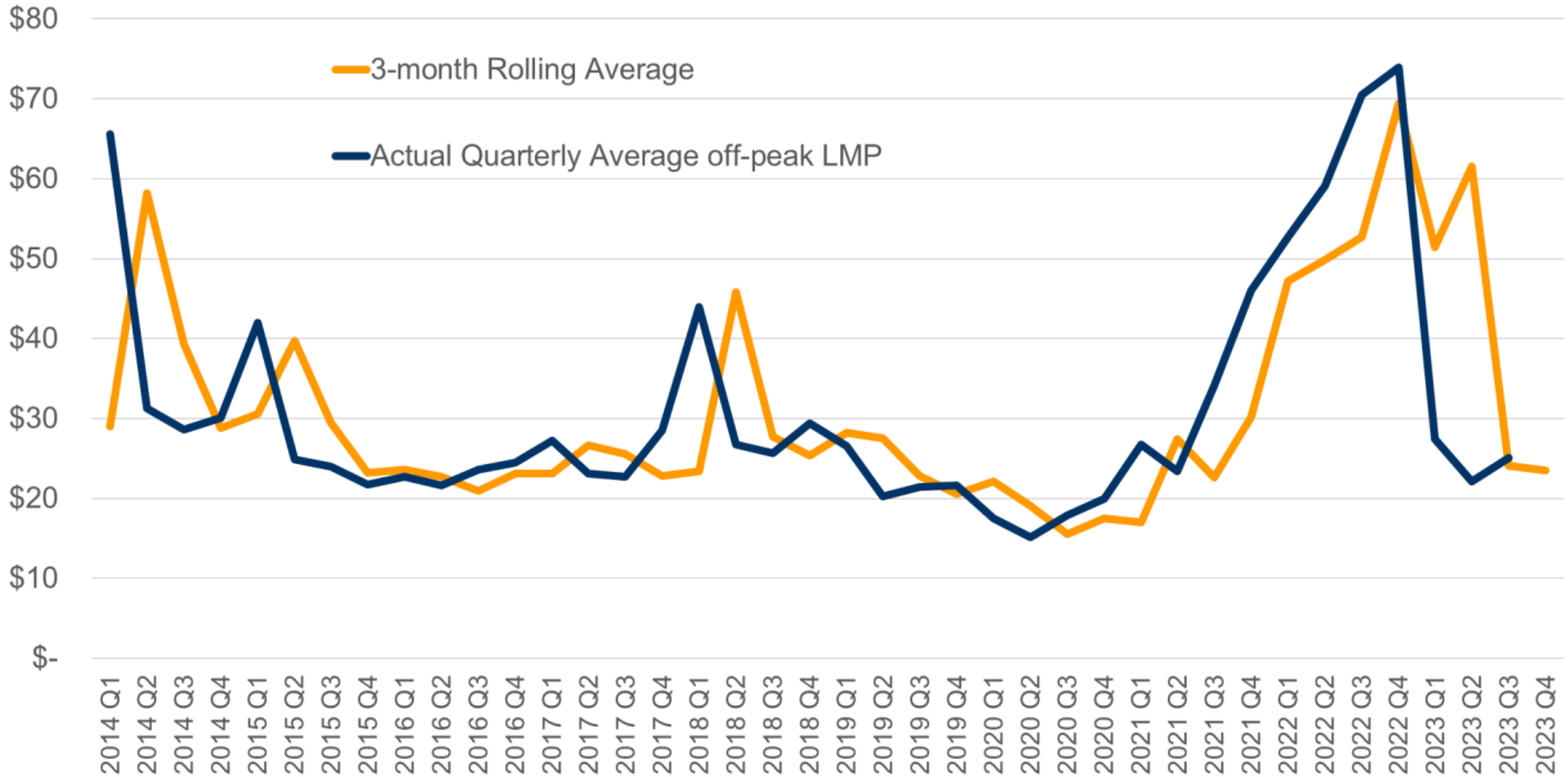


Actual Quarterly LMP and 12-month Station Service Rate





Actual Quarterly LMP and 3-month Station Service Rate





Accuracy in RTO Station Service Rates

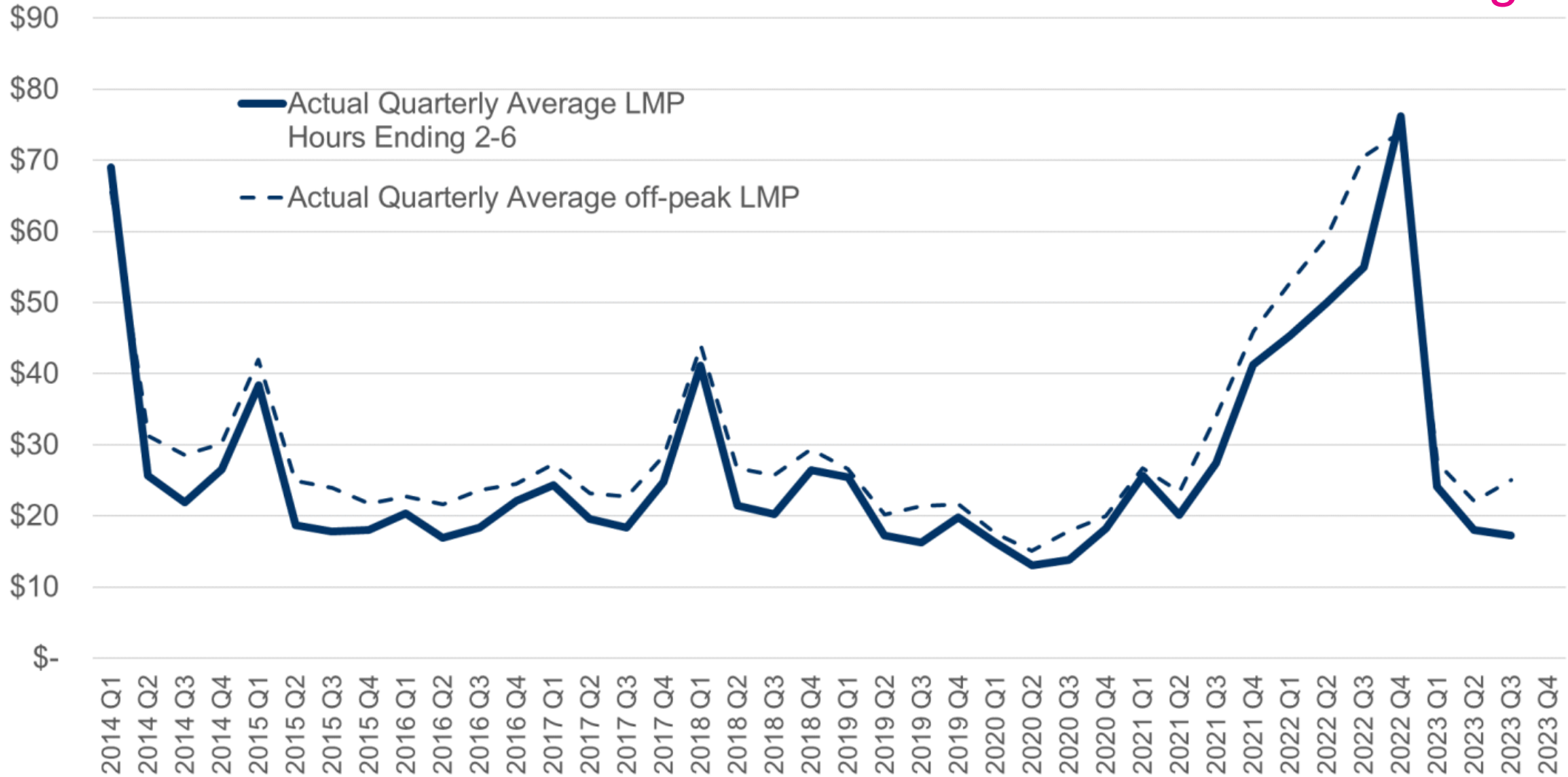
Quarter	3-month Rolling Average Error	12-month Rolling Average Error	Quarter	3-month Rolling Average Error	12-month Rolling Average Error
2014 Q1	-55.8%	-53.8%	2019 Q1	6.3%	19.6%
2014 Q2	86.5%	19.6%	2019 Q2	36.2%	34.6%
2014 Q3	37.4%	37.3%	2019 Q3	6.6%	21.5%
2014 Q4	-4.2%	29.1%	2019 Q4	-4.9%	14.7%
2015 Q1	-27.1%	-6.5%	2020 Q1	26.1%	32.6%
2015 Q2	59.7%	39.0%	2020 Q2	25.8%	39.5%
2015 Q3	23.1%	34.3%	2020 Q3	-13.1%	8.0%
2015 Q4	6.4%	41.2%	2020 Q4	-12.4%	-7.1%
2016 Q1	4.1%	27.9%	2021 Q1	-36.4%	-35.4%
2016 Q2	5.2%	14.6%	2021 Q2	17.4%	-17.2%
2016 Q3	-11.4%	-4.3%	2021 Q3	-33.9%	-38.2%
2016 Q4	-5.7%	-7.8%	2021 Q4	-34.3%	-47.2%
2017 Q1	-15.2%	-17.5%	2022 Q1	-10.5%	-39.6%
2017 Q2	15.2%	1.4%	2022 Q2	-15.6%	-36.6%
2017 Q3	12.4%	8.2%	2022 Q3	-25.3%	-36.2%
2017 Q4	-20.1%	-14.1%	2022 Q4	-6.2%	-26.0%
2018 Q1	-46.7%	-44.1%	2023 Q1	87.3%	103.4%
2018 Q2	71.2%	9.8%	2023 Q2	178.3%	165.7%
2018 Q3	7.7%	16.4%	2023 Q3	4.2%	105.5%
2018 Q4	-13.6%	4.0%	2023 Q4		
			Average	8%	10%
			5-year Average	10%	14%
			Mean Absolute Percent Error	28%	32%
			5-year MAPE	31%	44%
			Max Negative Error	-56%	-54%
			Max Positive Error	178%	166%

Negative values indicate that the station service rate was lower than actual LMP.

Positive values indicate that the station service rate was higher than actual LMP.

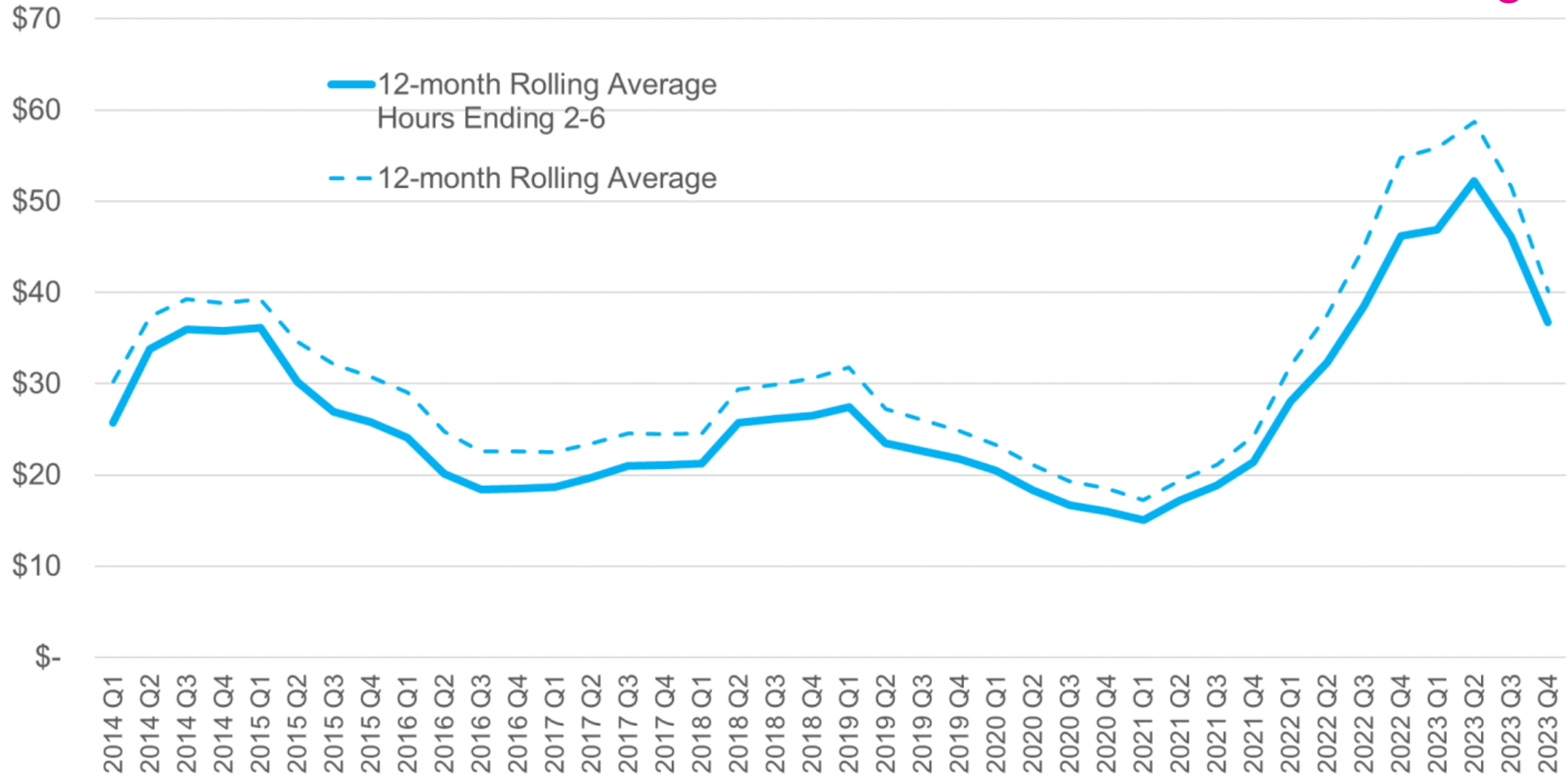


Actual Quarterly RTO Average LMP Off-Peak and Hours Ending 2-6

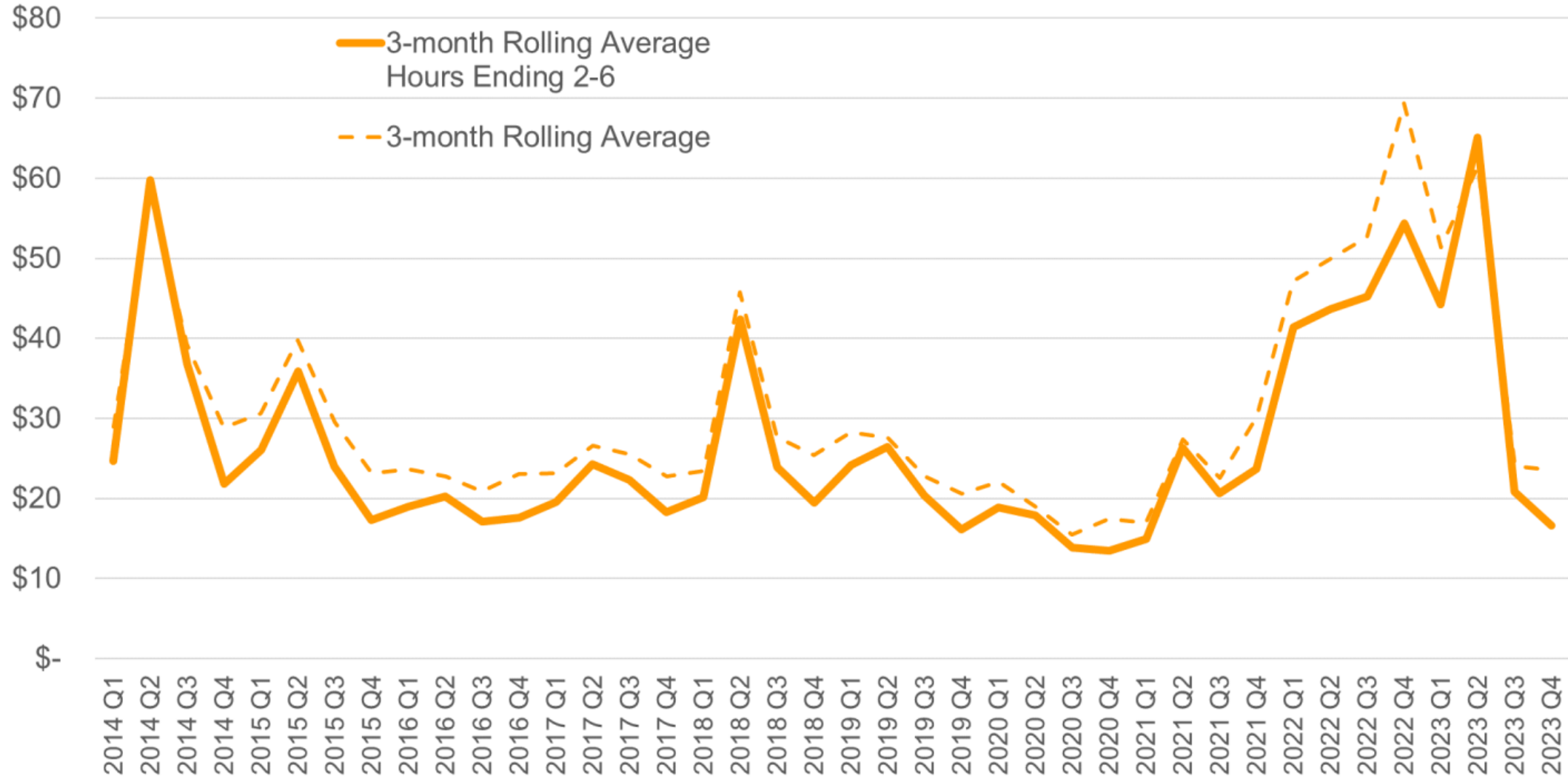




12-Month Station Service Rate Off-Peak and Hours Ending 2-6

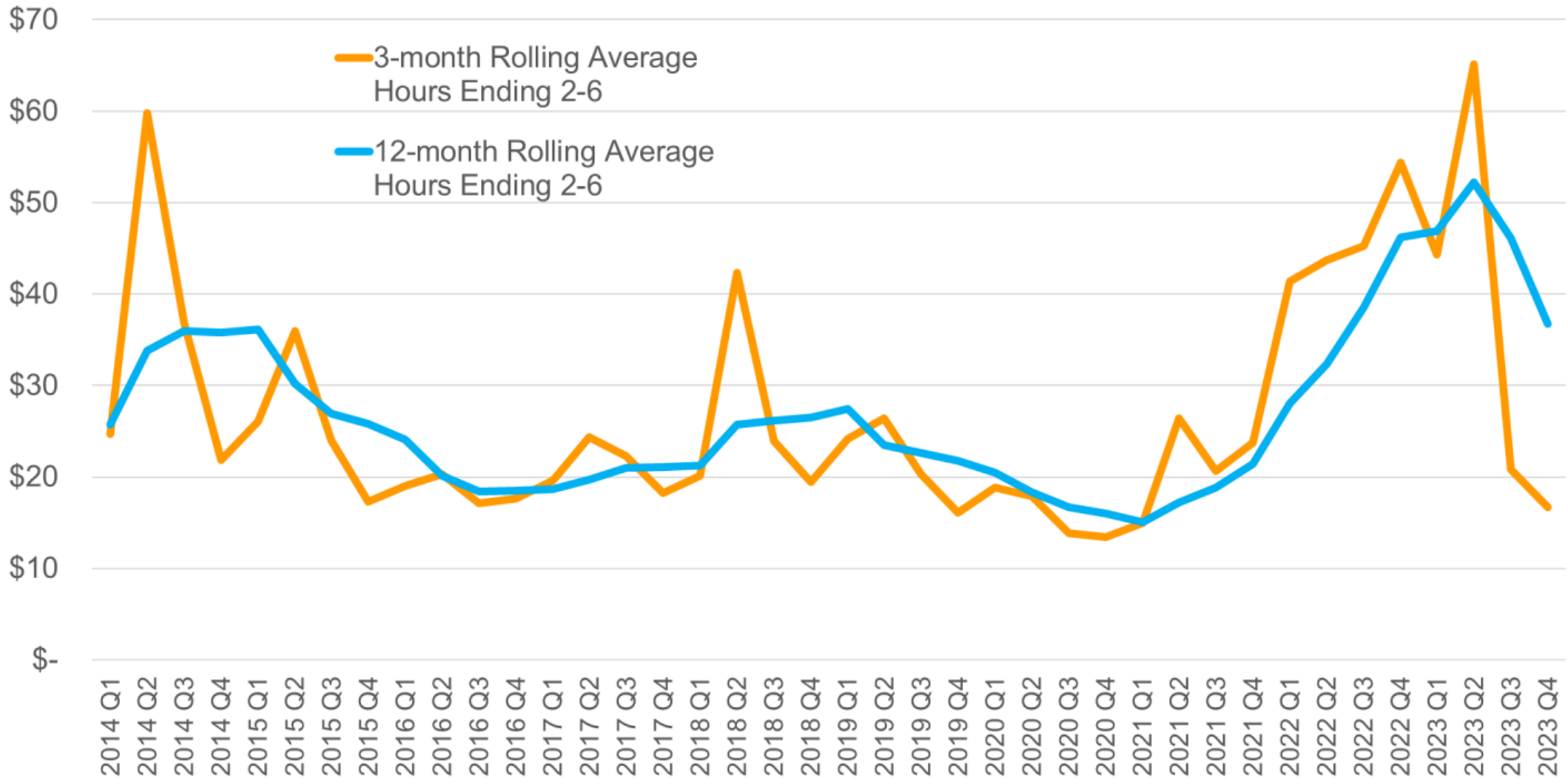


3-Month Station Service Rate Off-Peak and Hours Ending 2-6





RTO Station Service Rates – Using Hours Ending 2-6



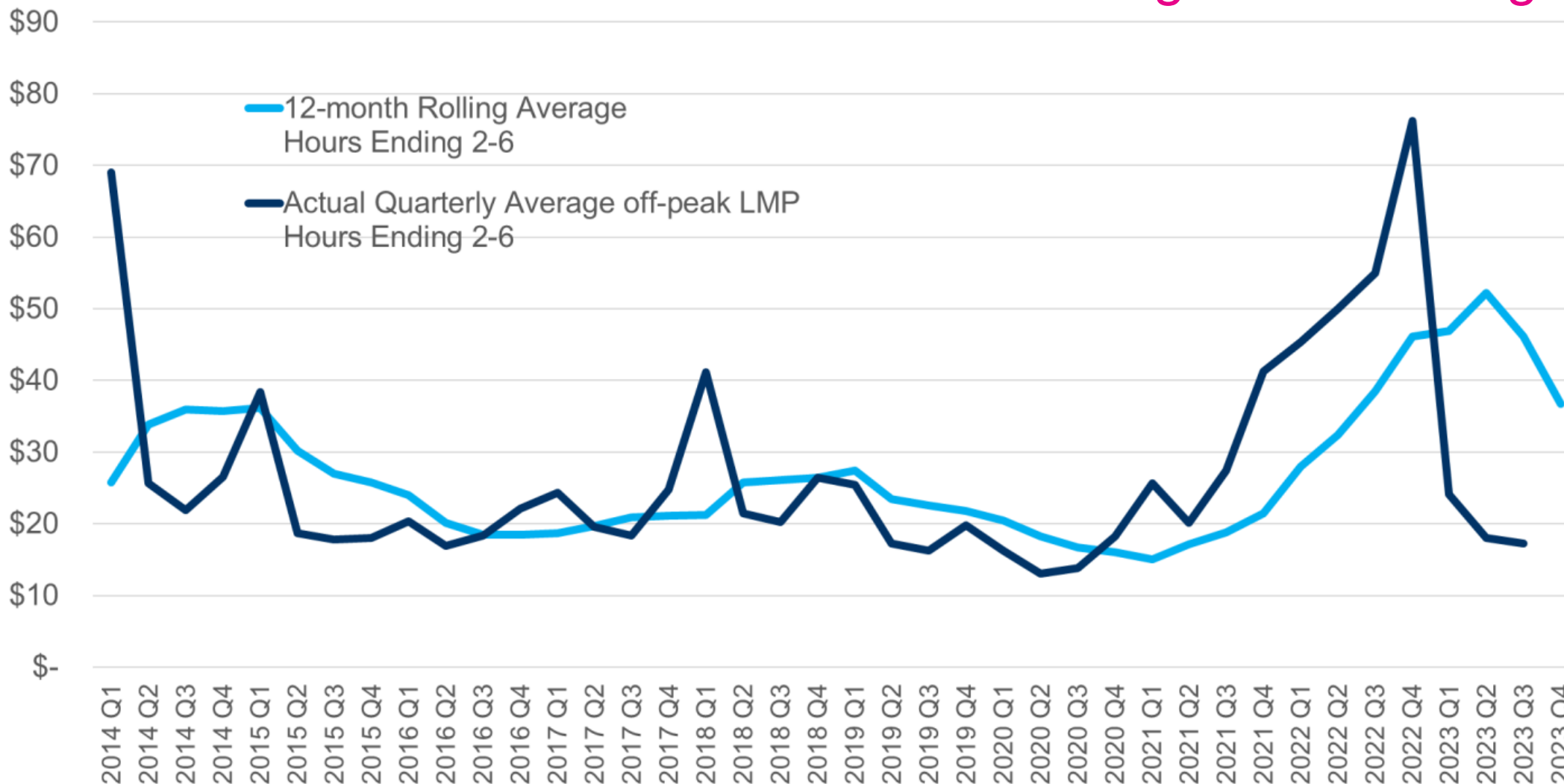


RTO Station Service Rates – Using Hours Ending 2-6

Quarter	Actual Quarterly Average off-peak LMP Hours Ending 2-6	3-month Rolling Average Hours Ending 2-6	12-month Rolling Average Hours Ending 2-6	Quarter	Actual Quarterly Average off-peak LMP Hours Ending 2-6	3-month Rolling Average Hours Ending 2-6	12-month Rolling Average Hours Ending 2-6	
2014 Q1	\$69.05	\$24.72	\$25.74	2019 Q1	\$25.41	\$24.14	\$27.47	
2014 Q2	\$25.65	\$59.77	\$33.81	2019 Q2	\$17.30	\$26.45	\$23.50	
2014 Q3	\$21.92	\$36.82	\$35.95	2019 Q3	\$16.30	\$20.31	\$22.60	
2014 Q4	\$26.53	\$21.82	\$35.78	2019 Q4	\$19.80	\$16.12	\$21.76	
2015 Q1	\$38.35	\$26.06	\$36.12	2020 Q1	\$16.25	\$18.86	\$20.44	
2015 Q2	\$18.70	\$35.93	\$30.16	2020 Q2	\$13.01	\$17.87	\$18.29	
2015 Q3	\$17.77	\$23.98	\$26.95	2020 Q3	\$13.86	\$13.84	\$16.67	
2015 Q4	\$18.06	\$17.27	\$25.81	2020 Q4	\$18.23	\$13.45	\$16.01	
2016 Q1	\$20.34	\$19.02	\$24.05	2021 Q1	\$25.69	\$14.97	\$15.03	
2016 Q2	\$16.94	\$20.29	\$20.14	2021 Q2	\$20.08	\$26.40	\$17.17	
2016 Q3	\$18.39	\$17.15	\$18.43	2021 Q3	\$27.39	\$20.61	\$18.86	
2016 Q4	\$22.14	\$17.63	\$18.52	2021 Q4	\$41.26	\$23.72	\$21.43	
2017 Q1	\$24.37	\$19.59	\$18.66	2022 Q1	\$45.41	\$41.40	\$28.03	
2017 Q2	\$19.53	\$24.31	\$19.67	2022 Q2	\$50.00	\$43.70	\$32.36	
2017 Q3	\$18.33	\$22.31	\$20.96	2022 Q3	\$55.03	\$45.23	\$38.51	
2017 Q4	\$24.80	\$18.25	\$21.12	2022 Q4	\$76.24	\$54.37	\$46.18	
2018 Q1	\$41.17	\$20.16	\$21.26	2023 Q1	\$24.11	\$44.27	\$46.89	
2018 Q2	\$21.42	\$42.34	\$25.76	2023 Q2	\$18.07	\$65.13	\$52.25	
2018 Q3	\$20.28	\$23.91	\$26.16	2023 Q3	\$17.31	\$20.85	\$46.15	
2018 Q4	\$26.43	\$19.48	\$26.47	2023 Q4		\$16.66	\$36.73	
					10-year Average	\$ 26.95	\$ 26.98	\$ 26.95
					5-year Average	\$ 28.46	\$ 28.42	\$ 28.32
					Standard Deviation	\$ 14.46	\$ 12.78	\$ 9.35
					5-year Standard Deviation	\$ 16.70	\$ 14.66	\$ 11.69

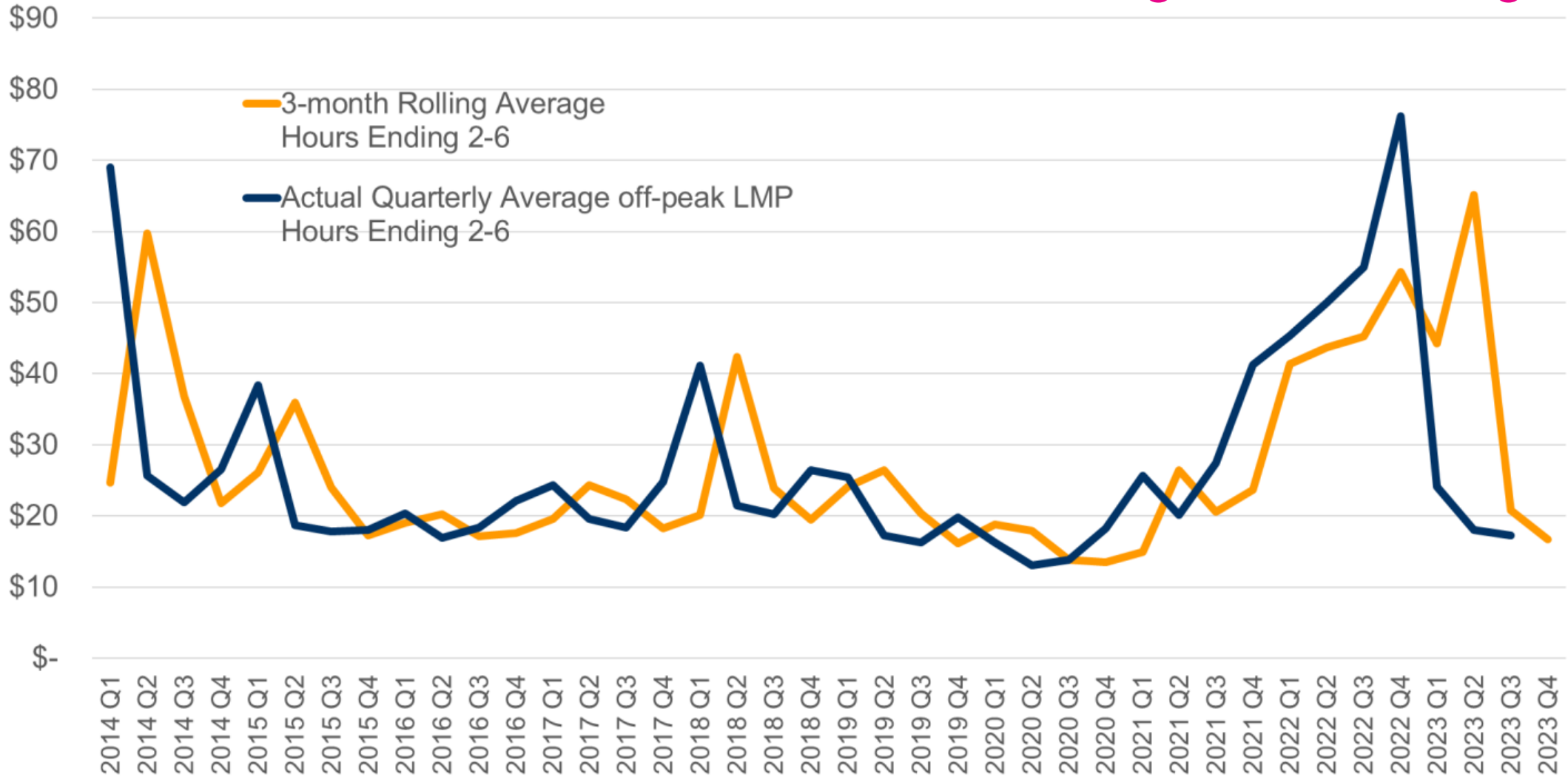


Actual Quarterly LMP and 12-month Station Service Rate – Using Hours Ending 2-6





Actual Quarterly LMP and 3-month Station Service Rate – Using Hours Ending 2-6





Accuracy in RTO Station Service Rates – Using Hours Ending 2-6

Quarter	3-month Rolling Average Error Hours Ending 2-6	12-month Rolling Average Error Hours Ending 2-6	Quarter	3-month Rolling Average Error Hours Ending 2-6	12-month Rolling Average Error Hours Ending 2-6
2014 Q1	-64.2%	-62.7%	2019 Q1	-5.0%	8.1%
2014 Q2	133.0%	31.8%	2019 Q2	52.9%	35.8%
2014 Q3	68.0%	64.0%	2019 Q3	24.6%	38.7%
2014 Q4	-17.8%	34.9%	2019 Q4	-18.6%	9.9%
2015 Q1	-32.0%	-5.8%	2020 Q1	16.1%	25.8%
2015 Q2	92.1%	61.3%	2020 Q2	37.4%	40.6%
2015 Q3	34.9%	51.7%	2020 Q3	-0.1%	20.3%
2015 Q4	-4.4%	42.9%	2020 Q4	-26.2%	-12.2%
2016 Q1	-6.5%	18.2%	2021 Q1	-41.7%	-41.5%
2016 Q2	19.8%	18.9%	2021 Q2	31.5%	-14.5%
2016 Q3	-6.7%	0.2%	2021 Q3	-24.8%	-31.1%
2016 Q4	-20.4%	-16.4%	2021 Q4	-42.5%	-48.1%
2017 Q1	-19.6%	-23.4%	2022 Q1	-8.8%	-38.3%
2017 Q2	24.5%	0.7%	2022 Q2	-12.6%	-35.3%
2017 Q3	21.7%	14.3%	2022 Q3	-17.8%	-30.0%
2017 Q4	-26.4%	-14.8%	2022 Q4	-28.7%	-39.4%
2018 Q1	-51.0%	-48.4%	2023 Q1	83.6%	94.5%
2018 Q2	97.7%	20.3%	2023 Q2	260.4%	189.2%
2018 Q3	17.9%	29.0%	2023 Q3	20.5%	166.6%
2018 Q4	-26.3%	0.2%	2023 Q4		
			Average	14%	14%
			5-year Average	16%	18%
			Mean Absolute Percent Error	39%	38%
			5-year MAPE	40%	48%
			Max Negative Error	-64%	-63%
			Max Positive Error	260%	189%

Negative values indicate that the station service rate was lower than actual LMP.

Positive values indicate that the station service rate was higher than actual LMP.



Comparison Summary of Off-Peak and Hours Ending 2-6

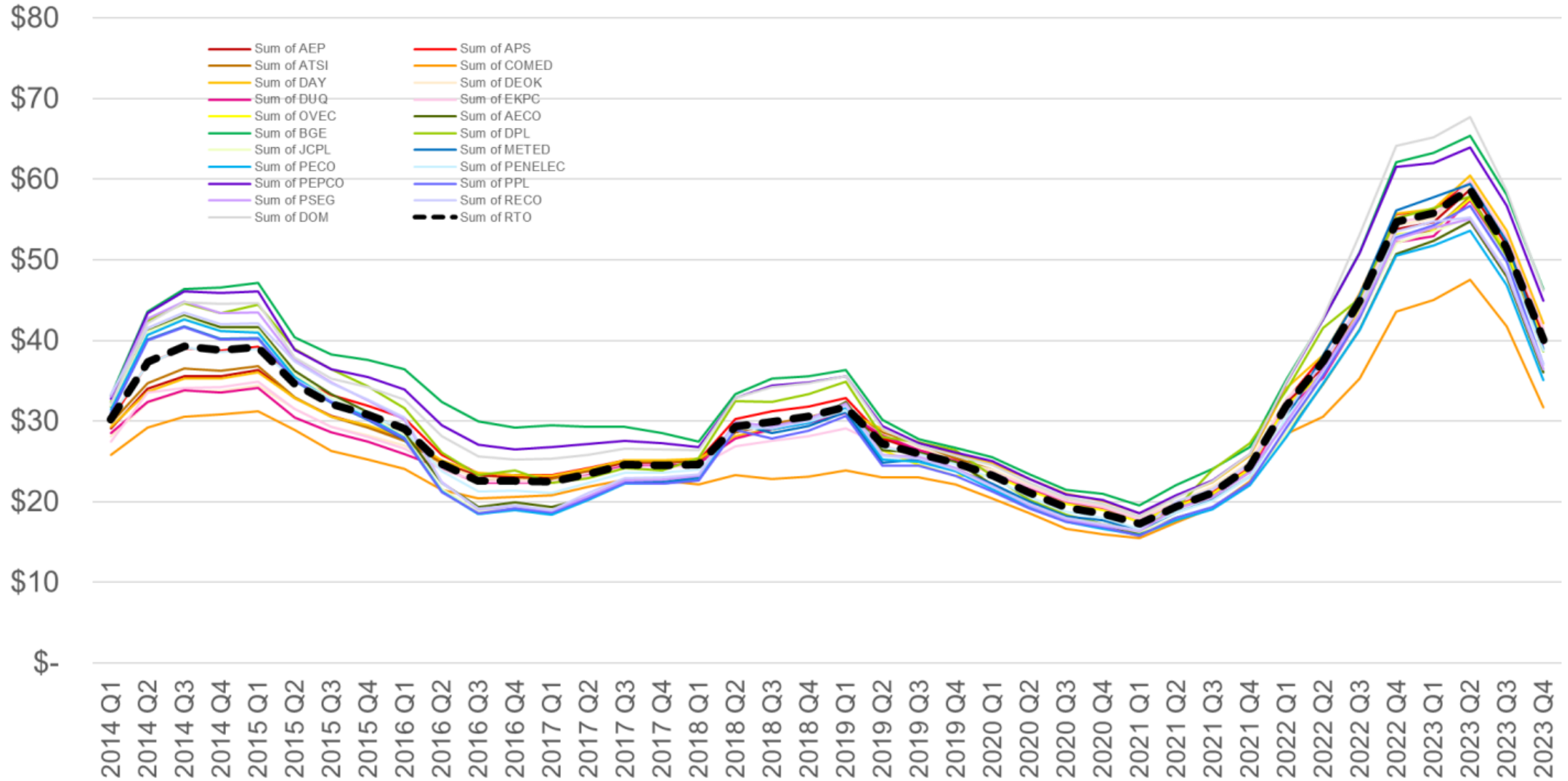
Quarter	Actual Quarterly Average off-peak LMP	3-month Rolling Average	12-month Rolling Average	3-month Rolling Average Error	12-month Rolling Average Error
Average	\$ 31.01	\$ 30.98	\$ 31.01	8%	10%
5-year Average	\$ 32.71	\$ 32.51	\$ 32.47	10%	14%
Standard Deviation	\$ 14.56	\$ 13.12	\$ 10.47	**28%	**32%
5-year Standard Deviation	\$ 13.44	\$ 15.95	\$ 13.51	**31%	**44%
					**MAPE
Quarter	Actual Quarterly Average LMP Hours Ending 2-6	3-month Rolling Average Hours Ending 2-6	12-month Rolling Average Hours Ending 2-6	3-month Rolling Average Error Hours Ending 2-6	12-month Rolling Average Error Hours Ending 2-6
Average	\$ 26.95	\$ 26.98	\$ 26.95	14%	14%
5-year Average	\$ 28.46	\$ 28.42	\$ 28.32	16%	18%
Standard Deviation	\$ 14.46	\$ 12.78	\$ 9.35	**39%	**38%
5-year Standard Deviation	\$ 16.70	\$ 14.66	\$ 11.69	**40%	**48%
					**MAPE

Quarter	3 mo. (SSR - LMP)	12 mo. (SSR - LMP)	3 mo. (SSR - LMP) - HE 2-6	12 mo. (SSR - LMP) - HE 2-6
Min	(\$36.56)	(\$35.30)	(\$44.33)	(\$43.31)
Max	\$39.43	\$36.64	\$47.06	\$34.18
Average	\$0.16	(\$0.24)	\$0.30	(\$0.25)

**Negative values indicate that the station service rate was lower than actual LMP.
Positive values indicate that the station service rate was higher than actual LMP.**

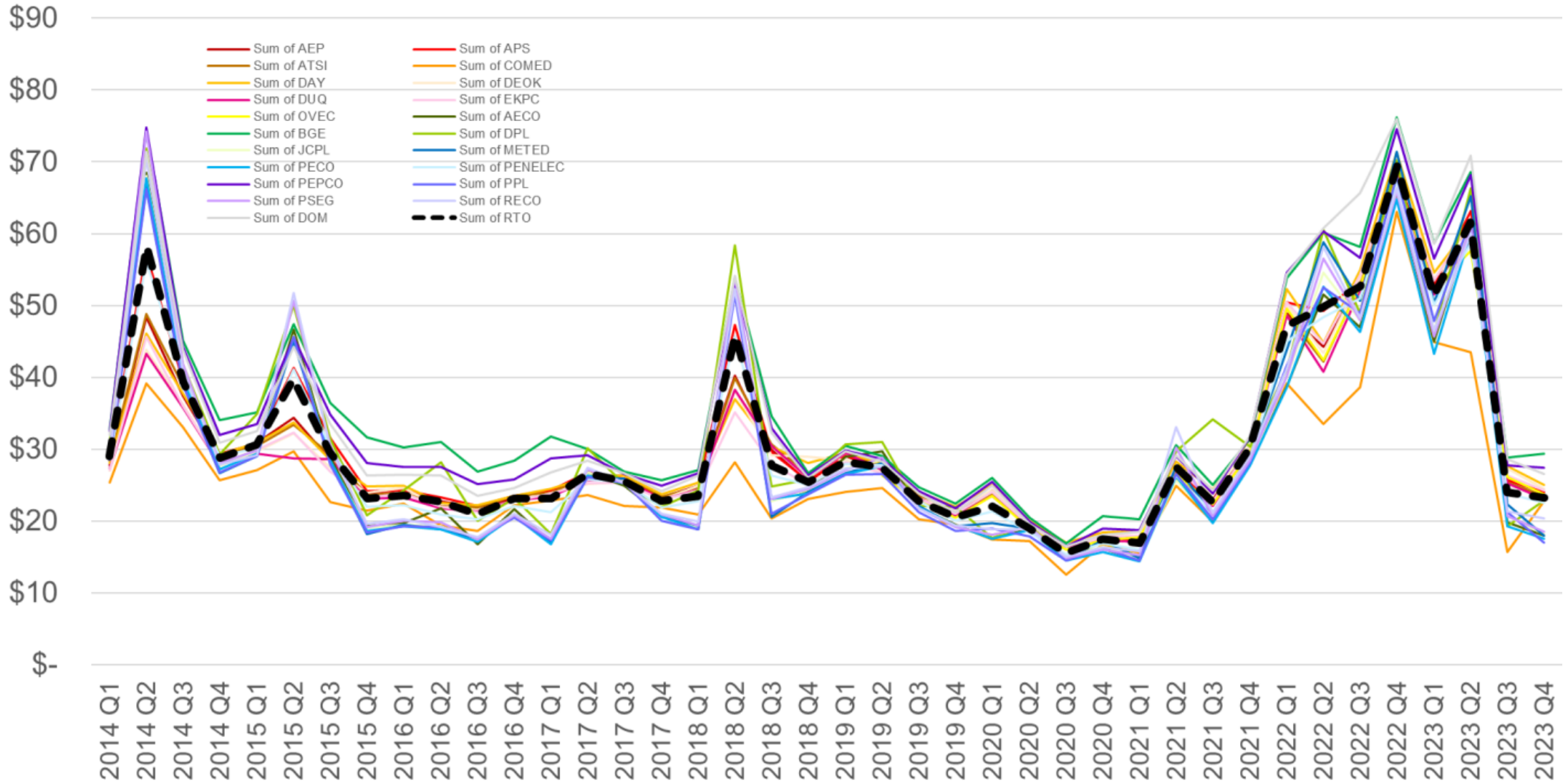


Zonal Station Service Rates, 12-month Rolling Average





Zonal Station Service Rates, 3-month Rolling Average





Summary of Zonal Station Service Rates – 10 year average

West, South & RTO	AEP	APS	ATSI	COMED	DAY	DEOK	DUQ	EKPC	OVEC	DOM	RTO
12 mo. Average	\$ 30.61	\$ 31.65	\$ 30.56	\$ 25.91	\$ 31.23	\$ 30.35	\$ 29.71	\$ 30.10	\$ 31.93	\$ 34.61	\$ 31.01
3 mo. Average	\$ 30.65	\$ 31.67	\$ 30.55	\$ 25.84	\$ 31.31	\$ 30.46	\$ 29.73	\$ 30.21	\$ 32.33	\$ 34.71	\$ 30.98
Mid-Atlantic	AECO	BGE	DPL	JCPL	METED	PECO	PENELEC	PEPCO	PPL	PSEG	RECO
12 mo. Average	\$ 29.86	\$ 35.96	\$ 32.52	\$ 29.86	\$ 30.32	\$ 29.35	\$ 30.28	\$ 34.81	\$ 29.52	\$ 30.53	\$ 30.65
3 mo. Average	\$ 29.61	\$ 36.06	\$ 32.35	\$ 29.60	\$ 30.14	\$ 29.09	\$ 30.19	\$ 34.88	\$ 29.29	\$ 30.24	\$ 30.40

- When comparing RTO-based station service rates, over the long-run, there is little difference between using a 12-month or 3-month rolling average.
- A 3-month rolling average will be more responsive. When LMPs fall, the rate will drop more quickly, but it will also be subject to spikes when LMPs increases in response to extreme events.
- Patterns vary for zonal-based station service rates. A few zones are consistently above or below the RTO-based rates, but most zones fluctuate above and below the RTO-based rate.

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