



The chart displays three data series for PJM term structure:

- ATM Implied Volatility (Orange Bars):** Values range from approximately \$45.00 to \$85.00.
- Avg Hist Realized Vol (Blue Bars):** Values range from approximately \$35.00 to \$55.00.
- Futures (Yellow Line):** Values range from approximately 40% to 110%.

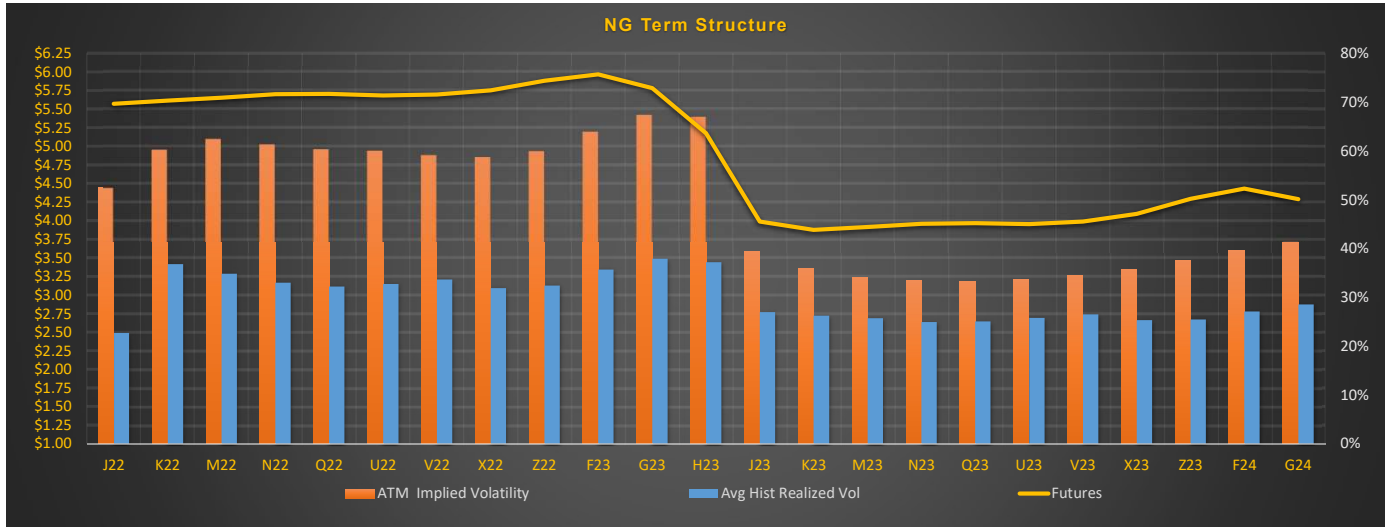
The x-axis represents terms from J22 to H24. The left y-axis represents dollar values (\$25.00 to \$115.00), and the right y-axis represents percentages (0% to 120%).

Term	ATM Implied Vol (\$)	Avg Hist Realized Vol (\$)	Futures (%)
J22	85.00	45.00	45
K22	70.00	45.00	50
M22	68.00	45.00	55
N22	70.00	45.00	65
Q22	70.00	42.00	60
U22	60.00	38.00	50
V22	60.00	35.00	48
X22	60.00	35.00	50
Z22	65.00	42.00	55
F23	98.00	50.00	110
G23	98.00	55.00	105
H23	60.00	42.00	55
J23	50.00	35.00	40
K23	50.00	35.00	40
M23	50.00	35.00	40
N23	55.00	38.00	55
Q23	55.00	38.00	50
U23	50.00	35.00	40
V23	50.00	35.00	38
X23	50.00	35.00	40
Z23	55.00	38.00	50
F24	70.00	45.00	80
G24	70.00	45.00	70
H24	50.00	40.00	40

Contract	PJM Term Structure															
	Option Expiry	Trade Days to Expiry	Futures Price	ATM Straddle	Break-even	ATM Implied Volatility				Realized Volatility		Implied Volatility and Skew				
						Vol	1D Chg	1Wk Chg	1Mo Chg	Avg Hist	30 day	10d Put	25d Put	ATM	25d Call	10d Call
J22	3/30/22	3	\$ 60.10	\$ 3.52	\$ 3.07	81.0%	1.0%	18.3%	25.0%	26.1%	38.9%	-1.4%	-0.5%	81.0%	0.5%	0.7%
K22	4/28/22	23	\$ 64.50	\$ 9.36	\$ 2.50	61.5%	2.2%	0.0%	12.8%	25.4%	36.9%	-4.3%	-2.3%	61.5%	6.4%	10.5%
M22	5/27/22	44	\$ 66.55	\$ 12.77	\$ 2.47	59.0%	2.1%	6.0%	11.2%	26.9%	36.6%	-4.1%	-2.1%	59.0%	8.0%	16.1%
N22	6/29/22	66	\$ 79.30	\$ 19.96	\$ 3.11	62.3%	0.2%	4.4%	10.6%	25.7%	35.3%	-11.2%	-6.2%	62.3%	9.7%	25.4%
Q22	7/28/22	86	\$ 75.30	\$ 21.30	\$ 2.91	61.3%	0.2%	4.3%	11.8%	22.5%	35.6%	-9.9%	-5.6%	61.3%	9.3%	20.1%
U22	8/30/22	109	\$ 68.25	\$ 18.11	\$ 2.20	51.2%	0.2%	3.2%	7.6%	17.8%	34.0%	-9.3%	-4.9%	51.2%	6.3%	20.3%
V22	9/29/22	130	\$ 67.70	\$ 18.46	\$ 2.06	48.2%	0.2%	3.2%	10.0%	15.8%	32.4%	-7.8%	-3.7%	48.2%	8.8%	17.3%
X22	10/28/22	151	\$ 69.75	\$ 20.33	\$ 2.11	48.0%	0.5%	3.0%	10.0%	16.8%	33.0%	-5.2%	-2.9%	48.0%	3.6%	9.0%
Z22	11/29/22	172	\$ 77.35	\$ 29.45	\$ 2.85	58.5%	0.5%	5.6%	15.0%	24.2%	38.6%	-10.0%	-4.1%	58.5%	5.1%	11.2%
F23	12/29/22	193	\$ 107.45	\$ 71.73	\$ 6.70	99.0%	1.0%	8.0%	27.5%	34.2%	48.0%	-11.2%	-7.1%	99.0%	20.6%	35.0%
G23	1/30/23	213	\$ 104.55	\$ 72.73	\$ 6.45	98.0%	1.0%	8.0%	26.5%	40.1%	50.2%	-11.1%	-7.0%	98.0%	21.2%	35.0%
H23	2/27/23	232	\$ 63.55	\$ 25.53	\$ 2.12	53.0%	0.5%	2.0%	8.0%	25.2%	25.2%	-4.6%	-2.7%	53.0%	10.0%	24.7%
J23	3/30/23	255	\$ 51.90	\$ 14.20	\$ 1.12	34.3%	0.3%	0.3%	4.3%	16.1%	24.2%	-5.2%	-3.3%	34.3%	4.6%	8.9%
K23	4/27/23	274	\$ 52.00	\$ 14.30	\$ 1.09	33.3%	0.3%	0.3%	4.3%	15.1%	34.0%	-3.9%	-2.4%	33.3%	4.2%	9.4%
M23	5/30/23	296	\$ 51.65	\$ 14.73	\$ 1.08	33.2%	0.2%	0.2%	4.2%	15.2%	33.9%	-3.9%	-2.6%	33.2%	5.1%	10.1%
N23	6/29/23	318	\$ 64.00	\$ 23.00	\$ 1.63	40.5%	0.5%	0.5%	5.5%	17.0%	21.3%	-5.6%	-3.9%	40.5%	6.8%	25.2%
Q23	7/28/23	338	\$ 59.35	\$ 21.49	\$ 1.48	39.5%	0.5%	0.6%	6.5%	16.8%	21.4%	-5.5%	-3.8%	39.5%	6.8%	25.6%
U23	8/30/23	361	\$ 51.85	\$ 16.63	\$ 1.10	33.8%	0.2%	0.3%	4.8%	14.3%	34.6%	-5.4%	-3.8%	33.8%	6.8%	11.6%
V23	9/28/23	381	\$ 50.90	\$ 16.26	\$ 1.05	32.8%	0.3%	0.4%	4.9%	13.4%	23.3%	-5.0%	-3.6%	32.8%	6.2%	10.9%
X23	10/30/23	403	\$ 51.95	\$ 17.03	\$ 1.07	32.8%	0.3%	0.4%	4.7%	14.2%	23.8%	-4.2%	-3.0%	32.8%	6.5%	10.4%
Z23	11/29/23	424	\$ 59.35	\$ 23.41	\$ 1.44	38.5%	0.5%	0.5%	8.0%	18.9%	24.5%	-1.2%	-0.5%	38.5%	8.5%	15.6%
F24	12/28/23	444	\$ 83.45	\$ 53.63	\$ 3.29	62.5%	0.0%	-0.5%	5.5%	27.0%	#N/A	-2.4%	-1.4%	62.5%	17.2%	21.1%
G24	1/30/24	465	\$ 78.70	\$ 50.90	\$ 3.05	61.5%	0.0%	-0.5%	5.5%	31.3%	#N/A	-2.4%	-1.4%	61.5%	17.3%	21.2%
H24	2/28/24	485	\$ 50.55	\$ 21.55	\$ 1.24	39.0%	0.0%	0.0%	3.0%	20.5%	#N/A	-1.7%	-0.8%	39.0%	5.2%	8.3%

PJM Cal 1x Term Structure																
Contract	Option Expiry	Trade Days to Expiry	Futures Price	ATM Straddle	Break-even	ATM Implied Volatility				Realized Volatility		Implied Volatility and Skew				
						Vol	1D Chg	1Wk Chg	1Mo Chg	Avg Hist	30 day	10d Put	25d Put	ATM	25d Call	10d Call
Cal23	12/23/22	190	\$ 63.81	\$ 18.72	\$ 1.72	42.9%	1.0%	3.7%	8.3%	13.0%	25.7%	-5.8%	-4.9%	42.9%	3.2%	5.8%
Cal24	12/22/23	441	\$ 54.14	\$ 16.27	\$ 1.01	29.7%	0.6%	1.1%	3.9%	10.7%	23.1%	-2.5%	-1.8%	29.7%	4.4%	6.7%
Cal25	12/20/24	692	\$ 52.39	\$ 16.62	\$ 0.83	25.3%	0.2%	0.8%	3.9%	9.6%	18.5%	-1.6%	-1.0%	25.3%	4.0%	5.9%

Option Trade Recap



NG Term Structure																
Contract	Option Expiry	Trade Days to Expiry	Futures Price	ATM Straddle	Break-even	ATM Implied Volatility				Realized Volatility		Implied Volatility and Skew				
						Vol	1D Chg	1Wk Chg	1Mo Chg	Avg Hist	30 day	10d Put	25d Put	ATM	25d Call	10d Call
J22	3/28/22	1	\$ 5.571	\$ 0.25	\$ 0.184	52.4%	-2.1%	6.9%	-3.9%	22.7%	51.6%	-3.3%	-3.9%	52.4%	4.0%	13.3%
K22	4/26/22	21	\$ 5.611	\$ 0.81	\$ 0.213	60.2%	1.9%	9.0%	8.6%	36.8%	50.4%	-3.5%	-3.0%	60.2%	5.3%	11.0%
M22	5/25/22	42	\$ 5.651	\$ 1.15	\$ 0.222	62.4%	2.3%	11.1%	12.2%	34.8%	49.4%	-5.7%	-4.0%	62.4%	5.7%	10.3%
N22	6/27/22	64	\$ 5.701	\$ 1.42	\$ 0.220	61.3%	2.6%	9.9%	12.6%	33.0%	48.4%	-7.0%	-4.6%	61.3%	4.7%	9.4%
Q22	7/26/22	84	\$ 5.706	\$ 1.59	\$ 0.217	60.3%	2.3%	8.7%	11.9%	32.3%	48.1%	-6.7%	-4.1%	60.3%	4.7%	9.8%
U22	8/26/22	107	\$ 5.684	\$ 1.76	\$ 0.215	60.0%	2.0%	8.1%	11.8%	32.8%	48.1%	-6.1%	-3.9%	60.0%	5.2%	10.2%
V22	9/27/22	128	\$ 5.693	\$ 1.91	\$ 0.212	59.1%	1.4%	7.4%	10.4%	33.7%	47.7%	-6.0%	-3.9%	59.1%	6.1%	11.6%
X22	10/26/22	149	\$ 5.750	\$ 2.04	\$ 0.213	58.7%	1.5%	7.0%	8.7%	31.9%	46.2%	-4.3%	-3.6%	58.7%	9.6%	18.5%
Z22	11/25/22	170	\$ 5.880	\$ 2.28	\$ 0.222	59.9%	1.9%	4.4%	8.7%	32.4%	44.2%	-7.2%	-5.9%	59.9%	13.6%	9.5%
F23	12/27/22	191	\$ 5.968	\$ 2.60	\$ 0.240	63.9%	1.0%	2.9%	8.3%	35.7%	43.2%	-9.2%	-6.9%	63.9%	16.6%	34.9%
G23	1/26/23	211	\$ 5.781	\$ 2.81	\$ 0.245	67.3%	1.0%	4.1%	8.4%	37.9%	43.1%	-10.4%	-8.1%	67.3%	19.0%	-67.3%
H23	2/23/23	230	\$ 5.176	\$ 2.61	\$ 0.218	66.9%	1.8%	4.5%	9.9%	37.2%	38.4%	-9.7%	-7.8%	66.9%	18.9%	33.7%
J23	3/28/23	253	\$ 3.985	\$ 1.25	\$ 0.099	39.3%	1.5%	2.1%	4.1%	26.9%	24.3%	0.9%	0.1%	39.3%	1.8%	5.5%
K23	4/25/23	272	\$ 3.876	\$ 1.15	\$ 0.088	35.9%	1.2%	1.7%	5.0%	26.2%	23.1%	0.9%	0.1%	35.9%	1.7%	5.3%
M23	5/25/23	294	\$ 3.914	\$ 1.14	\$ 0.084	34.1%	1.0%	1.4%	4.6%	25.7%	22.6%	0.9%	0.1%	34.1%	1.7%	5.2%
N23	6/27/23	316	\$ 3.959	\$ 1.17	\$ 0.083	33.4%	0.9%	1.4%	4.6%	24.9%	22.1%	1.0%	0.1%	33.4%	1.8%	5.1%
Q23	7/26/23	336	\$ 3.967	\$ 1.22	\$ 0.083	33.3%	1.0%	1.5%	4.5%	25.1%	21.4%	1.0%	0.1%	33.3%	1.8%	5.3%
U23	8/28/23	359	\$ 3.953	\$ 1.25	\$ 0.084	33.6%	1.0%	1.5%	4.5%	25.8%	21.1%	1.0%	0.1%	33.6%	1.9%	5.3%
V23	9/26/23	379	\$ 3.986	\$ 1.34	\$ 0.087	34.5%	1.0%	1.6%	4.8%	26.5%	20.7%	1.0%	0.1%	34.5%	1.9%	5.6%
X23	10/26/23	401	\$ 4.091	\$ 1.46	\$ 0.092	35.7%	0.9%	1.1%	4.9%	25.3%	19.5%	0.1%	-0.5%	35.7%	3.8%	8.9%
Z23	11/27/23	422	\$ 4.295	\$ 1.65	\$ 0.102	37.6%	1.0%	0.6%	2.9%	25.5%	17.7%	0.1%	-0.5%	37.6%	3.9%	8.8%
F24	12/26/23	442	\$ 4.432	\$ 1.83	\$ 0.111	39.7%	0.8%	0.9%	0.1%	27.1%	17.3%	-3.0%	-2.7%	39.7%	9.1%	10.3%
G24	1/26/24	463	\$ 4.287	\$ 1.90	\$ 0.112	41.4%	1.4%	1.7%	-0.2%	28.6%	18.2%	-3.2%	-2.9%	41.4%	7.9%	8.9%

