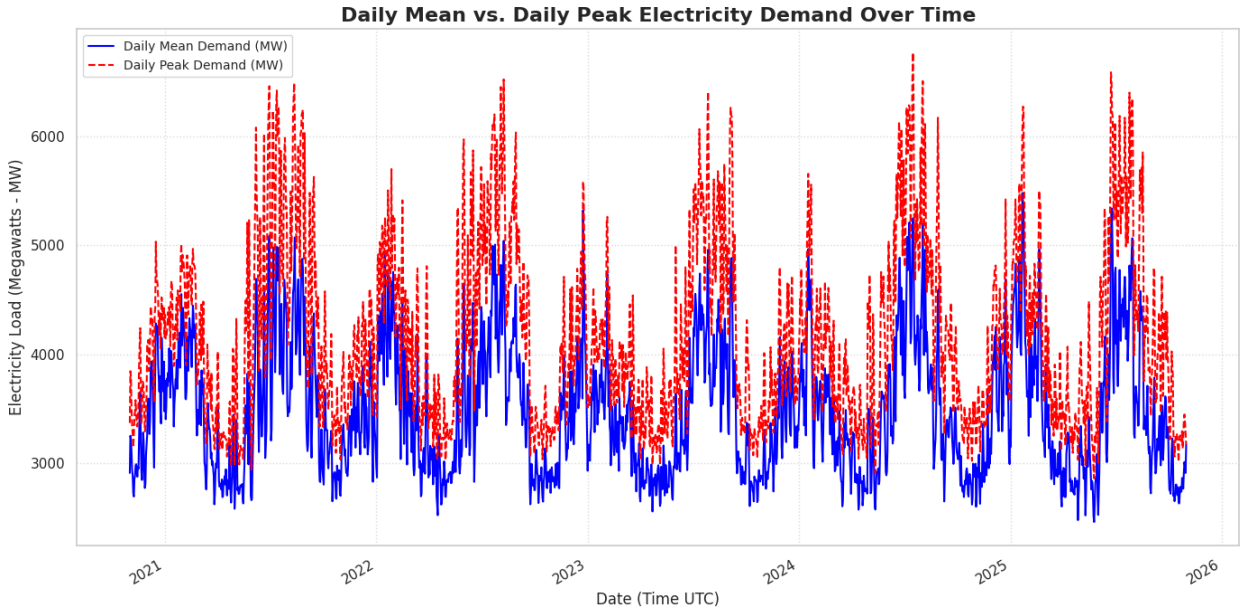
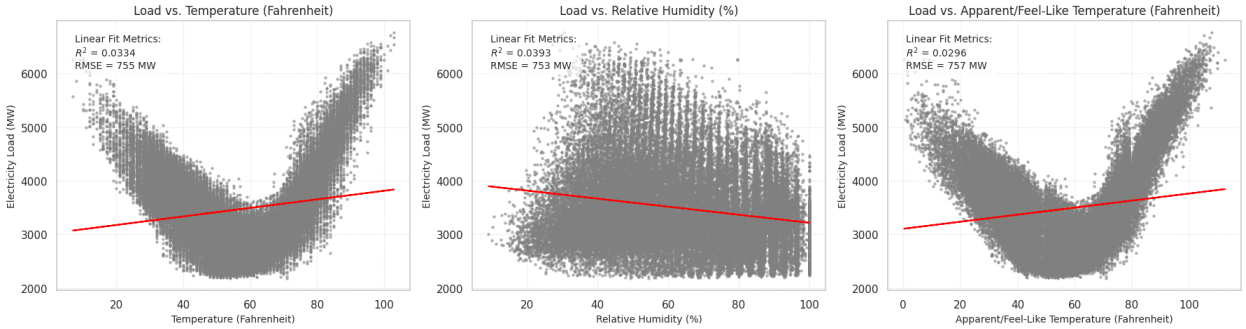
Tables and Figures

--- Summary Table ---

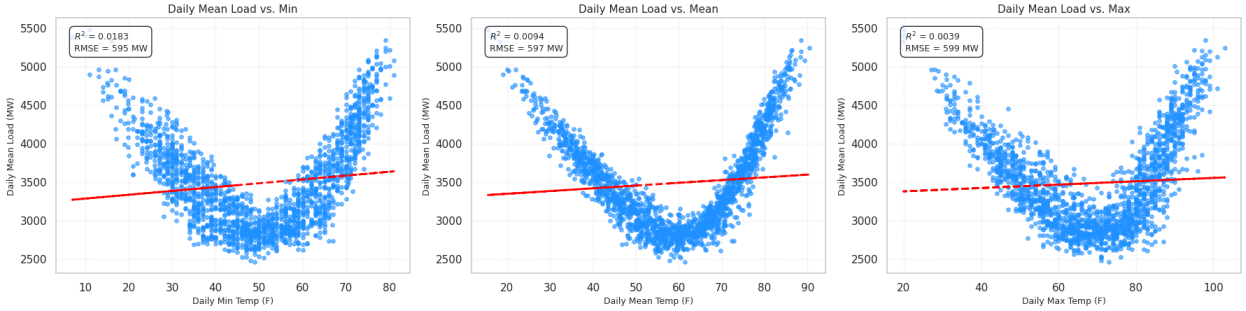
Year	Demand Mean (MW)	Demand Max (MW)	Temp Mean (C)	Temp Min (C)	Temp Max (C)	RH Mean (%)	RH Min (%)	RH Max (%)	Feel Mean (F)	Feel Min (F)	Feel Max (F)
2020	3374.32	5033.15	7.78432	-5	25.5556	63.6237	20.83	97.2333	43.5728	11.09	78.1
2021	3541.31	6485.98	14.9666	-6.72222	36.6667	62.9691	12.81	100	57.9591	10.03	107.81
2022	3544.02	6520.05	14.3266	-11.7222	36.6667	64.0681	15.05	100	56.6295	1.46	106.285
2023	3370.11	6405.74	15.3292	-10	37.2222	63.6916	9.13	100	58.7556	2.5	110.14
2024	3475.71	6765.92	14.9221	-10.5556	39.4444	66.8996	17.31	100	57.9027	2.65	112.62
2025	3503.48	6584.91	15.6707	-13.8889	36.6667	65.0899	14.73	100	59.267	0.27	107.33



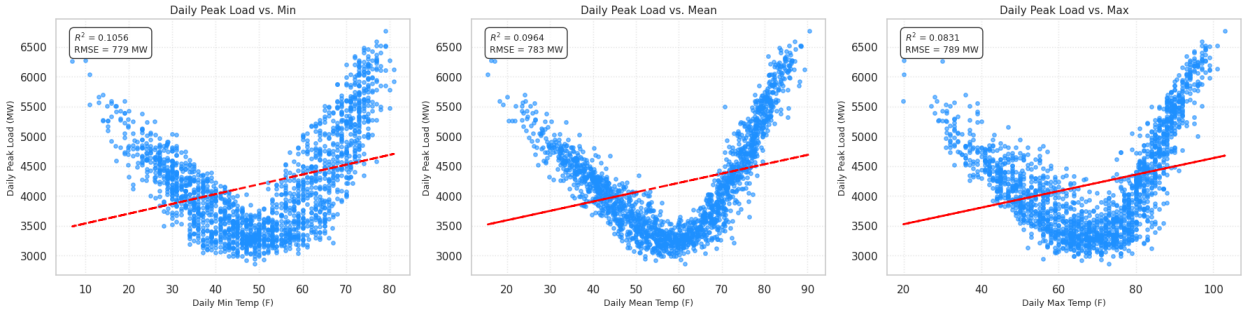
Load (MW) vs. Meteorological Variables (Hourly Data)
Load CV: 22.06%



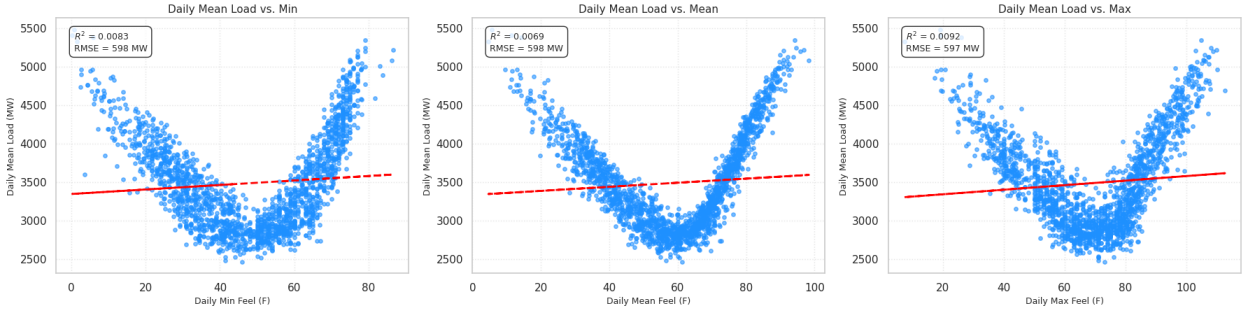
Daily Mean Load vs. Temperature Metrics (Tmin, Tmean, Tmax)



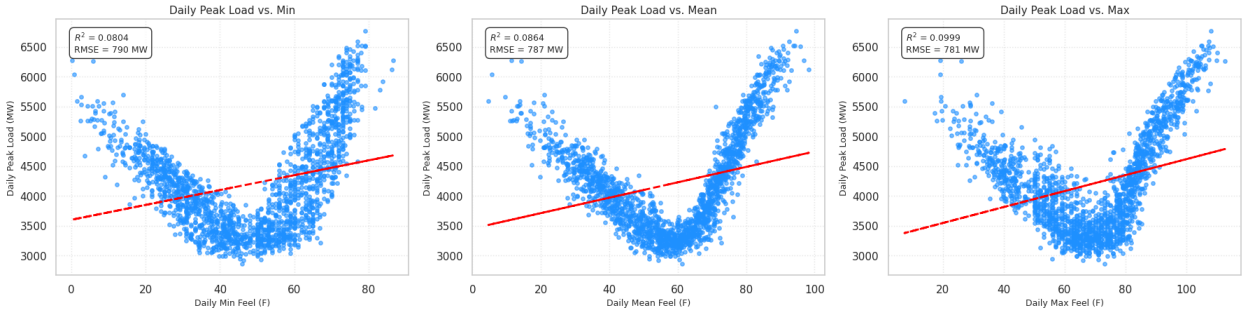
Daily Peak Load vs. Temperature Metrics (Tmin, Tmean, Tmax)



Daily Mean Load vs. Feel-Like Temperature Metrics (Feelmin, Feelmean, Feelmax)



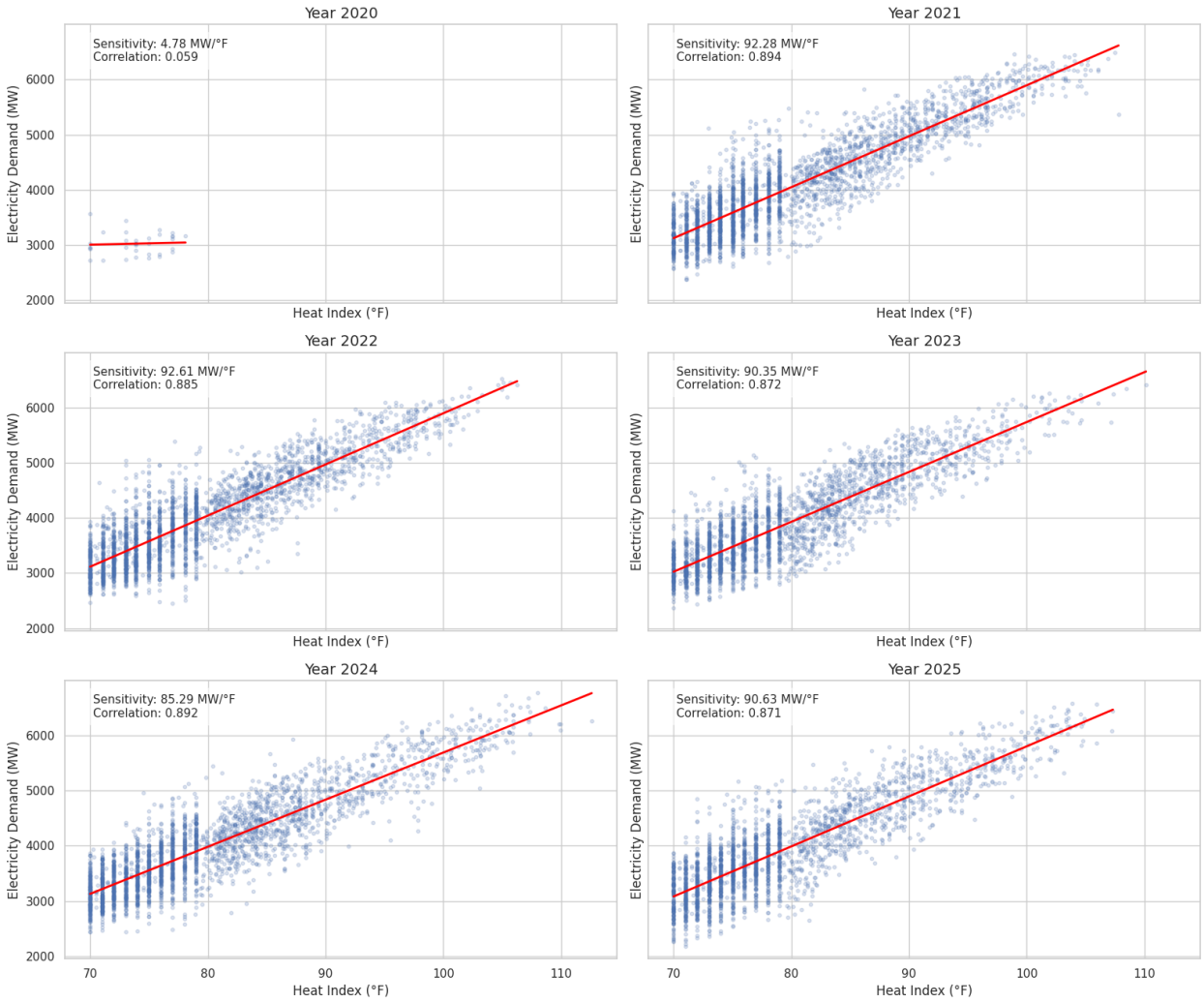
Daily Peak Load vs. Feel-Like Temperature Metrics (Feelmin, Feelmean, Feelmax)

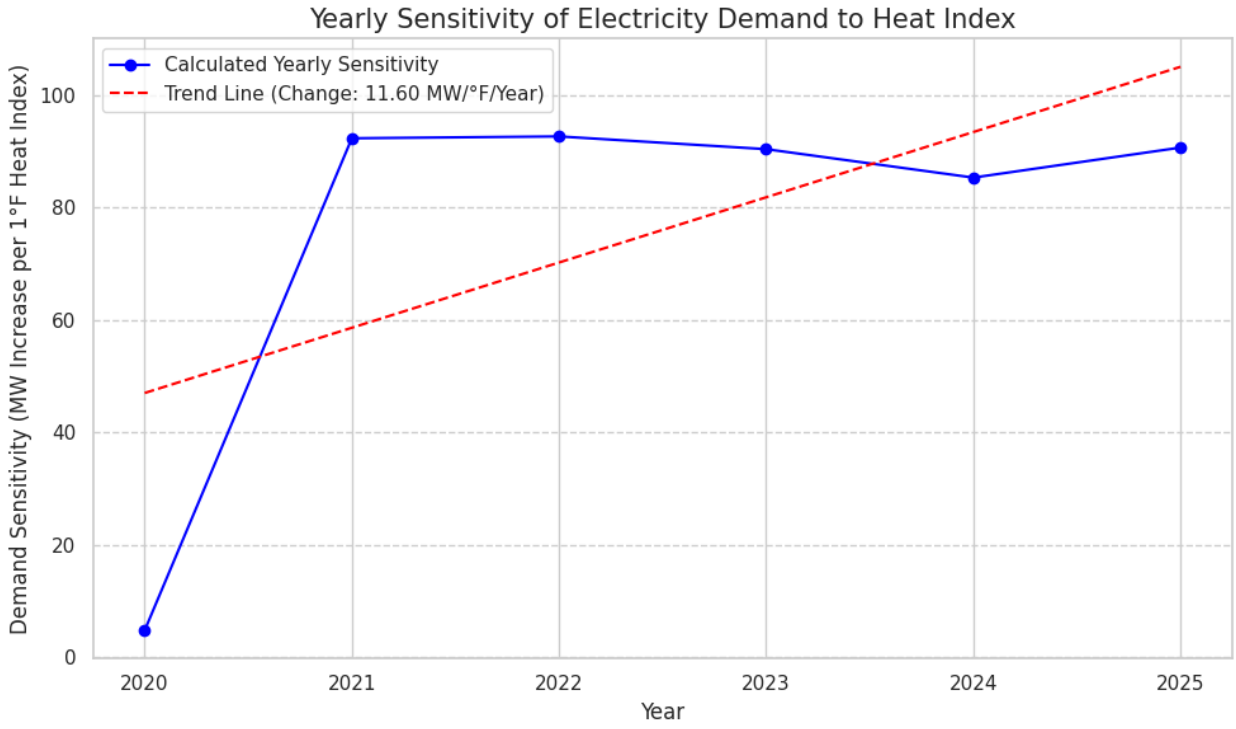


1. Data Loading and Cleaning...
   -> Retained 14,036 high-temperature data points (feel >= 70.0°F).
2. Calculating Yearly Sensitivity Metrics...

Yearly Demand Sensitivity Summary (MW increase per 1°F increase):

Year	Sensitivity_Slope	Correlation
2020	4.783	0.059
2021	92.282	0.894
2022	92.614	0.885
2023	90.349	0.872
2024	85.291	0.892
2025	90.633	0.871


Electricity Demand vs. Heat Index (feel ≥ 70.0°F) by Year
Year 2020
Sensitivity: 4.78 MW/°F
Correlation: 0.059
Year 2021
Sensitivity: 92.28 MW/°F
Correlation: 0.894
Year 2022
Sensitivity: 92.61 MW/°F
Correlation: 0.885
Year 2023
Sensitivity: 90.35 MW/°F
Correlation: 0.872
Year 2024
Sensitivity: 85.29 MW/°F
Correlation: 0.892
Year 2025
Sensitivity: 90.63 MW/°F
Correlation: 0.871
Electricity Demand (MW)
Heat Index (°F)



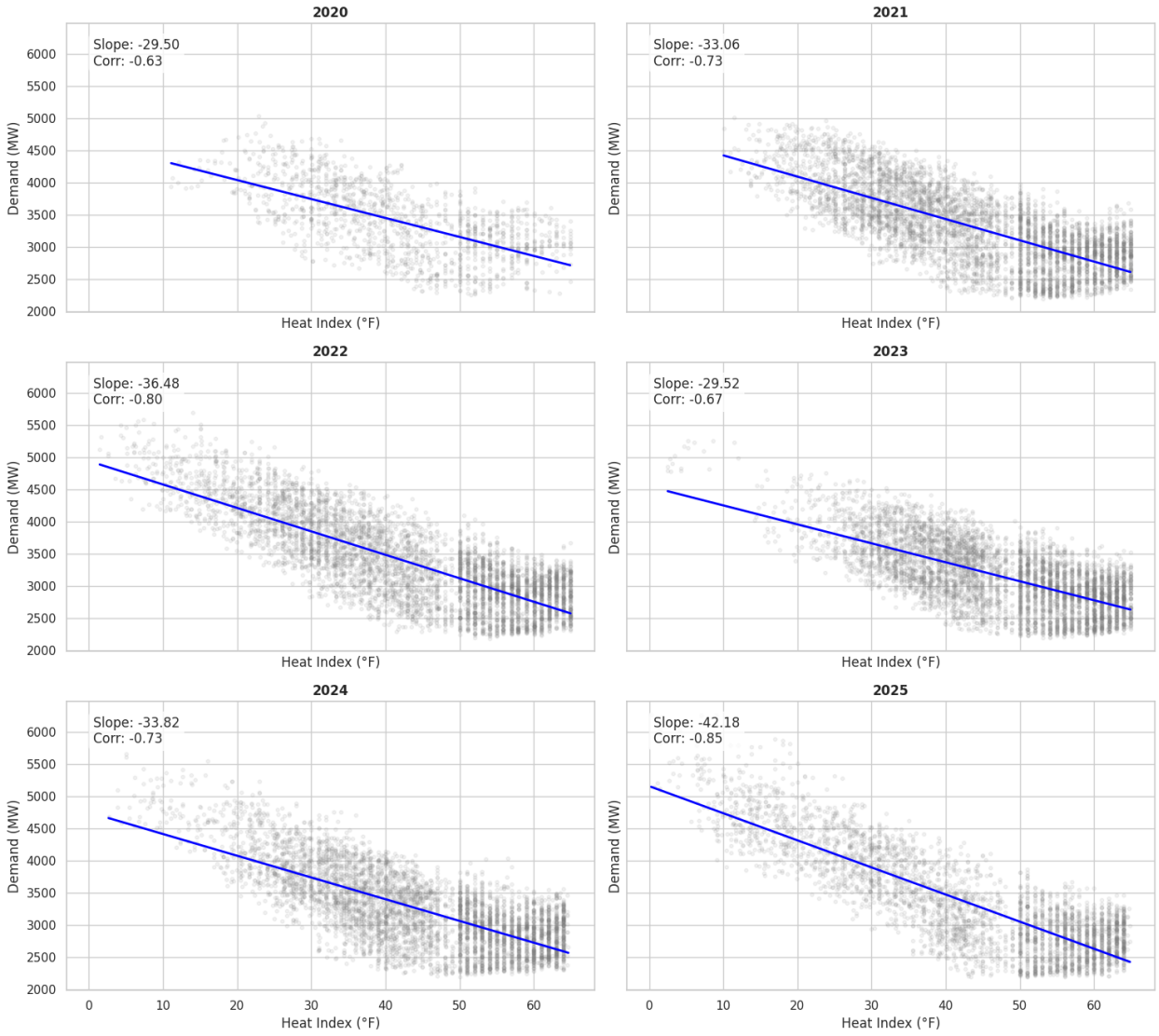
Heating Data Points (Feel < 65.0°F): 26052
Cooling Data Points (Feel >= 65.0°F): 17680

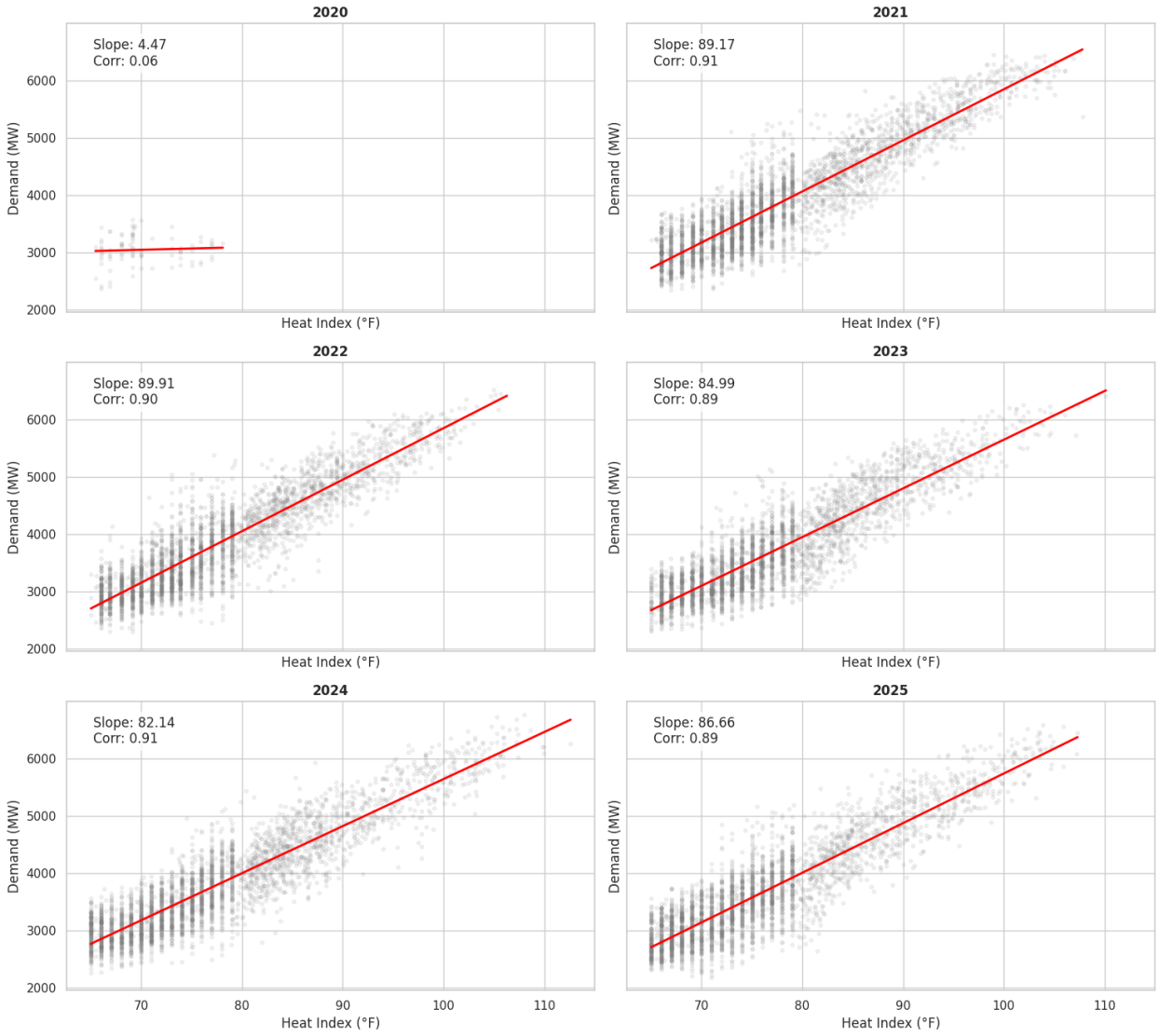
--- HEATING SENSITIVITY SUMMARY (Winter/Cold) ---
Interpretation: A more NEGATIVE slope means heating demand is MORE sensitive to cold.

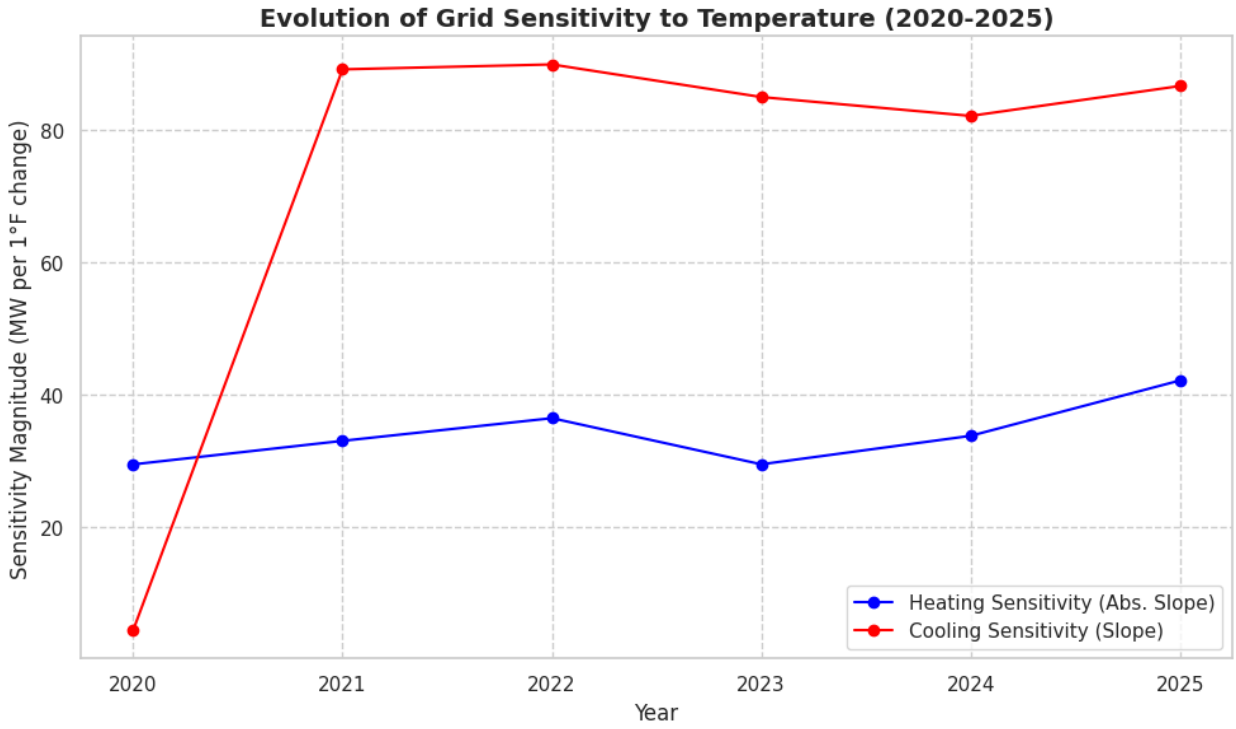
Year	Slope (MW/°F)	Correlation
2020	-29.504	-0.631
2021	-33.06	-0.731
2022	-36.485	-0.797
2023	-29.517	-0.672
2024	-33.817	-0.729
2025	-42.179	-0.845

--- COOLING SENSITIVITY SUMMARY (Summer/Hot) ---
Interpretation: A more POSITIVE slope means cooling demand is MORE sensitive to heat.

Year	Slope (MW/°F)	Correlation
2020	4.469	0.062
2021	89.17	0.906
2022	89.914	0.901
2023	84.99	0.887
2024	82.141	0.907
2025	86.658	0.892

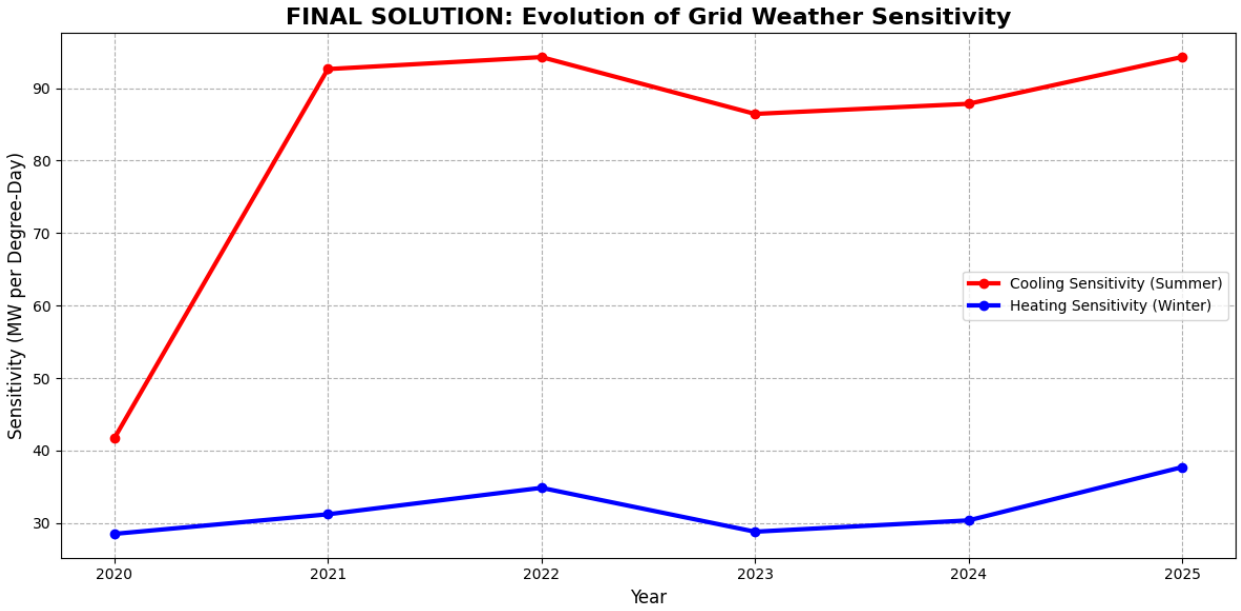

Heating Analysis: Demand vs Feel (< 65.0°F)
2020
Slope: -29.50
Corr: -0.63
2021
Slope: -33.06
Corr: -0.73
2022
Slope: -36.48
Corr: -0.80
2023
Slope: -29.52
Corr: -0.67
2024
Slope: -33.82
Corr: -0.73
2025
Slope: -42.18
Corr: -0.85
Demand (MW)
Heat Index (°F)


Cooling Analysis: Demand vs Feel (>= 65.0°F)
2020
Slope: 4.47
Corr: 0.06
2021
Slope: 89.17
Corr: 0.91
2022
Slope: 89.91
Corr: 0.90
2023
Slope: 84.99
Corr: 0.89
2024
Slope: 82.14
Corr: 0.91
2025
Slope: 86.66
Corr: 0.89
Demand (MW)
Heat Index (°F)
2000
3000
4000
5000
6000
70
80
90
100
110



Model Parameters by Year:

Year	Base Load (MW)	Heating Sensitivity (MW/HDD)	Cooling Sensitivity (MW/CDD)	R2 Score
2020	2741.54	28.518	41.706	0.401
2021	2660.73	31.219	92.634	0.744
2022	2622.65	34.867	94.285	0.744
2023	2647.01	28.818	86.447	0.706
2024	2653.24	30.379	87.844	0.731
2025	2566.2	37.722	94.302	0.756


FINAL SOLUTION: Evolution of Grid Weather Sensitivity
Sensitivity (MW per Degree-Day)
Year
Cooling Sensitivity (Summer)
Heating Sensitivity (Winter)
90
80
70
60
50
40
30
2020
2021
2022
2023
2024
2025