Project 3 Proposal - Temperature vs Natural Gas Volatility for US Cities

Summary
Our team plans to analyze how volatility in the natural gas futures market correlates with temperature in the top consuming United States' cities. We will use ATR (average true range) as our volatility indicator. The true range indicator is taken as the greatest of the following: current high less the current low; the absolute value of the current high less the previous close; and the absolute value of the current low less the previous close. The ATR is then a moving average, generally using 14 days, of the true ranges[1]. The cities in which we will be analyzing are based on the natural gas consumption by residential end users from the US Energy Information Administration. The temperature and price data will be from the winter season (December through February). The natural gas futures ticker being used is NG=F. We plan to pull historical temperature data using the Meteostat API and natural gas prices using the Yahoo Finance API. The visualizations planned to be used are a heat map for natural gas residential consumption, a pie chart to show the percentage of natural gas residential consumption relative to the total US consumption, a temperature chart, and a price chart with a drop down menu or selector for state. The project will be powered by a Python Flask API and include the use of Python, HTML/CSS, JavaScript, and the chosen database (SQL, MongoDB, SQLite, etc.). Highcharts is a prospective javascript library planned to be used.

Question
How does volatility in the natural gas futures market correlate with temperature in the top consuming United States' cities?

Specifications
Volatility Indicator used will be ATR (average true range)
Cities used will be based on natural gas consumption by residential end users from the US Energy Information Administration
Temperature and price data used will be from the winter season (December through February)
Natural gas ticker used will be NG=F

Visualizations
Heat map for natural gas residential consumption
Pie chart to show the percentage of natural gas residential consumption relative to the total US consumption
Temperature chart
Price chart with a drop down menu or selector for state

Prospective Data Sources
Meteostat API - https://rapidapi.com/meteostat/api/meteostat/
Yahoo Finance API - https://pypi.org/project/yfinance/

[1] https://www.investopedia.com/terms/a/atr.asp

US Energy Information Administration - https://www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_vgt_mmcf_a.htm
Highcharts Javascript Library - https://www.highcharts.com/demo

Prospective Tools
Python
HTML
CSS
Javascript
SQL
Highcharts