Analyzing Investment Trends of Climate Tech Startups Since 2016
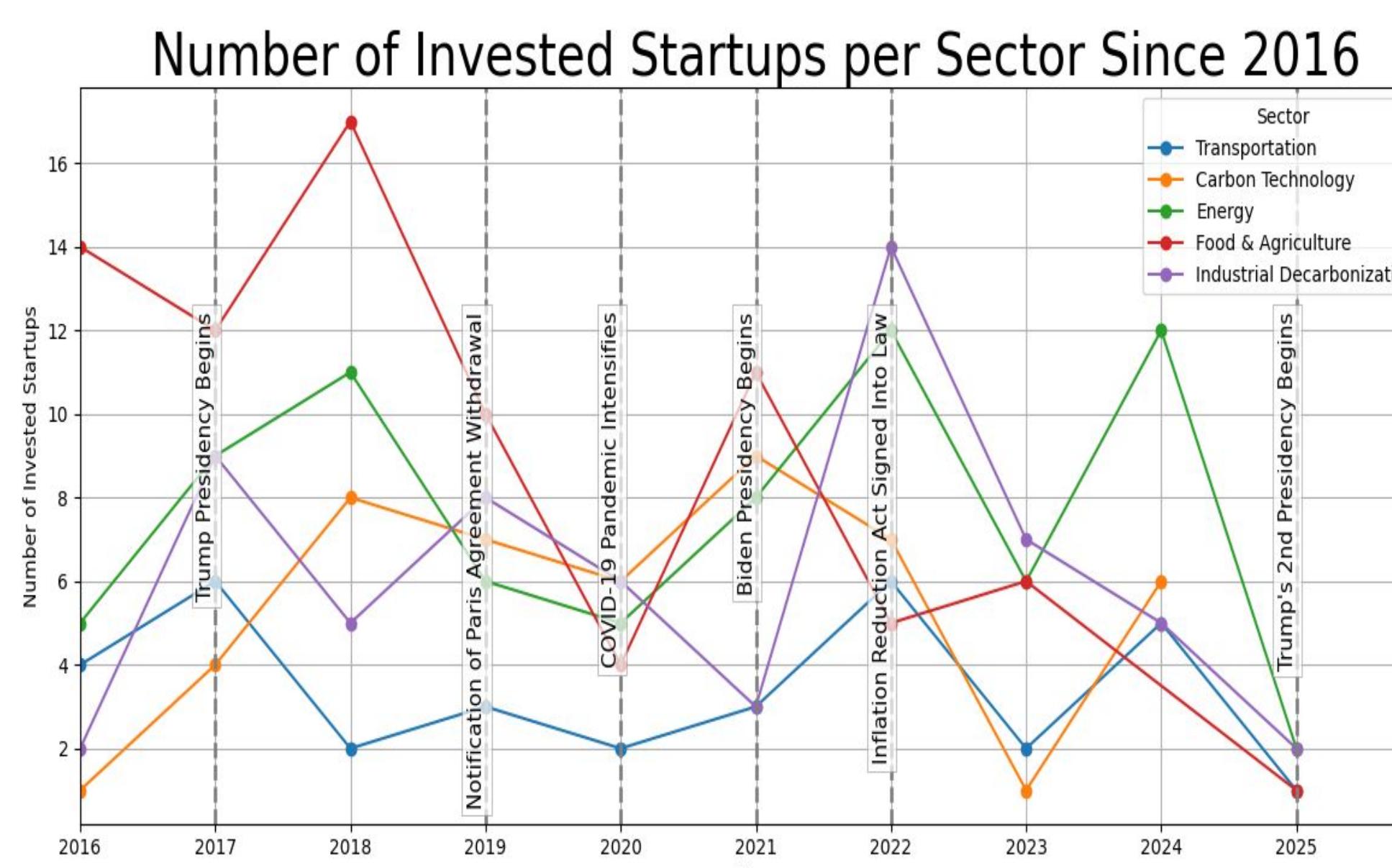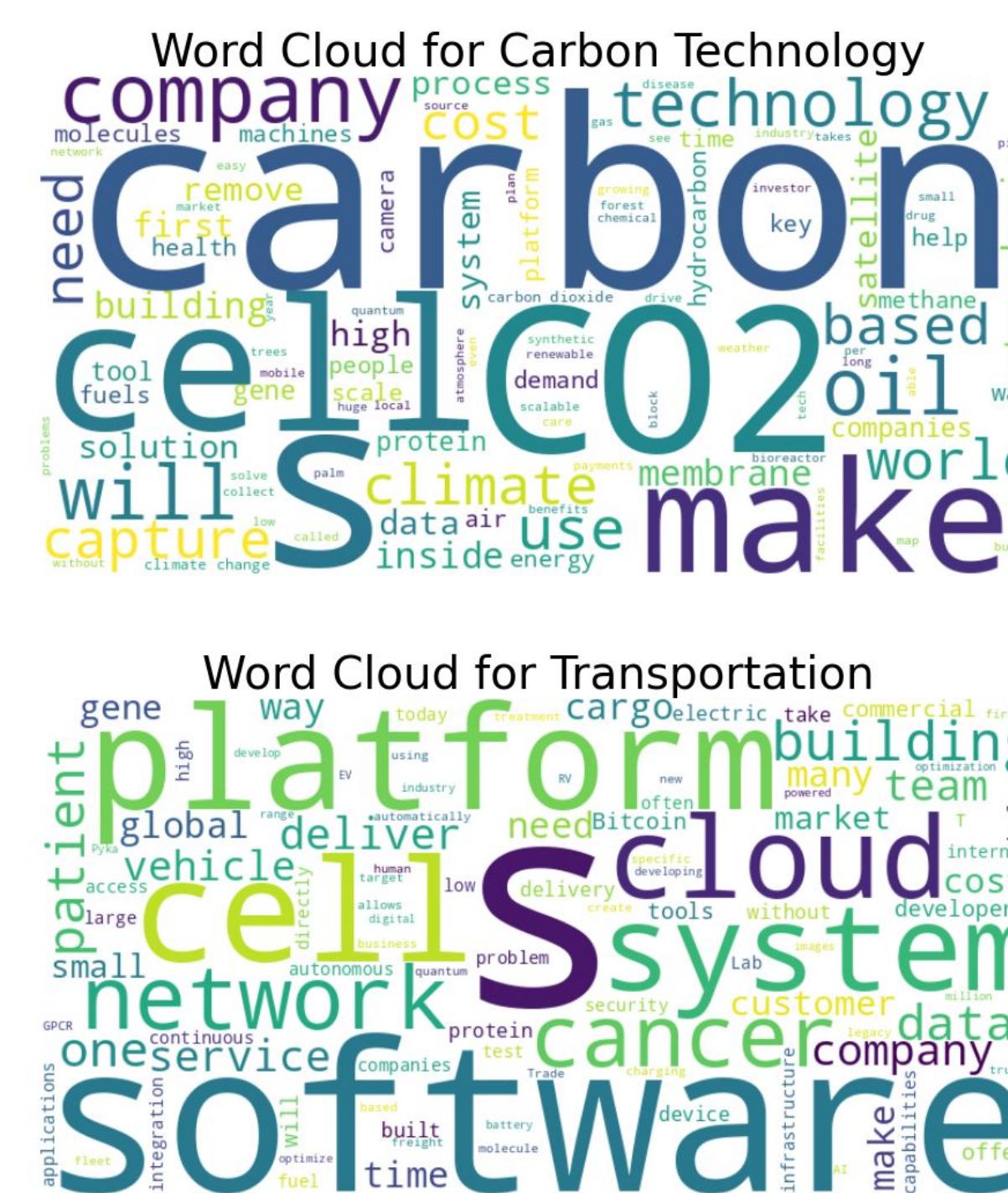
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Abstract

While past research has focused on climate tech investment over the past 5 years, that data has focused on amount of funding overall. Our research aims to focus on how presidencies and policies have specifically shaped climate tech investment, and instead of looking at funding, we viewed the quantity of startups invested. With the past 3 presidencies significantly affecting climate investment, we selected data from climate venture capital firms starting from 2016 to present day, focusing on the 5 main climate sectors: Energy, Food & Agriculture, Carbon Technology, Industrial Decarbonization, and Transportation. We found Food & Agriculture to have decreased while Energy to have increased. COVID-19 & Biden's term also saw startup increases in sectors.
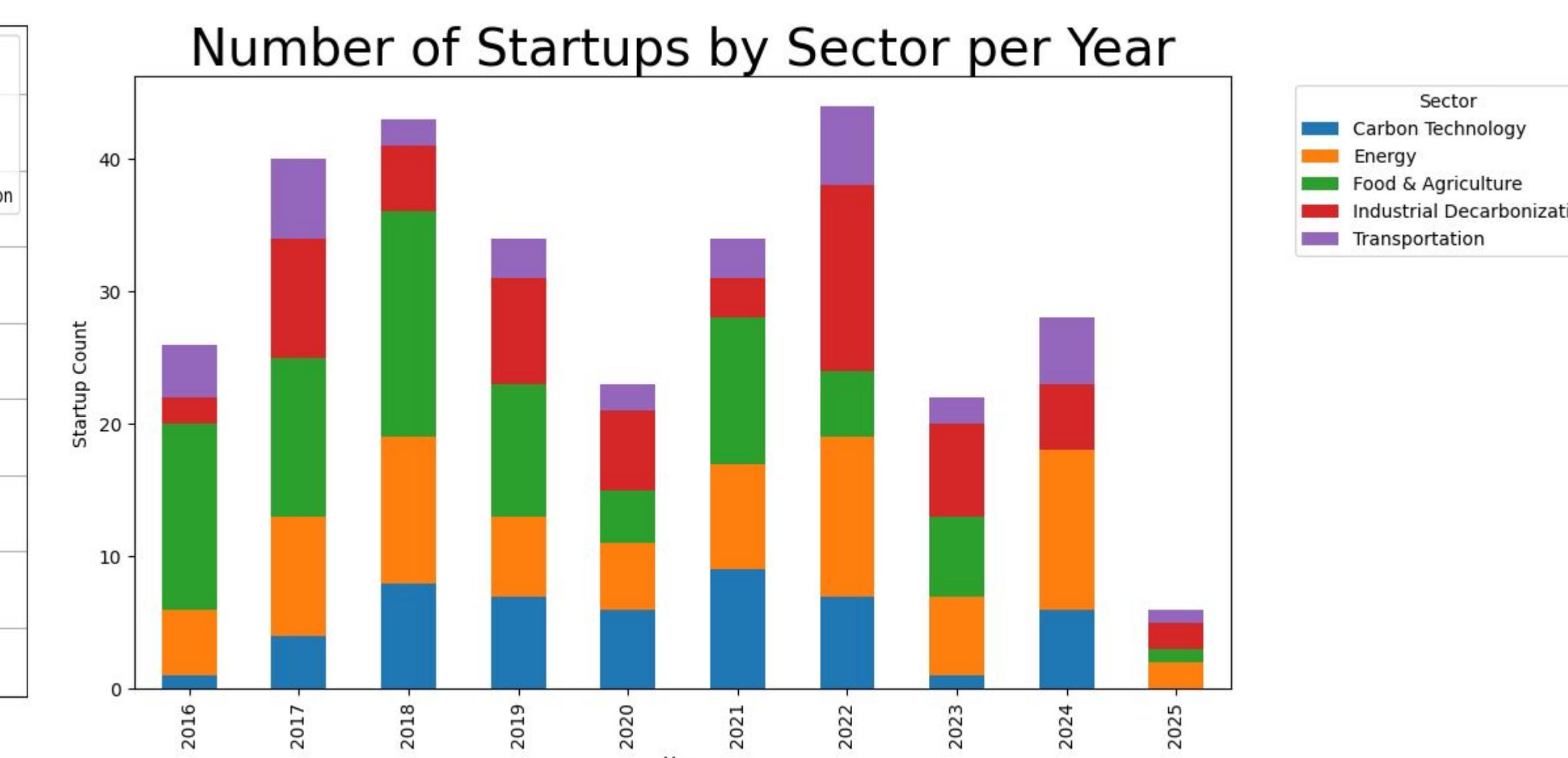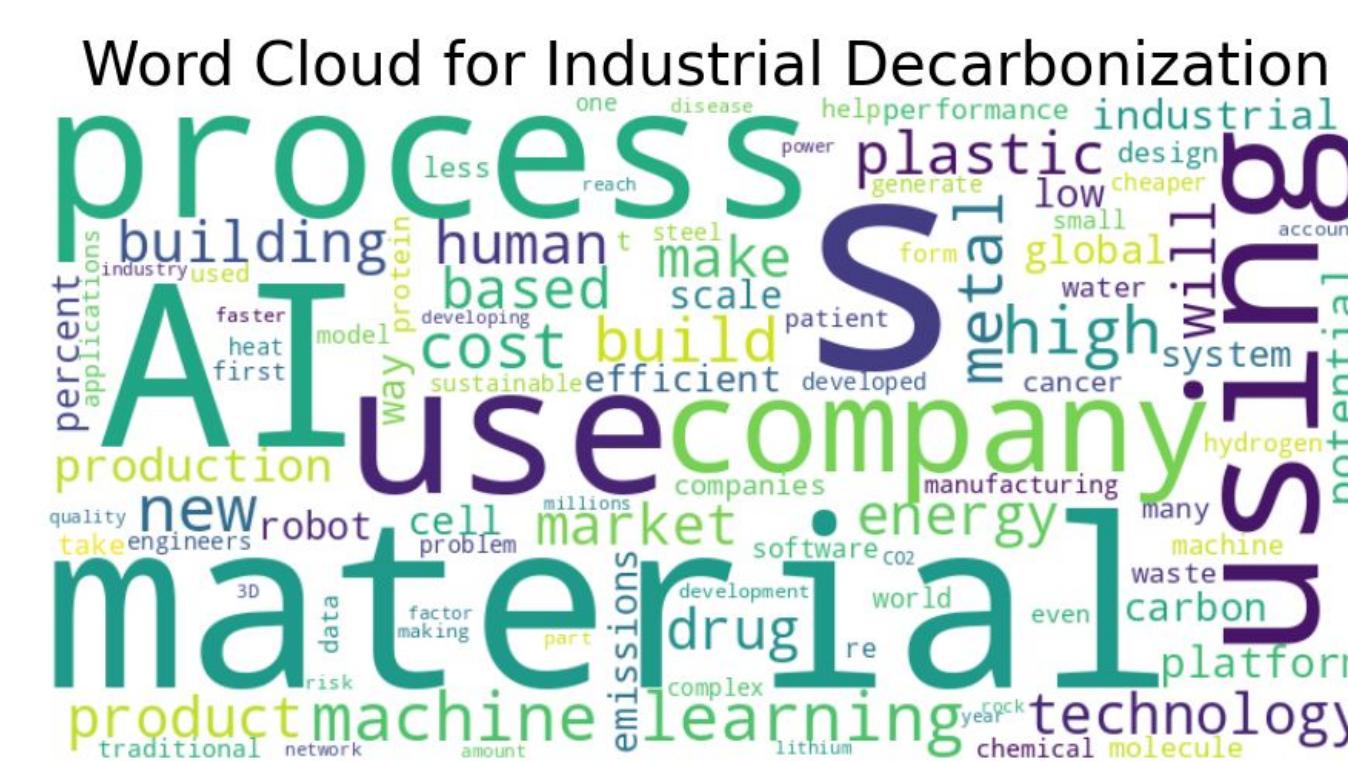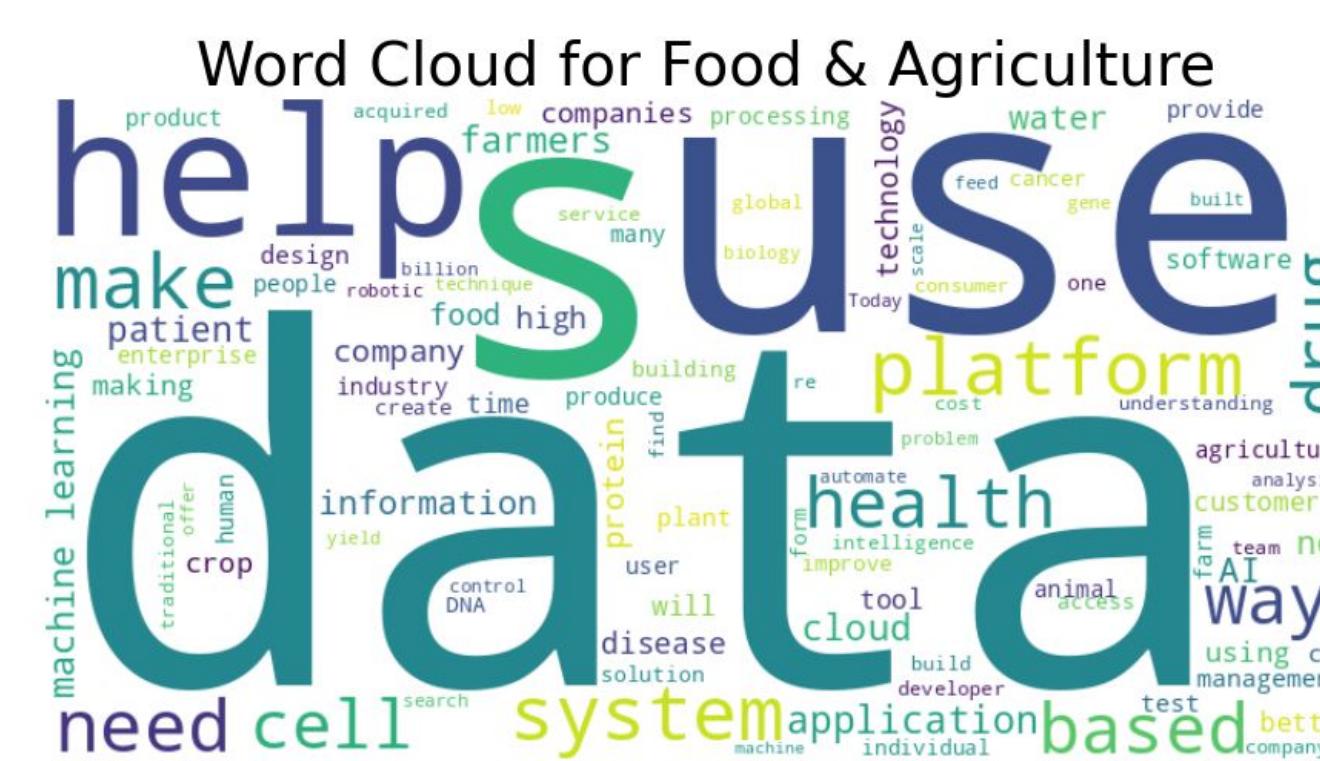
Research Question

Research Questions: How has the number of investments in different climate sector startups changed within the past three presidencies?
What language commonly appears in each startup's startup descriptions?
Are there patterns in investment timing that correlate with major climate or policy events?

Word Cloud for Carbon Technology
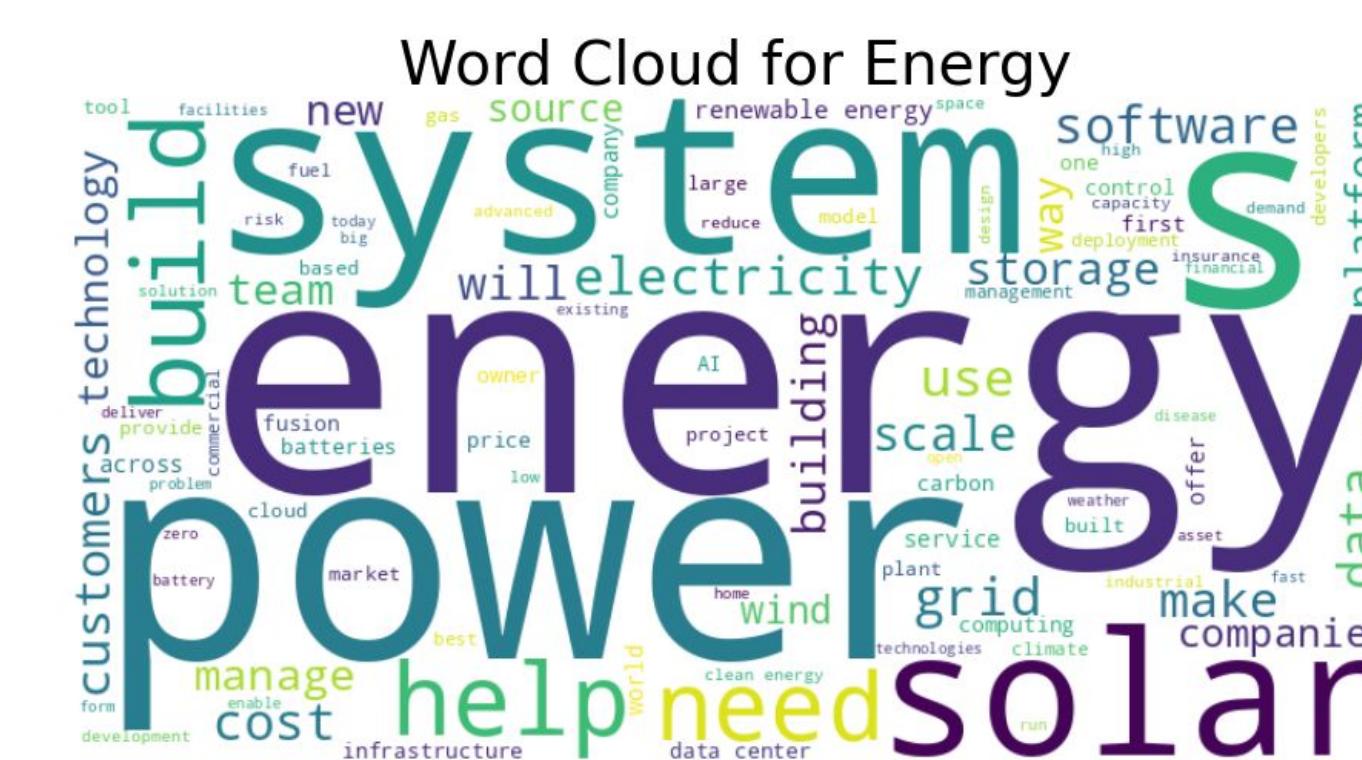

Word Cloud for Transportation

Data Collection

We web scraped 4 VCs (Wireframe, DCVC, Prelude, Y Combinator) Portfolios for each startup's name, description, and investment dates. Because each VC website had different formatting, we had to approach web scraping differently for each site.

Word Cloud for Food & Agriculture

Word Cloud for Industrial Decarbonization
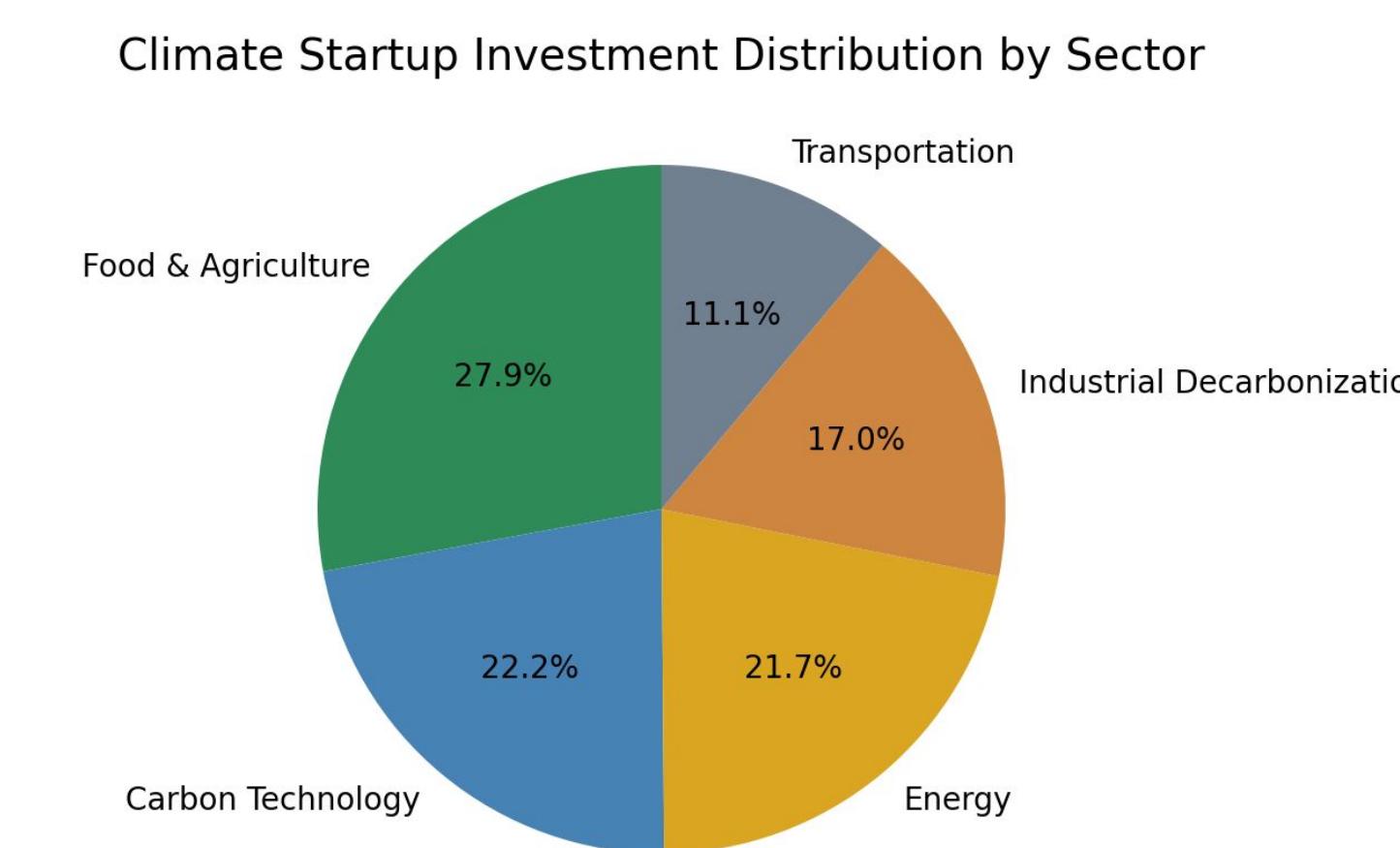

Data Exploration

We manually classified a dataset of startup descriptions to 5 climate sectors and trained a Multinomial Naive Bayes classifier with TF-IDF text features to predict the sector of each startup based on description. We improved model performance with text preprocessing and hyperparameter tuning, achieving a macro F1-score of ~0.79. We identified sectoral trends over time with a line graph and stacked area plot. We also found the most common words for each sectoral startup description and sectoral investment distribution overall through a pie chart.

Word Cloud for Energy

Data Analysis

From our data, we found:
1. Food & Agriculture was invested in the most early on before decreasing since.
2. COVID & Biden's presidency resulted in an overall increase in the Energy, Transportation, and industrial Decarbonization sectors.
3. "AI", "data", "software", and other digital terminology dominate the startup descriptions.
4. Energy sector is dominating overall (most recent increase and high investment distribution).

Climate Startup Investment Distribution by Sector

Transportation 11.1%
Industrial Decarbonization 17.0%
Energy 21.7%
Carbon Technology 22.2%
Food & Agriculture 27.9%

Conclusion

Overall startup investment peaked mid-presidency for both terms, with Energy increasingly gaining traction and Food & Agriculture decreasing over time. Not enough data has been conducted in 2025 to discern the current presidency's impact. Future research should expand to more VCs and analyze the current presidency's impact when there's more data.

Number of Invested Startups per Sector Since 2016

Number of Startups by Sector per Year

Stanford University