

Public Perspectives on EV Policy: Insights from YouTube Data

Ann Lian, Yuhan Ma, Junling Shao



Significance

Growing popularity of EVs

- Concerns related to **climate change** and **air quality**.
- EVs are more **environmentally friendly** choice compared to traditional vehicles.
- **Lower operation cost, improved performance** and advancements in **battery technology**.

Introduction

Current Policies of EVs

- Tax credits
- Funding for charging infrastructure
- HOV lane access
- Subsidy
- Zero-emission vehicle mandates

Research Questions

- What is the most common EV policy on social media? What are some of the arising criticisms during the implementation of EV policies?
- What are the predominant sentiments expressed on social media platforms regarding Electric Vehicles Policy?
- What valuable insights can be derived from sentiment analysis to inform the development of future EV policies and strategies?

Research Design

Data Collection

- Utilized the YouTube API to gather video-related information including video IDs, titles, descriptions, publish dates, and comments.

Data Analysis

- **BERT Topic Model:** Implemented BERT for more advanced topic modeling and understanding the contextual meaning within comments.
- **Sentiment Analysis:** Employed Sentiment Analysis techniques to evaluate the emotional tone of comments, using VADER for initial analysis
- **TF-IDF:** Calculated numerical statistics to determine the importance of words within individual comments across the entire dataset.

Number of Videos and Comments

Data Scraping

Collect Video ID related with 'EV policy'

- ['video_id', 'video_publish_date', 'video_title', 'video_description']

Get comments of each videos

- ['video_id', 'comment_publish_date', 'text', 'commenter_rating', 'reply_count']

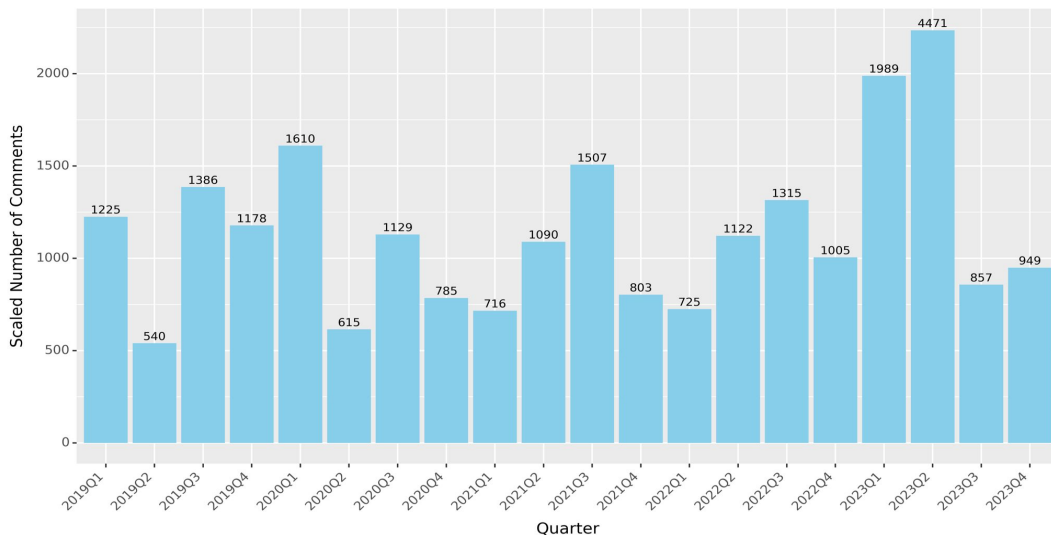
Data Cleansing

Remove some rows

- the length of the text >=100
- video_id == none

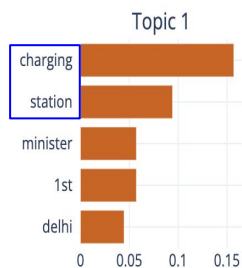
Add new columns

- `quarter`, `new_publish_date`

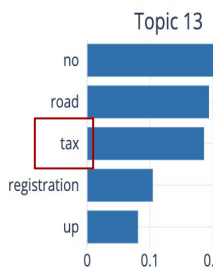


Year	2019	2020	2021	2022	2023
Videos	154	106	168	162	175
diff	0	-48	62	-6	13
Comments	4329	4139	4116	4167	8266
diff	0	-190	-23	51	4099

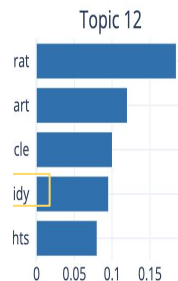
Top Four Discussed Policies



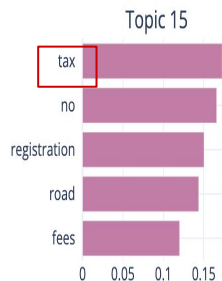
2019 Topic



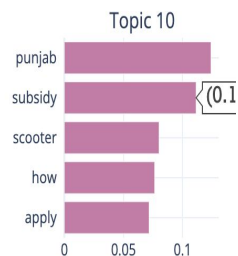
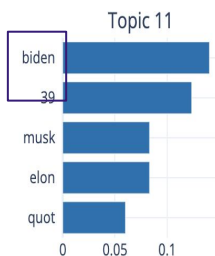
2020 Topic



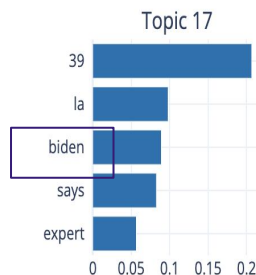
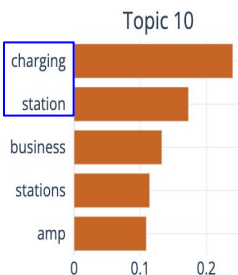
2021 Topic



2022 Topic



2023 Topic



Tax

- providing financial incentives, such as tax credits or rebates, to consumers and manufacturers

Infrastructure

- establishing the charging station and battery swapping station to enhance the convenience of EV car consumers

Subsidy

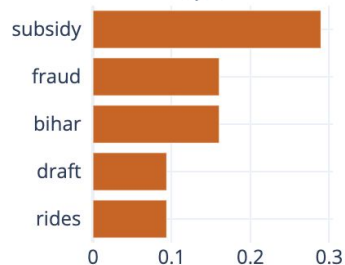
- offering direct financial support to buyers and manufacturers of electric vehicles, effectively lowering the cost

Mandate

- setting a certain percentage of new vehicle sales to be electric by a specific date, and of emissions reduction

Top Four Concerns towards EV Policies

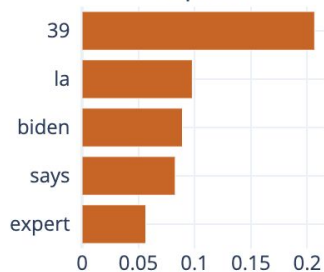
Topic 24



Subsidy Waste

- “Electric vehicle Subsidy fraud in india/subsidy fraud in electric cars in india”
- “Electric Vehicle Subsidy Fraud”

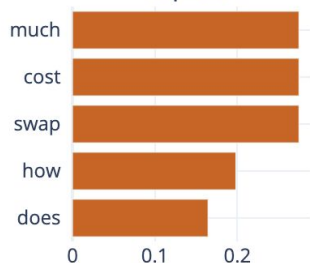
Topic 17



Aggressive Mandate

- GOVERNMENT-DICTATED DISASTER : Fossil fuels expert sounds alarm on Biden's EV push
- “ ‘I Was Appalled’: Debbie Lesko Rips Biden's EV Policy, Claims It 'Does Nothing To Benefit Americans’ ”

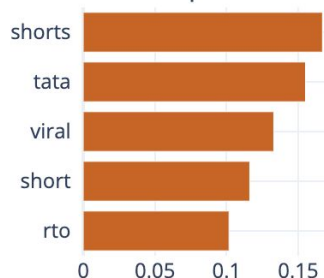
Topic 24



Cost of Electrification

- “How Much Does a Tesla Swap cost? V.S. How much would a Regular EV Swap Cost”

Topic 18



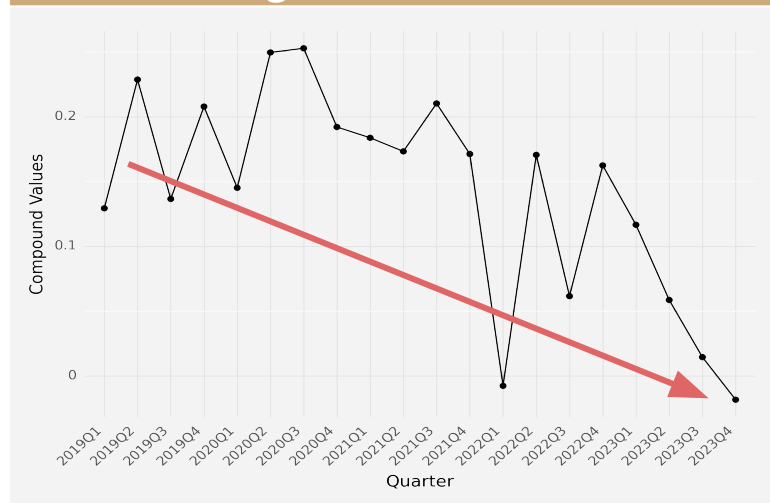
EV Technical Issues

- “PROBLEMS WITH TIAGO EV | 3 Days Old Tiago EV Broke Down | Tata Service Reality”

Sentiment Over the Past Five Years

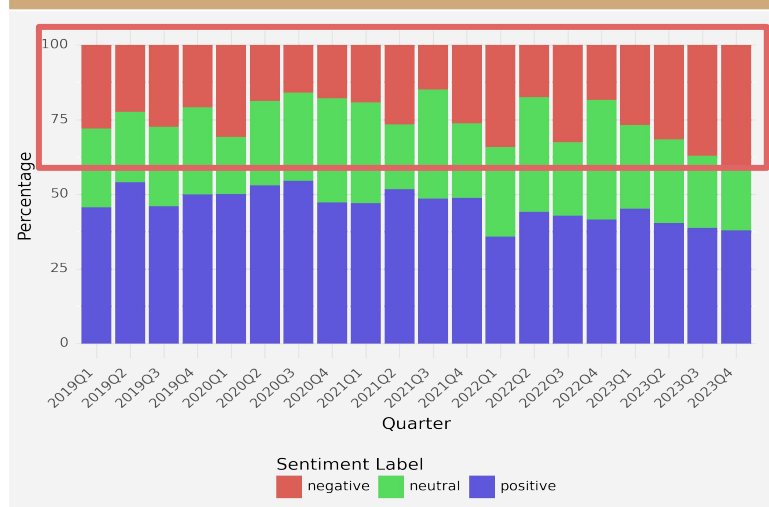
- **Summary: A shift towards Less positive sentiments, attributed to a rising proportion of negativity and a decrease in neutrality**

The change of sentiment scores



- The majority of data points are above 0, Overall, people's attitudes are positive
- A shift towards less positive sentiments

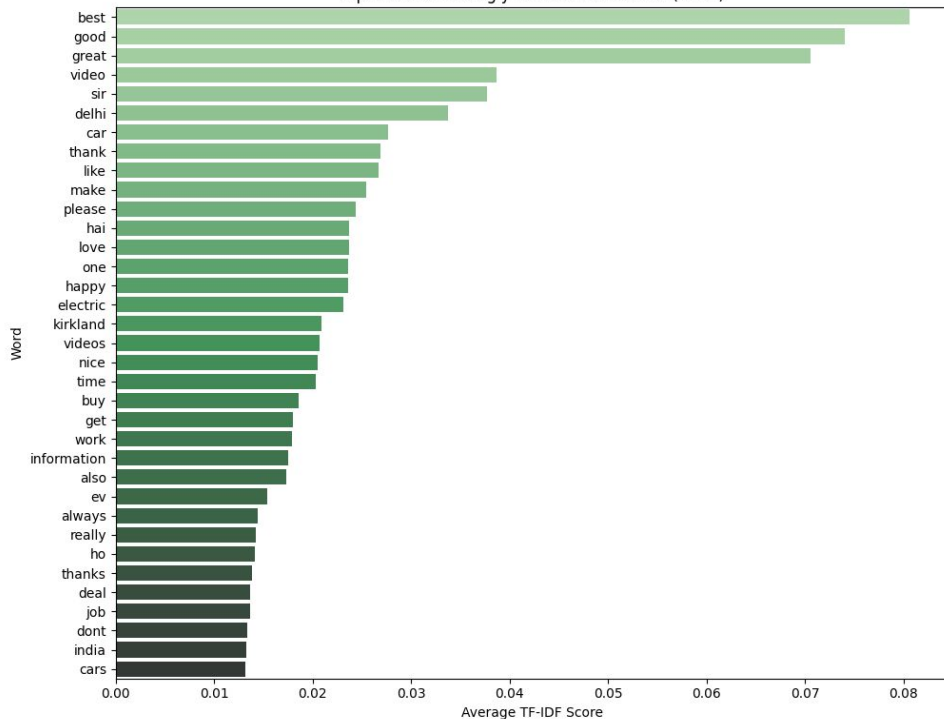
The distribution of sentiment



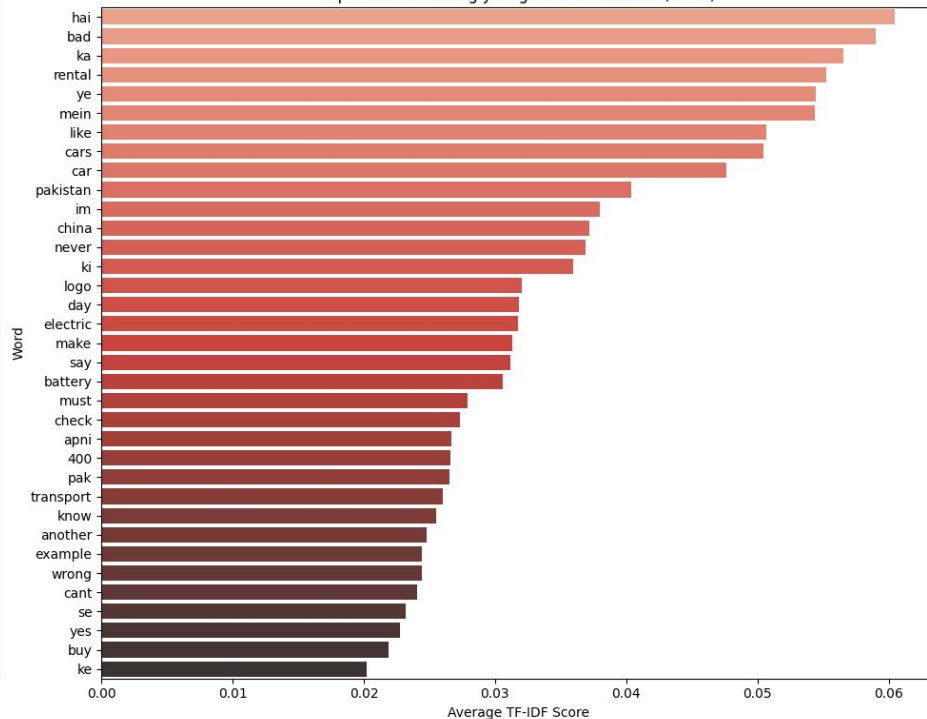
- Positive: relatively stable trend across quarters
- Negative: a rising prevalence of negative sentiments
- Neutral: a decrease in the neutrality of sentiments

Top Words in Positive and Negative Comments

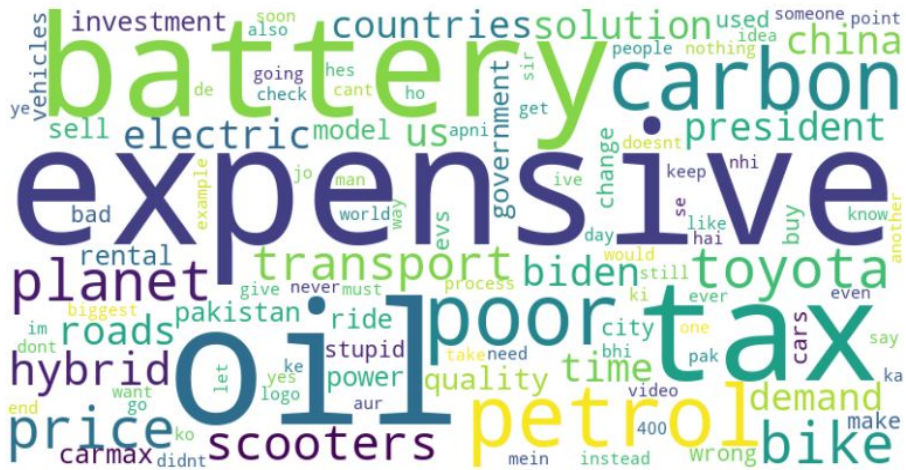
Top Words in Strongly Positive Comments (2019)



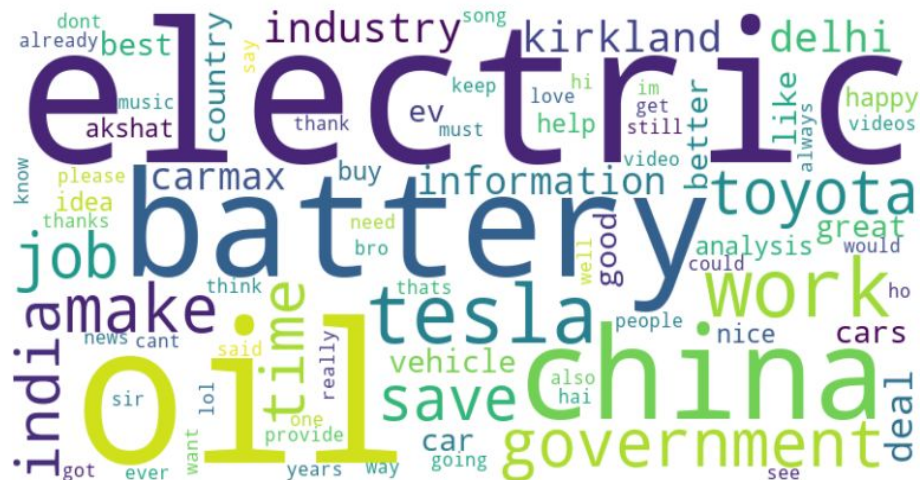
Top Words in Strongly Negative Comments (2019)



Top Words in Positive and Negative Comments (2019-2023)



Top Words in Negative Comments



Top Words in Positive Comments

Public Focuses

Relevant Top Words in Positive Comments (2019 - 2023)

Battery	Carmax	China	Deal	Delhi	Electric	Government	India	Industry	Information
Job	Kirkland	Make	Oil	Save	Tesla	Time	Toyota	Work	

Positive comments highlights the advancements in **EV technology**, **economic advantages**, **performance of leading brands**, and **supportive government policies**. Additionally, **regional market developments** and **local government initiatives** are recognized as pivotal in shaping the favorable reception of EVs.

Relevant Top Words in Negative Comments (2019 - 2023)

Expensive	Oil	Battery	Tax	Petrol	Carbon	Poor	Planet	Price	Bike
Toyota	Transport	Scooters	Hybrid	China	Biden	Electric	Time	Roads	President
Us	Solution	Countries	Demand	Quality	Investment	Sell	Government	Rental	Pakistan
Ride	Power	Carmax	Model						

Negative comments point towards concerns about the **cost and affordability of EVs**, skepticism about their **environmental impact** and **technical performance**, challenges with **infrastructure**, and criticism of **government policies** and **market dynamics**.

Limitation & Reflection

1. When collecting comments for each video, we limit the maximum results. Increased results contribute to more noise within our dataset
2. Video titles and comments provide less information than video content
3. Data imbalance: most of the videos available are focused on India
4. The connection between specific policies and the corresponding reaction in public sentiment was not distinctly clear

Question?