

Business Report: Electric Vehicles Chargers

Introduction

The rise of the Electric Vehicle is a result of several factors, including strong technological progress, cost reductions, climate change and so on. As electric vehicles are becoming mainstream, the costs are falling and there are a wide variety of benefits for people make the switch. From the environmental impact to savings on fuel, tax and maintenance, electric vehicles could help you save significant amount of money.

Sales of electric vehicles are expected to skyrocket in the next decade. And by 2050, most of the cars on the road will be electric. (nexus media news, 2021). Most of those electric vehicles will charge at home or at work, but there is still a need for a network of public charging stations. Which brings me to my question: Who will build that network?

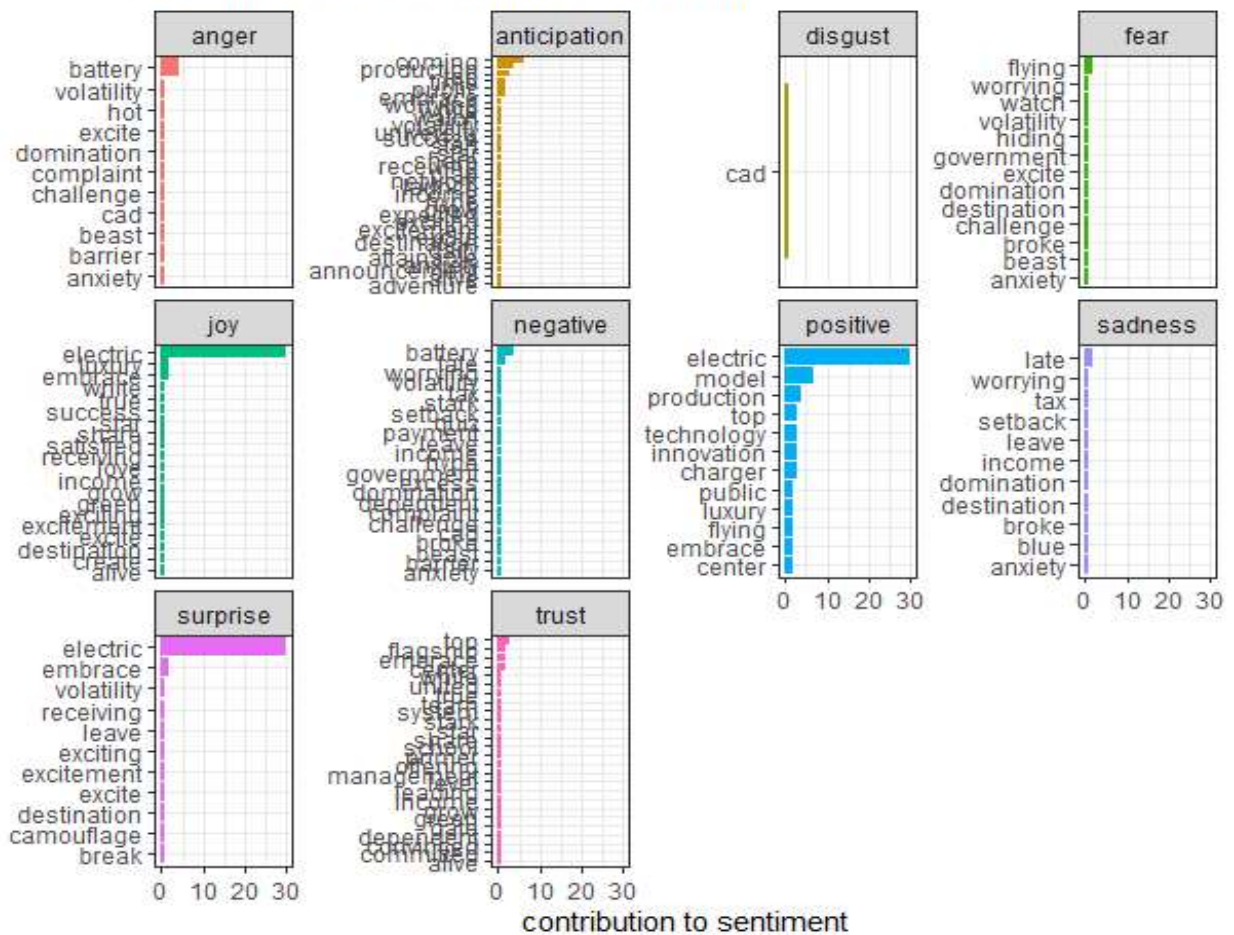
This report outlines an analysis of user tweets from twitter for electric cars and electric car chargers. It aims to provide insight on people's sentiment towards the key words.

Analysis and Insights

If you're an average car owner in America (gasoline), there is one thing you are generally unworried about: finding gasoline. You live at least withing a mile of the country's 115,000 gas stations. You sleep well knowing that as soon as the sun comes up in the morning, if your car is empty, you just stroll into your neighborhood gas station, fill up your car in two or three minutes and be good for the next 300 to 400 miles.

In my analysis, I fetched data from a hundred recent tweets and analyzed their sentiments towards electric cars and electric chargers.

Electric Cars Sentiment - nrc Lexicon

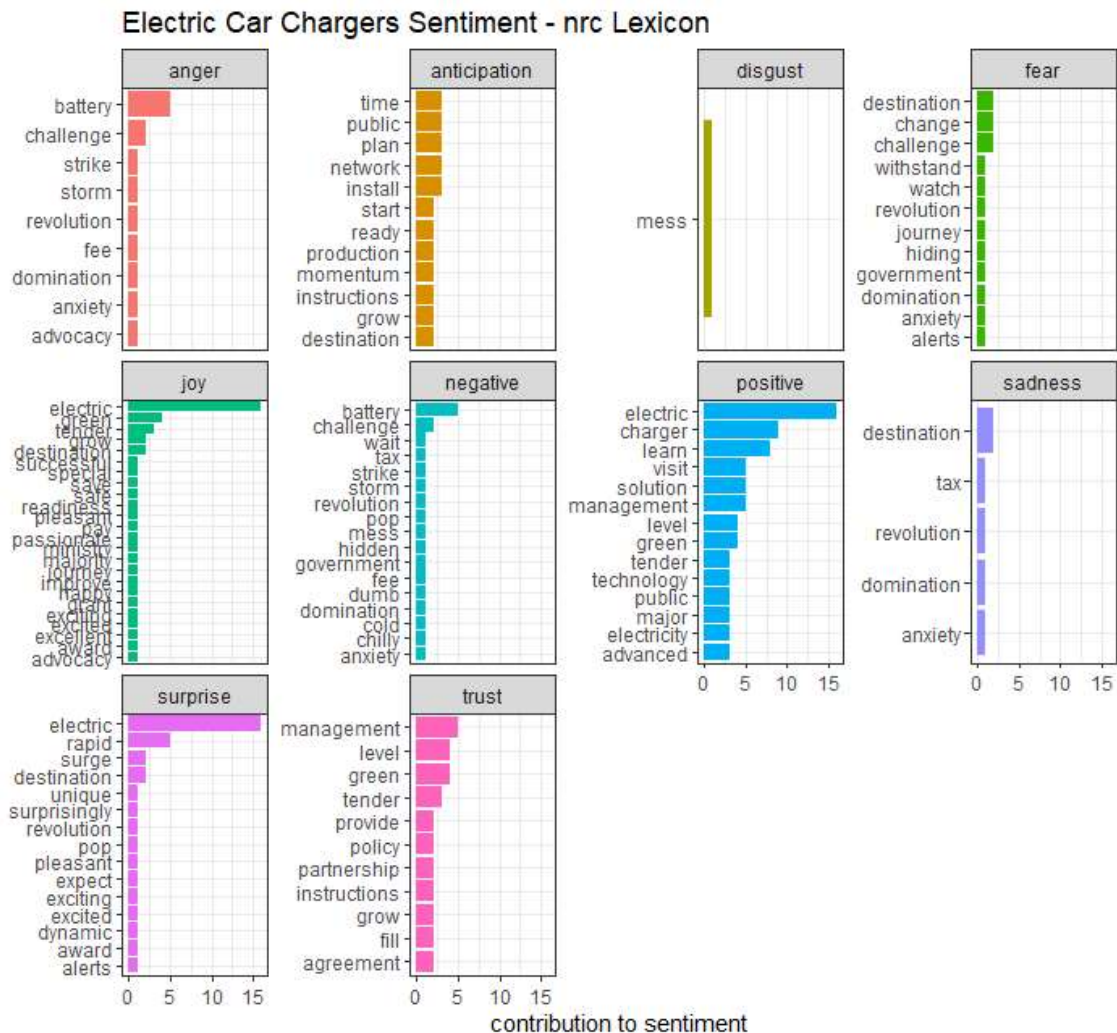


Note that the analysis was conducted using the nrc lexicon. This lexicon categorizes words in a binary fashion ("yes"/ "no") into categories of positive, negative, anger, anticipation, disgust, fear, joy, sadness, surprise, and trust.

If you pay attention to the positive plot in the diagram above, you will see that these twitter users show a high positive sentiment towards electric, innovation, technology and charger. However, in the negative and anger plot, they show a high negative sentiment towards battery. This could be because some of these users may have electric vehicles and may have had issues with their cars dying on the road due to less charging stations around them or staying too long in traffic and so on.

This is where the problem comes for the electric car, over the next few years, nearly every major automaker on the planet and not a few start ups are releasing pickups, sedans, SUVs, vans, trailers and more. I do not expect most of these automakers to build their own charging stations just as we did not expect them to build gasoline stations when they released their first gasoline cars. My prediction: Electrical Vehicle charging will be a gold rush, while gas stations will just be another relic of the past like phone booths and cassettes.

According to LeVine (2020), Industry consultants and research houses are forecasting that millions of these vehicles will be snapped up as part of a new age of EVs for the masses. But as things stand, these forecasts will be wrong — unless, that is, a dense, highly visible, and convenient network of charging stations materializes to replicate the soothing infrastructure that underpins the combustion economy. And not just any stations, but fast-charging stations. What this means is that Electrical car owners need to be able to get in and out in 10 minutes or so. They want that “gas station experience” mentioned earlier.



Now, looking at the sentiment analysis carried out on 100 twitter users using the keyword electric car chargers, these particular twitter users have a high positive sentiment towards charger; highly anticipating a charging network, public chargers in anticipation plot. And express sadness when they use the word destination. What this means is that in these users' locations, there is probably a small number of charging stations in those areas which are quite far apart or far from where they live or work.

From my analysis, the crucial point on whether Electric cars go mainstream is eliminating all fear of running out of power, failing to find a charging station, and becoming stranded. People are accustomed to gas stations. This will be the successful format for the new charging age.

I believe my analysis could be leveraged to target the users in this category, understand these areas, the percentage of active electrical car users in these areas. All these are pre-requisites to developing a strategy to build these charging stations; and not just ordinary charging stations but fast charging stations to give them the “gas station experience”.

Conclusion

Although full transitions to electric vehicles may take time but it is worth comparing this transition to what happened more than a century ago, when gas-powered cars replaced horses.

I believe building these fast charging stations is one way to ease the transition to Electric Vehicles and to save the planet for the next generation.

References

EVANNEX (2019, October 20). Next gold rush: Electric vehicle charging stations.

<https://medium.com/@EVANNEX/next-gold-rush-electric-vehicle-charging-stations-b746b5fd460e>

LeVine (2020, November 24). Most Americans Won't Buy an Electric Car Unless They Get the 'Gas Station Experience'.

<https://themobilist.medium.com/most-americans-wont-buy-an-electric-car-unless-they-get-the-gas-station-experience-b8b0ac4095f1>

LeVine (2021, January 22). EV Charging Prices Are Going to Go Way Up.

<https://themobilist.medium.com/ev-charging-prices-are-going-to-go-way-up-809598dd0346>

nexus media news (2021). Everybody Wants EV Charging Stations. Almost Nobody Wants to Build Them. <https://nexusmedianews.com/everybody-wants-ev-charging-stations-almost-nobody-wants-to-build-them-video-dedf40cdfefb/?source=bookmarks-----3----->

Appendix

```
# OSANWUTA OGECHUKWU JASPER
```

```
# MsBA1
```

```
# TEXT ANALYTICS: R
```

```
# BUSINESS REPORT
```

```
# Loading required packages
```

```
library(rtweet)
```

```
library(dplyr)
```

```
library(tidyverse)
```

```
library(tidytext)
```

```
library(textdata)
```

```
library(ggplot2)
```

```
library(reshape2)
```

```
library(stringr)
```

```
# STEP 1: Searching for tweets
```

```
##### FIRST SEARCH#####
```

```
ev_ca <- search_tweets( #ev_ca == electric cars
```

```
  "#electriccar",
```

```
  n= 100, include_rts = FALSE
```

```
)
```

```
### SECOND SEARCH ###
```

```
ev_ch <- search_tweets( #ev_ch == electric car chargers
```

```
  "#EVcharging",
```

```
n= 100, include_rts = FALSE
)
```

STEP 2: Processing tweet to tidy text, Cleaning text and Tokenizing

Processing each tweet to tidy text

```
ev_ca_tweets <- ev_ca %>%
```

```
# selecting two variables, screen name and text
```

```
select(screen_name, text)
```

```
ev_ca_tweets
```

Processing each tweet to tidy text

```
ev_ch_tweets <- ev_ch %>%
```

```
# selecting two variables, screen name and text
```

```
select(screen_name, text)
```

```
ev_ch_tweets
```

Cleaning the text

```
head(ev_ca_tweets$text)
```

```
ev_ca_tweets$clean_text1 <- gsub("http\\s+", " ", ev_ca_tweets$text)
```

```
ev_ca_tweets$clean_text1 <- gsub("https?:/.+", " ", ev_ca_tweets$text)
```

```
ev_ca_tweets$clean_text1 <- gsub("t.co", " ", ev_ca_tweets$text)
```

Tokenizing

```
ev_ca_tweets_1 <- ev_ca_tweets %>%  
  select(clean_text1) %>%  
  unnest_tokens(word, clean_text1)
```

Removing stop words

```
ev_ca_cleaned_tweets <- ev_ca_tweets_1 %>%  
  anti_join(stop_words)
```

Cleaning the text

```
head(ev_ch_tweets$text)  
ev_ch_tweets$clean_text2 <- gsub("http\\s+", " ", ev_ch_tweets$text)  
ev_ch_tweets$clean_text2 <- gsub("https?:://.+", " ", ev_ch_tweets$text)  
ev_ch_tweets$clean_text2 <- gsub("t.co", " ", ev_ch_tweets$text)
```

Tokenizing

```
ev_ch_tweets_1 <- ev_ch_tweets %>%  
  select(clean_text2) %>%  
  unnest_tokens(word, clean_text2)
```

Removing stop words

```
ev_ch_cleaned_tweets <- ev_ch_tweets_1 %>%  
  anti_join(stop_words)
```

```
# Doing a word frequency to check if there is any other unimportant  
#word(s) to remove
```

```
ev_ca_cleaned_tweets %>%  
  count(word, sort = TRUE)
```

```
ev_ch_cleaned_tweets %>%  
  count(word, sort = TRUE)
```

```
# STEP 3: Sentiment Analysis (nrc lexicon)
```

```
## For ev_ca  
ev_ca_nrc <- ev_ca_cleaned_tweets %>%  
  inner_join(get_sentiments("nrc")) %>%  
  count(word, sentiment, sort = TRUE) %>%  
  group_by(sentiment) %>%  
  top_n(10, n) %>%  
  ungroup() %>%  
  mutate(word = reorder(word, n)) %>%  
  ggplot(aes(word, n, fill = sentiment)) +  
  geom_col(show.legend = FALSE) +  
  facet_wrap(~sentiment, scales = "free_y") +  
  labs(y="contribution to sentiment", x=NULL,  
       title = "Electric Cars Sentiment - nrc Lexicon") +  
  coord_flip() + theme_bw()
```



```
print(ev_ca_nrc)
```

```
## For ev_ch
```

```
ev_ch_nrc <- ev_ch_cleaned_tweets %>%
```

```
  inner_join(get_sentiments("nrc")) %>%
```

```
  count(word, sentiment, sort = TRUE) %>%
```

```
  group_by(sentiment) %>%
```

```
  top_n(10, n) %>%
```

```
  ungroup() %>%
```

```
  mutate(word = reorder(word, n)) %>%
```

```
  ggplot(aes(word, n, fill = sentiment)) +
```

```
  geom_col(show.legend = FALSE) +
```

```
  facet_wrap(~sentiment, scales = "free_y") +
```

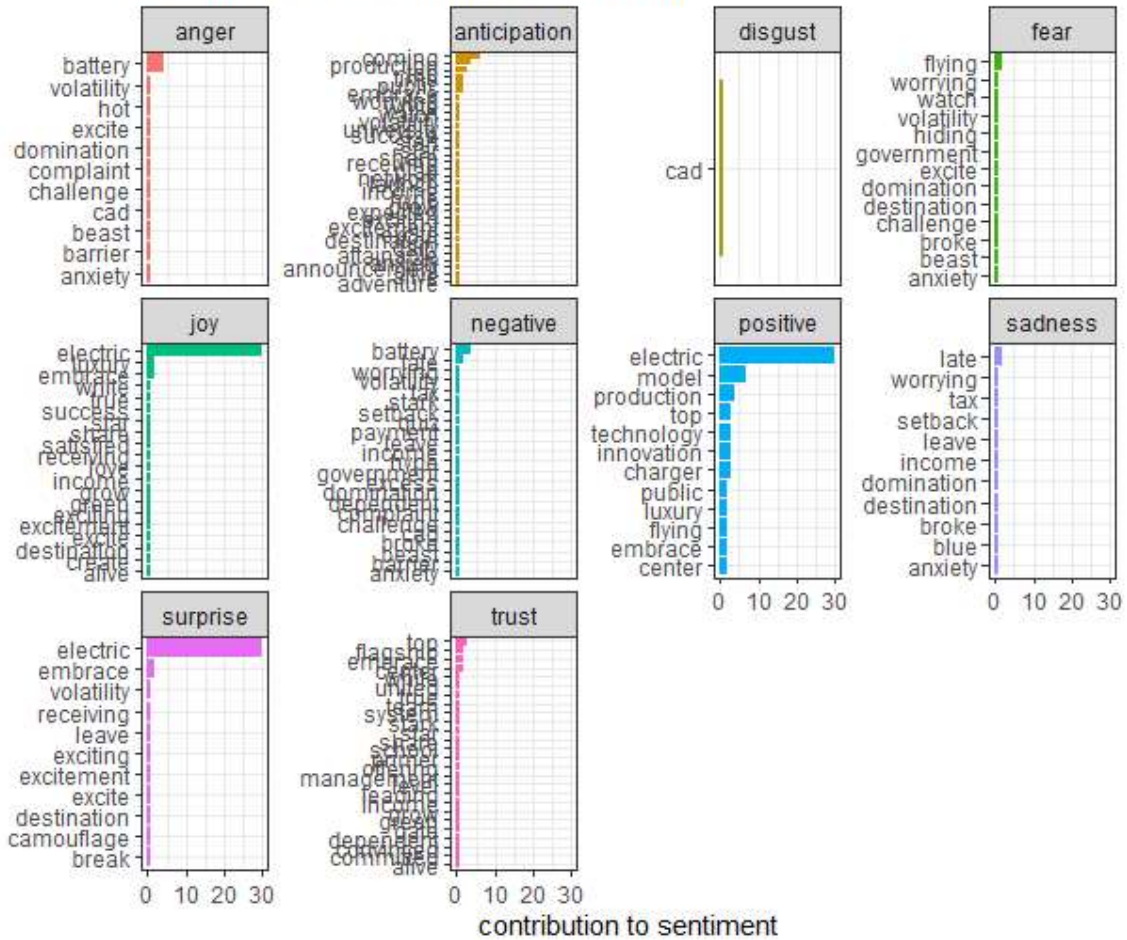
```
  labs(y="contribution to sentiment", x=NULL,
```

```
        title = "Electric Car Chargers Sentiment - nrc Lexicon") +
```

```
  coord_flip() + theme_bw()
```

```
print(ev_ch_nrc)
```

Electric Cars Sentiment - nrc Lexicon



Electric Car Chargers Sentiment - nrc Lexicon

