Friedrich-Alexander-Universität
Technische Fakultät

FAU

# Impact of electromobility to our environment

David Bogdahn

# Introduction

Introduction:

- Alternative driving solutions are a big topic in our society nowadays.
- electric driving becomes more and more populate when it comes to alternative driving

The question the project deals with is:

## Do electric vehicles have a significant impact on the co2 emission value in germany?

Project:

- analyzes datasources of co2 emission value in germany and muenster
- analyzes datasources of new registered vehicles in germany and muenster
- compares the values and tries to figure out the correlation between them

# Datasources

**Climate Data  of Germany:**

- containes differnet air quality values like for example co2 or N2. It shows the time related difference over the past 30 years.

https://www.umweltbundesamt.de/sites/default/files/medien/361/dokumente/2021_03_10_trendtabellen_thg_nach_sektoren_v1.0.xlsx

- Umweltbundesamt

**Climate Data of Muenster:**

- The Dataset containes co2 data of the city Münster from 2018 until 2022. https://opendata.stadt-muenster.de/sites/default/files/Muenster-CO2-Emissionen_2021.xls

- Opendata.stadt-muenster

**Vehicle registration data of Germany**

- The Dataset containes the number of new vehicle registrations over the last decade

https://www.kba.de/SharedDocs/Downloads/DE/Statistik/Fahrzeuge/FZ14/fz14_2022.xlsx?__blob=publicationFile&v=4

- Kraftfahrzeugbundesamt

**Vehicle registration data of Muenster:**

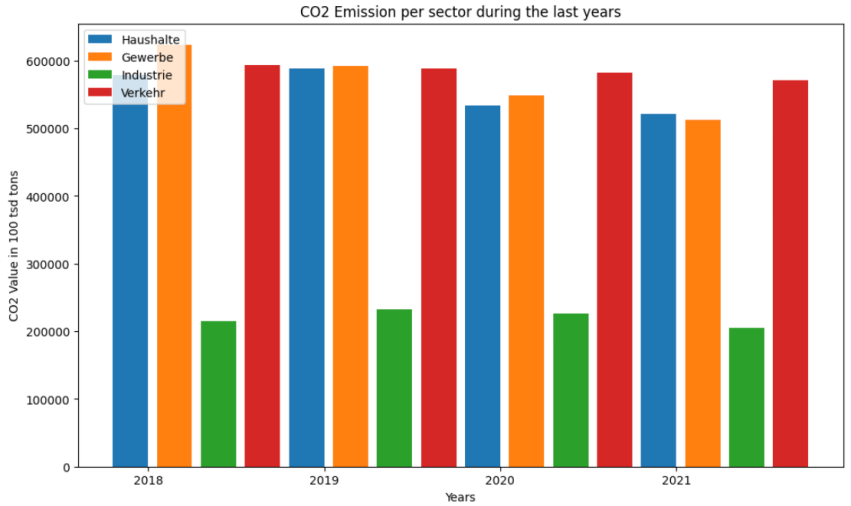
- This Dataset shows the vehicle registrations of the city Münster

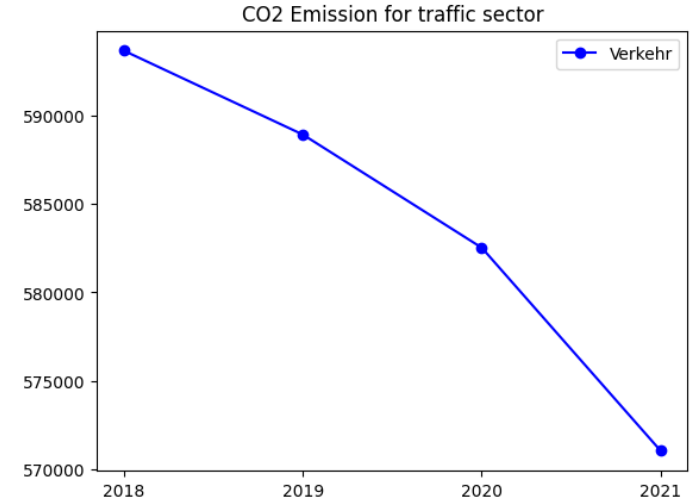
https://opendata.stadt-muenster.de/sites/default/files/Fahrzeugbestand-Regierungsbezirk-Muenster-2018-2022.xlsx

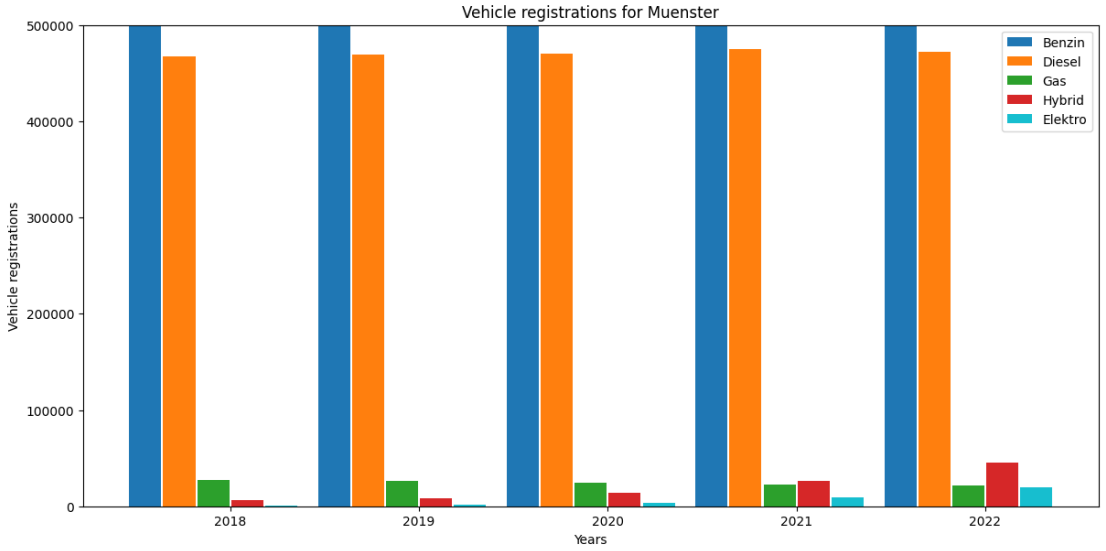
- Opendata.stadt-muenster

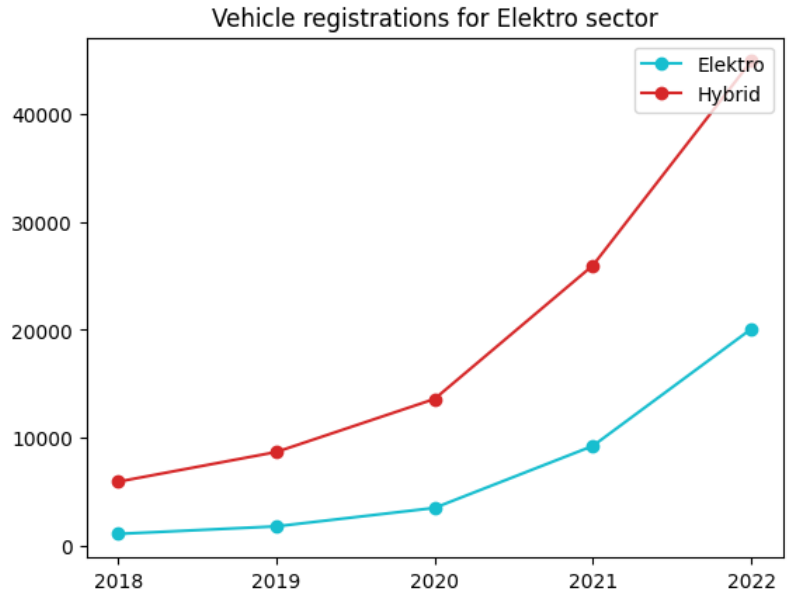
# Analysis

## Comparism between germany and muenster



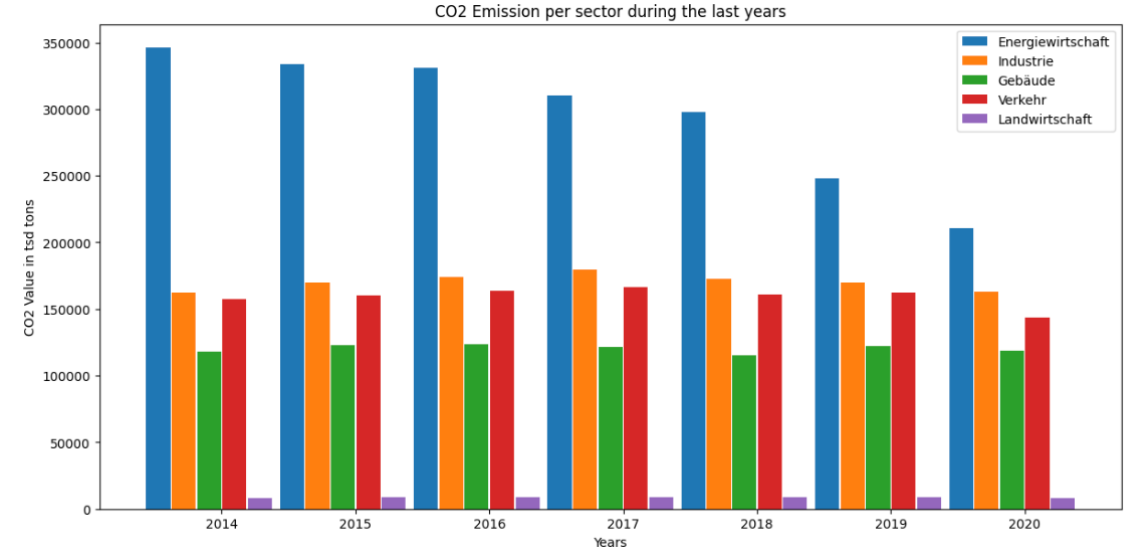



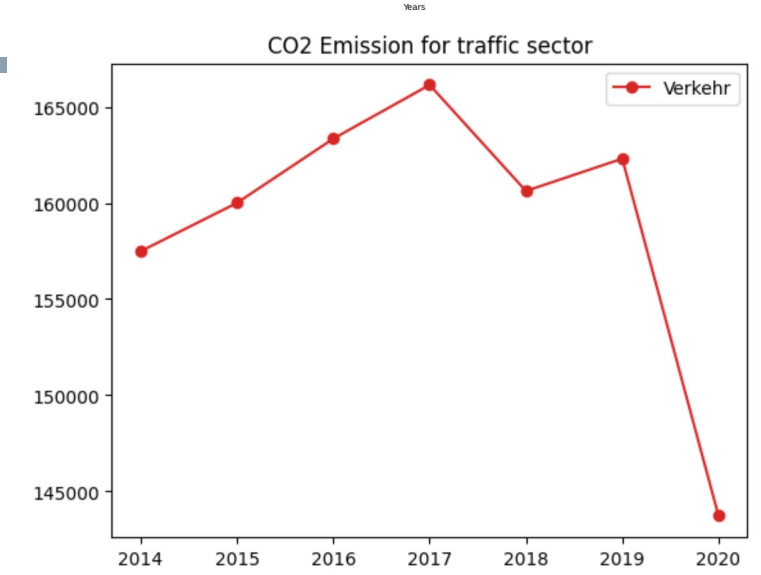



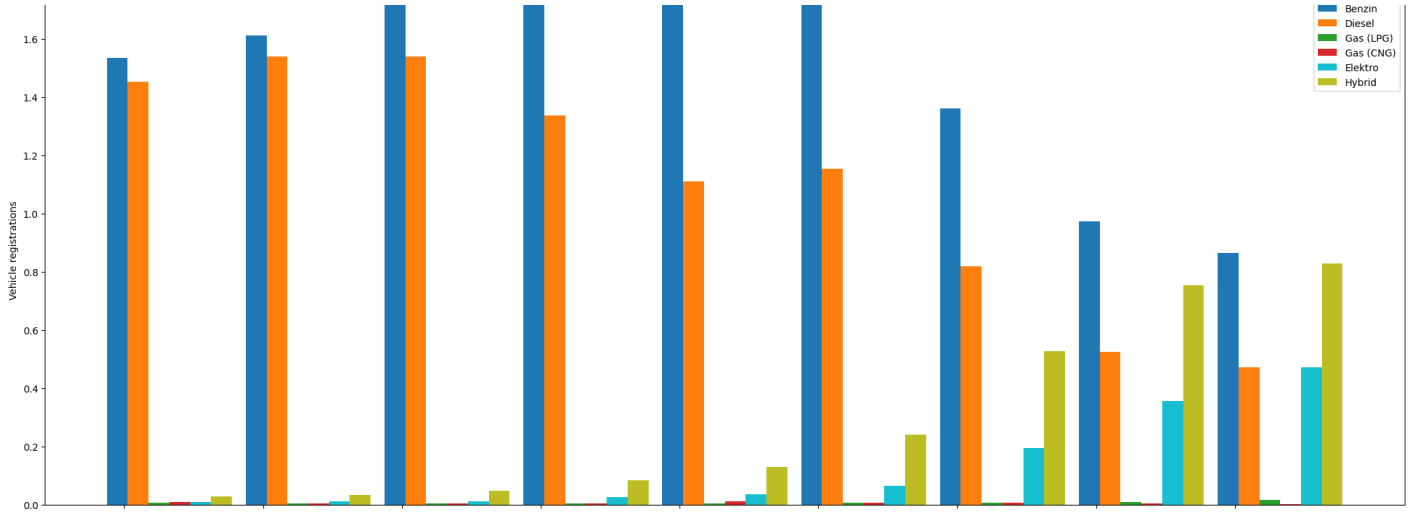



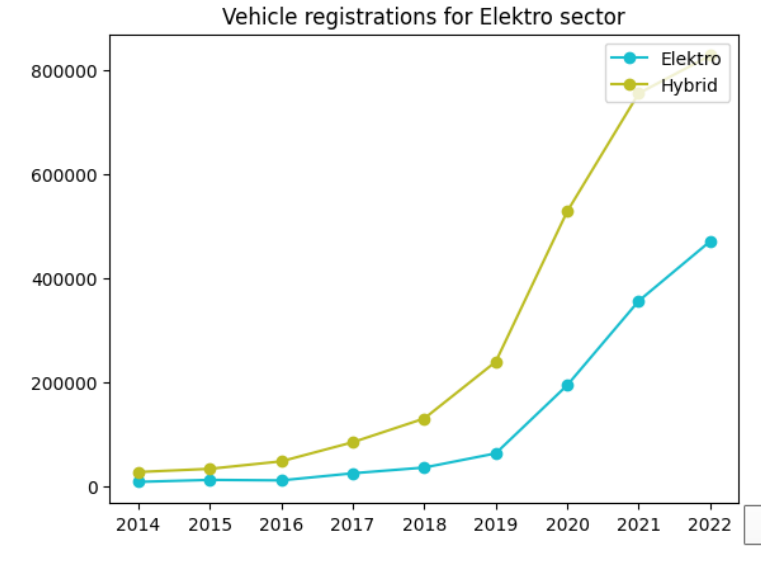
# Analysis

## Comparism between germany and muenster



# Analysis

## Comparism between germany and muenster

| | | Correlation Coefficient | p-Value |
|---|---|---|---|
| x | y | | |
| Verkehr | Benzin | 0.719263 | 0.068479 |
| | Diesel | 0.675760 | 0.095652 |
| | Gas (CNG) | -0.317644 | 0.487538 |
| | Gas (LPG) | -0.493759 | 0.260094 |
| | Hybrid | -0.806244 | 0.028507 |
| | Elektro | -0.860783 | 0.012868 |

| | | Correlation Coefficient | p-Value |
|---|---|---|---|
| x | y | | |
| Verkehr | Benzin | -0.866736 | 0.133264 |
| | Diesel | -0.991226 | 0.008774 |
| | Gas | 0.987555 | 0.012445 |
| | Elektro | -0.977041 | 0.022959 |
| | Hybrid | -0.992449 | 0.007551 |

Correlation Table for CO2 Value to growth rate of different vehicle types registered in Muenster

| | | Correlation Coefficient | p-Value |
|---|---|---|---|
| x | y | | |
| Verkehr | Benzin | 0.988208 | 0.011792 |
| | Diesel | 0.597938 | 0.402062 |
| | Gas | 0.379205 | 0.620795 |
| | Elektro | -0.554348 | 0.445652 |
| | Hybrid | -0.630500 | 0.369500 |

# Conclusion

- Number of co2 value is decreasing in traffic sector for muenster and germany

- Number of electric or hybrid vehicles is increasing for muenster and germany

- since 2019 the co2 value dropps rapidly in comparism the number of new registered electric and hybrid vehicles rises exponentially

- strong negative correlation between for new registered electric/ hybrid vehicles and decreasing co2 value for germany

- numbers of new registered vehicles for muenster stayed the same for petrol and diesel, so first correlation table gives us no clear result

- growth rate in correlation with co2 value results in strong negative correlation

→ positive significant influence when analyzing this data, BUT the data doesn‘t involve the battery production co2 emission of these vehicles, so the influence should not be seen as big as presented here.

- Further research:

    analyzing co2 of battery production

    comparing co2 value and new registered vehicles worldwide

# Thank you for your attention!