Friedrich-Alexander-Universität
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Association between newly registered Passenger cars and CO_2 emissions in the EU

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Introduction

Motivation

- Transport constitutes 25% of total EU greenhouse gas emissions.
- The European Green Deal sets a target to reduce transport sector emissions by 90% to achieve climate neutrality by 2050.
- In 2019, CO_2 emissions comprised 98.8% of exhaust greenhouse gas emissions from the transport sector.
- A clean environment is essential for global health, making air quality a focal point in environmental policies.

Does the type of motor engine in Passenger Cars constitute a significant factor in Contributing to climate change and CO_2 emissions?

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Data sources

Main data sources

Datasource1

Average CO_2 emissions per km from new passenger cars

The indicator is defined as the average carbon dioxide (CO_2) emissions per km by new passenger cars in a given year. The reported emissions are based on type-approval and can deviate from the actual CO_2 emissions of new cars.

Metadata: URL
Data URL: URL
Data Type: CSV

Datasource2

New passenger cars by type of motor energy

The data in this dataset comes from the Common Questionnaire for Transport Statistics, developed and surveyed by Eurostat in cooperation between the United Nations Economic Commission for Europe (UNECE) and the International Transport Forum (ITF) at OECD.

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Data Type: CSV

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CO_2 emissions in $[2019 - 2020]$

Analyzing the CO_2 emissions from newly registered cars in the EU indicates that Iceland, Norway, and the United Kingdom, there was a substantial 12% decrease in 2020 compared to 2019 levels.

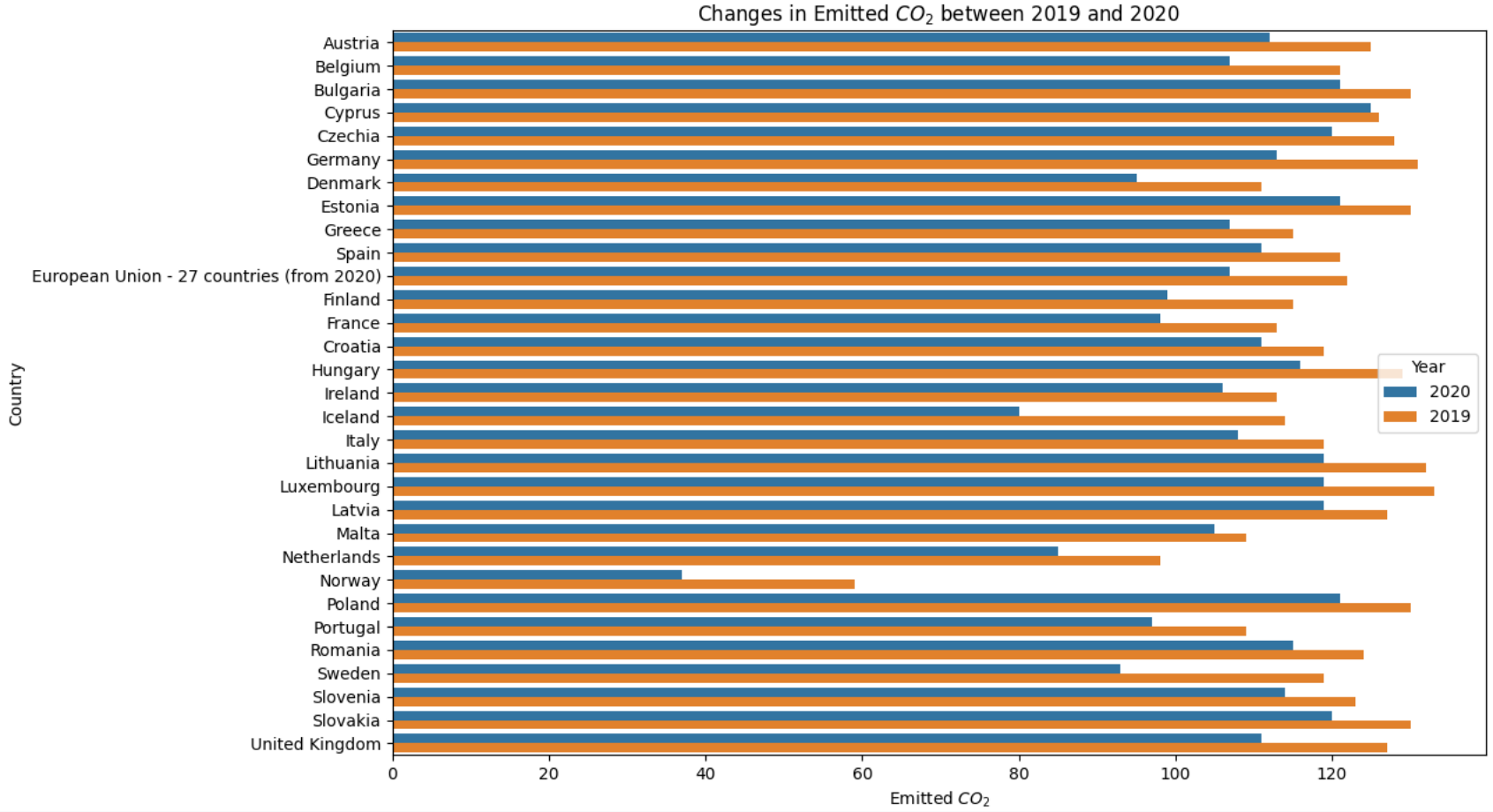


Figure: CO_2 emissions in $[2019 - 2020]$

Norway overview

Not in EU, but still important to be considered!

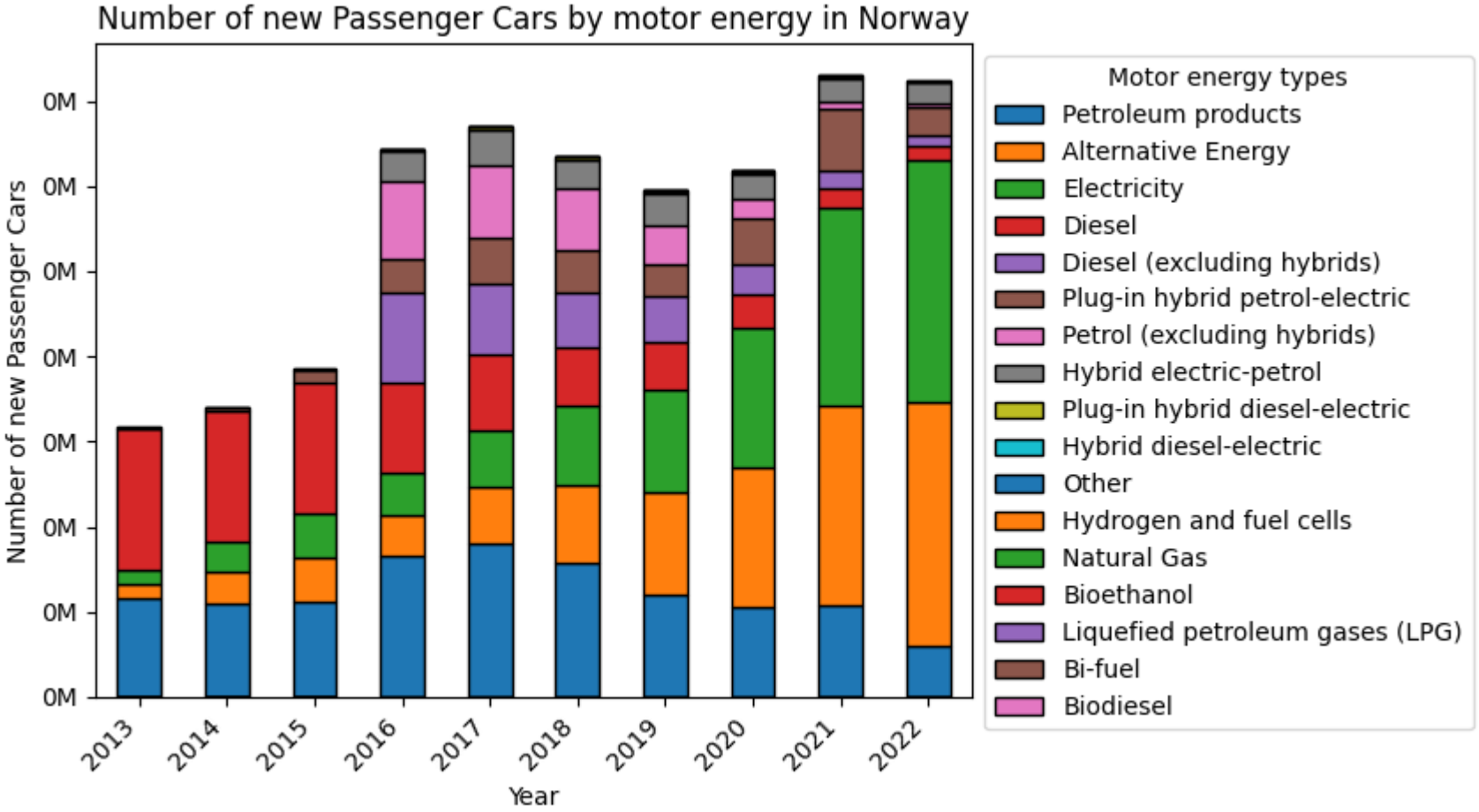
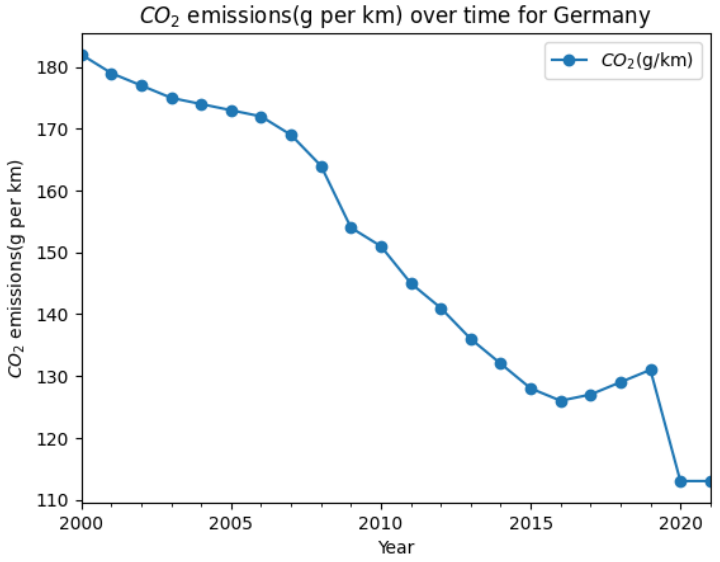
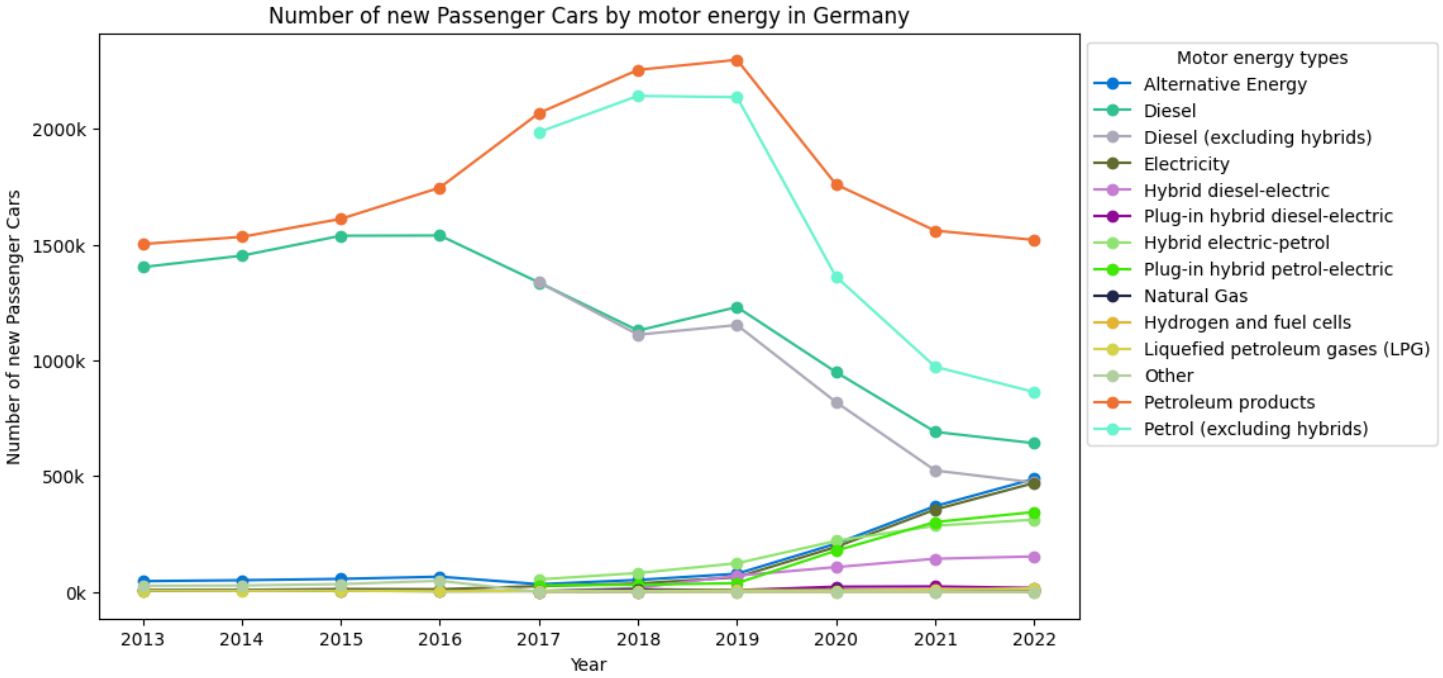


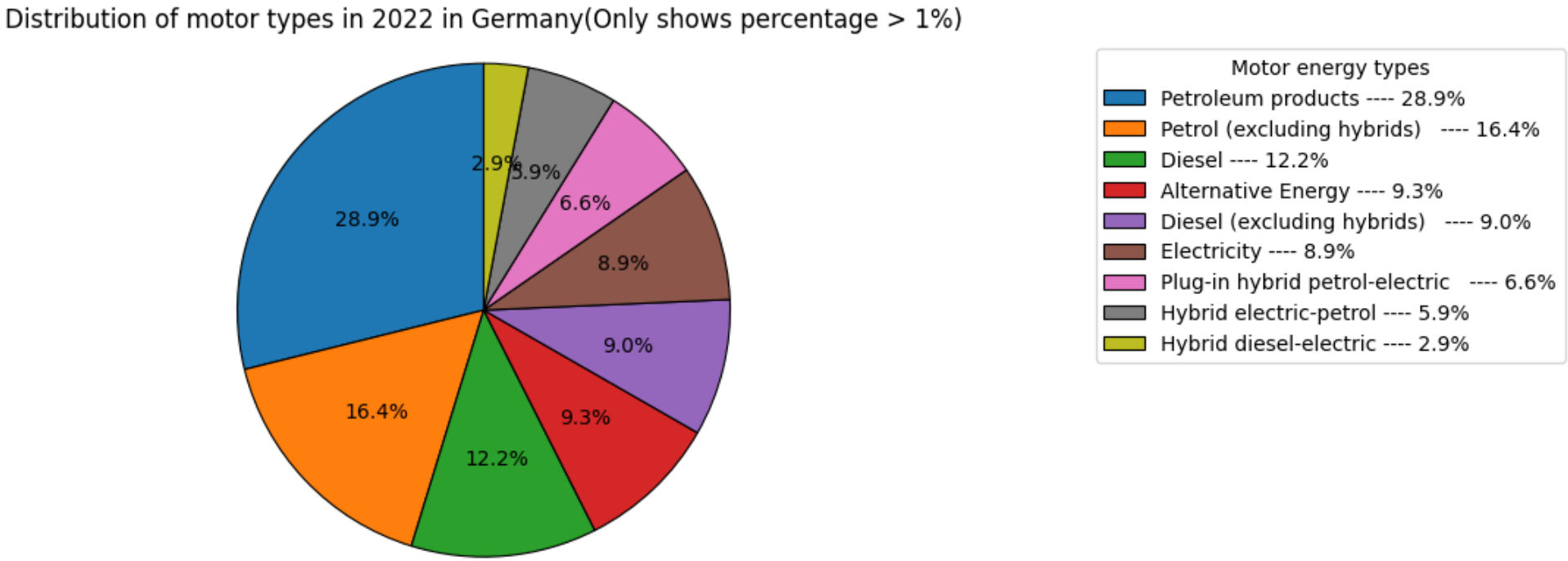
Figure: CO_2 emissions for Norway

Germany overview

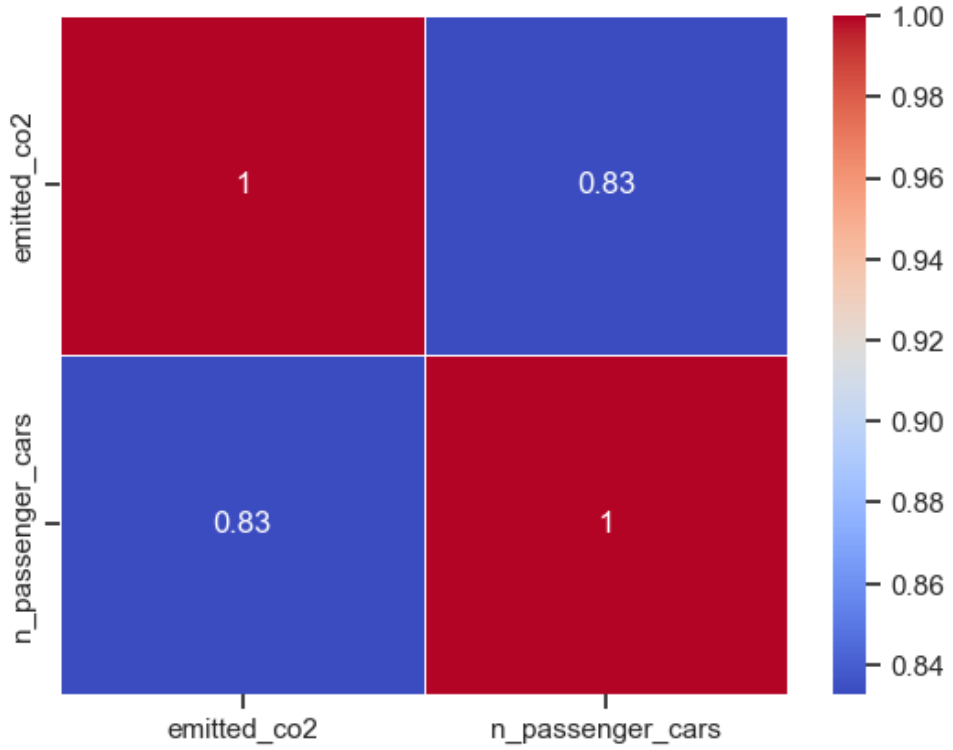


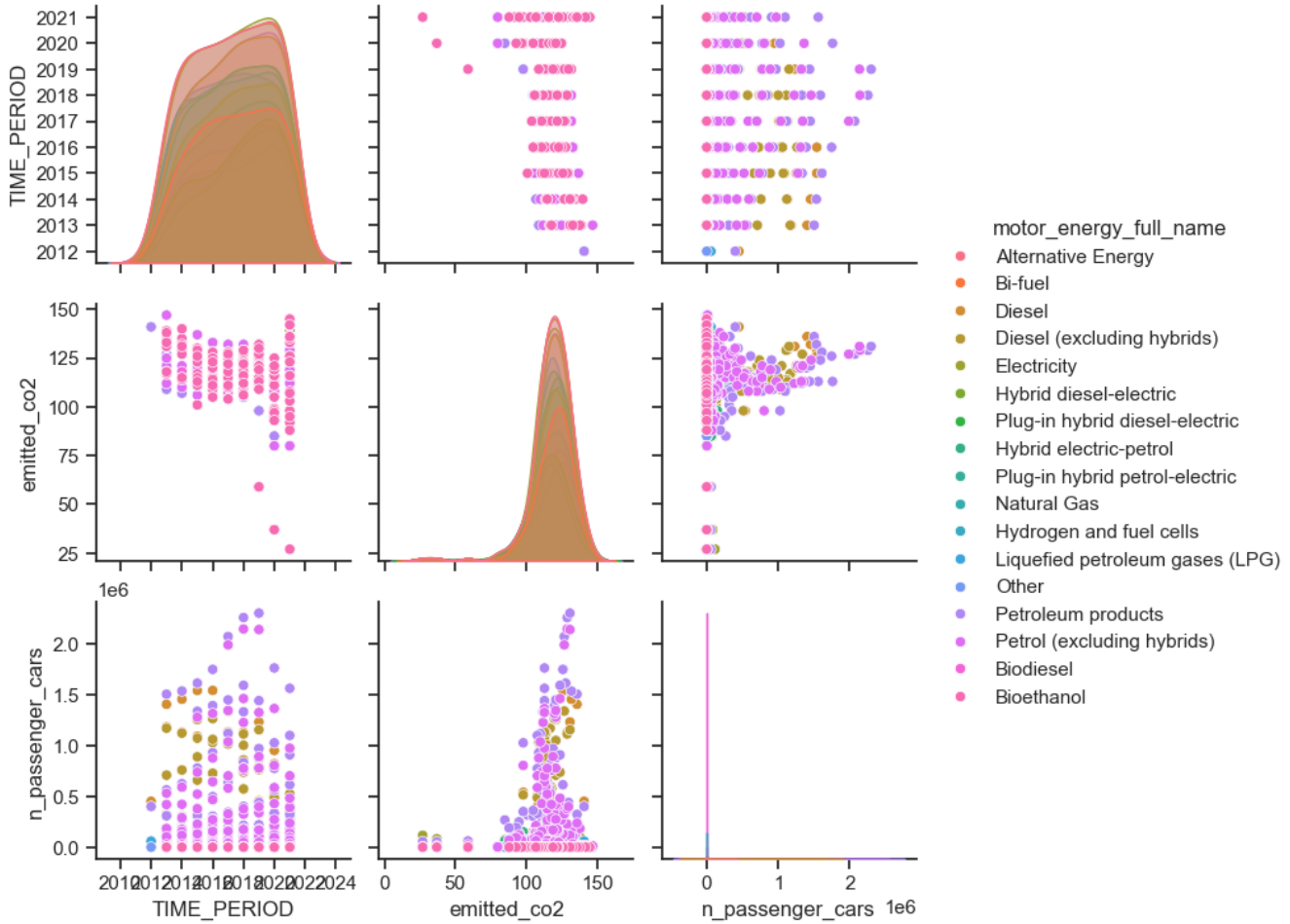


Germany overview



Correlation





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Conclusion

- CO_2 emissions have consistently declined over the past five years, and some countries, like Norway, have shown particularly noteworthy reductions.
- Newly registered passenger cars in recent years primarily employ either conventional petroleum or one of its by-products.
- Germany has achieved notable success in reducing CO_2 emissions over the years. A marked and sharp decrease is observable from 2019 to 2020, primarily attributed to the influence of the COVID-19 pandemic on the data.
- Positive correlation is shown between CO_2 emissions and number of new passenger cars and as it was shown most of passenger cars use petrol products engines. So CO_2 emissions and type of motor engine are related.

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Limitation

- Emission measurements since 2021 follow the Worldwide harmonized Light vehicles Test Procedure (WLTP), causing a break in the series compared to the New European Driving Cycle (NEDC) used until 2020.
- No CO_2 emission data is available for 2023. Fluctuations from 2019 to 2021 are mainly due to the impact of the COVID-19 situation.
- Missing data exists for certain motor types before 2017.

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Future Work

- Utilize open data, including greenhouse gas emissions during car production, for a comprehensive understanding.
- Include data on car age to understand emissions evolution and inform policy decisions.
- Leverage open data in Germany to train models for CO_2 emissions, enabling car comparisons.

Thanks for your attention!