



Development of the emission intensity of the passenger car fleets of Germany and other European countries – An international comparison

Energy consumption in the transport sector accounts for 23% of energy-related CO₂ emissions worldwide, making it, together with the industrial sector, the second largest contributor after coal-fired power generation (IEA, 2021). Many countries have set greenhouse gas (GHG) emission reduction targets for each sector, including the transport sector. However, in many of these countries, the transport sector is the only one with increasing GHG emissions in relation to the reference year 1990. For example, in Germany, annual targets are monitored, and immediate measures are taken if they are not met (KSG, 2019). At the same time, there are international regulations that also affect emissions in the transport sector, such as EU-wide regulations that target the CO₂ emission intensity of newly registered cars (EU, 2019).

The importance of policy measures for emissions is widely discussed in the literature (Probst, 2015). When analysing emissions in the transport sector, aggregated emission values are often used. However, this approach does not allow for conclusions about the influence of a national car fleet on emissions in the transport sector. Therefore, in this study, the newly registered cars will be analysed with regard to emission intensity on the one hand and to an influence of possible political measures on the other hand. For this purpose, data on the specific emissions of all newly registered cars within the EU for the period 2010-2019 are available (EEA, 2021).

This paper will first discuss how the emission intensity of passenger cars has developed over time for a selection of European countries. Furthermore, a comparison with GHG emissions of households regarding transport (OECD ilibrary, 2021) and an examination of these data in connection with the development of the emission intensity of new registrations is possible. Finally, determinants of emission intensity can be investigated quantitatively. With a suitable choice of explanatory variables, this would be possible both on the basis of a panel data analysis in an international comparison and, at the national level, on the basis of a regression analysis (Master only). Possible variables are, for example, the level of investment in the transport sector or an index for policy measures (Probst, 2015).

Key tasks and objectives of the thesis

- Evaluate the evolution of emission intensity of passenger car fleet for selected countries
- Relate evolution to policy and emission reduction targets
- Find determinants of passenger cars emission intensity

Your profile

- Study of economics, industrial engineering or comparable (both BA and MA are accepted, expectations regarding the thesis will adjust)
- Experience with quantitative research, econometric modelling, and a programming language

Literature

- EEA, 2021: Monitoring of CO₂ emissions from passenger cars – Regulation (EU) 2019/631 provided by European Environment Agency (EEA) <https://www.eea.europa.eu/data-and-maps/data/co2-cars-emission-19>.
- EU, 2019: REGULATION 2019/631 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 April 2019 setting CO₂ emission performance standards for new passenger cars and for new light commercial vehicles, and repealing Regulations (EC) No

443/2009 and (EU) No 510/2011 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02019R0631-20210301&from=EN>.

- IEA, 2021: Global energy-related CO2 emissions by sector, IEA, Paris <https://www.iea.org/data-and-statistics/charts/global-energy-related-co2-emissions-by-sector>.
- KSG, 2019: Bundes-Klimaschutzgesetz (KSG) v. 12. 12. 2019, BGBl. I S. 2513.
- OECD ilibrary, 2021: https://www.oecd-ilibrary.org/environment/data/oecd-environment-statistics/air-emissions-by-industry_data-00735-en
- Probst, M., Sauter, C., 2015: CO2 emissions and greenhouse gas policy stringency: an empirical assessment. In: IRENE Working Papers 15-03. IRENE Institute of Economic Research. <https://www5.unine.ch/RePEc/ftp/irn/pdfs/WP15-03.pdf>.

Contact



Amir Ashour Novirdoust

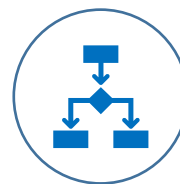
Tel.: +49 221 27729-321,
amir.ashour@ewi.uni-koeln.de

Topics



- Transport sector
- Environmental policy
- Policy evaluation

Methods



- Time series analysis
 - Regression analysis
 - Panel data analysis
-