ELECTRIC VEHICLES IN EUROPE

Analysis on evolution of EV sales.

Antonina Masko

antonina.masko@gmail.com

SUMMARY

New cars sold in the European Union (EU) must be zero-emission starting from 2035[1]. This means that the sales of new electric vehicles (EV) in the EU should increase over the next years. The analysis of the sales and stock of the EV might show the current trend in each country, as well as if there is any relation between the income and GDP per capita of each country and the sales. We could also see the trend and forecast the sales for the coming years.

DATA

DATA SOURCE

The data has been sourced from the Eurostat (European Statistical Office), whose main responsibilities are to provide statistical information to the institutions of the EU and promote the harmonization of statistical methods across the member countries as well as EFTA countries.

- New passenger cars by type of motor energy: https://ec.europa.eu/eurostat/databrowser/view/ROAD_EQR_CARPDA__custom_6003779/default/table?lang=en
- Stock of passenger cars, by type of motor energy: https://ec.europa.eu/eurostat/databrowser/view/ROAD_EQS_CARPDA/default/table?lang=en&category=road.road_eqs
- GDP per country: https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_GDP/default/table?lang=en&category=na10.nama10.nama_10_ma
- Mean and median income: https://ec.europa.eu/eurostat/databrowser/view/ILC_DI03$DV_405/default/table?lang=en&category=gol.gol_mlc.gol_mlc_i
- Population change: https://ec.europa.eu/eurostat/databrowser/view/DEMO_GIND/default/table?lang=en&category=demo.demo_ind

DATA COLLECTION METHOD

Data sourced directly from Eurostat, which combines statistical information from the EU member countries and EFTA countries.

DATA CONTENTS

New passenger cars: contains the number of new car registration from all EU countries plus EFTA countries, from 2013 to 2021, split by motor type.

Stock of passenger cars: contains the number of cars in stock in all EU countries plus EFTA countries, from 2013 to 2021, split by motor type.

GDP per country: GDP in euro in current prices for all EU and EFTA countries from 2013 to 2021

Mean and median income: data from all EU and EFTA countries from 1995 to 2021 (partially 2022), split by age group and sex.

[1] https://www.reuters.com/business/autos-transportation/eu-countries-poised-approve-2035-phaseout-co2-emitting-cars-2023-03-28/

Population change: total population from all EU and EFTA countries per year, from 1960 to 2021 (partially 2022)

DATA LIMITATION

Data is unfortunately only until 2021, which for the analysis might be quite old.

There is no data of the vehicles by car brand, which prevents us from creating further analysis, e.g., popularity and sales of the cars by price/brand.

DATA ETHICS

The data is open sourced from an EU official institution. There is no detailed information that can be Personal Identified Information. Therefore, there is no significant data privacy, storing or processing issues.

DATA PROFILE[2]

The final data after wrangling, cleaning, consistency checks and merging has 89'229 rows and 16 columns.

Column	**Description**	**Data type**	**Time variant/invariant**
engine_type_code	Type of car engine (code)	Qualitative	time-invariant
country_code	Country code	Qualitative	time-invariant
year	Year	Qualitative	time-invariant
new_car	New car registration	Quantitative	time-variant
stock_car	Car already in stock	Quantitative	time-variant
gdp_eur	Gross domestic product in EUR	Qualitative	time-variant
age_code	Age (code)	Qualitative	time-variant
income_indicator	Income indicator: mean or median	Qualitative	time-invariant
currency	Currency: can be EUR or PPS (purchasing power standard)	Qualitative	time-invariant
income	Income of the population	Quantitative	time-variant
demographic_indicator_code	The way how the population has been calculated. Here: average population	Qualitative	time-invariant
population	The number of the population	Quantitative	time-variant
engine	Type of car engine, grouped	Qualitative	time-invariant
country	Country name	Qualitative	time-invariant
age_group	Age groups	Qualitative	time-invariant
country_group	Country groups: EU, EFTA, other	Qualitative	time-invariant

[2] The data profile was prepared after the data was cleaned and merged.

QUESTIONS TO EXPLORE

1. How is the trend of electric vehicles sales in Europe? Is it going steadily upwards?
2. With the current trend, will EU reach sales of only EV by 2035?
3. Which countries have the highest sales of EV cars? What are the reasons?
4. Which car engine is most popular? And which one is growing fastest?
5. Is there a correlation between number of inhabitants, GDP and income and the sales of the new EV in each country?
6. Can the same trend as in the EU be observed in other European countries (e.g., EFTA)?
7. Do the governmental incentives work and increase the new EV sales? For this question, additional data must be sourced.
8. What is the average price of EV and combustible cars? And how does this impact the sales? For this question, additional data must be sourced.