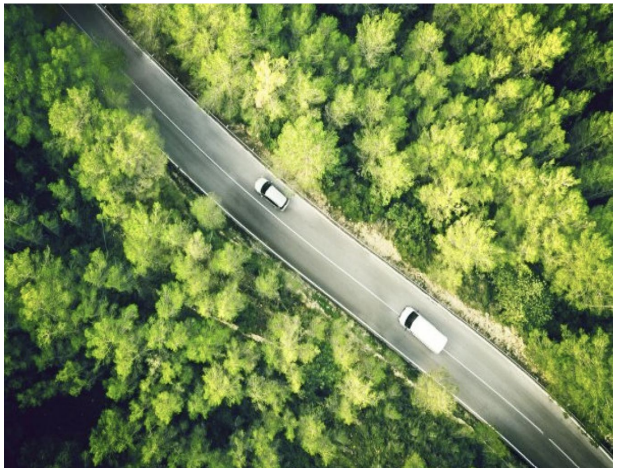
WBS CODING SCHOOL

Are Electric vehicles Really environmentally friendly?

Analysis of European Environment Agency Data



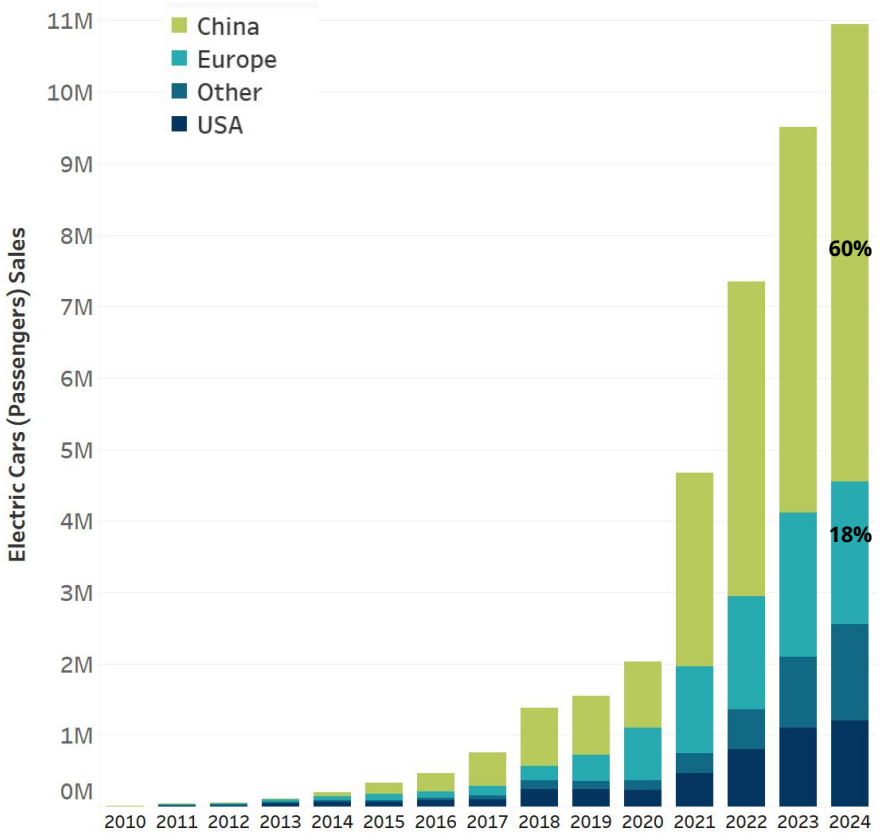
Zahra Homayounfar

11 September2025

Rapid Growth in Electric Vehicles Sales

Share of Electric Vehicles Worldwide:

- 2010: **0.1%**
- 2024: **4.5%**



Electric Vehicles: Not as Clean as They Seem

1. Battery Composition

High Lithium Demand: ~160 g per kWh (≈ 10 kg for 1 car)

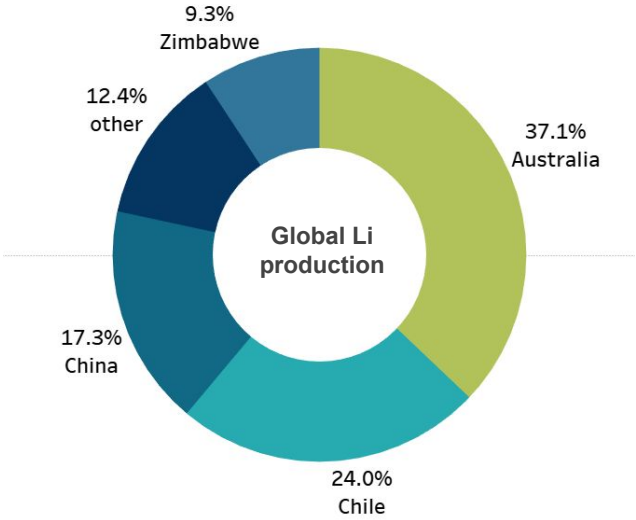
- **Water Consumption: 2 million tons for 1 tone Lithium (≈ 100 cars) !!!**

- **High Carbon Emissions: 70 - 120 kg CO_2 per kWh**

2. Electricity Consumption

Coal-Intensive Energy Sources: High Carbon Emissions

Renewable Energy Sources: Lower carbon footprint



Li Extraction Methods:

- **Hard Rock Mining**
- **Brine Extraction**
- **Lepidolite**

Key Questions of the Analysis

1. How do Electric and petrol cars compare in terms of **lifecycle CO_2 emissions**?
2. What is the **break-even point** where EVs become cleaner than petrol cars?
3. What factors change the results?

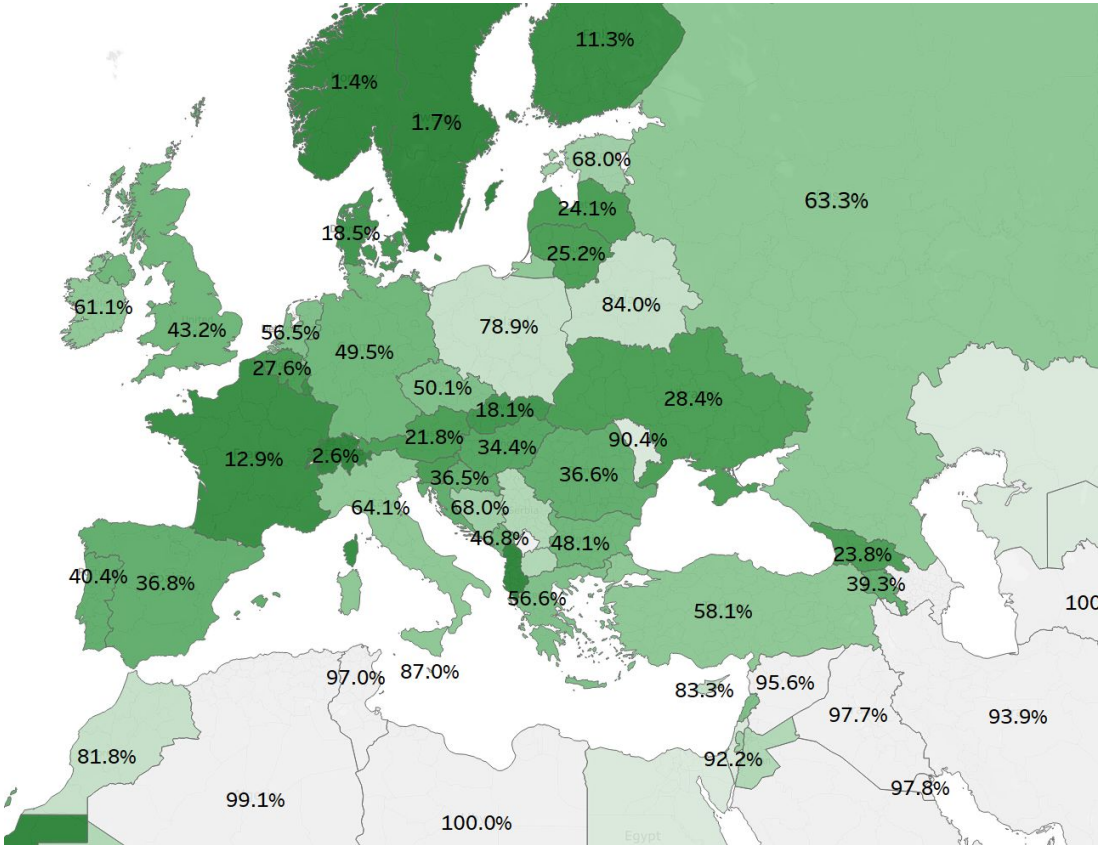
Data

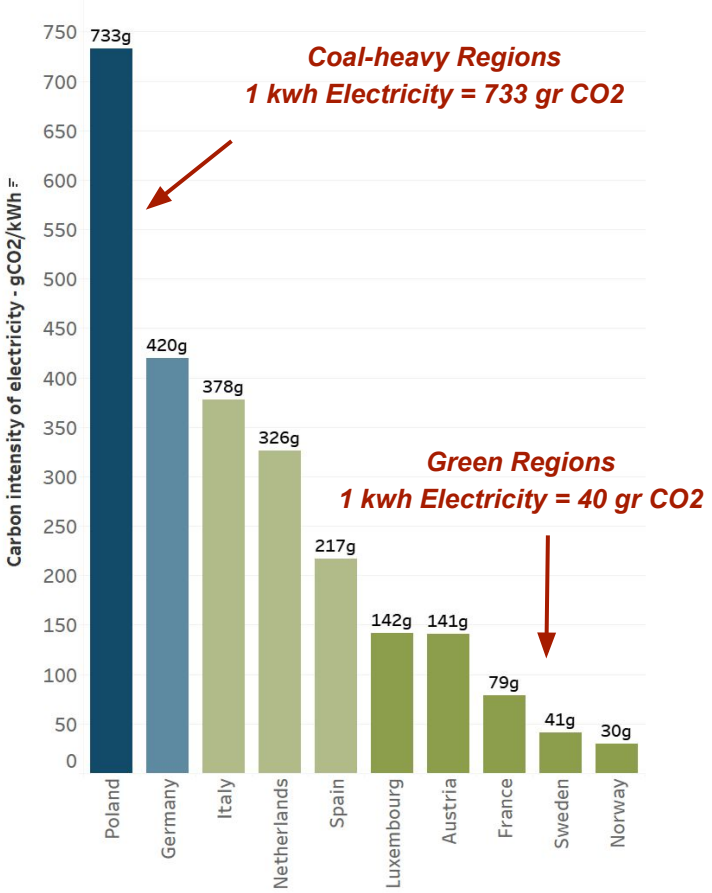
Over 1 million cars (petrol, BEV and Phev)

Year: 2022

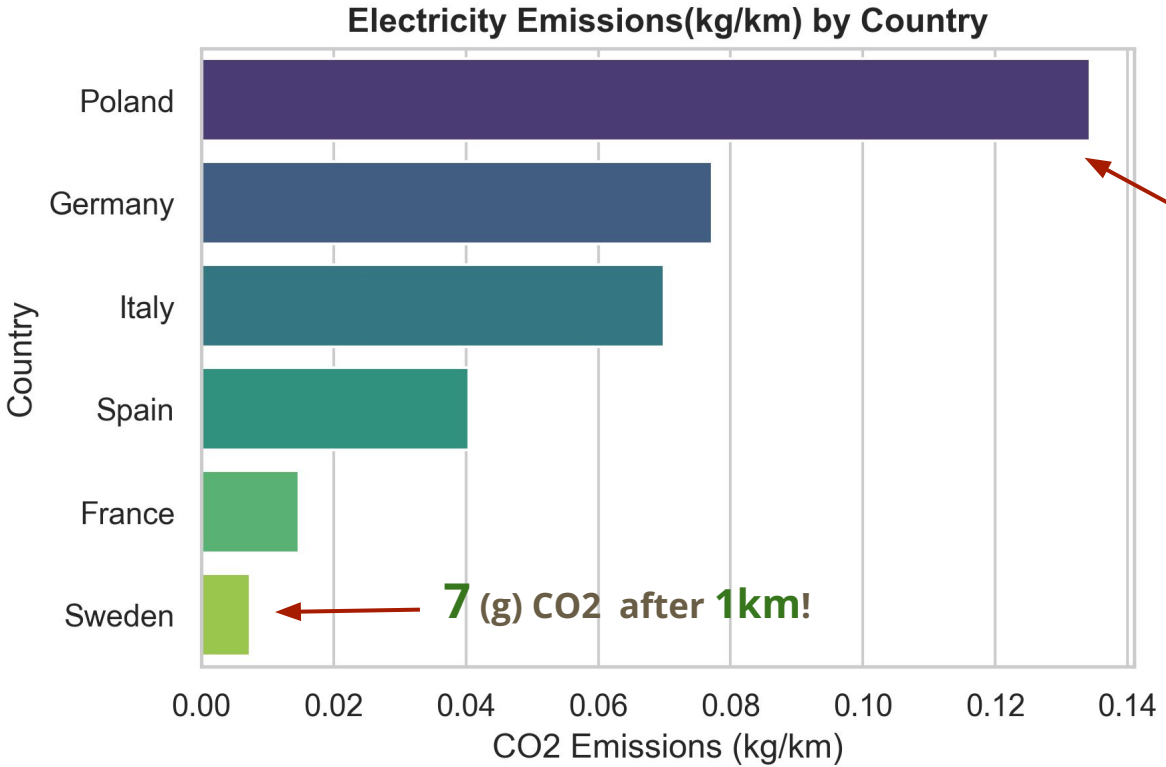
Region: EU

Grid Energy Dependency on Coal and Gas



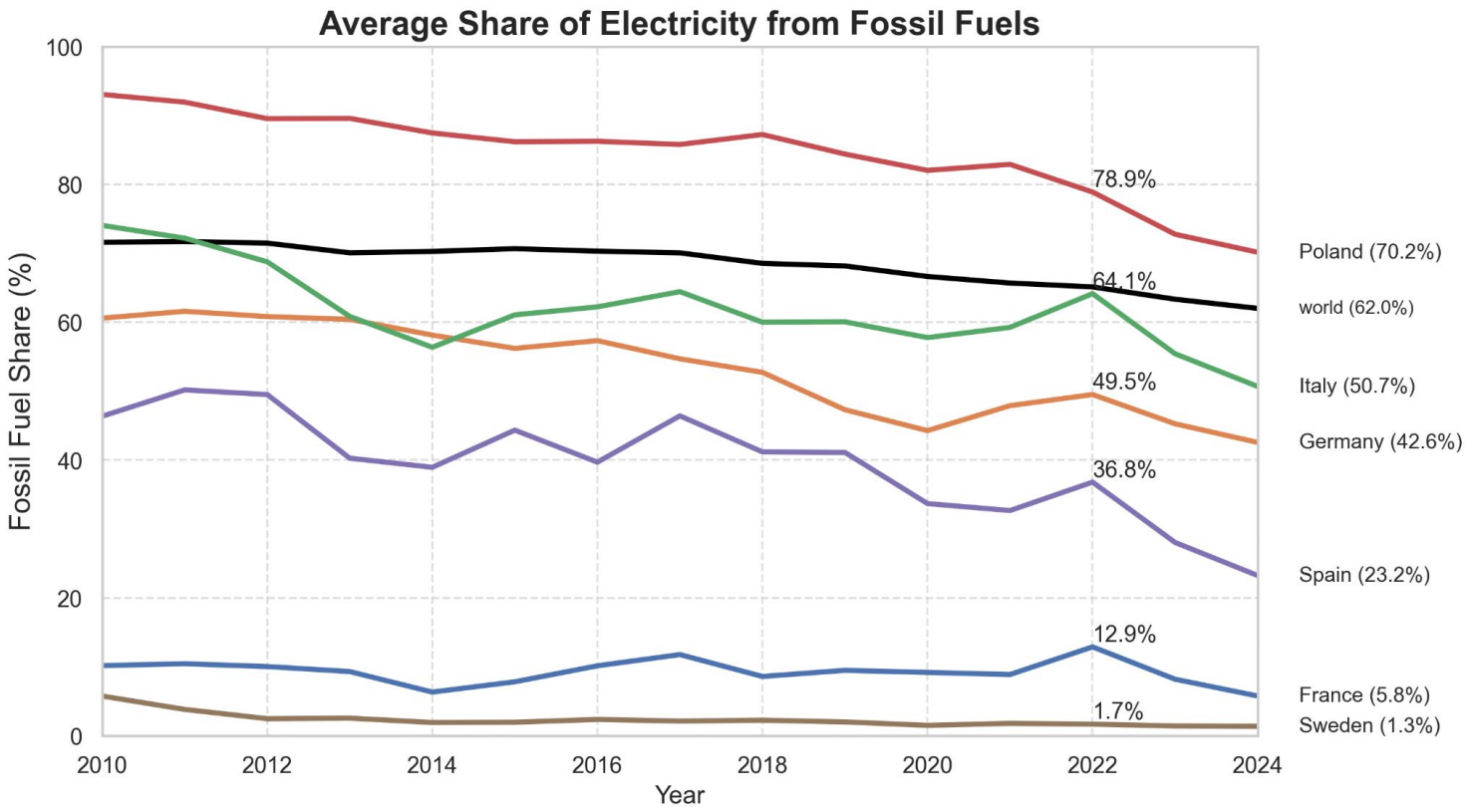


Average CO_2 Emissions per Kilometer Based on Electricity Usage

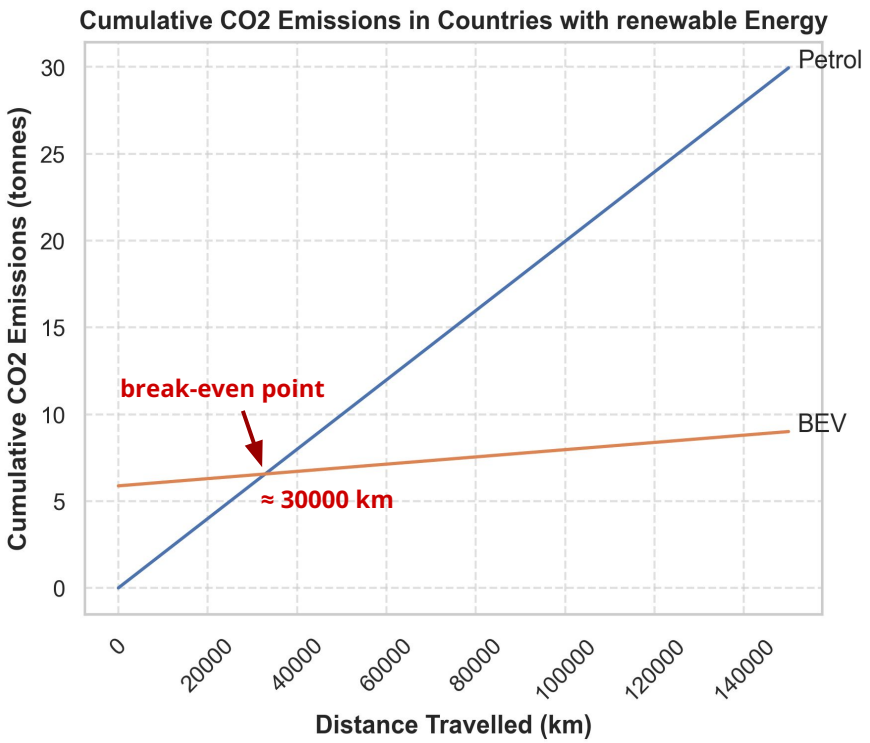


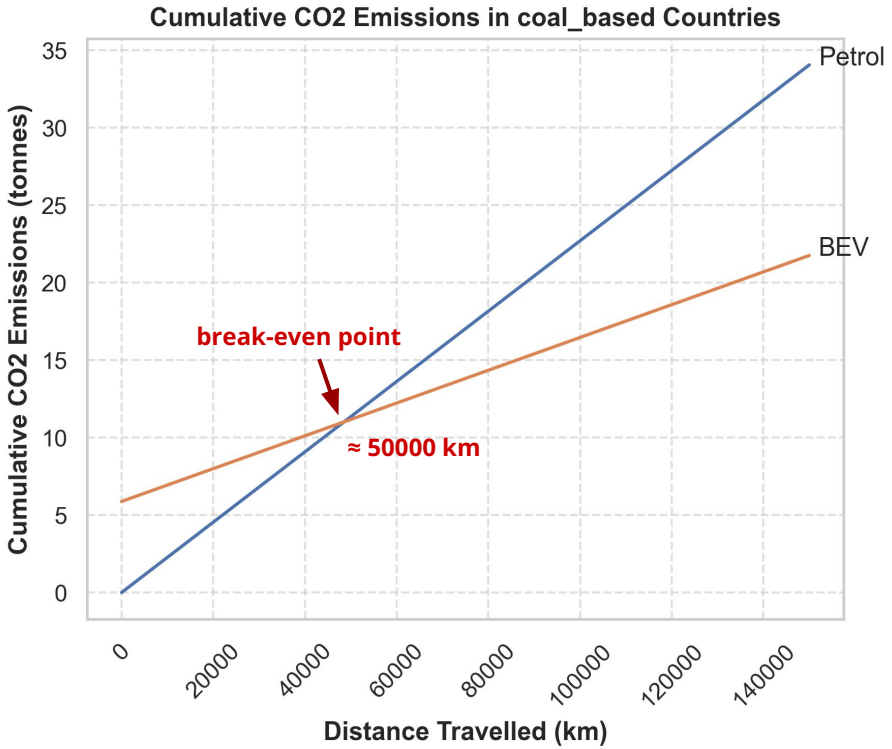
The cleaner the electricity, the greater the climate benefit of EVs

Electricity is getting cleaner!

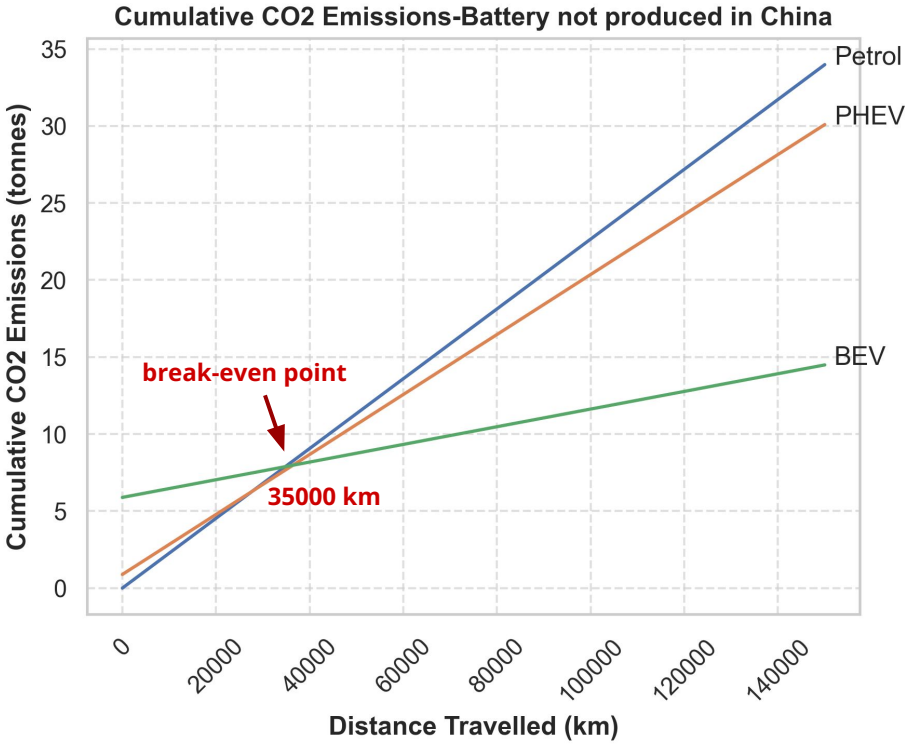


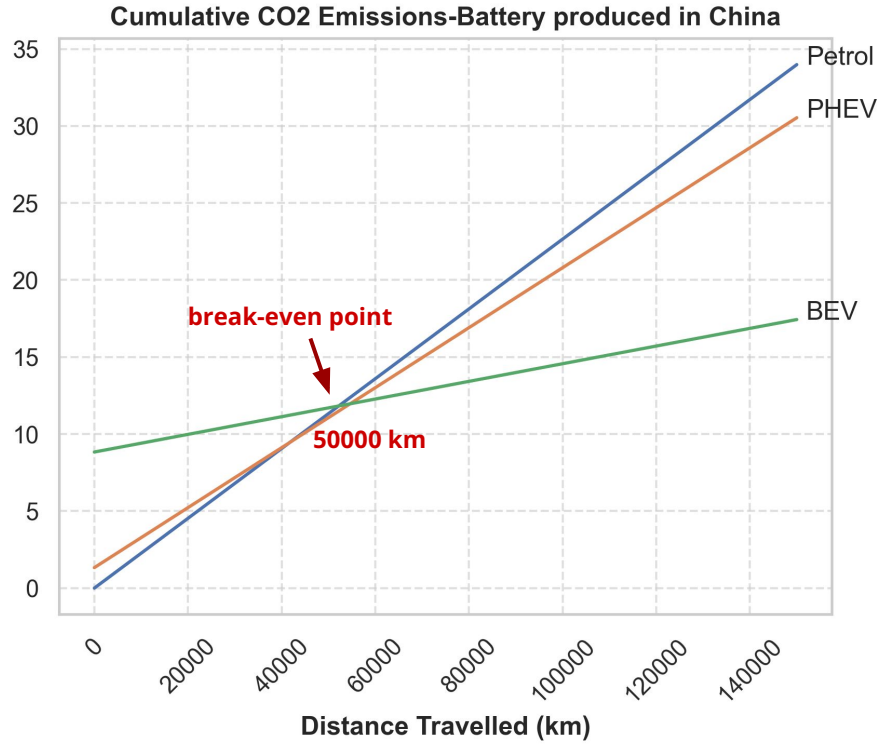
Break-even Point, where EVs become cleaner than conventional cars





The effect of Battery production methods on Break-even Point

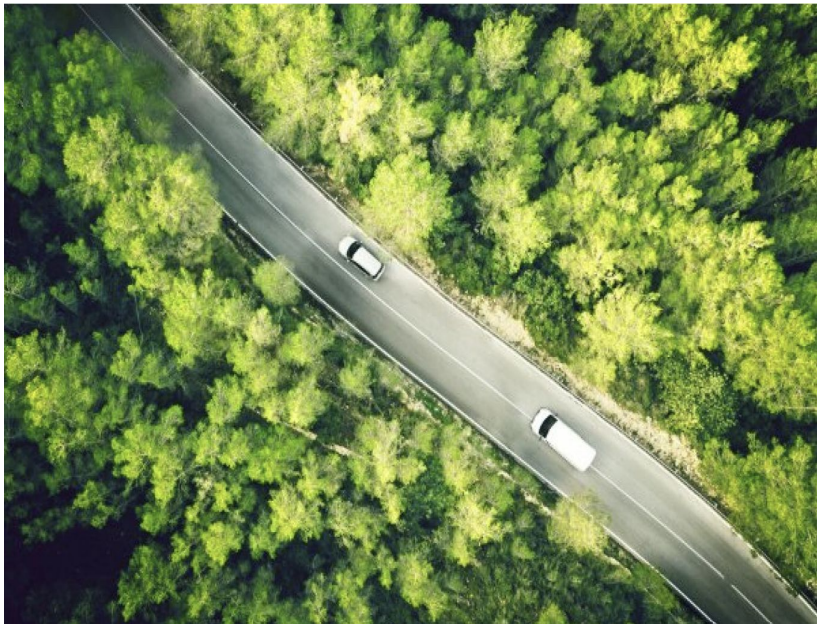




Key Findings & Recommendations

- **EVs perform much better in countries with cleaner energy sources.**
- **In the long term, EVs are genuinely beneficial for the environment during use.**
- **Environmental risks from battery disposal still exist.**
- **Investment in renewable energy and Battery production methods is essential to unlock the full potential of EVs**
- **Improvement in infrastructure, such as widespread charging stations, is critically important (**Maximum electric usage of phev: **35%)**

Thank you



🌿 *In hope of a future where nature and technology thrive side by side.*