Data Analysis

IronHack June 2025

Electric Vehicle Analysis in Europe
Growth, Infrastructure & Trends

David Hernández | Data Analyst
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Electric Vehicle Analysis in Europe
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EV Market Analysis in Europe

Growth, Infrastructure & Trends

To understand the growth of EV adoption, infrastructure development, and key trends across European countries.

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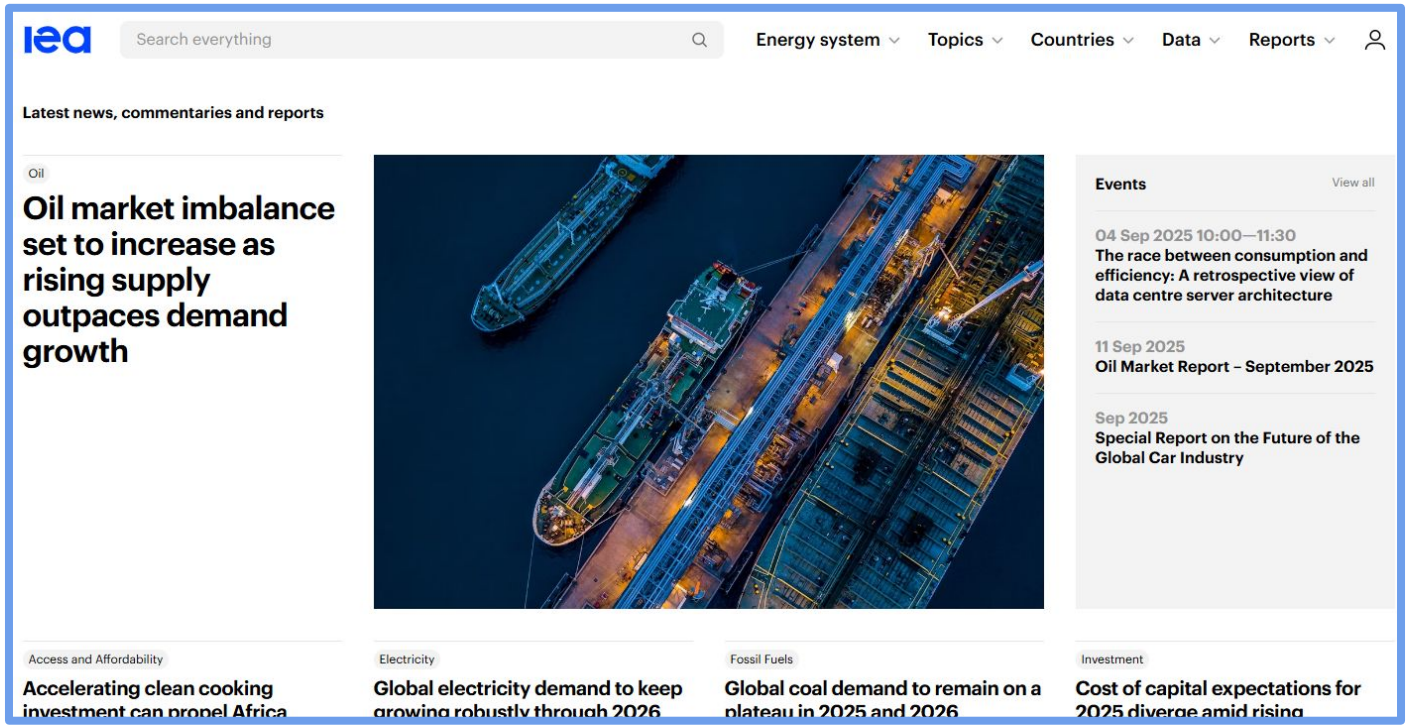
EV Market Analysis in Europe

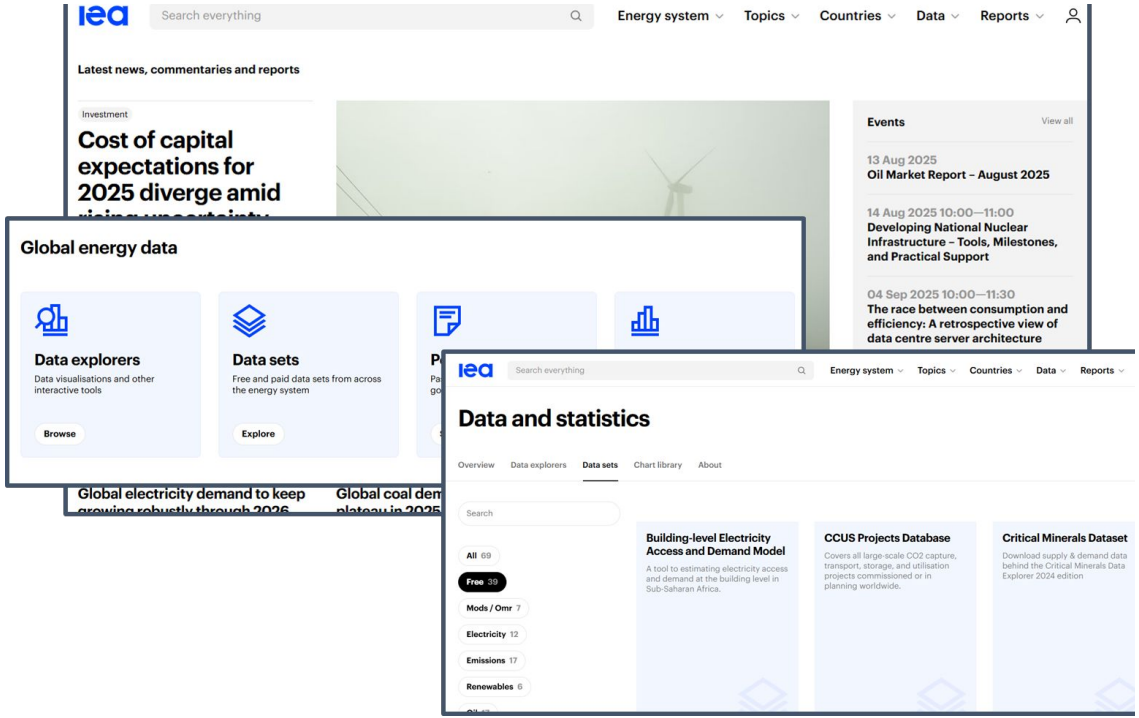
International Energy Agency



https://www.iea.org/data-and-statistics/data-product/global-ev-outlook-2025#global-ev-data

EV Market Analysis in Europe

International Energy Agency



https://www.iea.org/data-and-statistics/data-product/global-ev-outlook-2025#global-ev-data

Dataset Overview

Libraries imported

```
# Importing modules
import pandas as pd # Data manipulation and analysis
import plotly.express as px # Allows to create interactive plots, charts, graphs, maps, and more
import plotly.graph_objects as go # More control over plots
import matplotlib.pyplot as plt # Create visualizations
import seaborn as sns # Statistical data visualization
import ipywidgets as widgets # Interactive widgets for Jupyter notebooks
from IPython.display import display # Display widgets in Jupyter notebooks
```

✓ 20.7s

Dataset Overview

From region_country, year, to you_name_it!

```
df = pd.read_excel("C:/Users/jdhernandezd/Documents/IRONHACK/Labs/Electric_Vehicles_Project/EV Data Explorer 2025.xlsx")
df
```

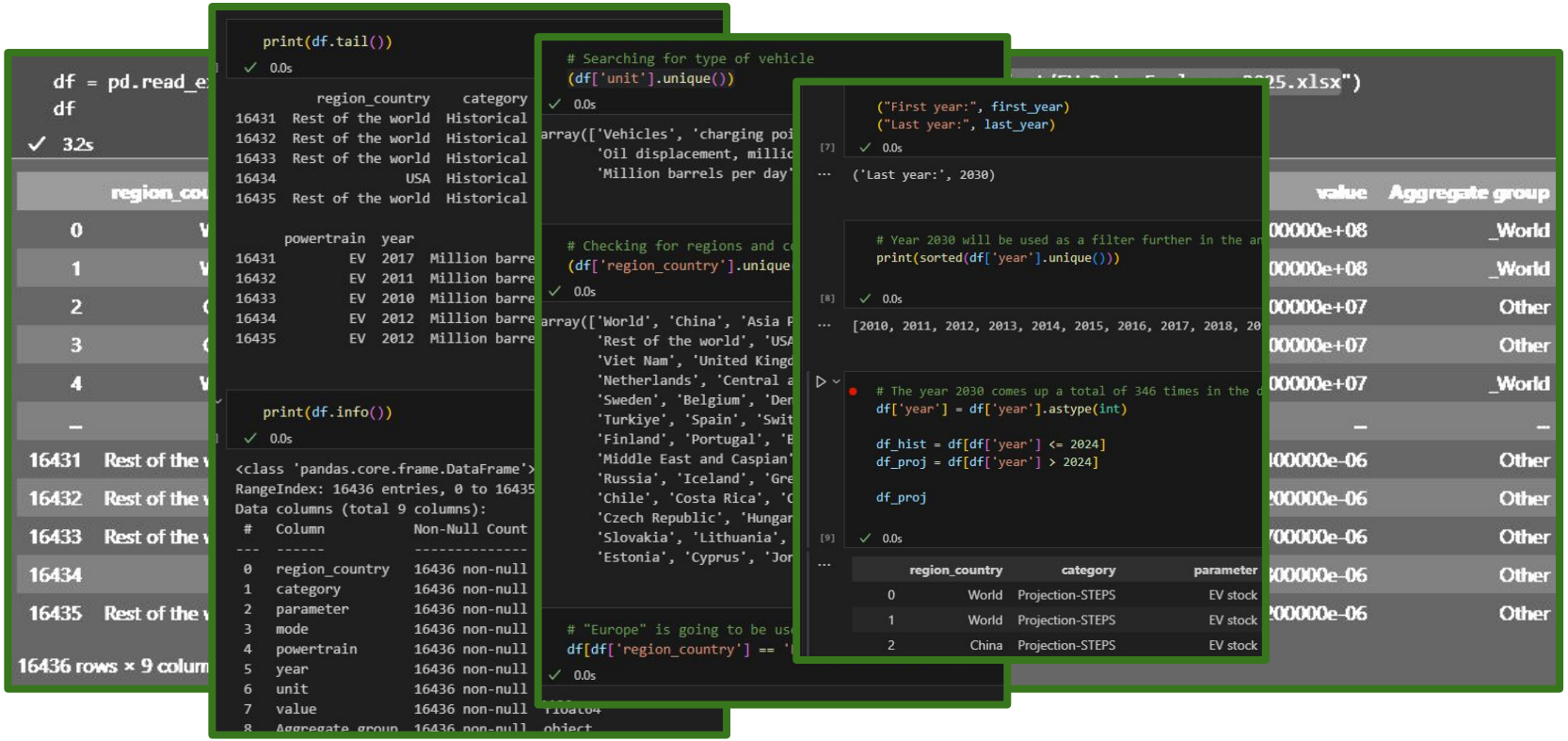
✓ 3.2s

	region_country	category	parameter	mode	powertrain	year	unit	value	Aggregate group
0	World	Projection-STEPS	EV stock	2 and 3 wheelers	BEV	2030	Vehicles	1.700000e+08	_World
1	World	Projection-STEPS	EV stock	Cars	BEV	2030	Vehicles	1.500000e+08	_World
2	China	Projection-STEPS	EV stock	2 and 3 wheelers	BEV	2030	Vehicles	9.100000e+07	Other
3	China	Projection-STEPS	EV stock	Cars	BEV	2030	Vehicles	8.200000e+07	Other
4	World	Projection-STEPS	EV stock	Cars	PHEV	2030	Vehicles	8.200000e+07	_World
...	...	...	...	...	...	...	...	...	...
16431	Rest of the world	Historical	Oil displacement Mbd	Trucks	EV	2017	Million barrels per day	2.400000e-06	Other
16432	Rest of the world	Historical	Oil displacement Mbd	2 and 3 wheelers	EV	2011	Million barrels per day	2.200000e-06	Other
16433	Rest of the world	Historical	Oil displacement Mbd	2 and 3 wheelers	EV	2010	Million barrels per day	1.700000e-06	Other
16434	USA	Historical	Oil displacement Mbd	2 and 3 wheelers	EV	2012	Million barrels per day	1.300000e-06	Other
16435	Rest of the world	Historical	Oil displacement Mbd	Trucks	EV	2012	Million barrels per day	1.200000e-06	Other

16436 rows × 9 columns

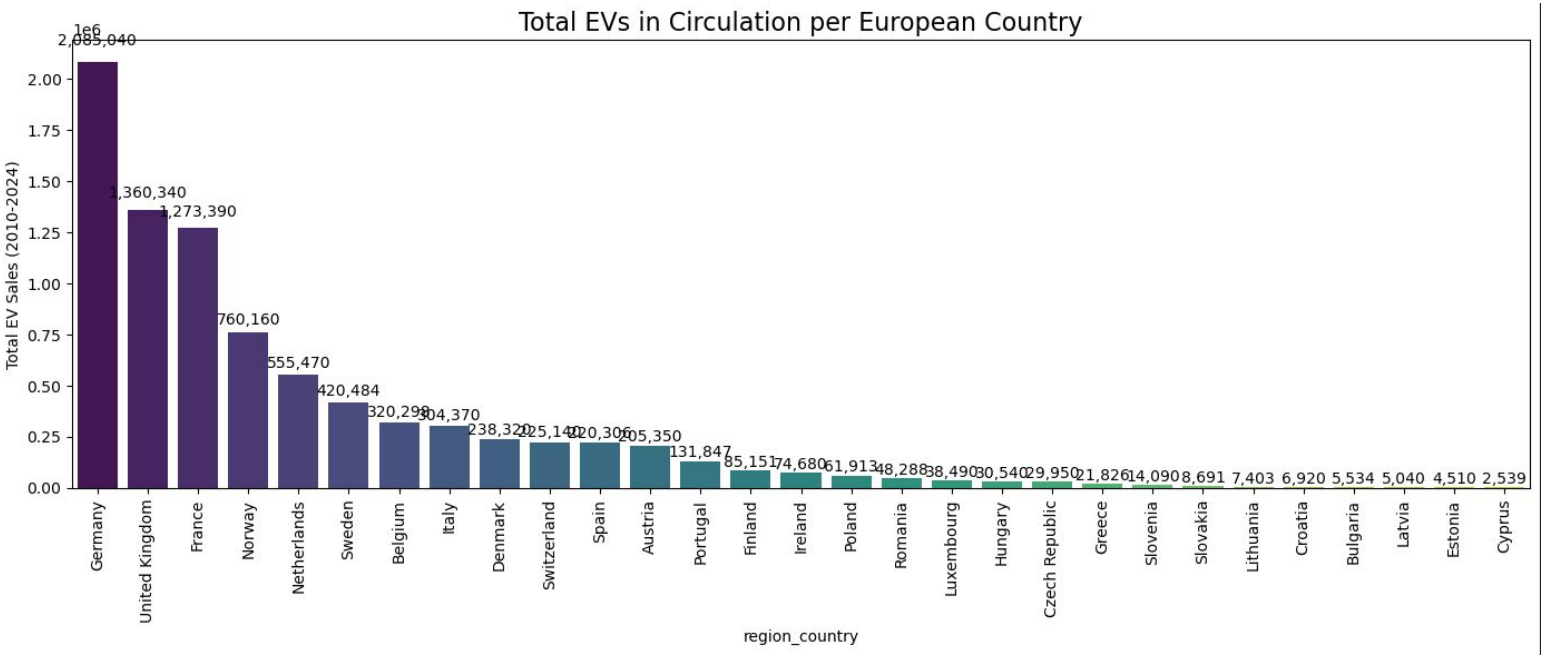
Dataset Overview

Analyzing the data, filtering values



Total EV's in Europe

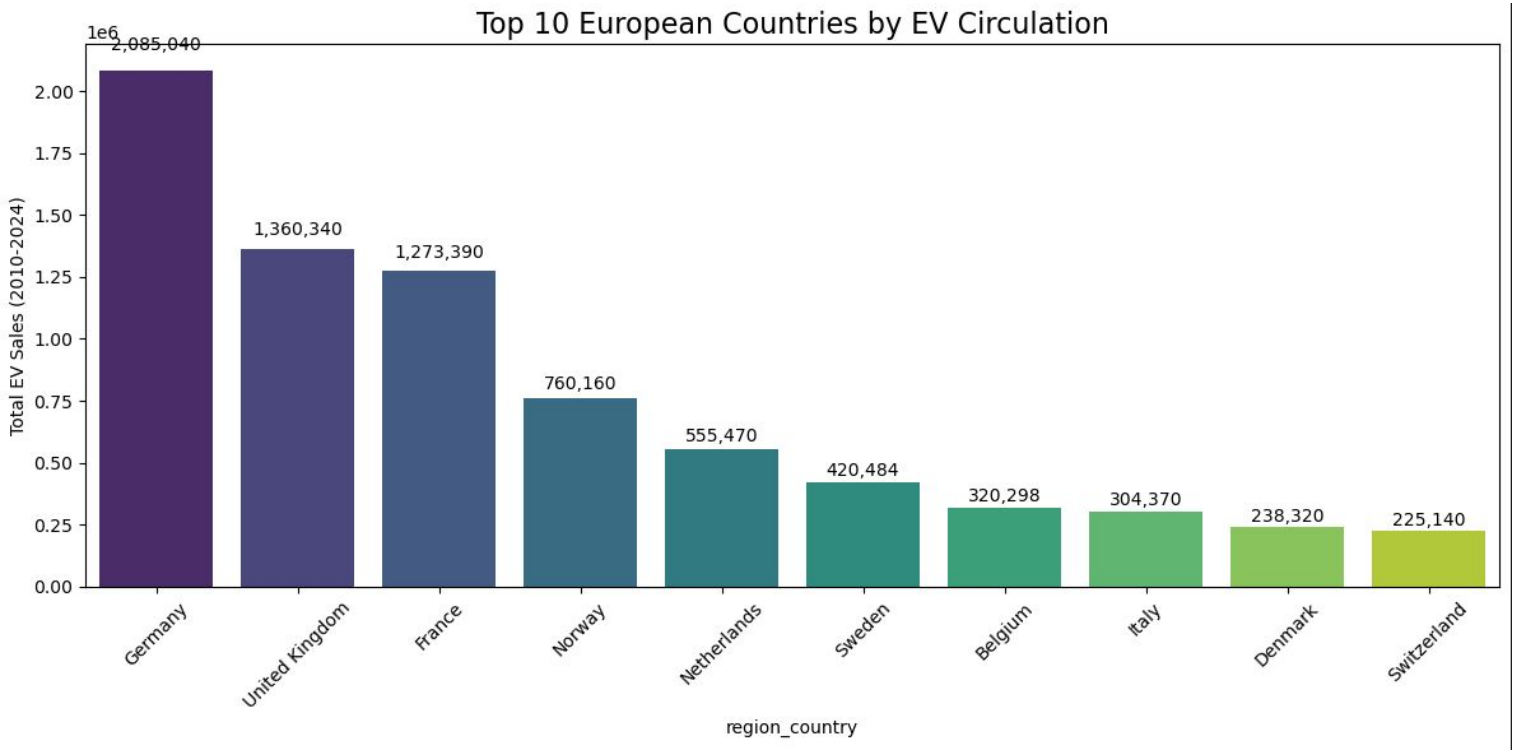
A look at every country



 # Total EVs in circulation in Europe (2010-2024): 8,546,080

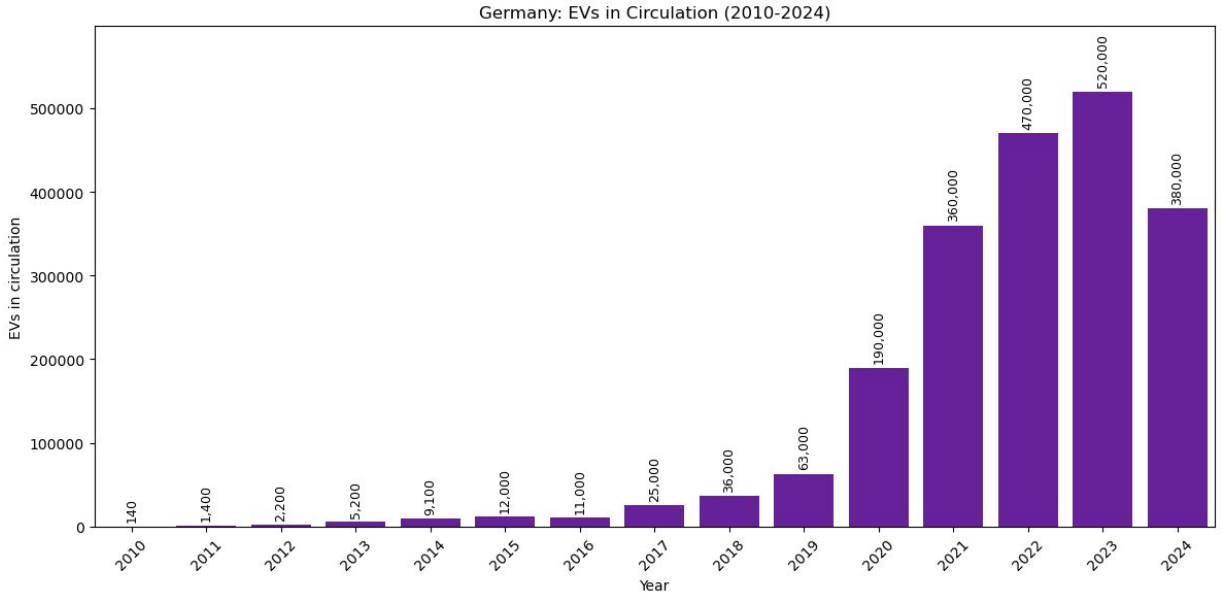
Total EV's in Europe

Focusing on Top 10



EV Growth Over Time

Germany’s trend over the years

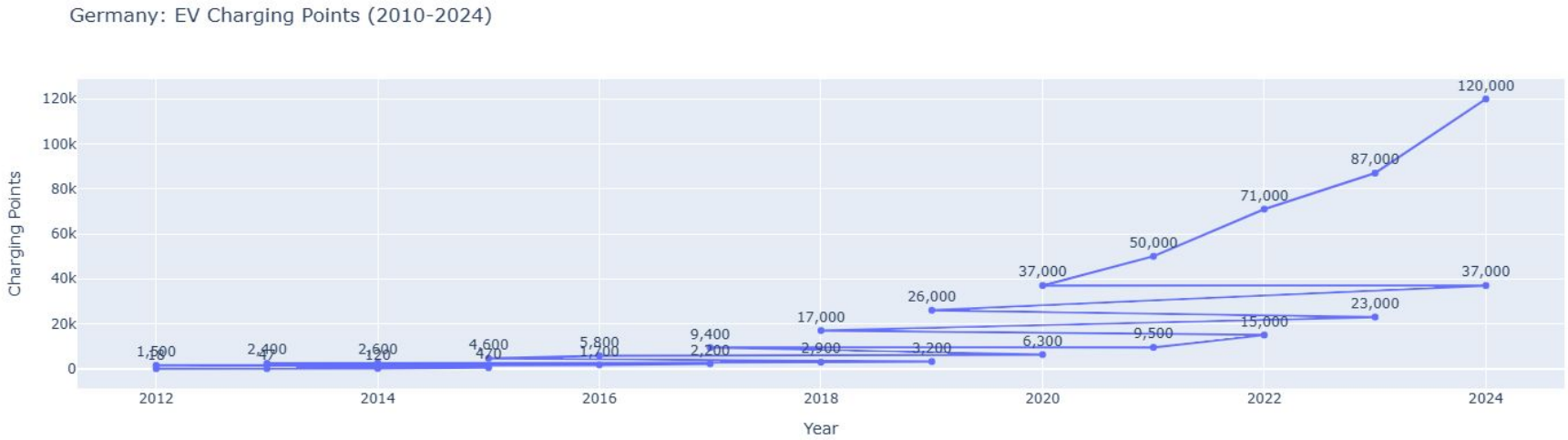


 # Total EVs in circulation in Germany (2010-2024): 2,085,040

2M

Charging Infrastructure

Germany’s preparation



Total **EV** Charging Points in Germany (2010-2024): 535,755

500K

Charging Infrastructure

Europe’s adoption

 # Total EV Charging Points in Europe (2010-2024): 3,495,361

3.4M

Charging Infrastructure

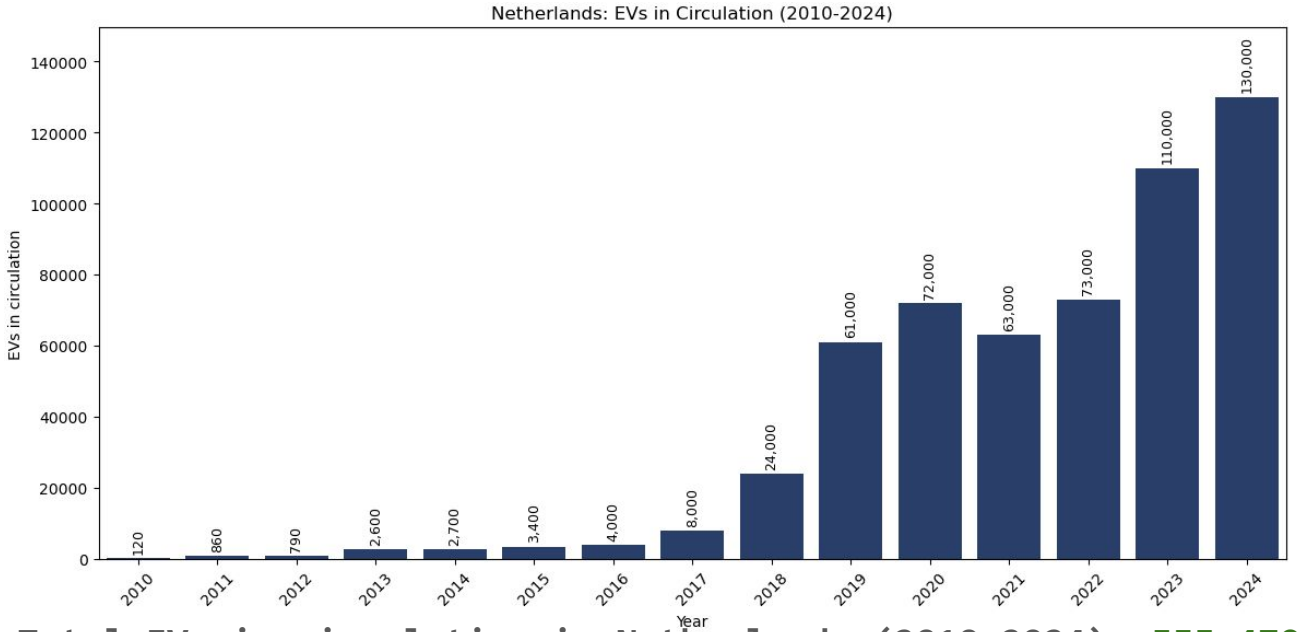
Netherlands' trend over the years

 # Total EV Charging Points in Netherlands (2010-2024): 796,312

796K

EV Growth Over Time

Netherland’s trend over the years

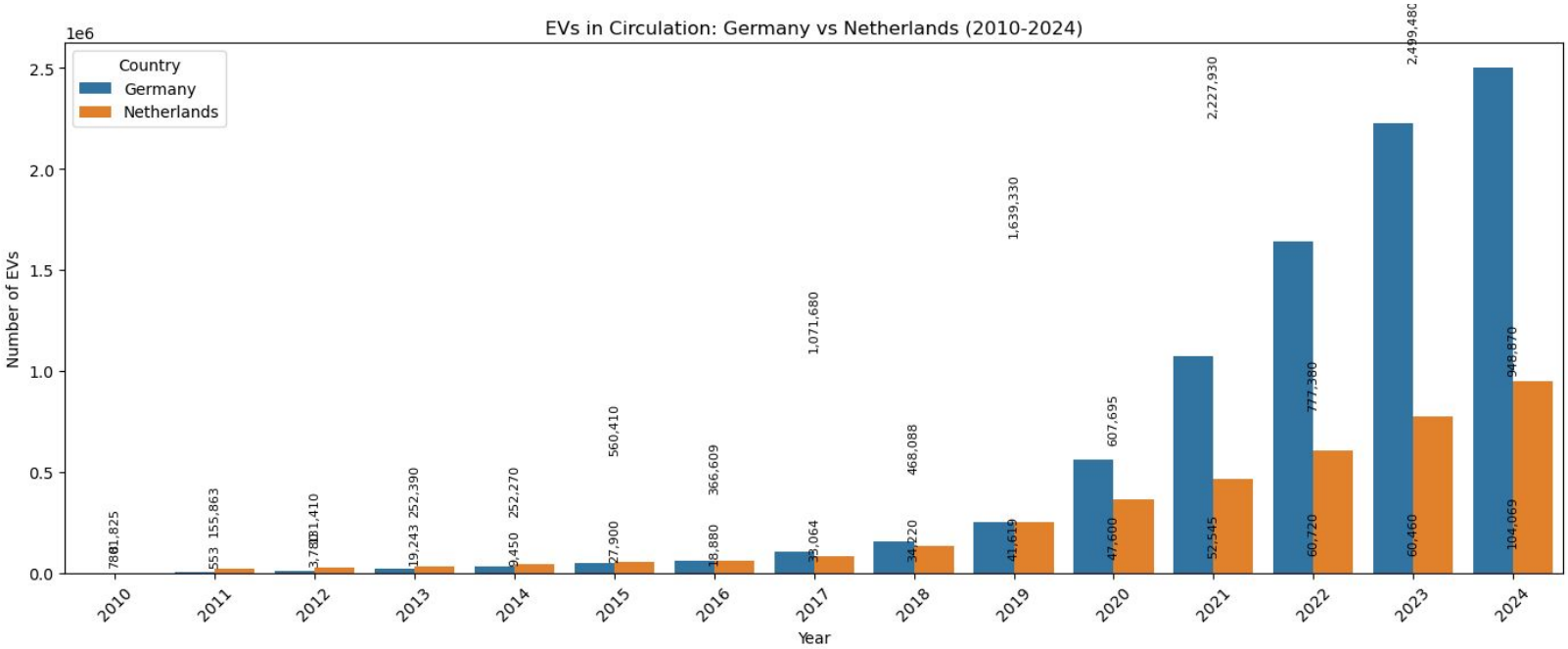


 # Total EVs in circulation in Netherlands (2010-2024): 555,470

500K

Acquisition and Preparation

Comparing the Front-Runners



 # Total EVs in circulation in Germany (2010-2024): 2,085,040

 # Total EVs in circulation in Netherlands (2010-2024): 555,470

Acquisition and Preparation

Charging Points installation

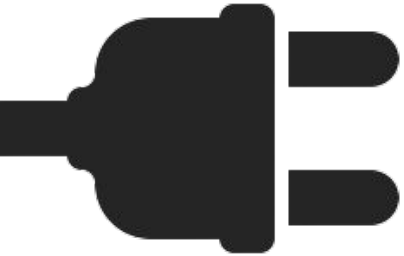
 # Total EV Charging Points in Netherlands (2010-2024): 796,312

 # Total EV Charging Points in Germany (2010-2024): 535,755

Environmental Impact

Let’s put into perspective…

 # Total oil displacement (2010-2024): 79,219 million lge



Represents **79.2 million liters of gasoline** not burned

Equivalent to **annual fuel consumption** of roughly **158 million conventional cars**

Environmental Impact

Let’s put into perspective…

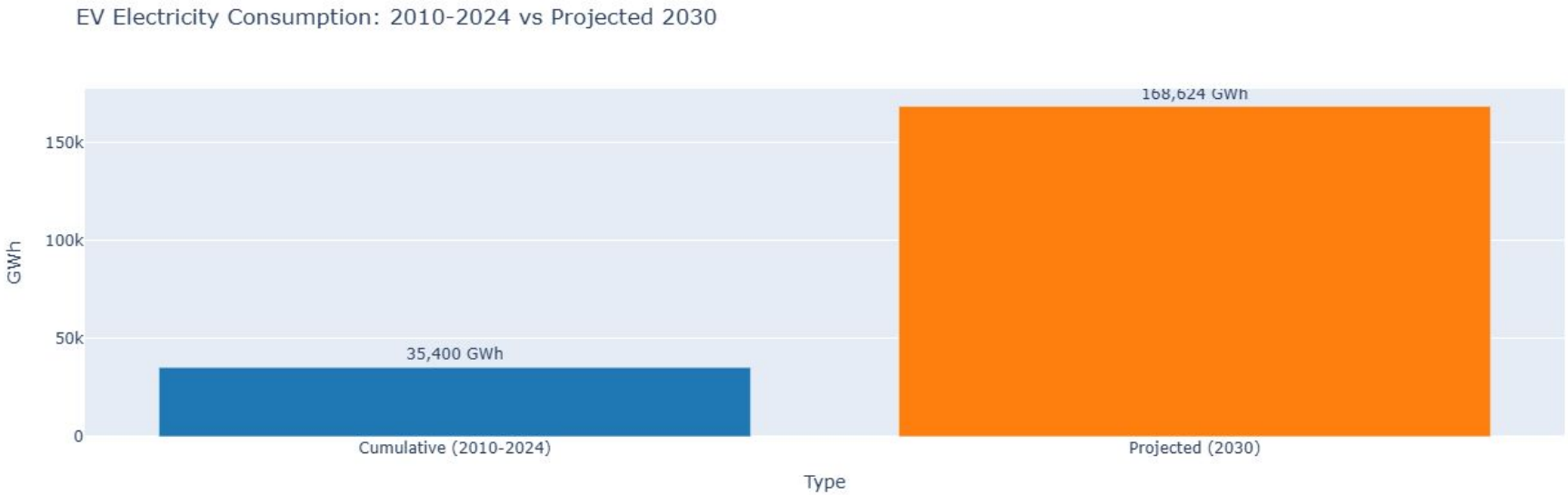
 # Total GWh consumed by EVs in Europe (2010-2024): 35,400 GWh

14 years worth of GWh consumption

Annual electricity usage for **10M** households

Environmental Impact

Let's put into perspective...



Projected EV electricity demand (2025–2030):**168,624 GWh**

Environmental Impact

Let's put into perspective...

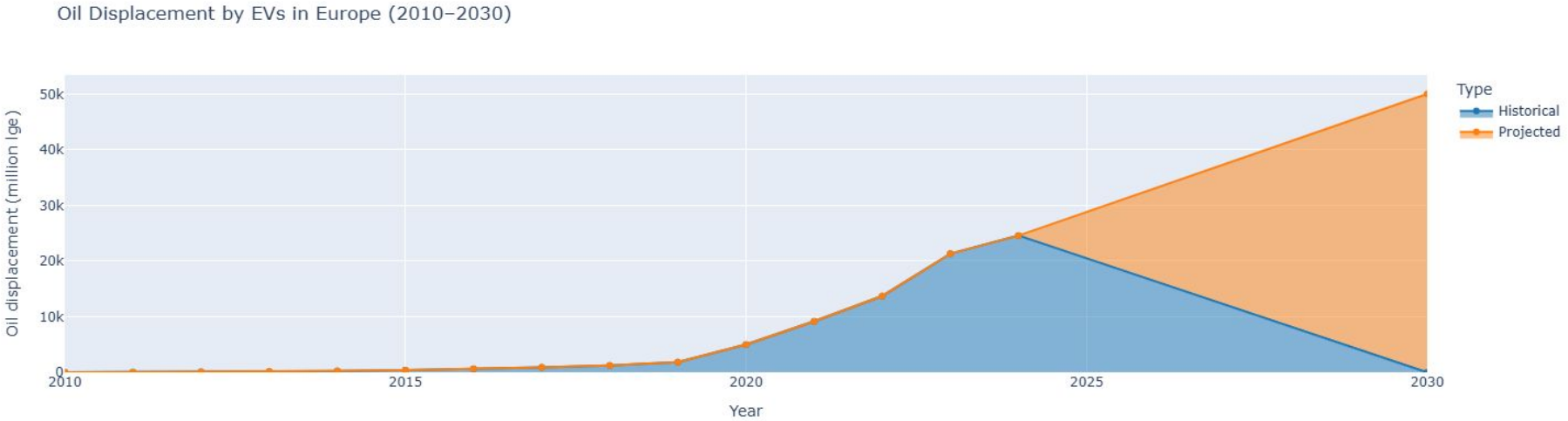
 # Projected EV electricity demand (2025–2030):168,624 GWh

Projected demand **168,624 GWh**
until the year **2030**

Annual electricity usage for **42 - 48 million**
European households

Environmental Impact

Let's put into perspective...

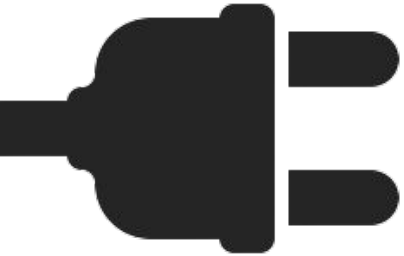


Total projected displacement (2025–2030): **86,9 billion lge**

Environmental Impact

Let’s put into perspective...

 # Total projected displacement (2025–2030): 86,9 billion lge



Represents **86.9 billion** liters of gasoline not burned.

546.5 million barrels of oil avoided.

Key Insights

Wrapping up

- **Germany leads in EV adoption,** registering the highest growth in EV adoption.
  In contrast, the **Netherlands** invested in infrastructure, creating one of the largest networks.

  This shows us two different national strategies: ***acquisition*** *vs* ***preparation****.*

Key Insights

Wrapping up

- Electric Vehicles **reduce oil dependency**, **but shift the demand to electricity.**

While EVs drastically reduce oil displacement—**saving millions of barrels per year**—they demand a **massive amount of electrical** energy to operate

Key Insights

Wrapping up

- **Grid innovation vs Car acquisition**

  As EV adoption increases, European countries must address how to generate, store, and distribute clean energy at scale—**without shifting the environmental burden elsewhere**.

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