

Electric vehicles and energy generation statistics

Statistics Explained

Data extracted in March 2023.

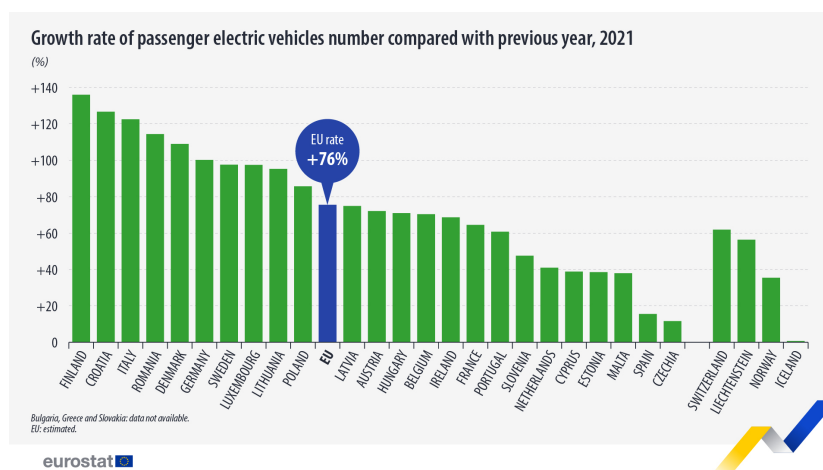
Planned article update: June 2024.

" Germany had the largest fleet of passenger electric vehicles (618 460 vehicles in 2021) in the EU in 2021."

" Norway has the largest share of electric vehicles in the total number of passenger cars (15.5% in 2021)."

" In 2021, the electricity used to charge electric cars from solar photovoltaics was highest in Malta (11.6 %)."

" In 2021, the electricity used to charge electric cars from wind turbines was highest in Denmark (48.6 %)."



This article sheds light on electricity generation and transport for electric [passenger cars](#), registered in EU member states. It covers the [European Union \(EU\)](#) and when available, the [EFTA countries](#) Iceland, Liechtenstein, Norway and Switzerland. Transport is one area where electricity consumption will increase considerably in the future. The first part of the article describes passenger electric trends at country level. The second part analyses electricity generation data and relates it to the e-vehicles consumption. Electricity generation mix is a good proxy of the energy source used for charging electric vehicles. However, electricity trade can affect this picture.

An electric vehicle charging was using electricity produced by the following sources (highest shares of each energy source in the EU, 2021 data):

- 11.6 % from solar photovoltaics in Malta
- 48.6 % from wind in Denmark
- 60.1 % from hydro in Austria
- 68.4 % from nuclear in France
- 71.1 % from solid fossil fuels in Poland

- 86.1 % from natural gas in Malta
- 84.9 % from oil and petroleum products in Cyprus

Transport sector data analysis

Total number of passenger electric vehicles (battery only) on the road

Figure 1 shows the total number of **passenger** electric vehicles (battery only) on the road per country. It is highest in Germany (618 460), France (402 669) and the Netherlands (245 091), as well as Norway (465 410). Data are not available for Greece and Slovakia.

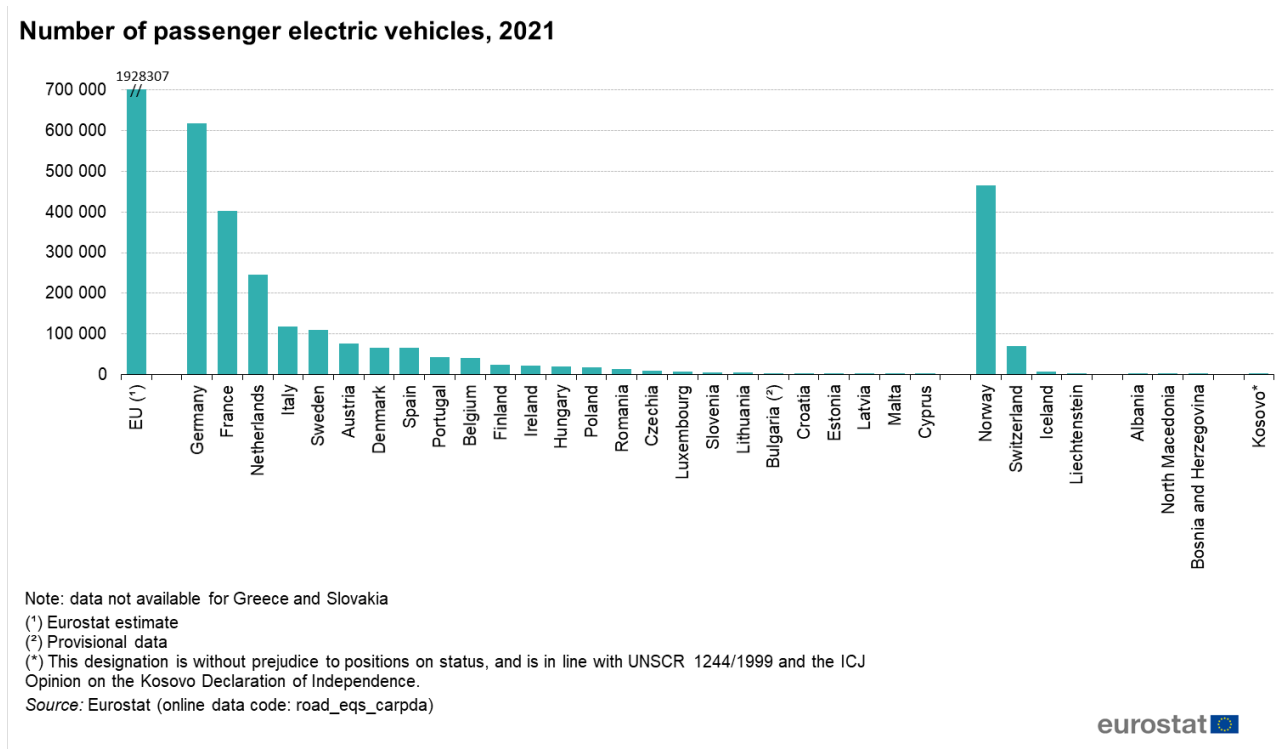
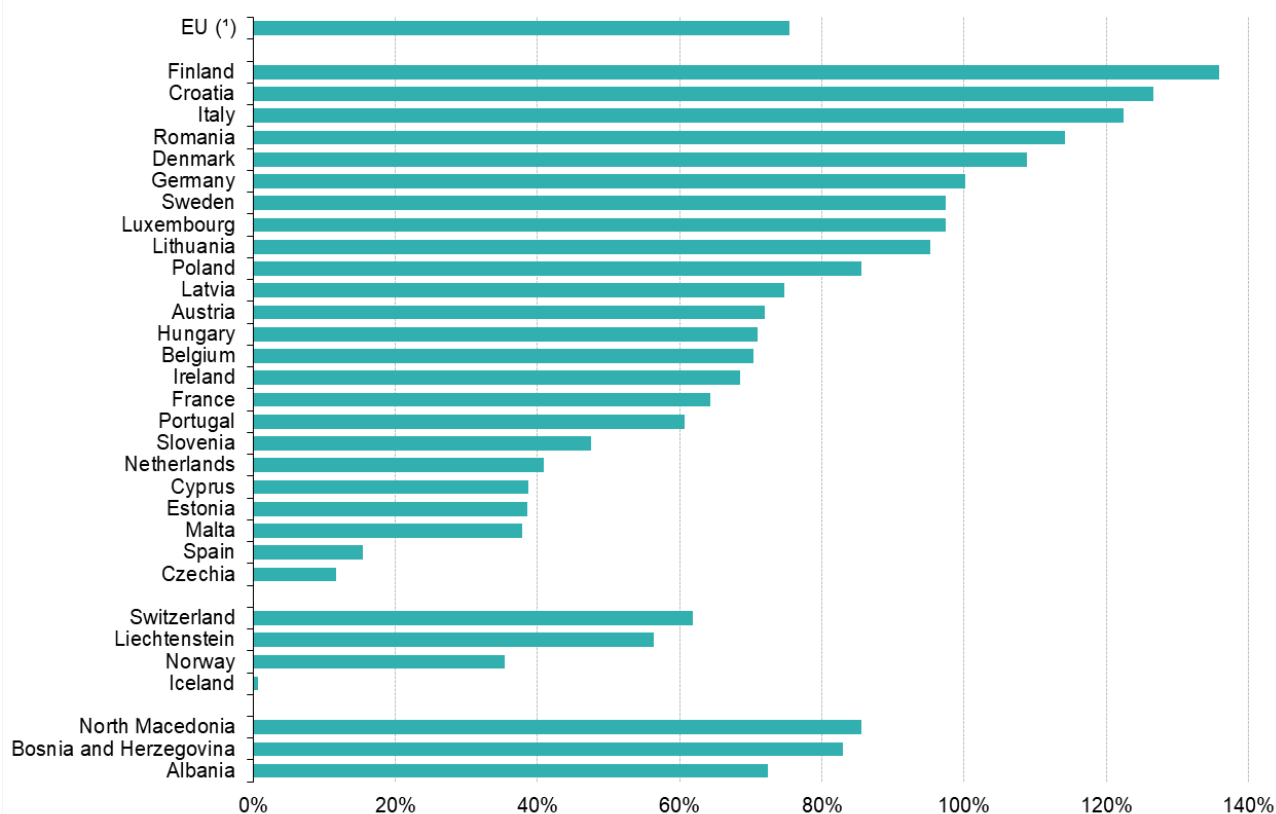


Figure 1: Number of passenger electric vehicles, 2021 (%) Source: Eurostat (road_eqs_carpda)

Growth rate of electric vehicles number compared with previous year

Figure 2 presents the growth rate of electric vehicles. In 2021 compared with 2020, the number of passenger electric vehicles has substantially increased. The largest increases were seen in Finland (135.9 %), Croatia (126.6 %) and Italy (122.4 %). Despite the fact that electric vehicles penetration is still comparatively low, their growth rate is evolving dynamically.

Growth rate of passenger electric vehicles number compared with previous year, 2021



Note: data not available for Bulgaria, Greece and Slovakia

(*) Eurostat estimate

Source: Eurostat (online data code: road_eqs_carpda)

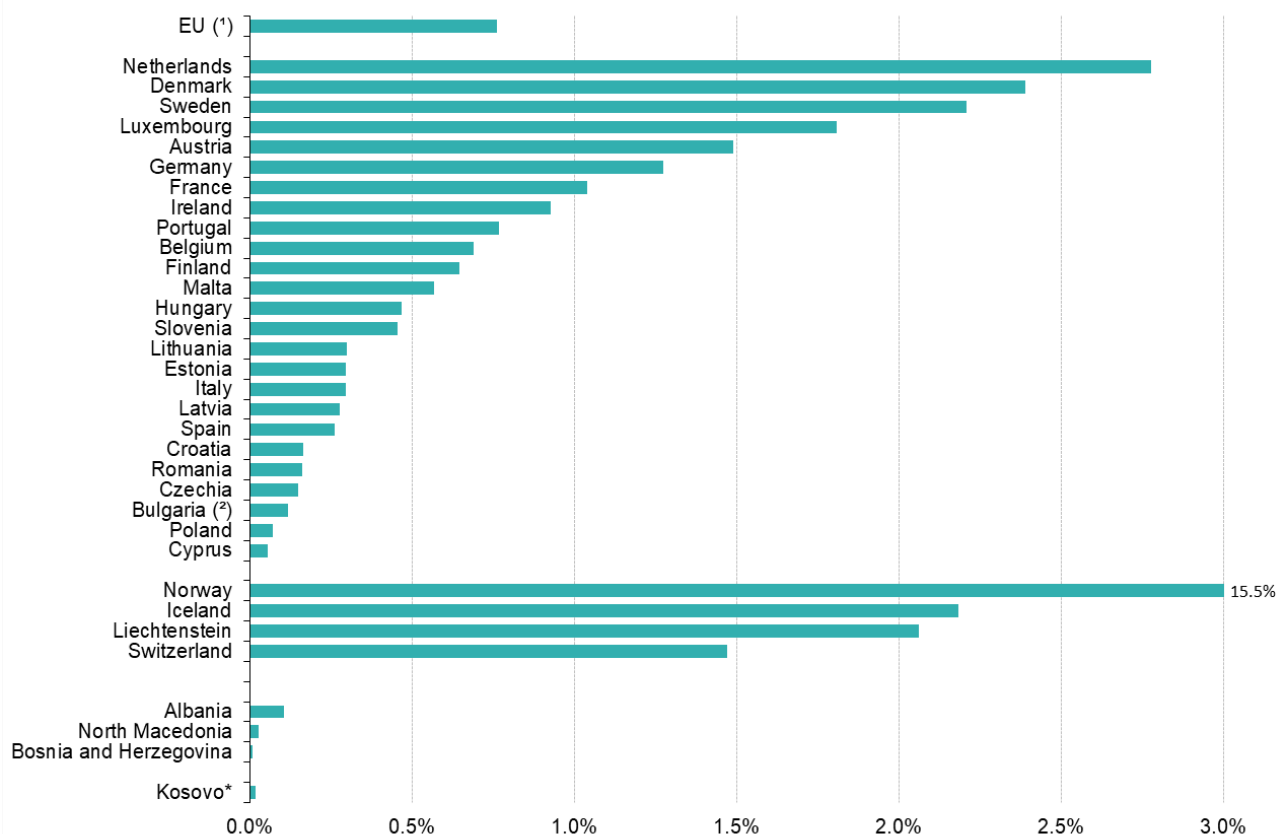
eurostat 

Figure 2: Growth rate of passenger electric vehicles number compared with previous year, 2021 (%) Source: (road_eqs_carpda)

Share of electric vehicles in the total number of passenger vehicles

Figure 3 presents the share of electric vehicles in the [passenger cars](#) fleet per country. In 2021, the EFTA country Norway, with a strong policy for electric vehicles, stands out with 15.5 %. In the EU, the Netherlands and Denmark had the largest shares with 2.8 %, and 2.4 % respectively. However, the absolute numbers remain very low for virtually all countries.

Share of electric vehicles in the total number of passenger cars, 2021



Note: data not available for Bulgaria, Greece and Slovakia

(*) Eurostat estimate

(?) Provisional data

(*) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: road_eqs_carpda)

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Figure 3: Share of electric vehicles in the total number of passenger cars, 2021 (%) Source: (road_eqs_carpda)

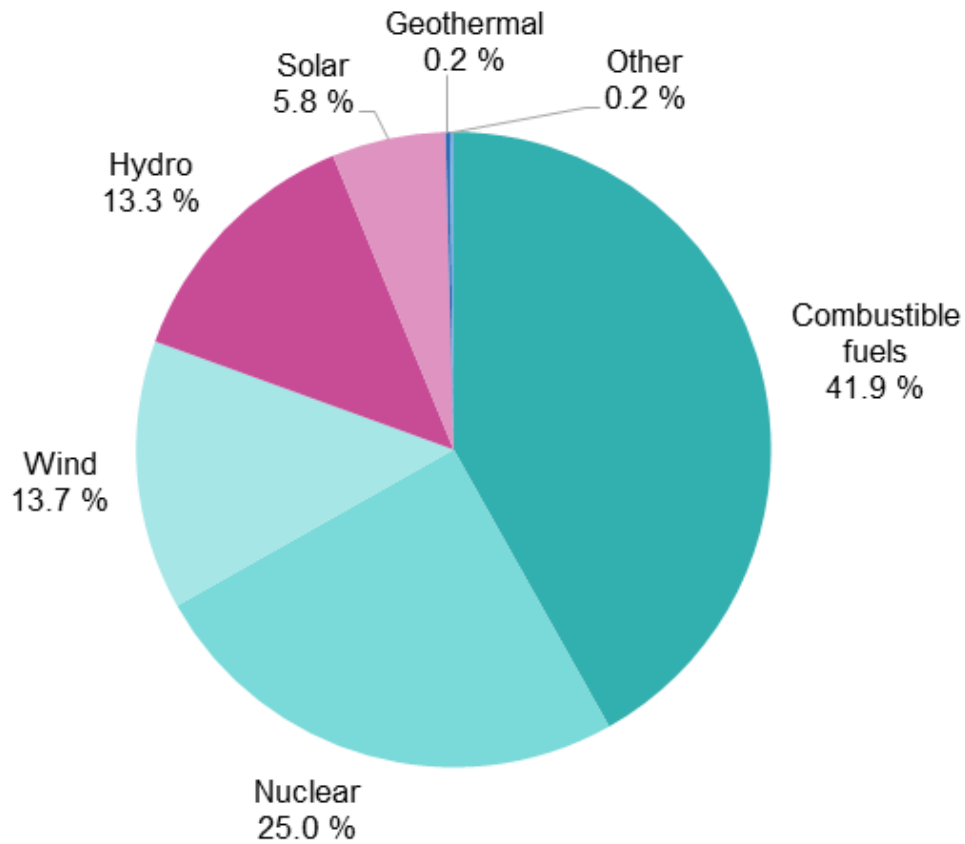
Electricity sector analysis

Gross electricity production

To assess how clean electric vehicles actually are, it is useful to look more closely at how electricity is generated in the EU in general. This can then be used as a proxy for where the electricity for charging vehicles comes from. At EU level in 2021 (Figure 4), combustible fuels accounted for 41.9 % of the total gross electricity production, wind, hydro, solar and geothermal production together corresponded to 33 %, whereas nuclear energy contributed with 25 %. In several countries, electricity is produced from renewables but in other cases, coal, lignite, natural gas or oil are the main fuels. For example in Iceland, Norway and Sweden, less than 2% of the electricity used to charge electric vehicles is generated from fossil fuels.

Gross electricity generation, EU, 2021

(%, based on GWh)



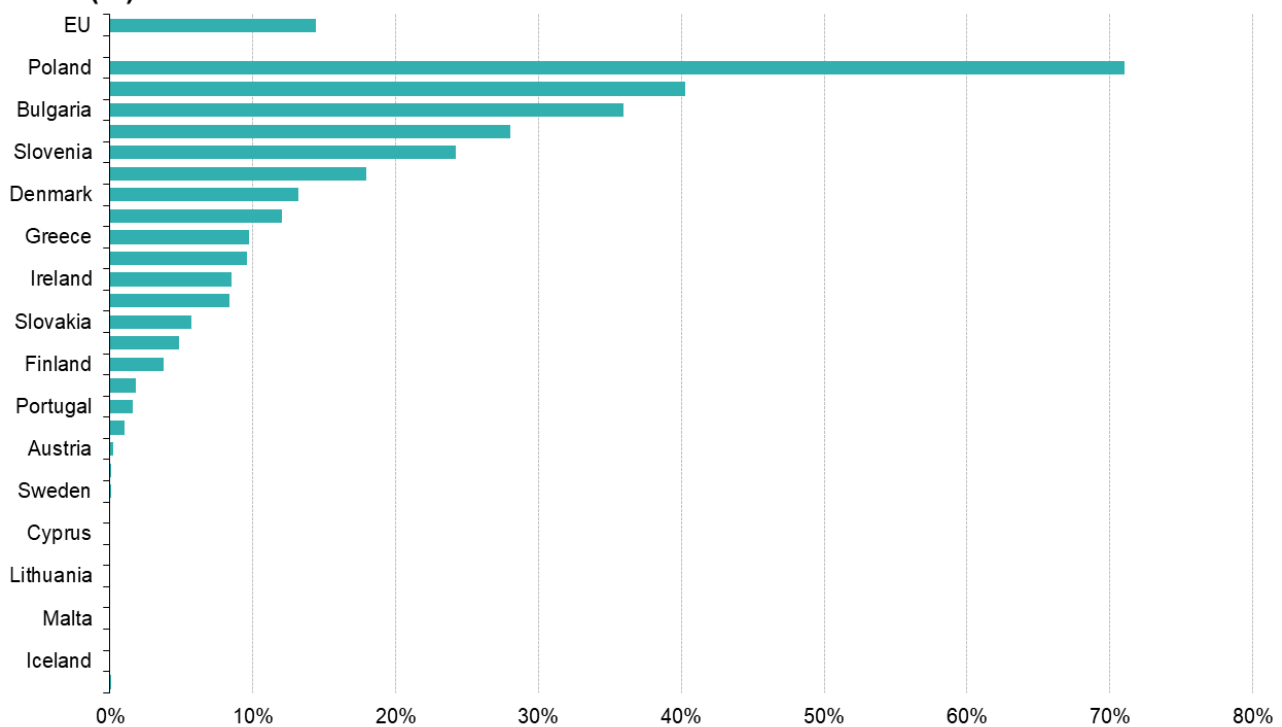
Source: Eurostat (online data code: nrg_ind_peh)



Figure 4: Gross electricity generation, 2021 (%) Source: Eurostat (nrg_bal_peh)

Looking into combustible fuels in detail, Figure 5 shows the percentage of gross electricity production from solid fossil fuels in 2021. Poland (71.1%), Czechia (40.2%) and Bulgaria (35.9%) have the highest percentage of gross electricity production from fossil fuels. Gross electricity production from solid fossil fuels in Sweden, Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, as well as Iceland and Norway is zero or negligible.

Percentage of gross electricity production from solid fossil fuels, 2021 (%)



Note: Gross electricity production from solid fossil fuels in Sweden, Estonia, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Iceland and Norway is zero or negligible.

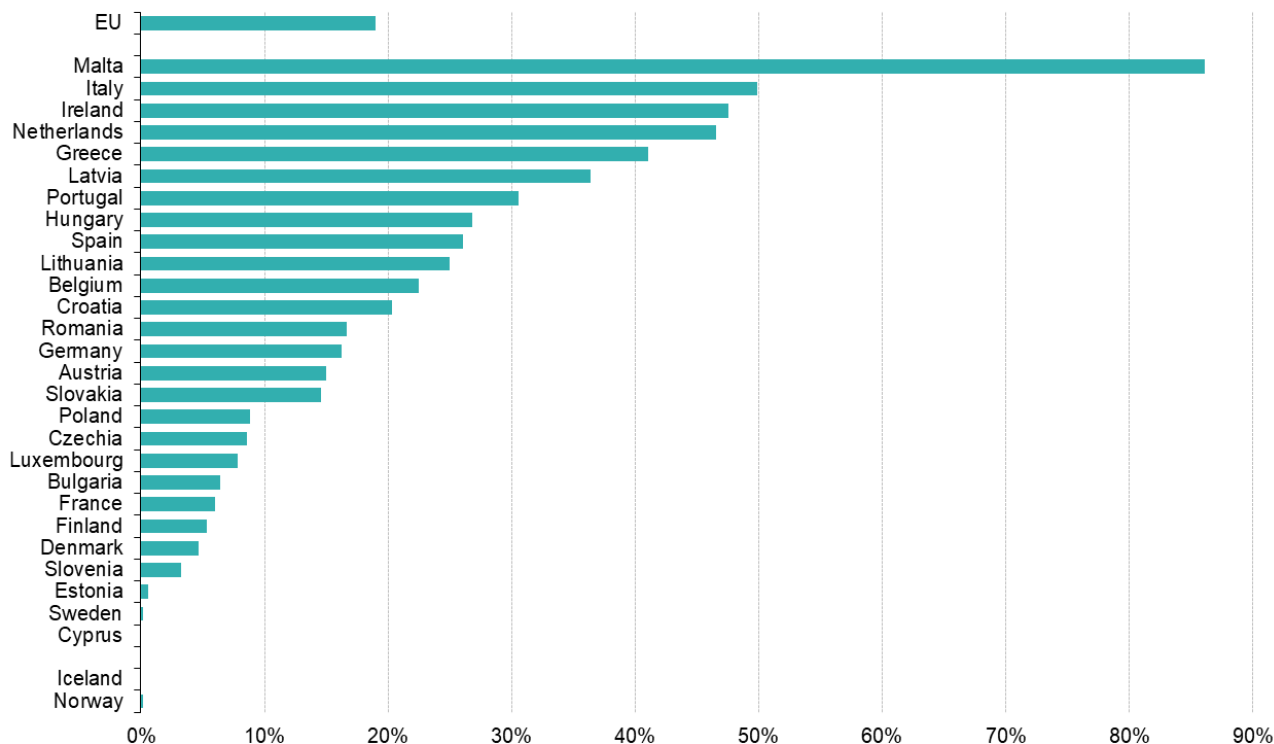
Source: Eurostat (online data codes: nrg_bal_peh)

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Figure 5: Percentage of gross electricity production from solid fossil fuels, 2021 (%) Source: Eurostat (nrg_bal_peh)

Figure 6 depicts the percentage of gross electricity production from natural gas. In the EU for 2021, the share of gross electricity production from natural gas is 19 %. Malta with 86.1 %, Italy (49.9 %), Ireland (47.6 %) and the Netherlands (46.6 %) each produce more than 45 % of their gross electricity from natural gas. Gross electricity production from natural gas in Cyprus, Sweden and Iceland is zero or negligible.

Percentage of gross electricity production from natural gas, 2021 (%)



Note: Gross electricity production from natural gas in Cyprus, Sweden and Iceland is zero or negligible.

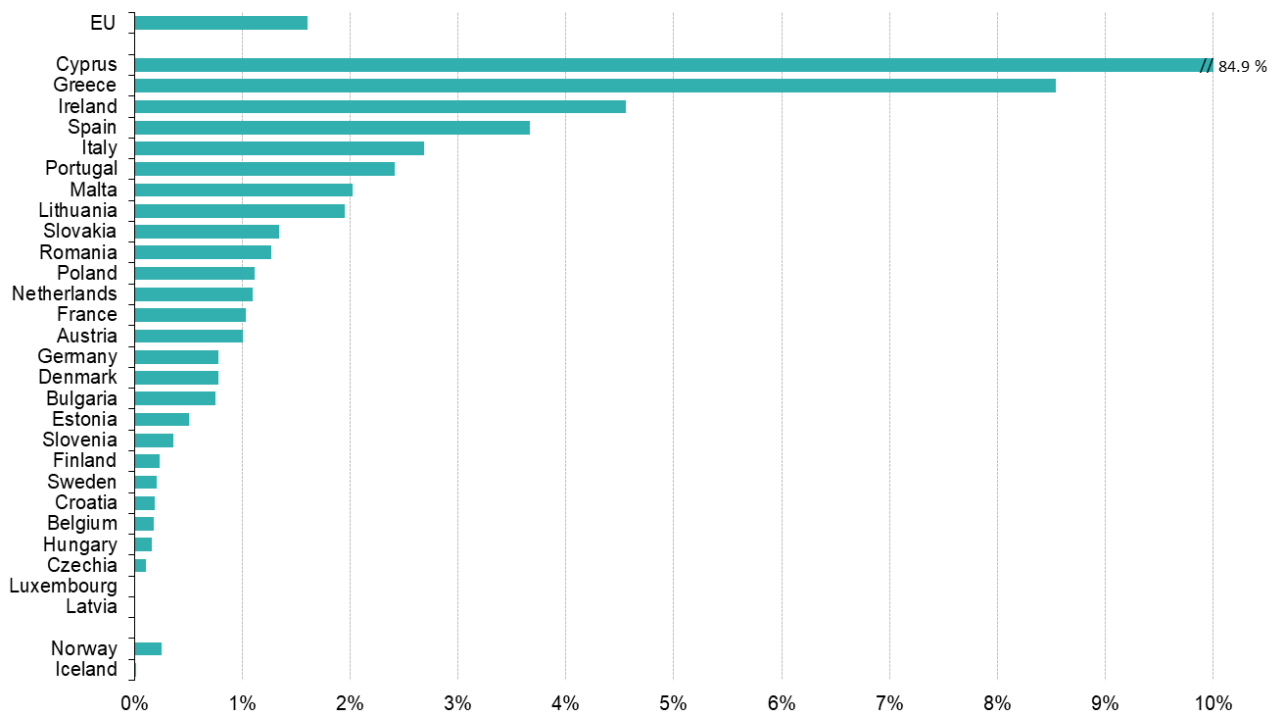
Source: Eurostat (online data codes: nrg_bal_peh)

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Figure 6: Percentage of gross electricity production from natural gas, 2021 (%) Source: Eurostat (nrg_bal_peh)

Figure 7 shows the percentage of gross electricity production from oil and petroleum products in 2021. EU countries typically produce a low or negligible percentage of gross electricity from oil and petroleum products. An exception to this is Cyprus, where 84.9 % of gross electricity production comes from oil and petroleum products, as well as to some extent Greece, where this figure stands at 8.5 %. However, this is slowly changing, as the rise in renewables is reducing the need for their use in electricity production.

Percentage of gross electricity production from oil and petroleum products, 2021 (%)



Note: Gross electricity production from oil or petroleum products in Latvia, Luxembourg and Iceland is zero or negligible.

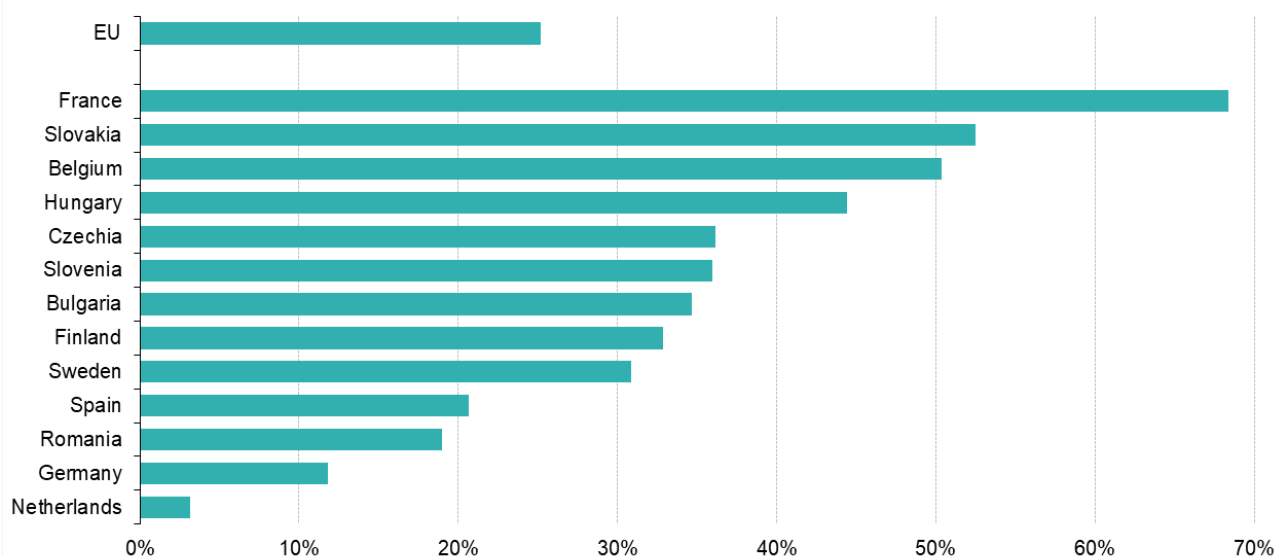
Source: Eurostat (online data codes: nrg_bal_peh)

eurostat 

Figure 7: Percentage of gross electricity production from oil and petroleum products, 2021 (%) Source: Eurostat (nrg_bal_peh)

Figure 8 presents the share of nuclear heat in the gross electricity production in 2021. The 13 countries that use nuclear energy in their mix are France, Slovakia, Hungary, Belgium, Bulgaria, Sweden, Slovenia, Czechia, Finland, Spain, Romania, Germany and Netherlands. The highest percentage in 2021 was recorded in France, which produced 68.4 % of its gross electricity using nuclear heat, while the Netherlands, with 3.1 %, had the lowest share of nuclear electricity among the 13 producing countries.

Percentage of gross electricity production from nuclear heat, 2021 (%)



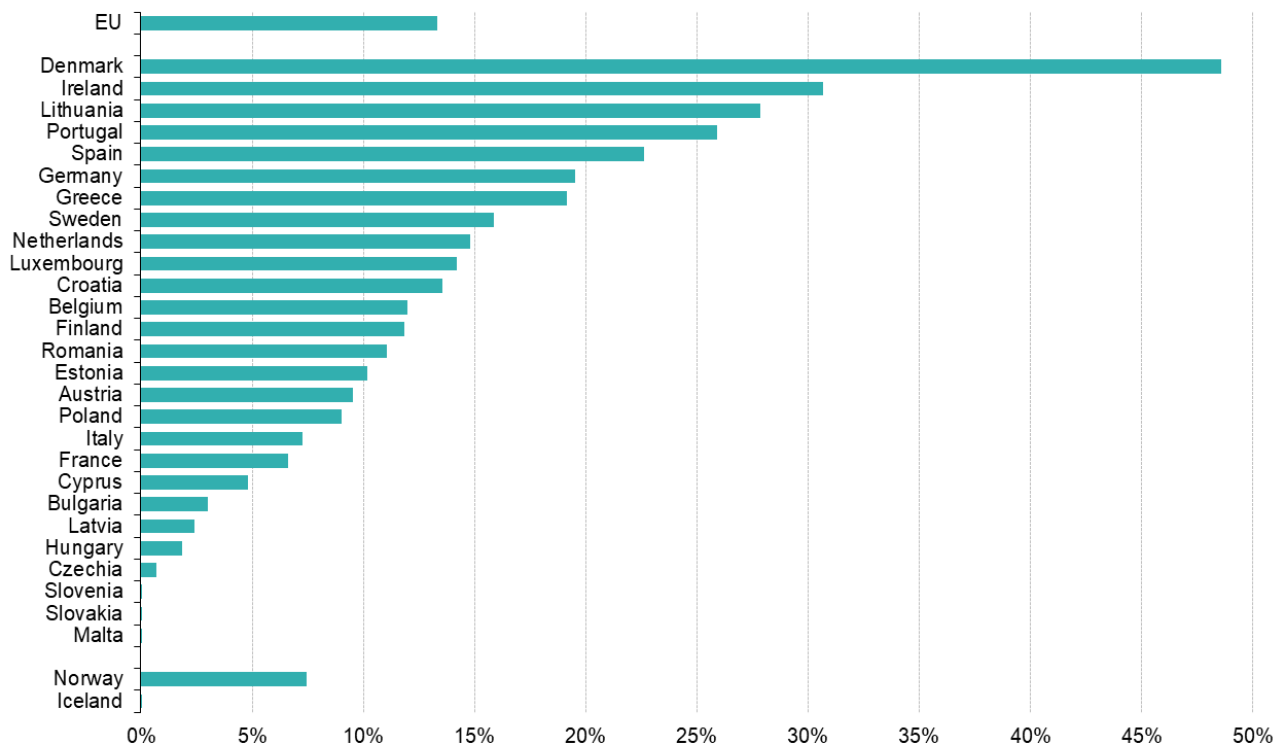
Source: Eurostat (online data codes: nrg_bal_peh)

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Figure 8: Percentage of gross electricity production from nuclear heat, 2021 (%) Source: Eurostat (nrg_bal_peh)

Looking at the renewables, the share of electricity produced from wind in the total gross electricity were highest in Denmark (48.6 %), Ireland (30.7 %) and Lithuania (27.9 %) in 2021. By contrast, gross electricity production from wind in Slovenia, Slovakia, Malta and Iceland was zero or negligible.

Percentage of gross electricity production from wind, 2021 (%)



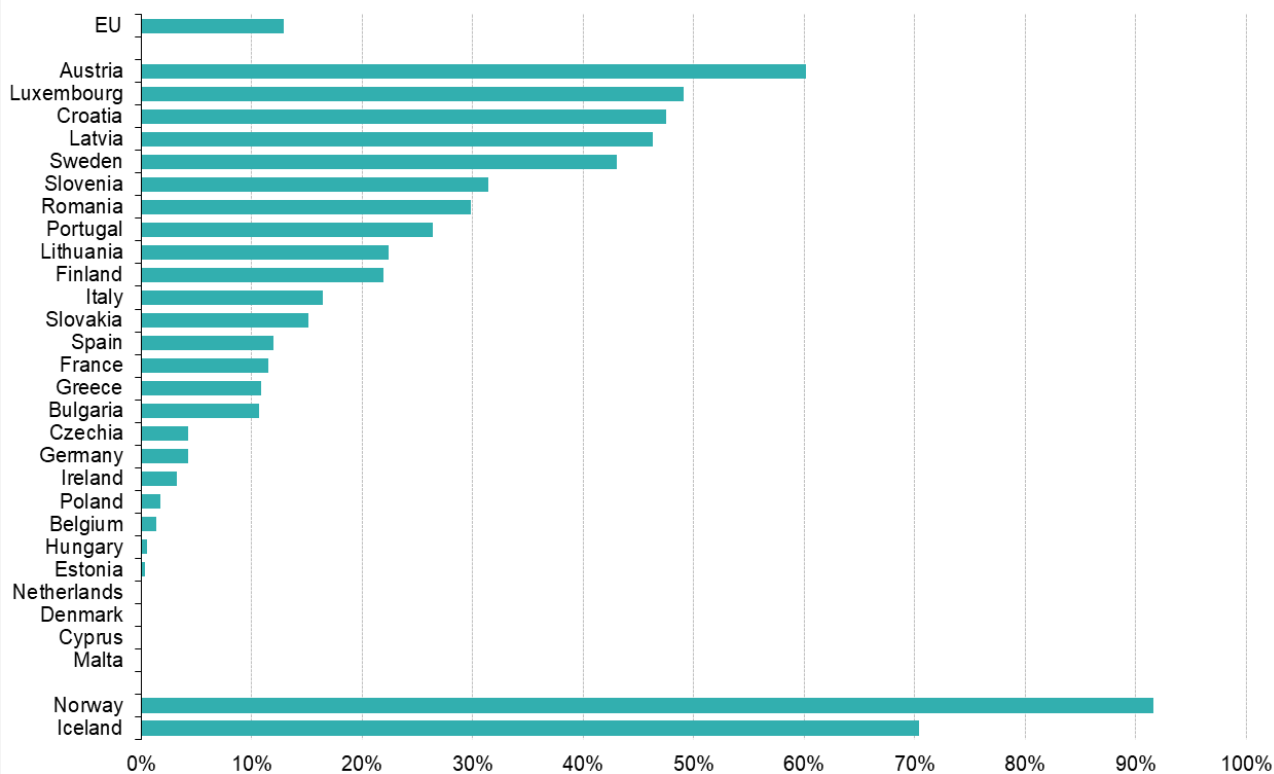
Note: Gross electricity production from wind in Slovenia, Slovakia, Malta and Iceland is zero or negligible.
 Source: Eurostat (online data codes: nrg_bal_peh)



Figure 9: Percentage of gross electricity production from wind, 2021 (EUR per kWh) Source: Eurostat (nrg_bal_peh)

Figure 10 shows the percentage of hydro in gross electricity production in 2021. Austria (60.1 %), Luxembourg (49.1 %) and Croatia (47.5 %) had the highest percentages. Gross electricity production from hydro in the Netherlands, Denmark, Cyprus and Malta is zero or negligible.

Percentage of gross electricity production from hydro, 2021 (%)



Note: Gross electricity production from hydro in Netherlands, Denmark, Cyprus and Malta is zero or negligible.

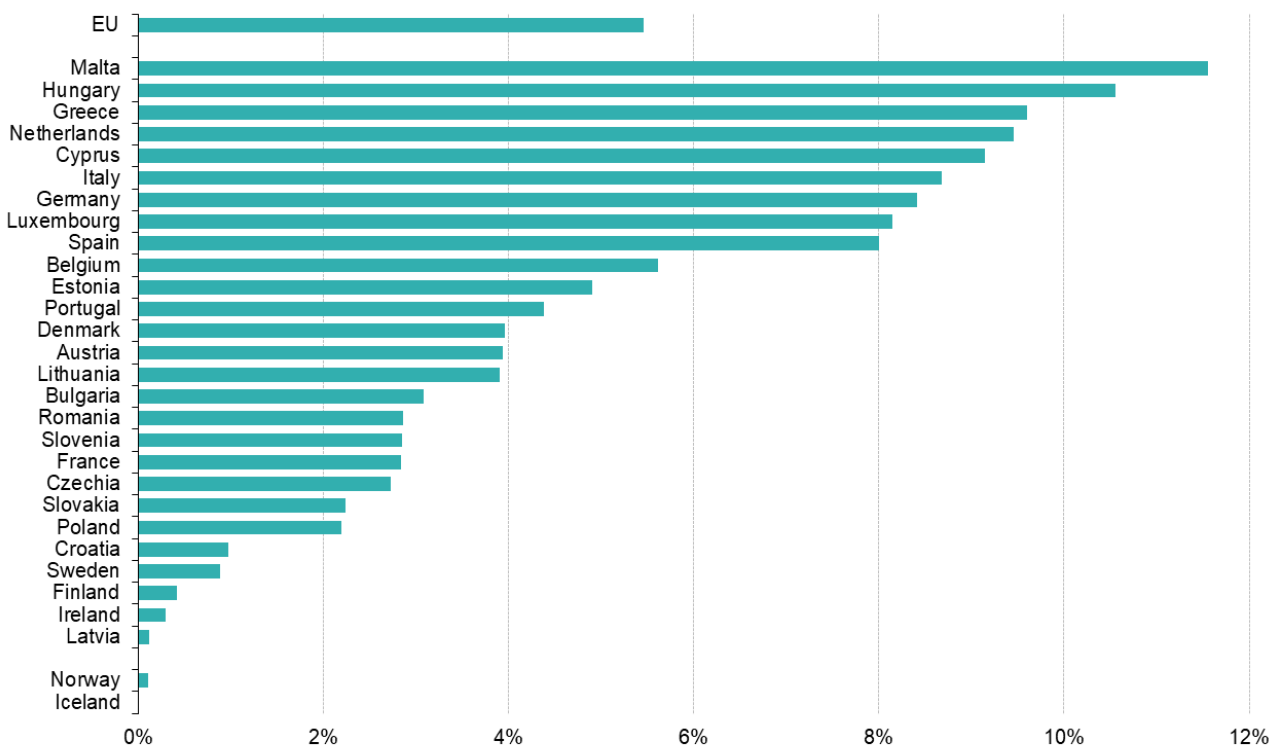
Source: Eurostat (online data codes: nrg_bal_peh)



Figure 10: Percentage of gross electricity production from hydro, 2021 (EUR per kWh) Source: Eurostat (nrg_bal_peh)

Figure 11 shows the percentage of solar photovoltaics in gross electricity production in 2021. Malta (11.6 %), Hungary (10.6 %) and Greece (9.6 %) had the highest percentages. The lowest were observed in Latvia (0.1 %), Ireland (0.3 %) and Finland (0.4 %). Gross electricity production from solar photovoltaics in Iceland is zero.

Percentage of gross electricity production from solar photovoltaics, 2021 (%)



Note: Gross electricity production from solar photovoltaics in Iceland is zero.

Source: Eurostat (online data codes: nrg_bal_peh)

eurostat

Figure 11: Percentage of gross electricity production from solar photovoltaics, 2021 (EUR per kWh) Source: Eurostat (nrg_bal_peh)

Electricity consumption in road transport

When referring to electricity consumption in road transport, the electricity used for charging electric vehicles is included, as well as the electricity consumed by electric trolley buses. Data and methodology are under development. In absolute terms for 2021, the highest consumption is in the EFTA country Norway, where 1 523 GWh are mostly used for charging electric vehicles. Among the EU Member States, Sweden and Germany had the highest consumption, at 1 433 GWh and 1 386 GWh respectively, mostly for electric vehicles charging.

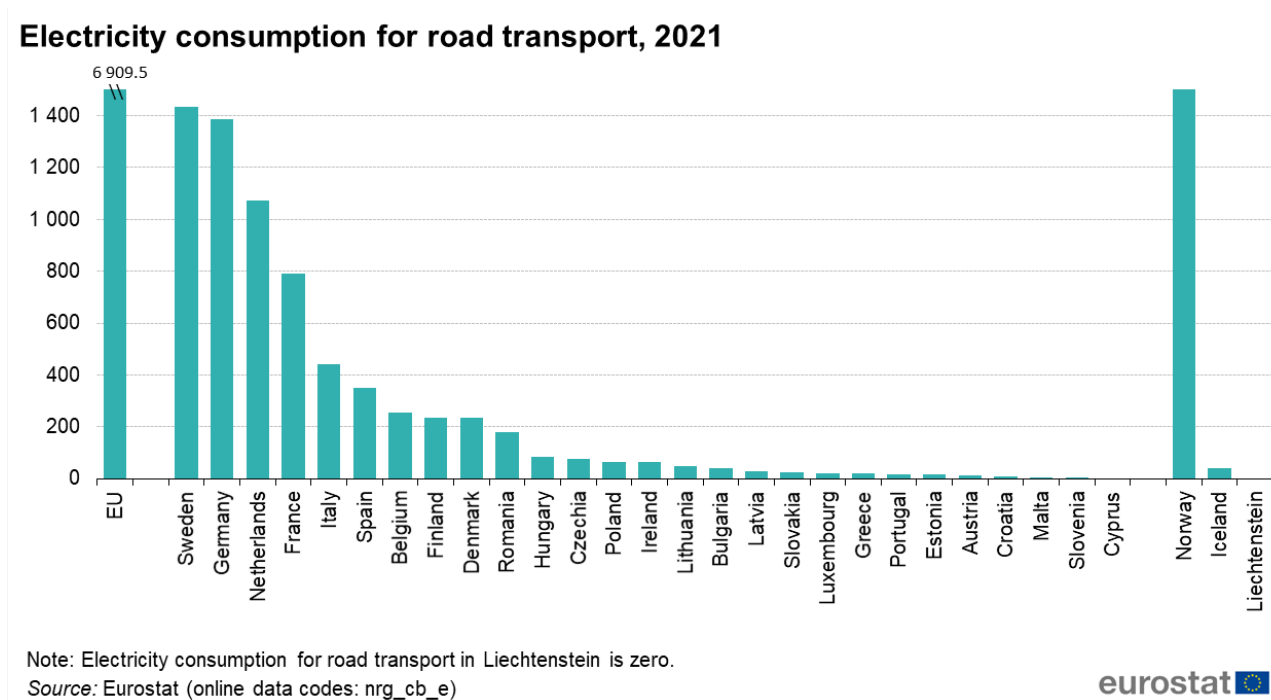


Figure 12: Electricity consumption for road transport, 2021 (GWh) Source: Eurostat (nrg_cb_e)

Source data for tables and graphs

- [Electric vehicles and electricity consumption statistics tables and graphs](#)

Context

In 2016, the European Commission presented the European Strategy for Low-Emission Mobility [COM2016\(501\) final](#). The Commission identified low-emission mobility as an essential component of the broader shift to the low-carbon, circular economy needed Europe to stay competitive and be able to cater to the people and goods mobility needs.

The [Fit for 55](#) legislative proposals cover a wide range of policy areas including climate, energy, transport and taxation, setting out the ways in which the Commission will reach its updated 2030 target in real terms.

[REPowerEU Plan](#) looks into accelerating the transition towards zero-emission vehicles. The Commission considers a legislative initiative to increase the share of zero emission vehicles in public and corporate car fleets above a certain size. The EU Save Energy Communication also includes many recommendations to cities, regions and national authorities that can effectively contribute to the substitution of fossil fuels in the transport sector. In 2023, Commission recommendations on how to exploit the potential of [Energy storage](#) gives emphasis to the potential of electric vehicles for energy storage.

Other articles

- [Energy production and imports](#)

Main tables

- [Energy - selected datasets \(t_nrg\)](#), see

Energy statistics - main indicators (t_nrg_indic)

Database

- [Energy - detailed datasets \(nrg\)](#) , see:

Energy statistics - quantities (nrg_quant)

Dedicated section

- [Energy](#)

Methodology

- [Energy statistics - quantities \(nrg_quant\)](#) (ESMS metadata file — nrg_quant_esms)

Visualisations

- [Energy visualisation](#)

External links

- [Eurelectric](#)
- [European Commission](#)

- [Directorate-General for Mobility and Transport - Electric Vehicles](#)