



ODYSSEE-MURE

ODYSSEE-MURE Fit4-55 (2022-2025)
Monitoring the Energy Efficiency Pillar for Climate Neutrality

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Round table on electric vehicles

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Electric vehicles are a key component of the transition in the transport sector

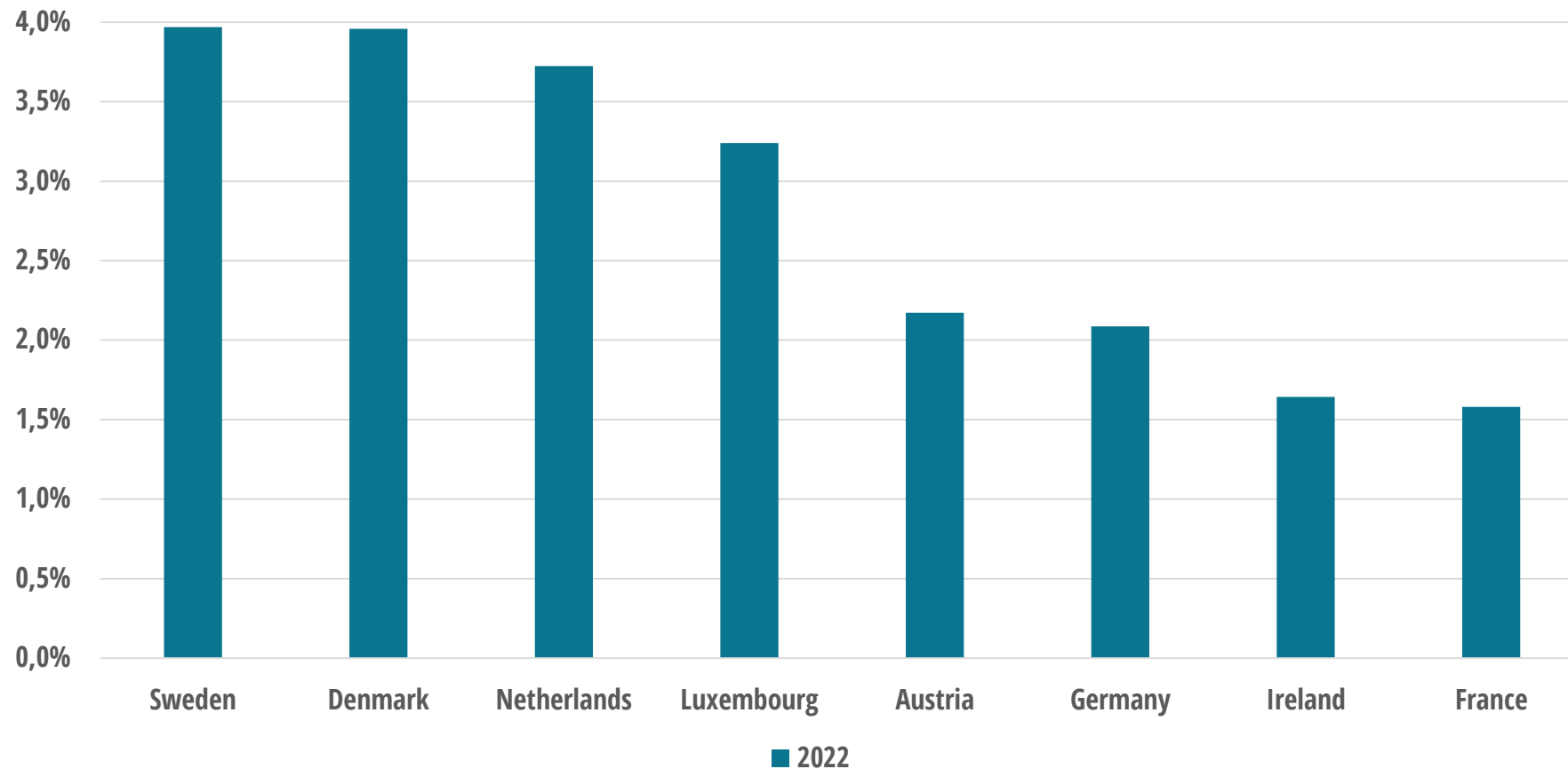
- To monitor this transition two components are necessary:
 - Have up to date data on the stock of electric vehicles, which includes two types of vehicles:
 - BEV, Battery Electric Vehicles and
 - PHEV, Plug In Electric Vehicles .
 - Have data on their electricity consumption

Data on the stock of electric vehicles

- Data are collected by ODYSSEE, but are imperfectly updated
 - Some countries did not provide the data (e.g. ES, SK)
 - 21 countries did not provide data for 2022 last year, whereas such data were readily available
 - Eurostat has data on electric vehicles, which are quite complete for BEV but incomplete for PHEV (only 14 countries), and well updated to 2022 (26 countries for BEV up to 2022).
 - Comparison ODYSSEE- Eurostat:
 - BEV: for 4 countries (DE,BG, LU, RO), there is a big gap (over 50%), for 3 other countries, there is a smaller gap (30% for FR and 10% for NL, CY)
 - PHEV: for 4 countries there is a big gap (>80%) (DE, PL,EE,AT,) et for 2 countries , there is a gap of 30% (LU, FR)
 - For Germany and France the difference comes from a different definition of the stock (end of year for Eurostat, mid-year for France and January for Germany)
- Some of the differences for PHEV may be due to a confusion between PHEV and full hybrids

Share of electric vehicles in 2022 in the stock of cars

- 8 countries with a share of electric vehicles over 2% of the stock in 2022, which is still low.
- Sweden and Denmark rank first for the penetration of electric vehicles, with a share of 50/50 between BEV and PHEV.
- In France and The Netherlands the share of BEV is higher (60%)

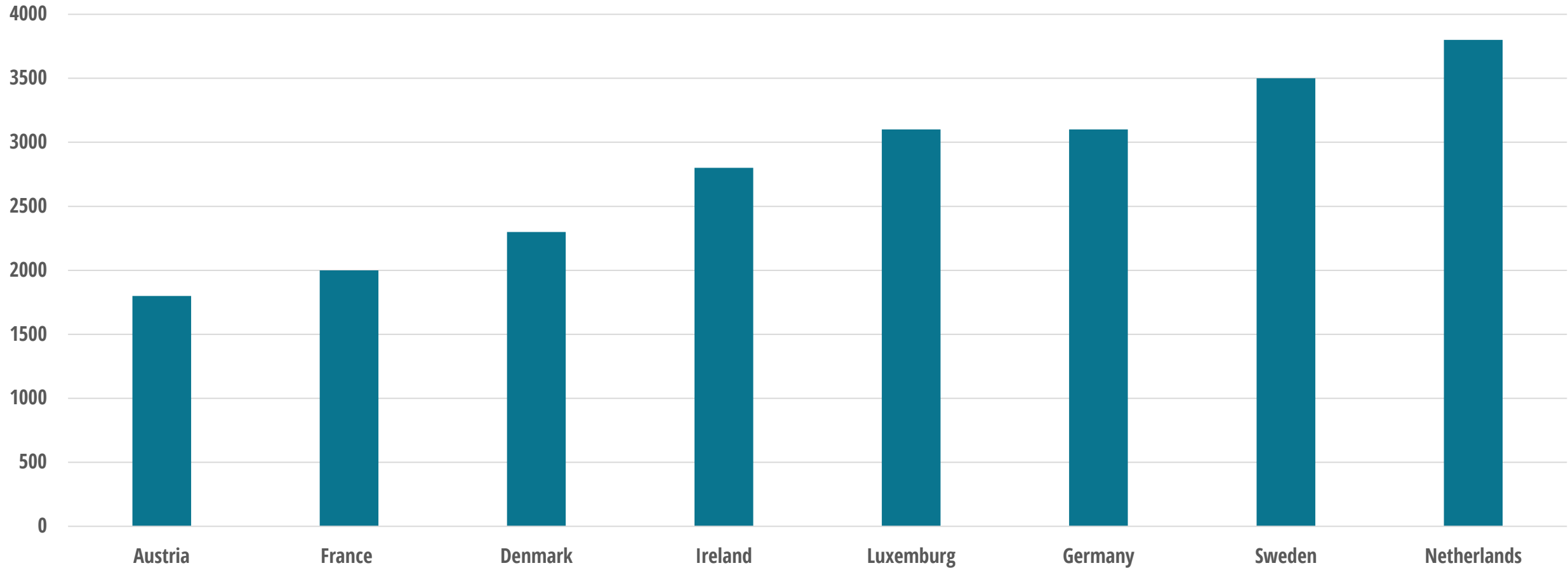


Data on electricity consumption of electric vehicles

- This consumption is reported by Eurostat under the electricity consumption of road transport.
- This information is difficult to collect as recharging takes place in different locations corresponding to different sectors:
 - **Households** if recharging at home
 - **Transport** if recharging in gas station
 - **Services** if recharging in public parking, hotels, offices buildings
- If not fully metered, the data need to be modeled to calculate the consumption for these different types of recharging and for removing from the sector's consumption to avoid double accounting.
- The idea of this round table was to see what were the methods used, focusing on the countries, with the highest penetration of EVs.

Average specific consumption of electric vehicles (kWh/year)

A rapid check of the **implicit average consumption of electric vehicles*** shows that their order of magnitude seems realistic, although with a large difference among countries (range of 2000 to 3500 kWh/year)



*Implicit specific consumption calculated as the average over 2019-2022 of the ratio consumption of road transport / number of electric

Cars

Questions addressed in the round table: participation from The Netherlands, Sweden and Luxembourg

- In your country is the consumption of all electric vehicles well included in transport, whatever the place of recharging ?
- If this is the case:
 - How this is done? (modeling, surveys, reporting...?);
 - What sources of data are used to estimate the specific consumption and pattern of use (km driven) of BEV and PHEV?
 - How is double accounting avoided (the electricity consumption of household for recharging at home should be removed from the electricity consumption of the residential sector ...)?

Evaluation of the consumption of electric vehicles: case of The Netherlands

- The total electricity consumption of cars is calculated by CBS team traffic and transport, based on registered number of cars by brand and type and average specific consumption by brand and type.
- The specific consumption of vehicles in MJ/km is provided by TNO on individual car (license plate) level. Such data come from petrol/charging station cards (tankpassen), as both the electricity charged and kilometers travelled are available for most vehicle types, and home charging is included in the data as well. For missing car models, WLTP** data are used with a factor of 1.18 to correct for real consumption***.
- These data are related to the stock of cars differentiated by type and the number of kilometers travelled on the vehicle level from RDW (the Netherlands Vehicle Authority).
- An estimate of the electricity charged at home comes from a survey by Elaad among owners of electric vehicles.
- Charging at work is seen as charging from public charging locations.
- To avoid double counting, the final electricity consumption of households is calculated by deducing from the electricity delivered from the grid the estimate of the consumption of vehicles charging vehicles at home.

*Contribution from Joost Gerdes of TNO, based on information provided by CBS, Statistics Netherlands.

**Worldwide Harmonised Light Vehicle Test Procedure

***Another option for missing vehicle data is to relate energy consumption and distance to vehicle

weight based on available vehicle data.

Evaluation of the consumption of electric vehicles: case of Sweden*

- The annual consumption of electric vehicles is estimated from data from the SNCT (National Society of Technical Control). The data are provided monthly and contain the number of km driven between two technical inspections and the theoretical specific consumption of vehicles.
- This data also indicates whether the owner is a private person or a legal person.
- There also exists statistics on the number and power of public or semi-public charging stations, and the electricity consumption from the charge terminals.
- In the energy balance, all consumption of resident electric vehicles is attributed to the transport sector. To avoid double counting, this amount is deducted from the consumption of households (if the vehicle belong to a private person) and services (if the vehicle belong to a legal entity).
- We do not know who charges on the charge terminals (private or legal persons, or even non-resident vehicles). It is therefore difficult to attribute this consumption. More complete information is needed: for example, Enovos, the electricity supplier, would be able to break down the consumption of charging stations according to private or legal entities (information requested at registration).

*Information provided by John Rasulov from STEM

Evaluation of the consumption of electric vehicles: case of Luxembourg*



- The annual consumption of electric vehicles is estimated from data from the SNCT (National Society of Technical Control). The data are provided monthly and contain the number of km driven between two technical inspections and the theoretical specific consumption of vehicles**.
- This data also indicates whether the owner is a private person or a legal person.
- There also exists statistics on the number and power of public or semi-public charging stations, and the electricity consumption from the charge terminals.
- In the energy balance, all consumption of resident electric vehicles is attributed to the transport sector. To avoid double counting, this amount is deducted from the consumption of households (if the vehicle belong to a private person) and services (if the vehicle belong to a legal entity)***.
- We do not know who charges on the charge terminals**** (private or legal persons, or even non-resident vehicles). It is therefore difficult to attribute this consumption. More complete information is needed: for example, Enovos, the electricity supplier, would be able to break down the consumption of charging stations according to private or legal entities (information requested at registration).

*Information provided by Yann Trausch from Klima Agence Luxembourg

**Technical data come from SNCA (National Society of Automobile Traffic). Missing specific consumption is estimated on the basis of the make and model of the vehicle.

*** Vehicles of private lease are listed under "legal entity".

****Network of public charging stations in Luxembourg