



ODYSSEE-MURE National Workshop Switzerland

*Energy efficiency indicators
for Transport*



**UNIVERSITÉ
DE GENÈVE**

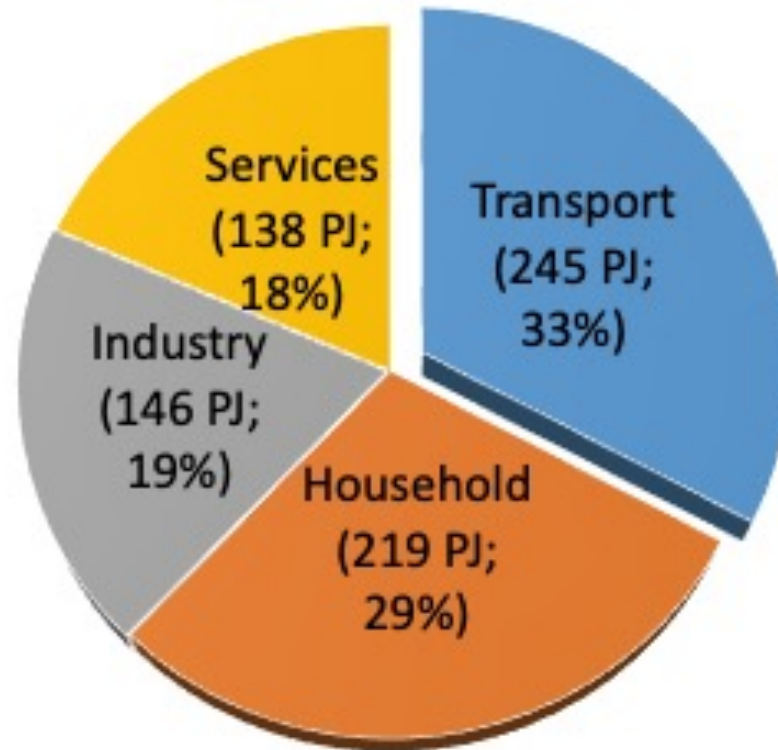
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19th November 2021

Outline

- ODEX
- Sector overview
- Trends for individual sub-sectors, transport modes, and end uses
- Cross country comparison
- Scoreboard rankings
- Conclusion

Transport sector



Share of end-use sectors within Switzerland TFE (SFOE, 2020)

Introduction: Transport ODEX

Transport ODEX:
Aggregated using energy shares

Unit consumption indices for transport modes:
Ratio of energy consumption and activity indicator (e.g., toe/pkm, toe/veh, toe/tkm)

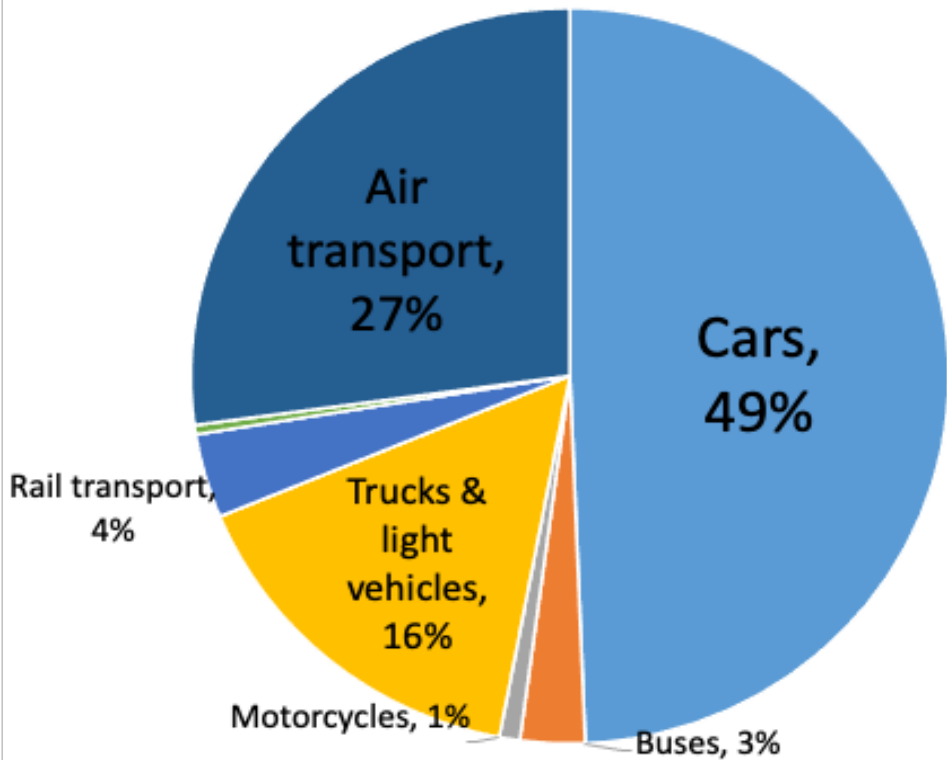
Data from national statistics:

- *Total final energy consumption*
- *Activity indicators: Passenger-km, Vehicle-km, tonne-km, number of vehicles, number of passengers*

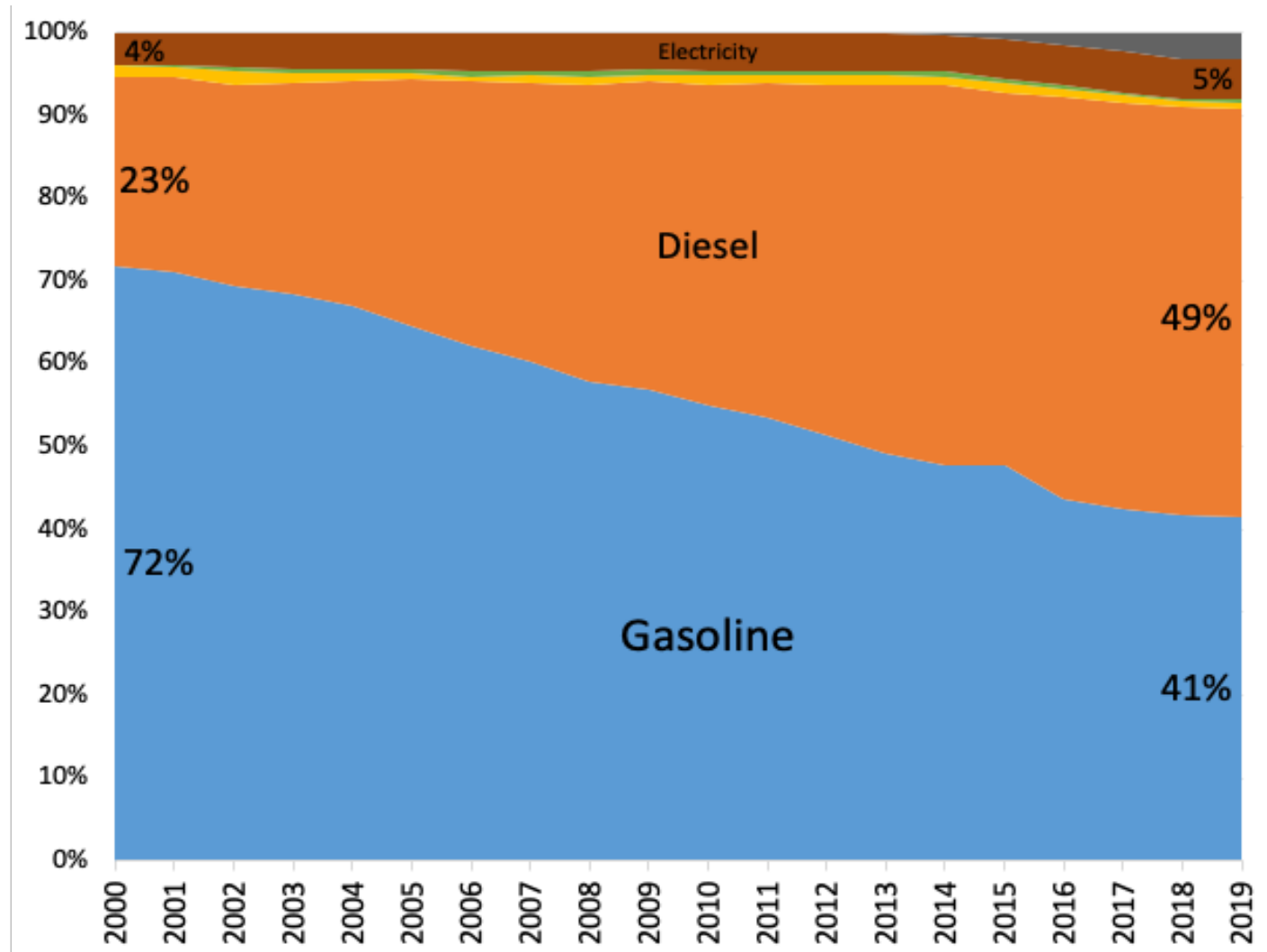
Transport (7 transport modes)

- Passenger transport: Cars, Buses, Motorcycles, Air transport, Trains
- Goods transport: Trucks, Light vehicles, Air transport, Trains

Transport: Overview

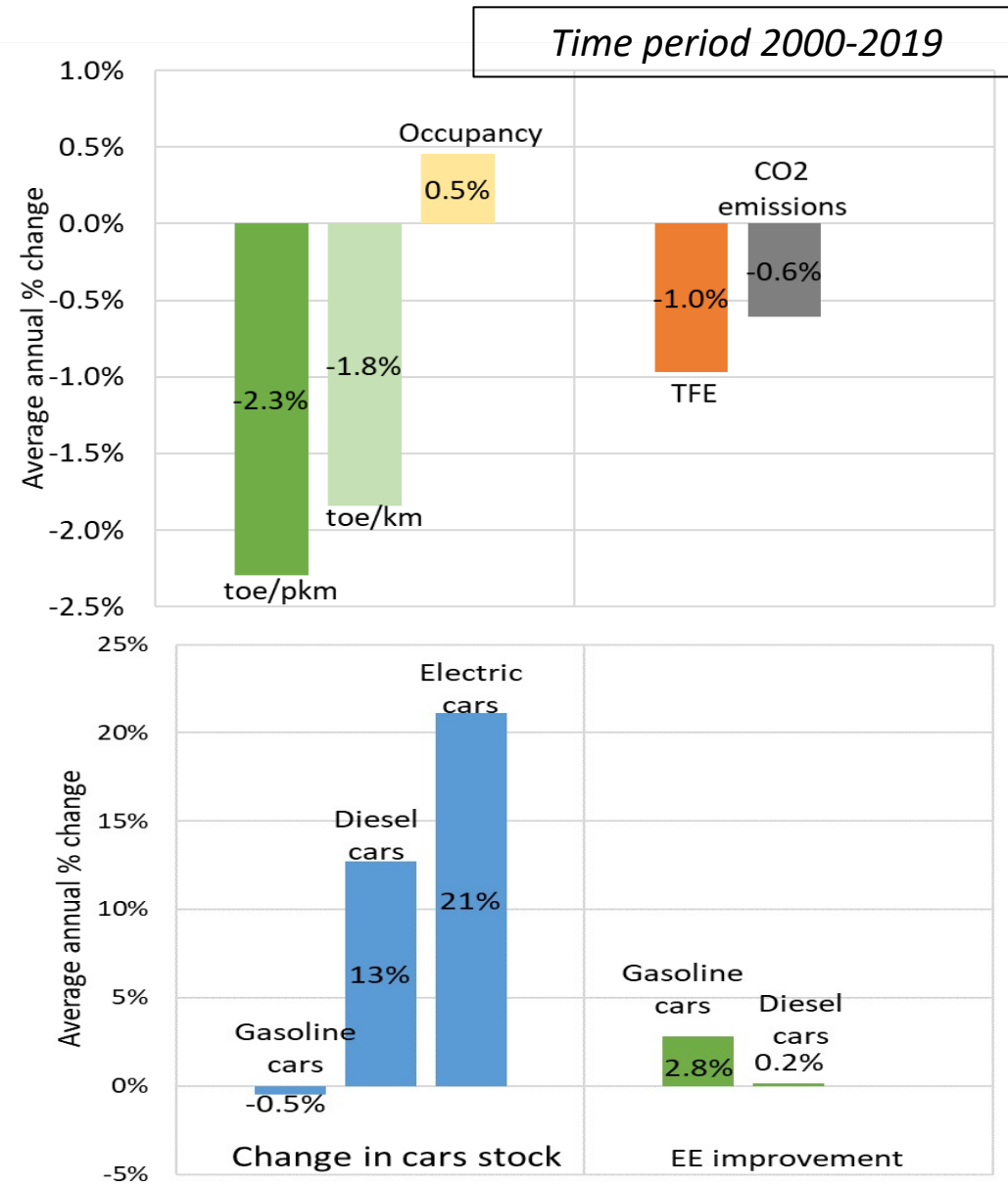
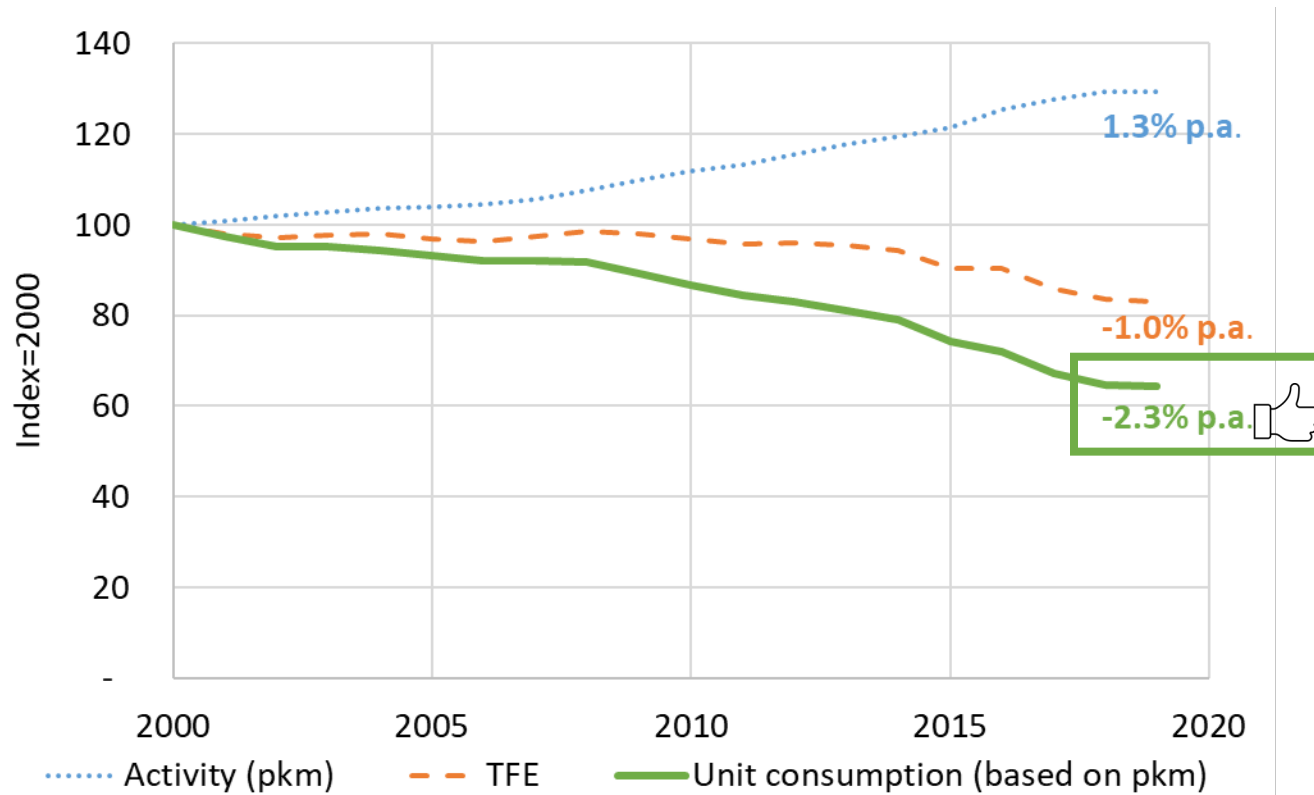


Share of transport modes within transport TFE (SFOE, 2020)



Development of energy carrier shares (Source:SFOE, 2020)

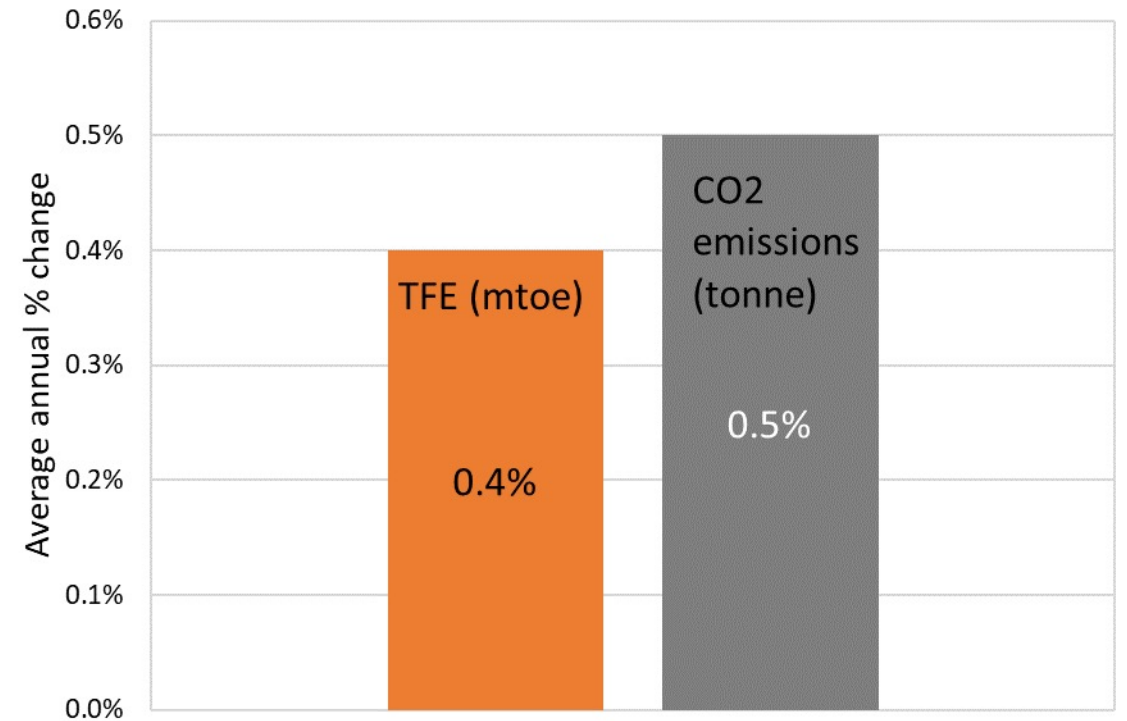
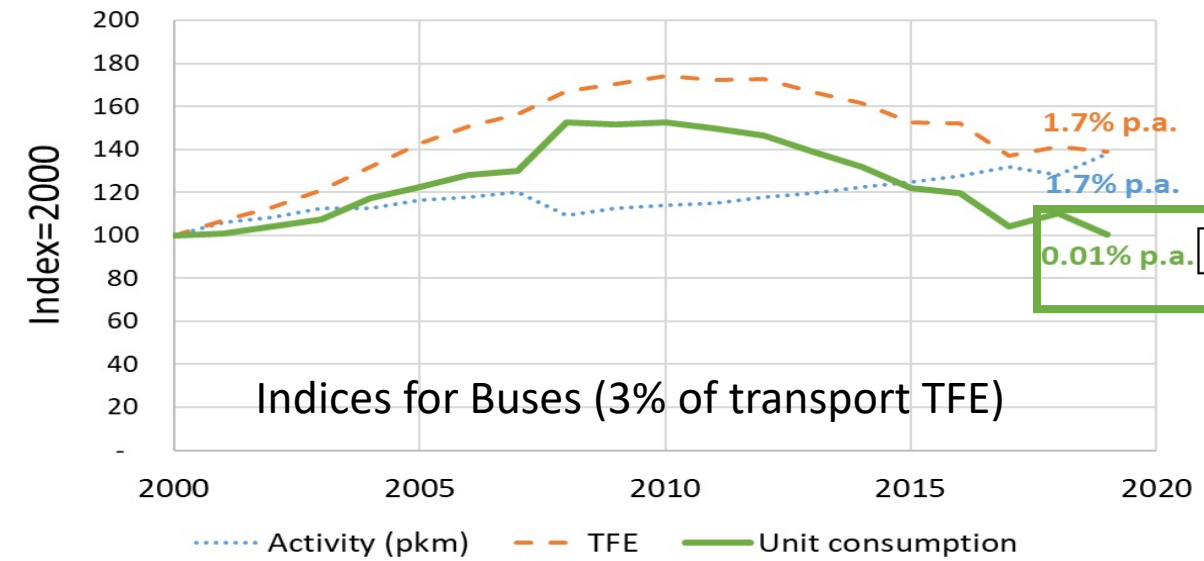
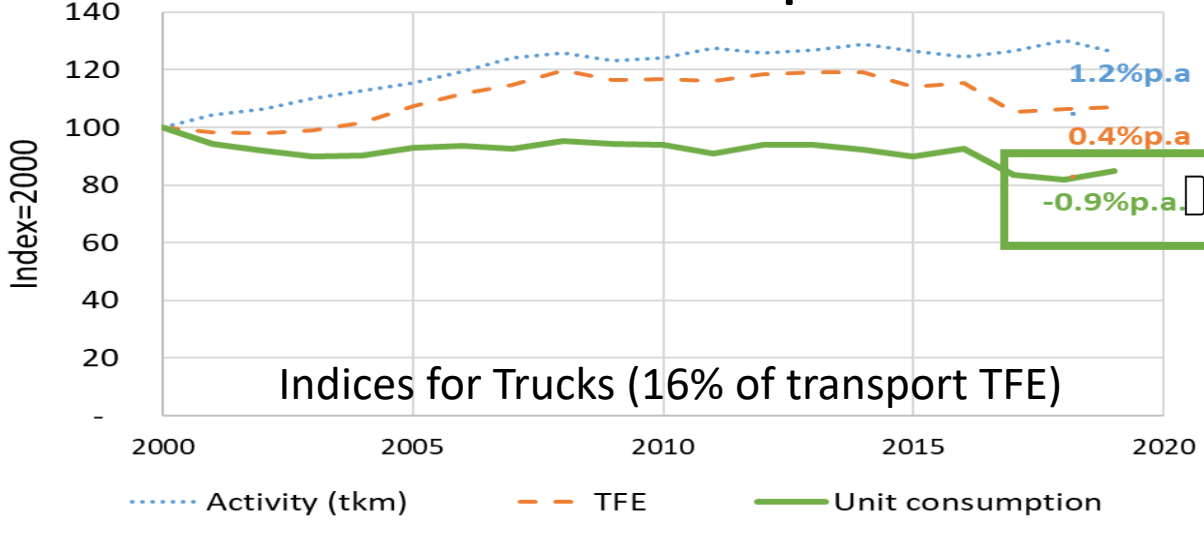
Cars (49% of industry TFE)



- Comparison of annual rates of toe/pkm and toe/km → Change in car occupancy

Sources: FEDRO, 2019; SFOE, 2019; EEA, 2019

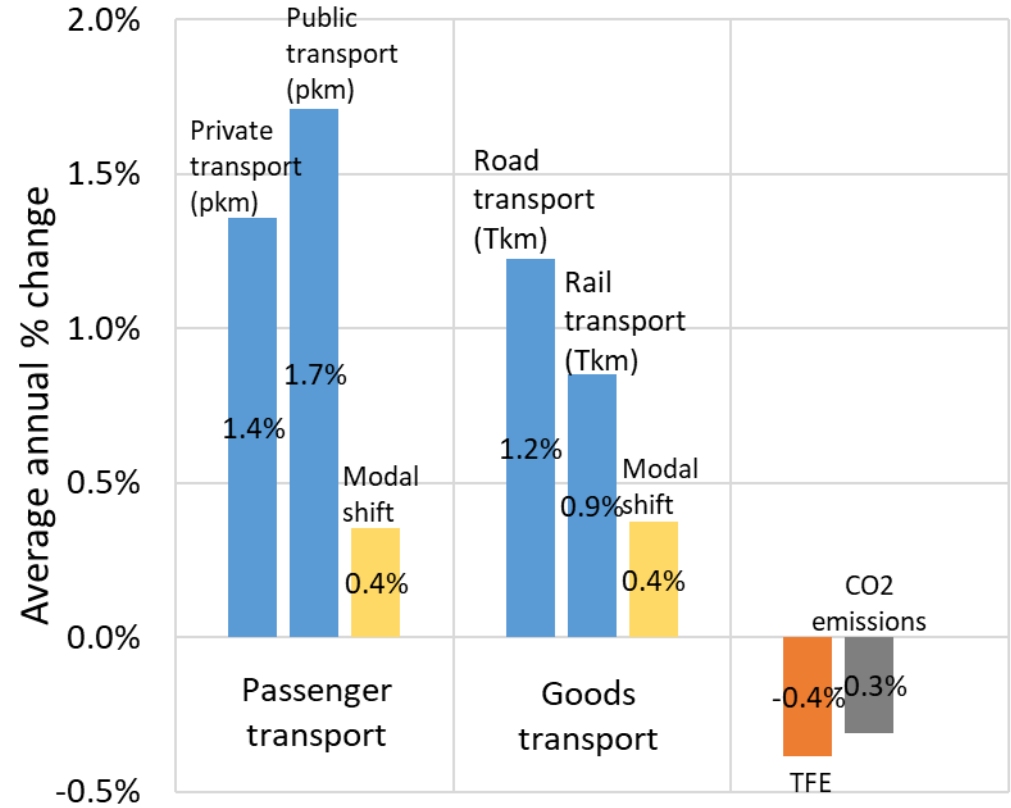
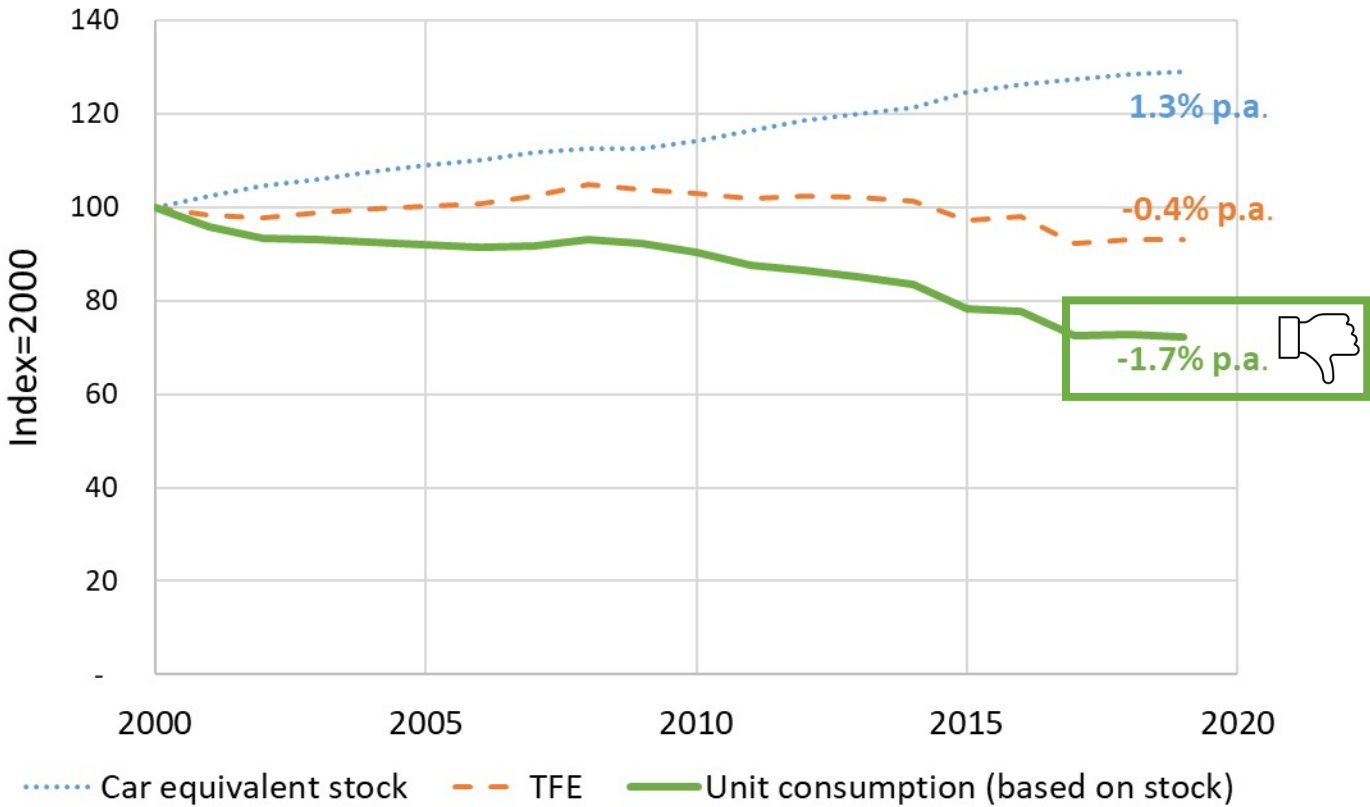
Other road transport (19% of transport TFE)



Average annual change of TFE and CO₂ emissions for trucks and buses

Sources: FEDRO, 2019; SFOE, 2019; EEA, 2019

Road transport (69% of transport TFE)

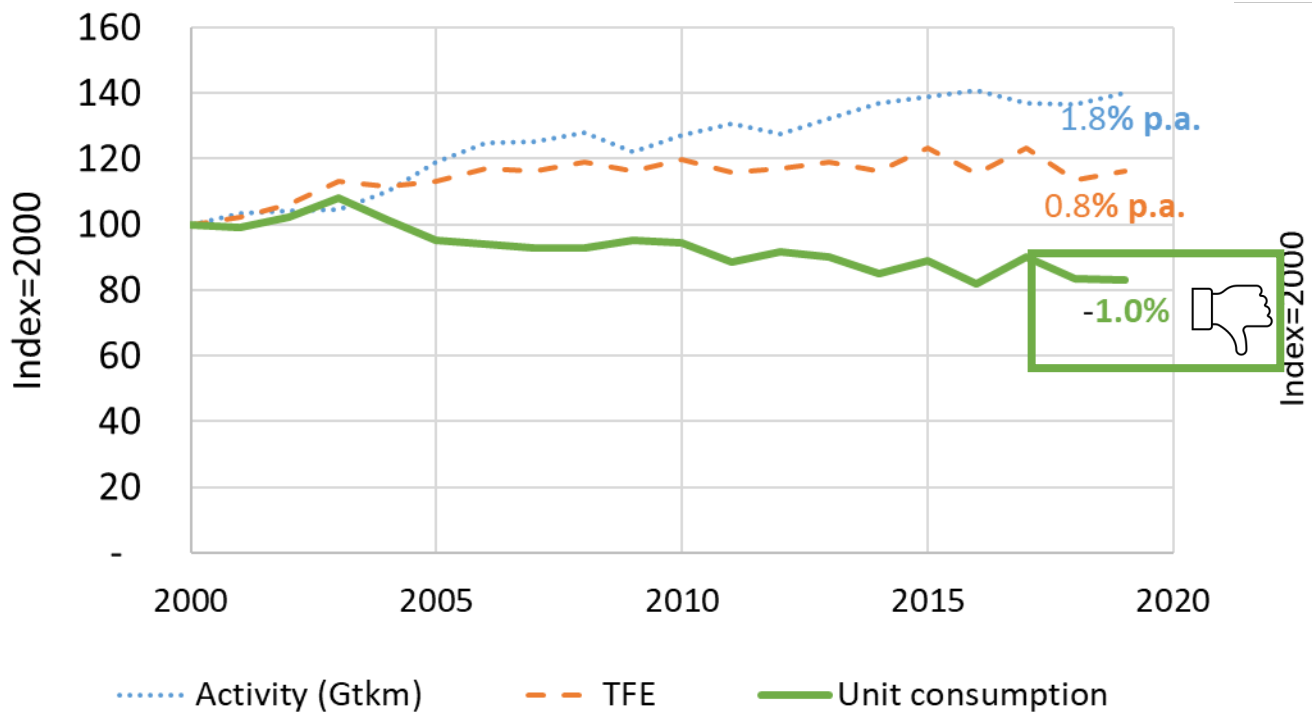


- Physical activity → Measured as car equivalent (Cars, Buses, motorcycles and trucks)

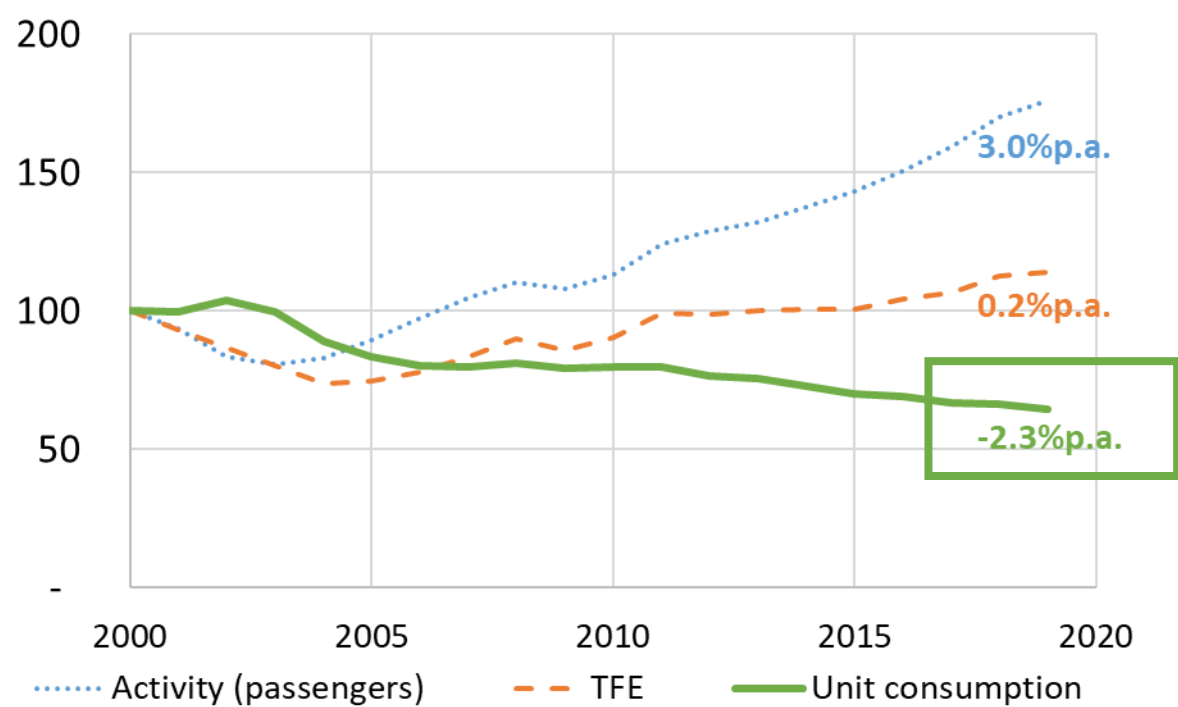
Sources: FEDRO, 2019; SFOE, 2019; EEA, 2019

Other transport modes (31% of transport TFE)

Rail transport (3% of transport TFE)

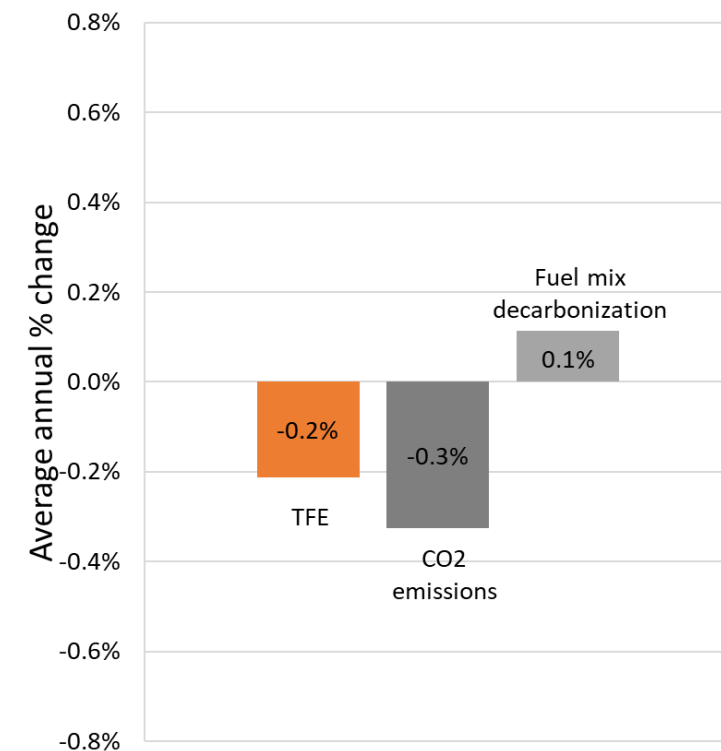
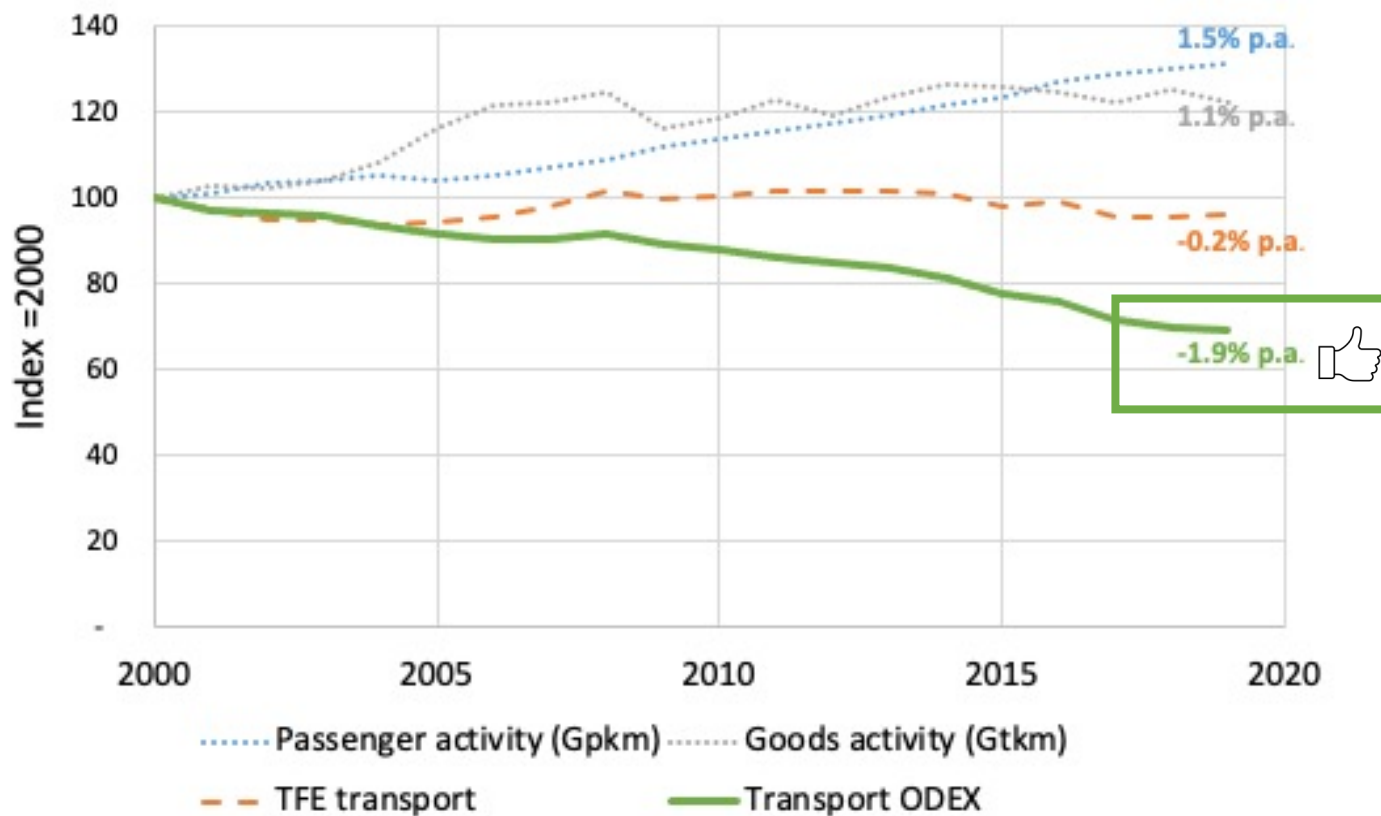


Air transport (27% of transport TFE)



Sources: FEDRO, 2019; SFOE, 2019; EEA, 2019

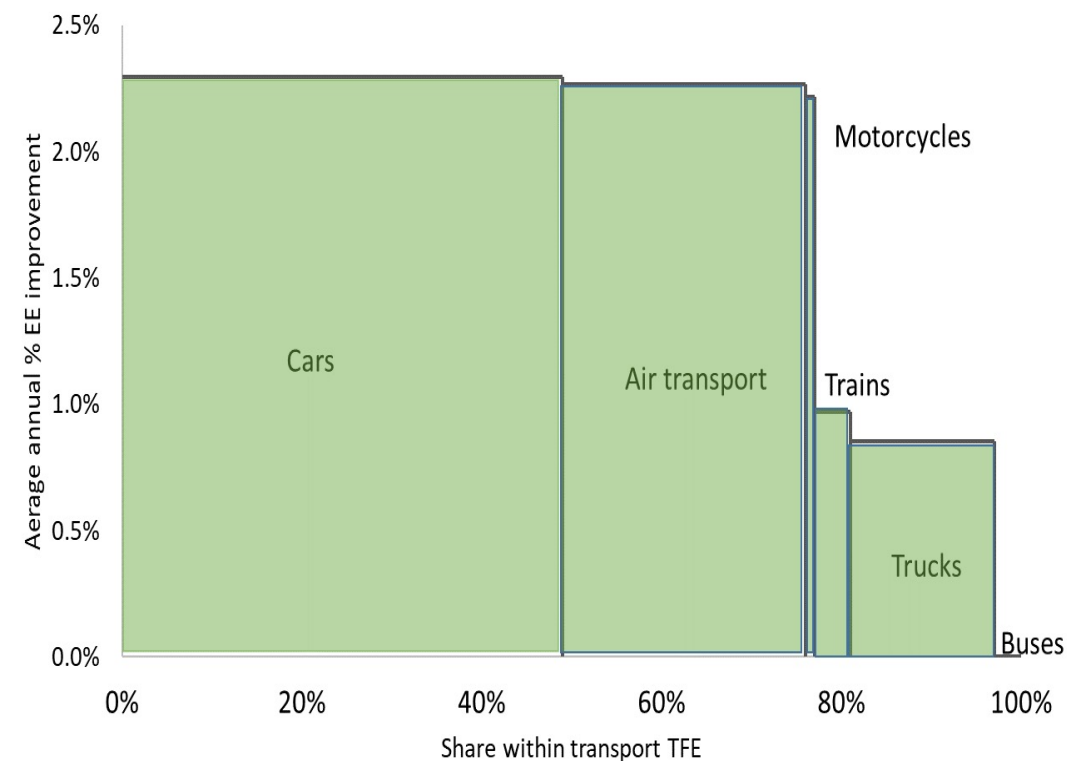
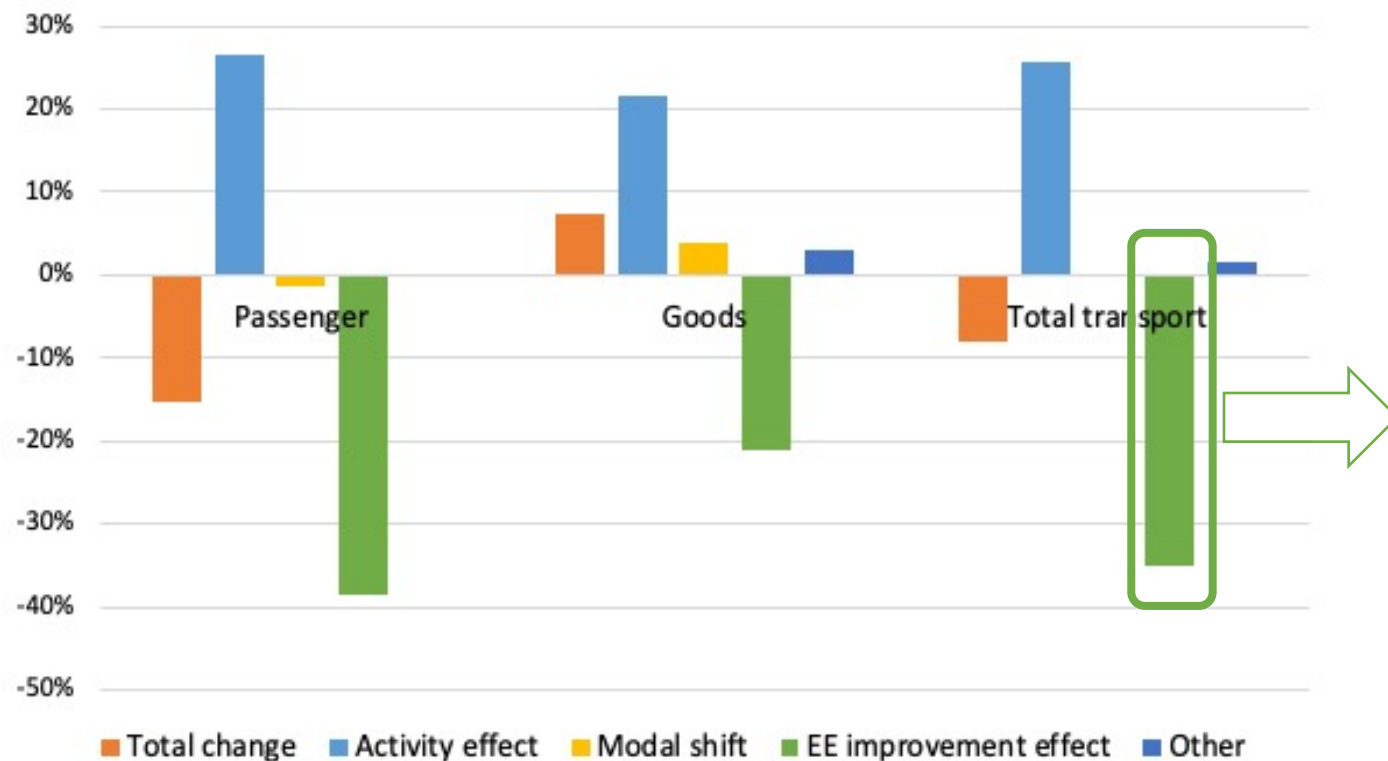
Total transport



- Physical activity → Measured using pkm for passenger transport and tkm for goods transport.
- Fuel mix decarbonization → Rate of change of t-CO₂ emitted/TJ of TFE consumed

Sources: FSO, 2019; SFOE, 2019; EEA, 2019

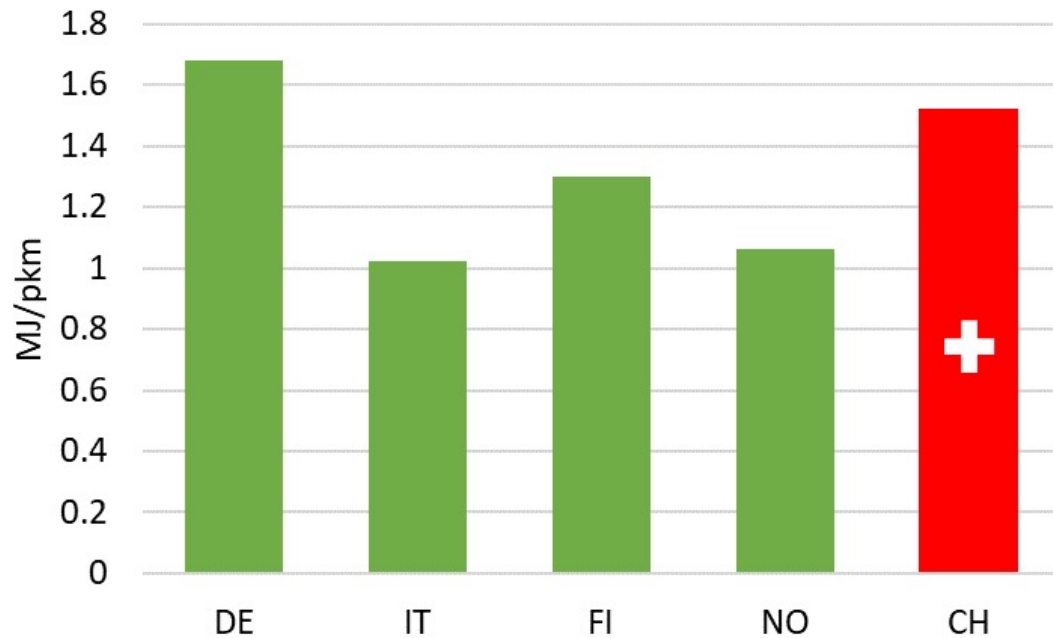
Decomposition analysis: Transport TFE (2000-2019)



- Modal shift in passenger transport → Shift towards public transport
- Modal shift in goods transport → Shift towards road transport

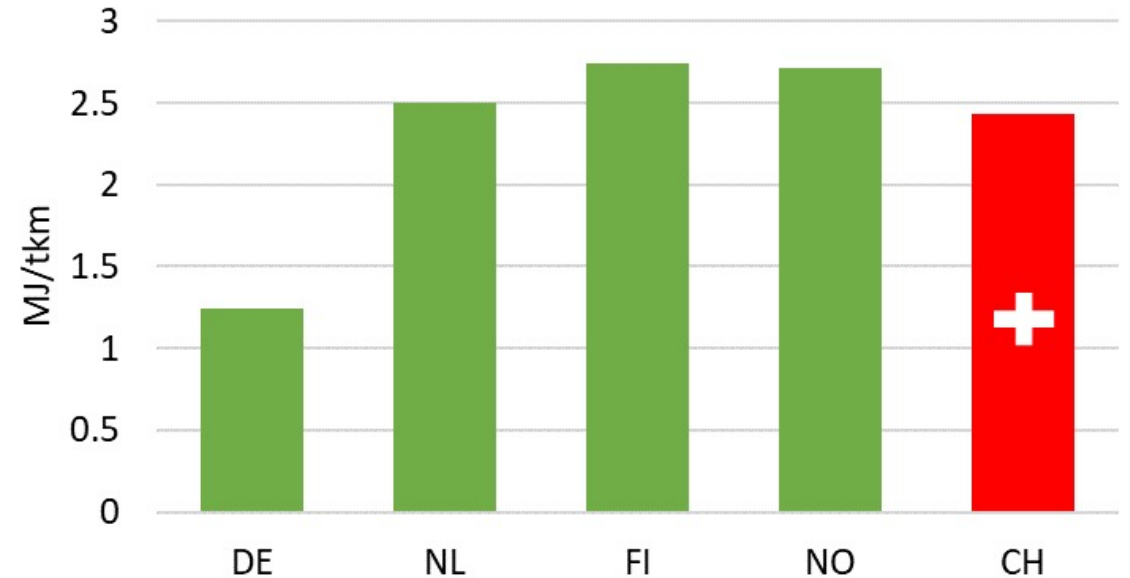
Sources: ODYSSEE-MURE Decomposition tool

Cross-country comparison (2019)



Comparison of unit energy consumption for cars

(Criterion: Weighted average engine size; 1600 cm³ for CH; 5th in Europe)

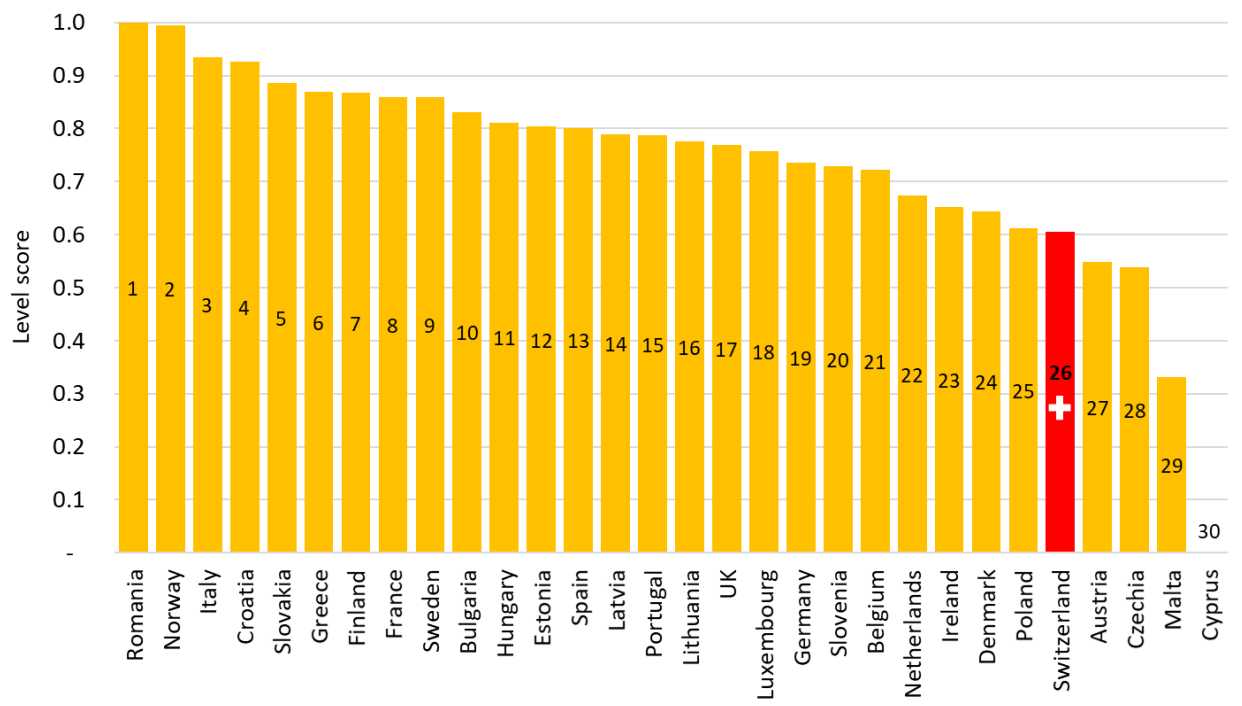


Comparison of unit energy consumption for trucks

(Criterion: Weighted average truck capacity)

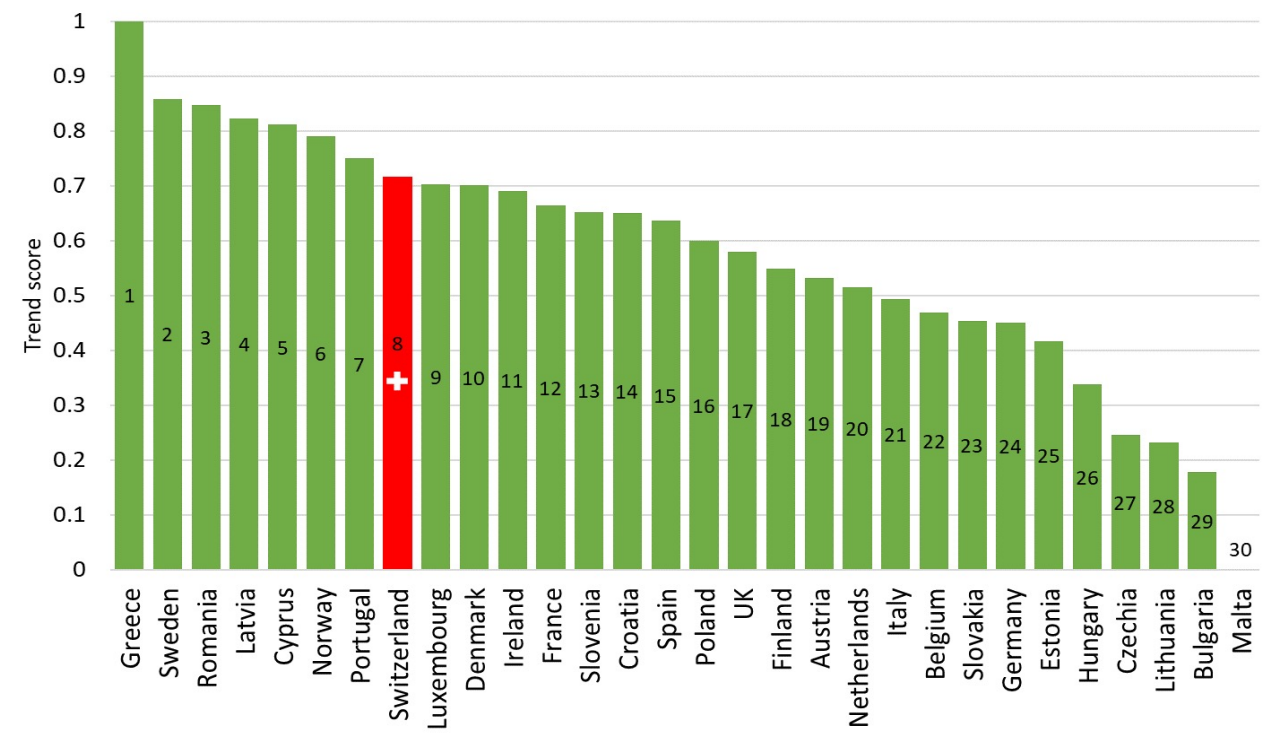
Sources: ODYSSEE-MURE database, 2020; Eurostat, 2020

Scoreboard



Level scoreboard

Score estimated based on unit consumption for transport modes



Trend scoreboard

Score estimated based on rate of change of unit consumption for transport modes

Switzerland's combined rank on transport scoreboard : 16th

Sources: ODYSSEE-MURE scoreboard tool ,2020

Conclusions

Physical activity (from 2000 to 2019)

- Moderate growth of passenger transport (1.5% p.a.).
- Slower growth of goods transport (1.1%).

Modal shift (from 2000 to 2019)

- Passenger transport: Growth of public transport was slightly higher than the private transport indicating modal shift towards public transport (although very small).
- Goods transport: Faster growth of roads transport for goods indicating modal shift towards the roads transport.
- Negligible contributions towards TFE variation.

EE improvement (1.9.% p.a.; from 2000 to 2019)

- Puts Switzerland in top third amongst other European countries.
- Offsets the TFE increase due to higher activity.
- Fastest improving transport modes: cars and aviation (both 2.3% p.a.)

Scoreboard

- Level: Ranks close to bottom as a result of relatively higher share of high powered vehicles.
- Trend: Ranks at 8th position as a result of rapid EE improvement of cars.

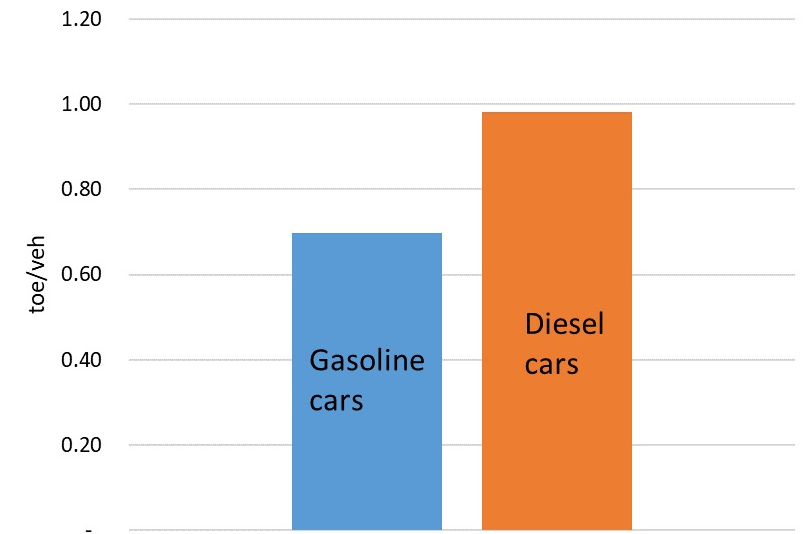
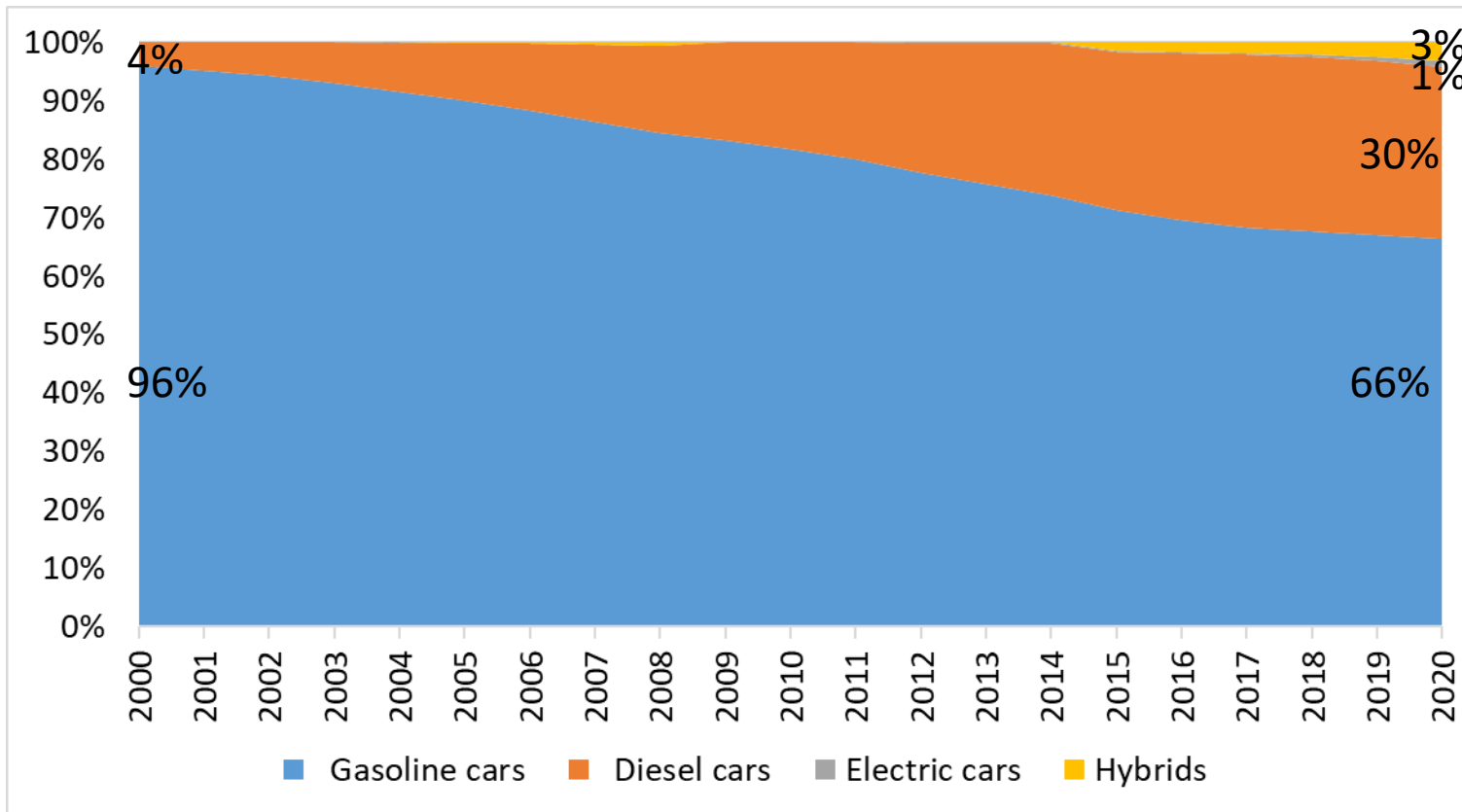
CO₂ emissions (from 2000 to 2019)

- Low rate of fuel mix decarbonisation (despite overall reduction in CO₂ emissions)

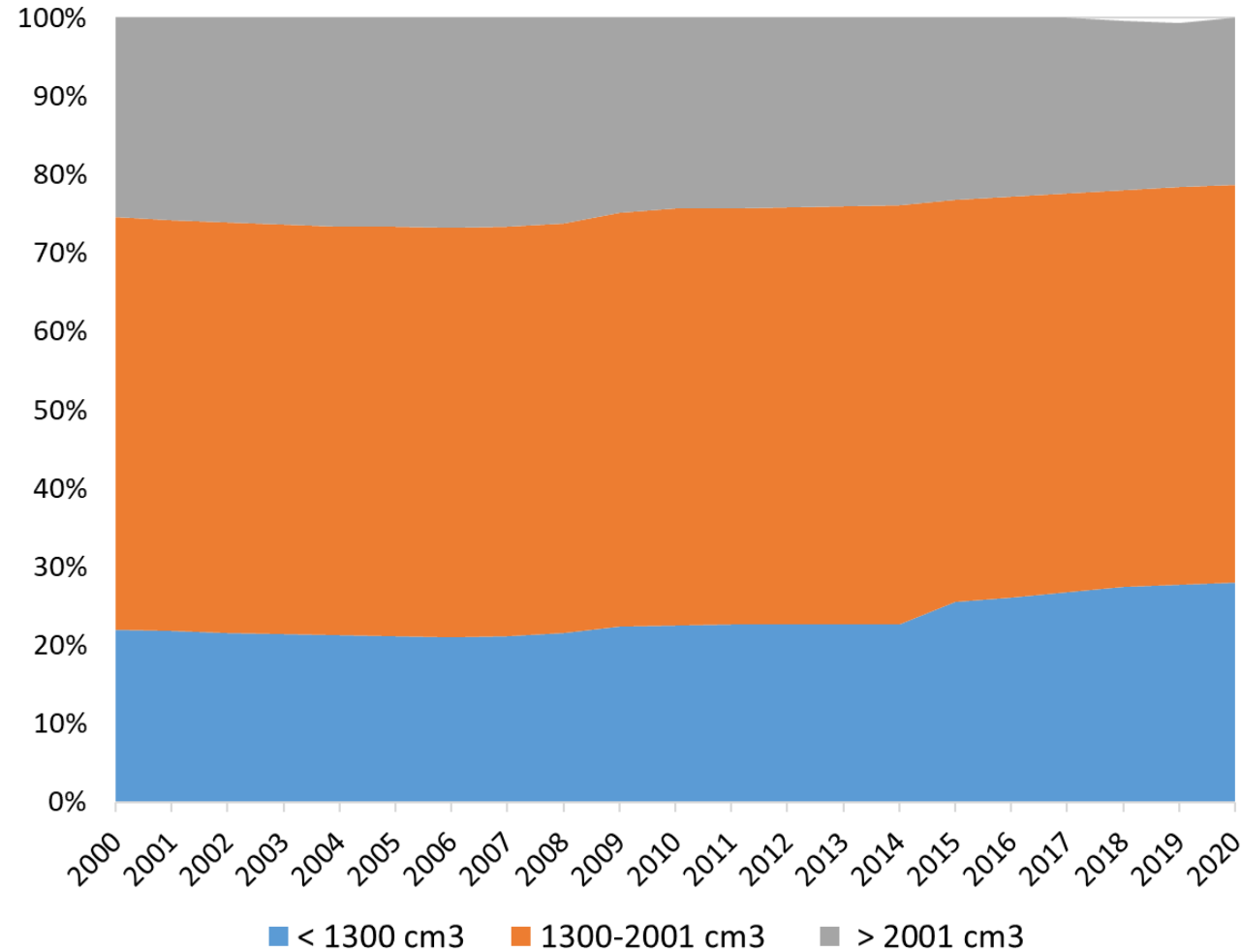
Thank you !

Additional slides

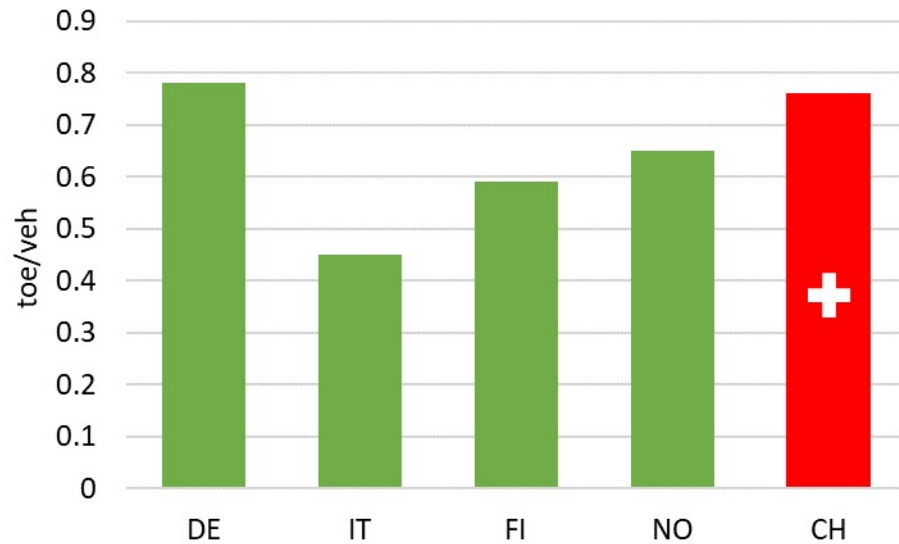
Cars share by fuel type



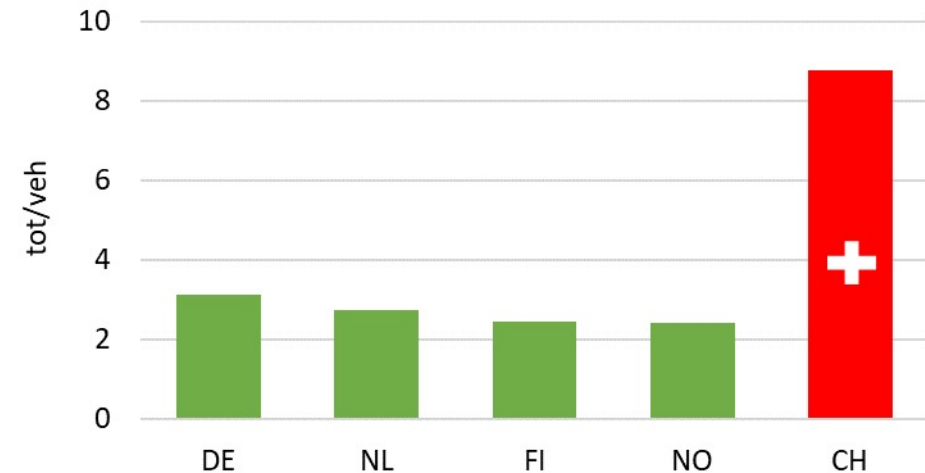
Cars share by engine size



Unit consumption per vehicle



Cars



Trucks and light vehicles