TECHNISCHE UNIVERSITÄT WIEN
Vienna | Austria

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Electric vs Gasoline Vehicles

Total Cost of Mobility

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Introduction

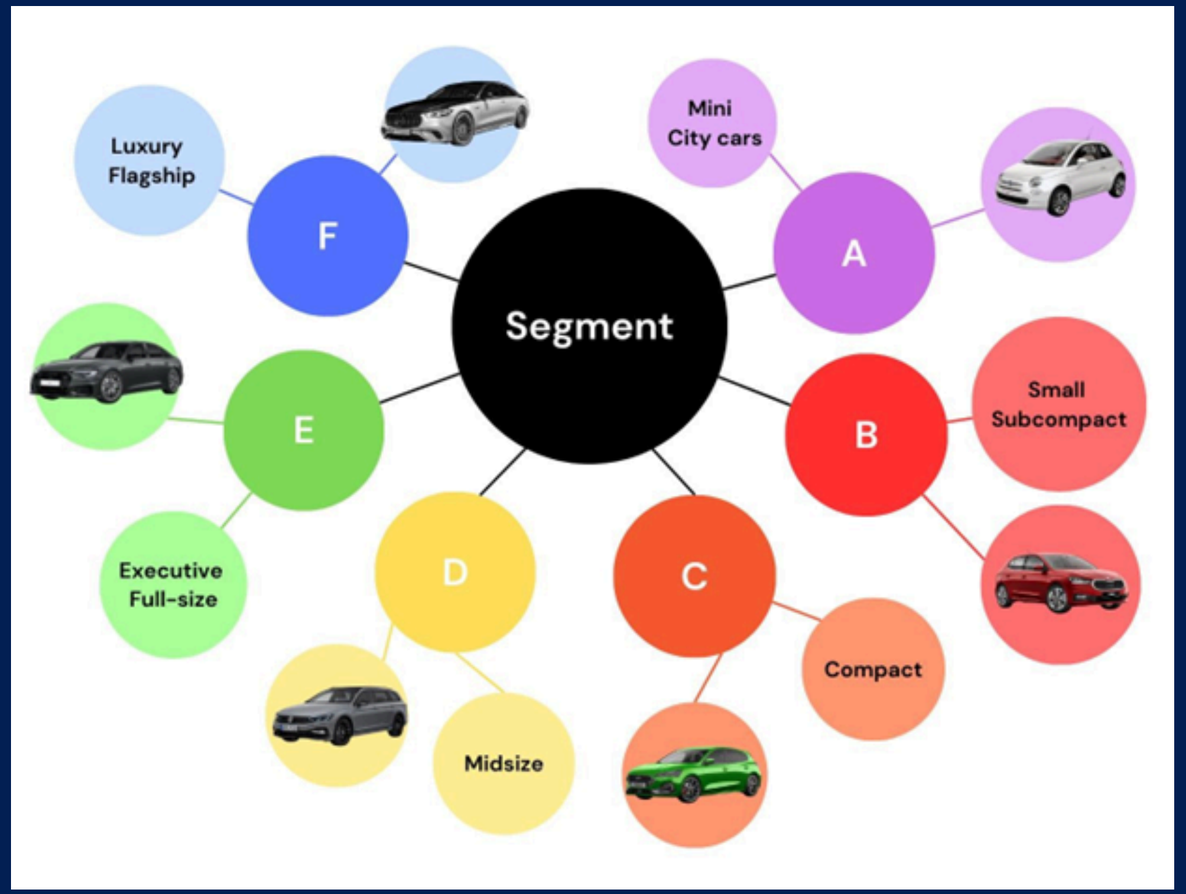
- Electric vehicles are becoming a key solution in the shift toward low-carbon mobility.

- This presentation compares EVs and gasoline vehicles in Austria and the Czech Republic based on their total cost of ownership (TCO), environmental impact, infrastructure, and policy.

Vehicle Classification & Initial Cost

Classification based on segment classification:

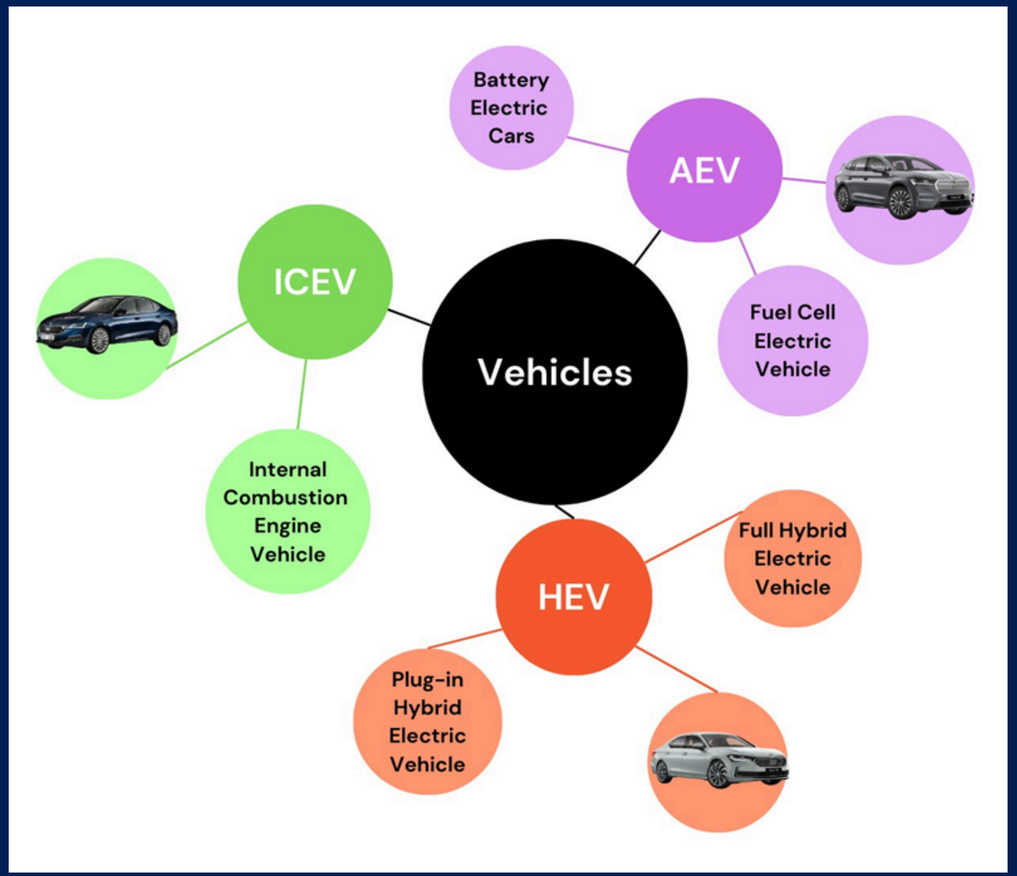
- Mini City cars
- Small Subcompact
- Compact
- Midsize
- Executive Full-size
- Luxury Flagship



Vehicle Classification & Initial Cost

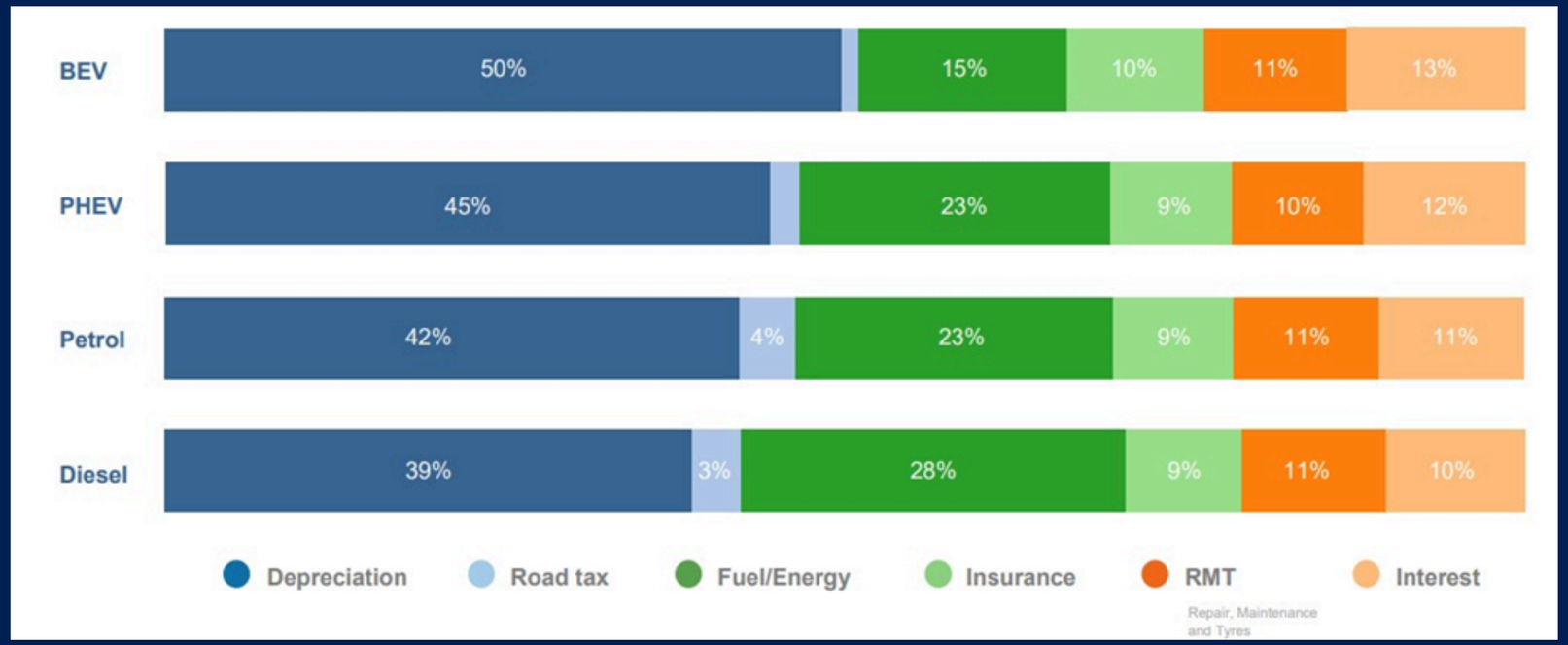
The basic classification of vehicle types:

- AEV (Fuel Cell Electric Vehicle, Battery Electric Cars)
- HEV (Full Hybrid Electric Vehicle, Plug-in Hybrid Electric Vehicle)
- ICEV (Internal Combustion Engine Vehicle)



Vehicle Classification & Initial Cost

Battery Electric cars have a higher initial investment but lower running costs.
The initial pruchase price of vehicles vary greatly country from country.
Switzerland: highest initial purchase price.
Greece: lowest initial purchase price.



LCA (Life Cycle Assement)

Method used to evaluate the total environmental impact of a vehicle over its entire lifetime

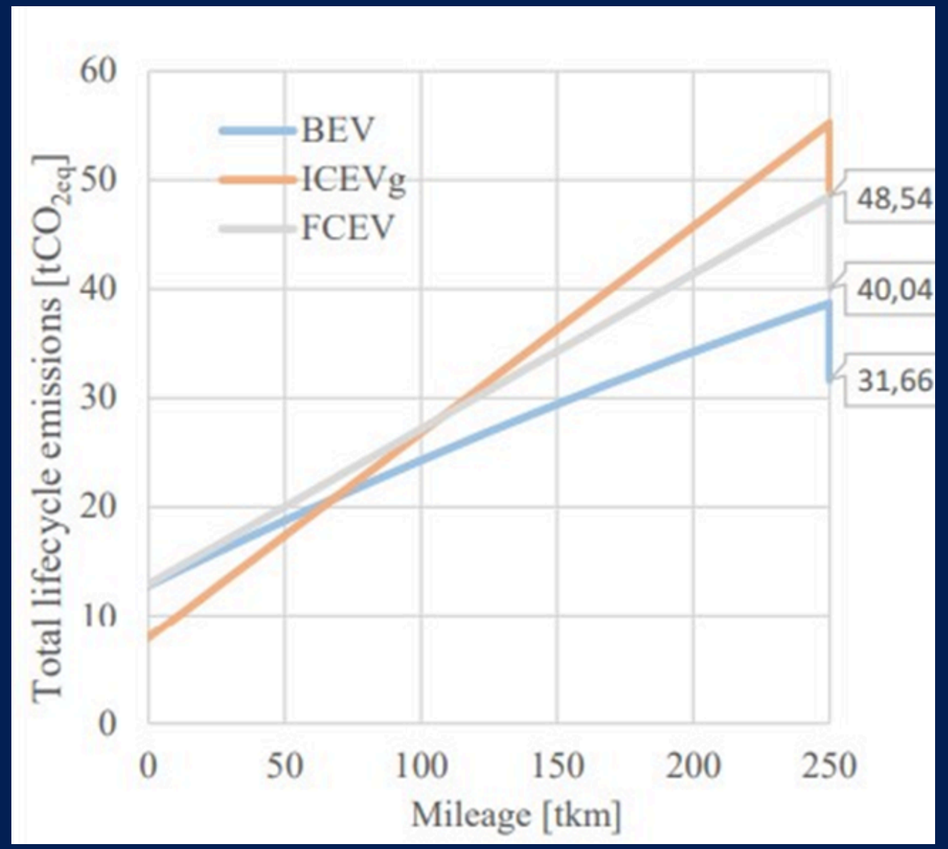
from PRODUCTION to DISPOSAL

Life Cycle Assessment (LCA) of different types of cars in the Czech Republic

Total emissions (over full lifetime):
BEV < FCEV < ICEV

ICEVs have lower emissions during production, they become the most polluting over time.

EVs surpass ICEVs in sustainability after about 70,000 km, and FCEVs after 111,000 km.

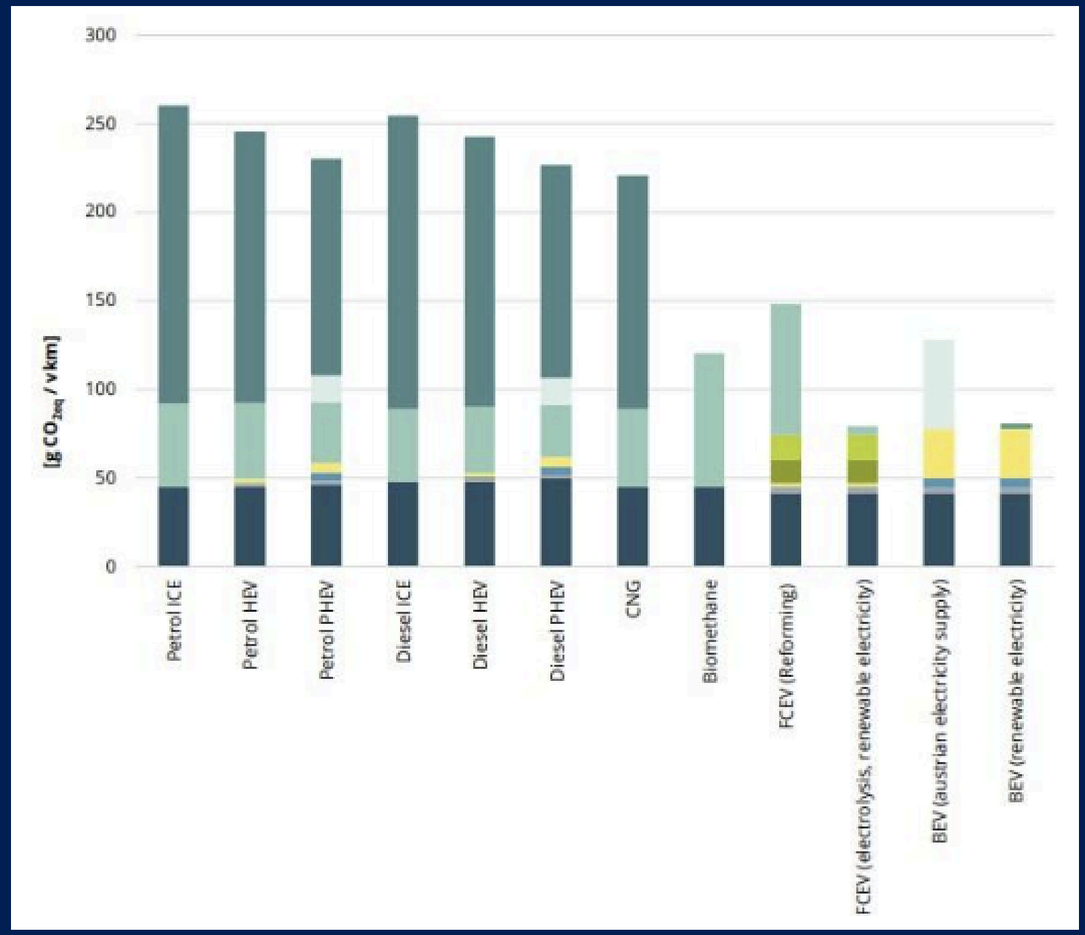


Life Cycle Assessment (LCA) of different types of cars in Austria

- Low emissions with renewables
- High emissions from traditional cars

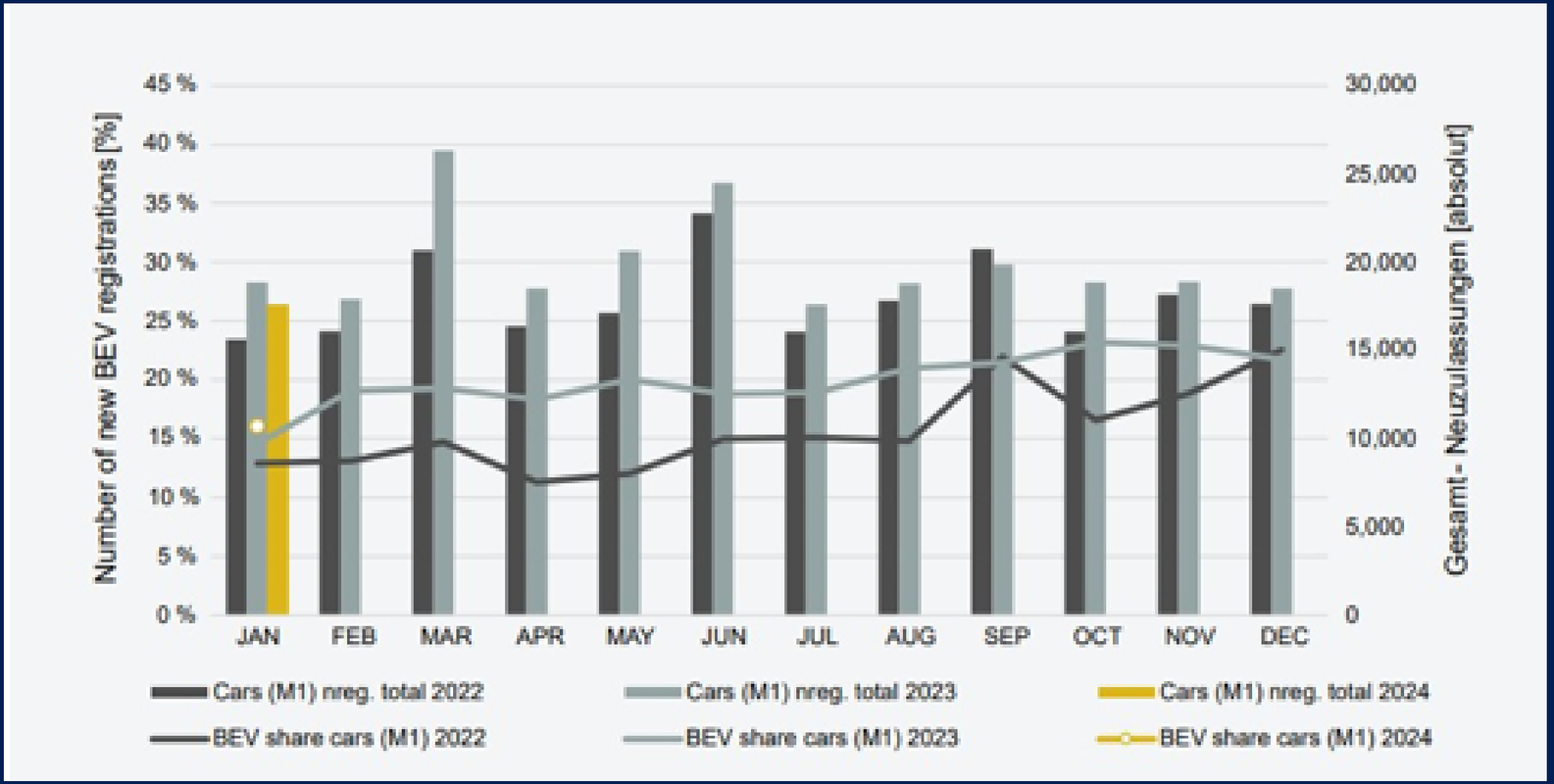
- production basic vehicle
- produtcion electric powertrain
- production fuel cell
- upstream GHG emissions energy supply
- emissions drive renewable electricity

- production electric engine
- production accumulator
- production hydrogen storage
- emissions drive austrian electricity supply
- direct GHG emissions



Development of clean vehicle registrations in the Czech Republic

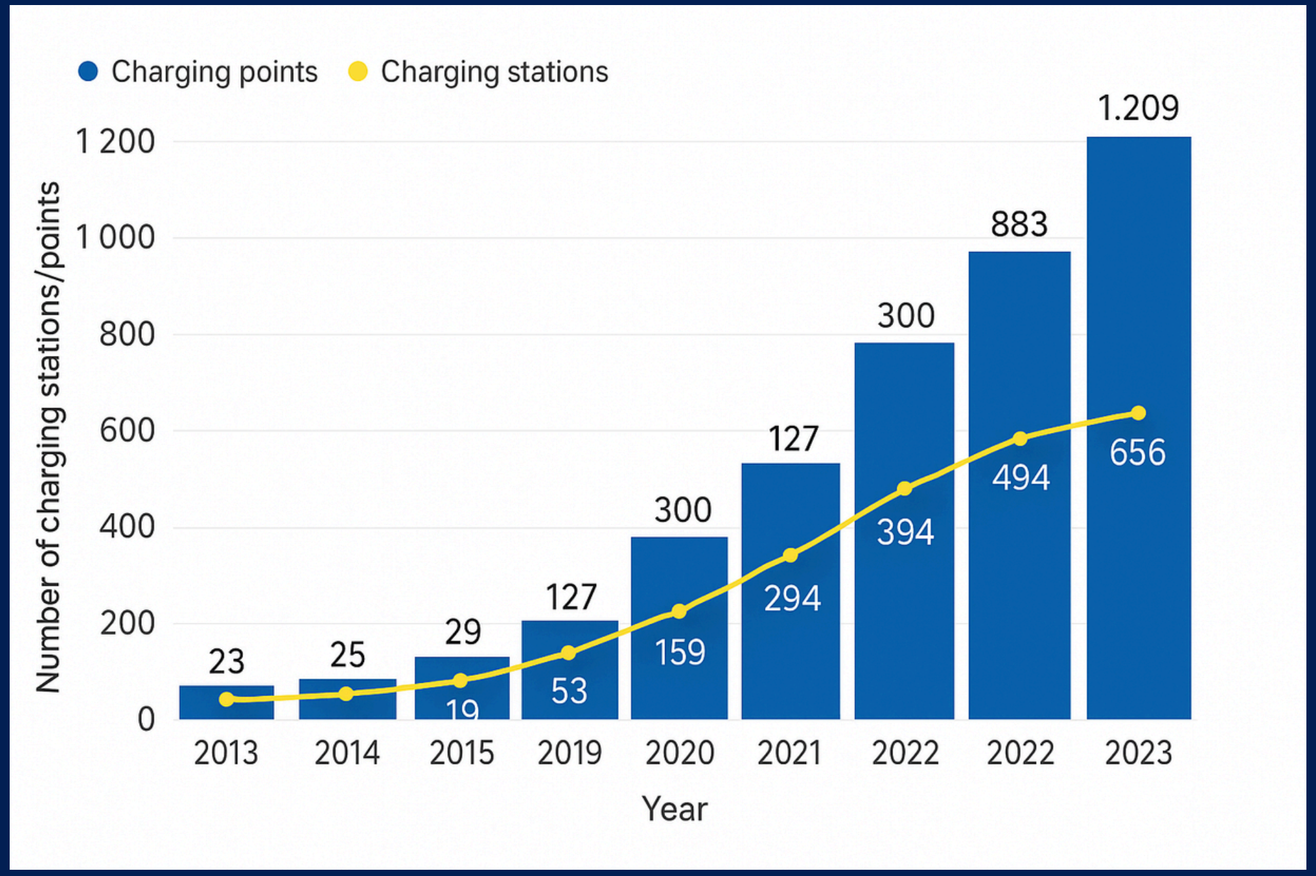
Development of clean vehicle registrations in Austria



The result of:

- Consistent government support
- Better charging infrastructure
- Public awareness of environmental issues

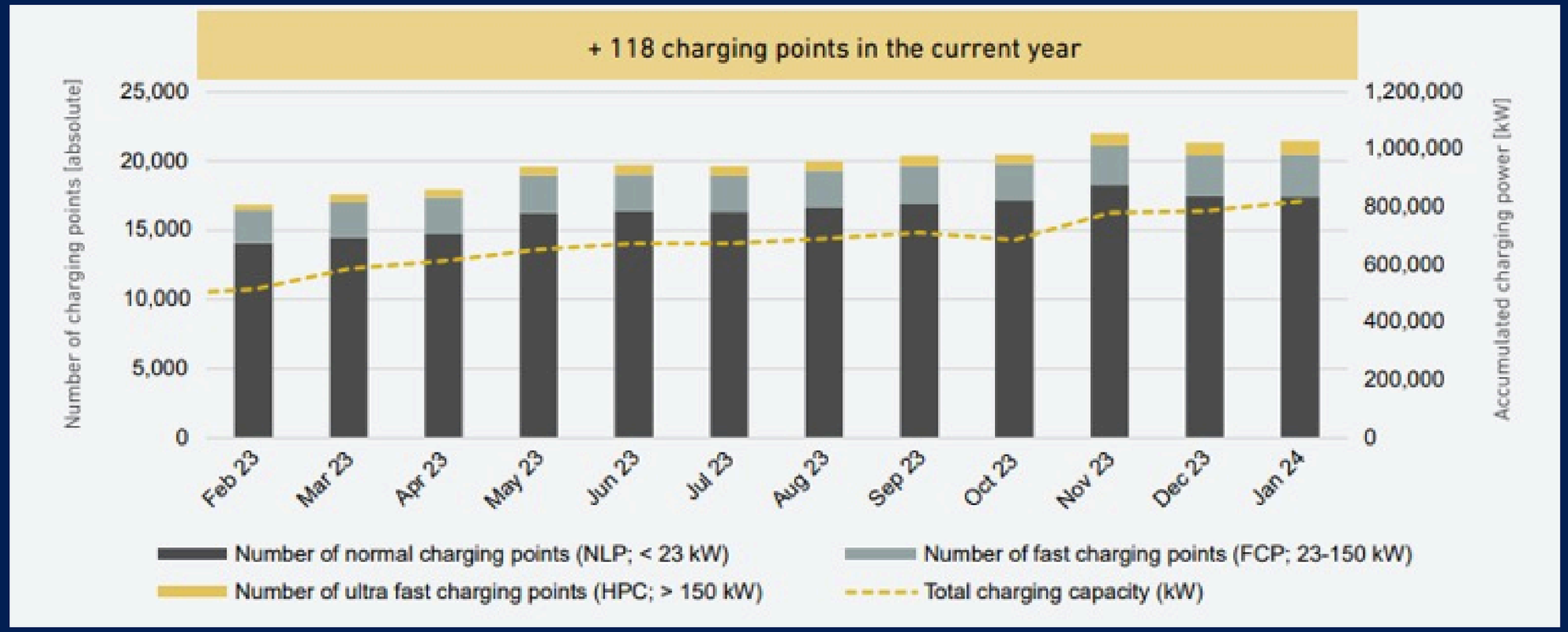
Development of the number of public charging points in the Czech Republic



- The number of charging points and stations has grown significantly
- Czech Republic still lags behind other EU countries

Could this limit consumer choice in rural or less-connected areas ?

Development of the number of public charging points in Austria



118 new charging points were added

Ultra-fast chargers remains limited

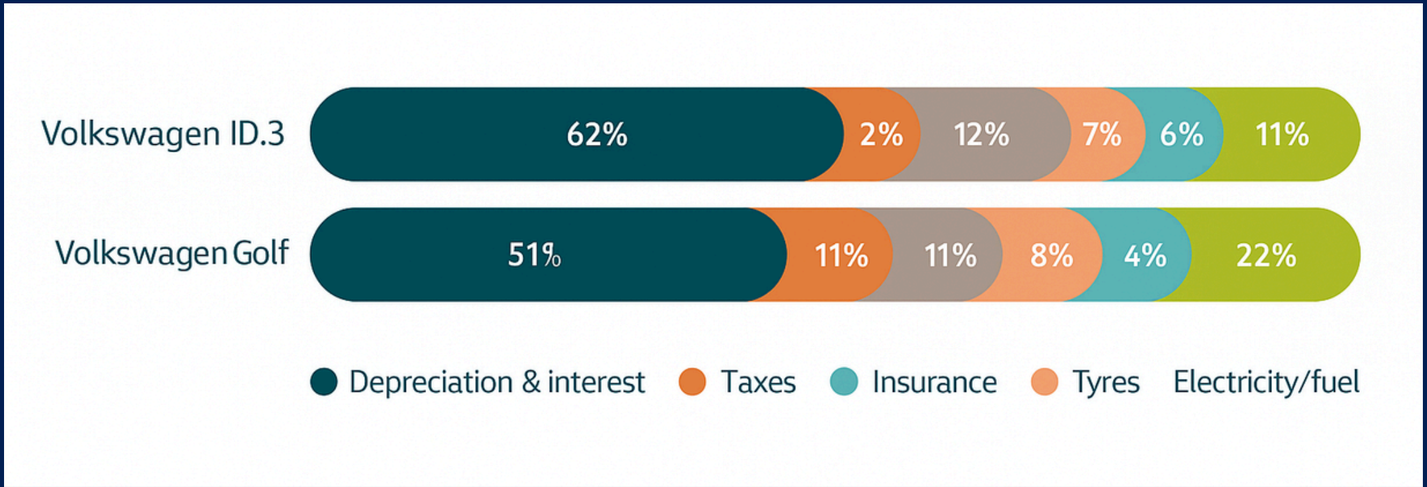
Fast chargers is growing (essential for long-distance travel)

Infrastructure & Adoption

	Czech Republic	Austria
Public Charging Points (2023)	1,209	21,462
EV share in new car registrations	4%	13,90%
EVs in total fleet (2022)	0,10%	2%
Growth trend	Moderate growth	Strong and steady growth

This comparison shows how a solid infrastructure and supportive policies can significantly accelerate the transition to electric mobility.

Comparative Analysis of Total Cost of Ownership (TCO) between the Czech Republic and Austria



Depreciation, insurance and tires are more expensive for Electric Vehicles, but taxes, maintenance and energy are cheaper.

Cost Competitiveness by Segment

Segment	**Austria**	**Czech Republic**
Sub-compact	❌	❌
Compact	✅	❌
Mid-size	✅	❌
Premium	✅	❌

Policy Assessment

Czech Republic

- Subsides for PYMES
- Exemption from driving tax

Austria

- Direct subsides
- Tax benefits
- Deduction for companies

Aspect	*Austria*	*Czech Republic*
Subsides for EVs	Up to 5.000€ for individuals and businesses	Up to 300.000 CZK for Pymes

Interview at “Klokočka” – certified Škoda dealership

⚡ Service costs for EVs are drastically lower: Prepaid service for the electric Škoda Elroq is CZK 10,000 for 5 years, while the gasoline Škoda Karoq costs up to CZK 51,000 for the same period.

🚗 EV purchase prices have nearly matched those of traditional cars, but cost advantages still depend on charging behavior and usage patterns.

🛣️ High-speed highway charging can make EVs more expensive to operate than efficient diesel cars — especially for drivers clocking 30,000 km/year.

💸 Government subsidies have run out, leaving only minor benefits like free city parking and exemption from road tax.

Interview at “Klokočka” – certified Škoda dealership

📈 The Czech Republic has one of the best EV charging networks in the EU — about 22 charging stations per 100 EVs (vs. EU average of 15).

💡 Electricity prices are now often higher than gasoline, undermining a key advantage that initially drove e-mobility adoption.

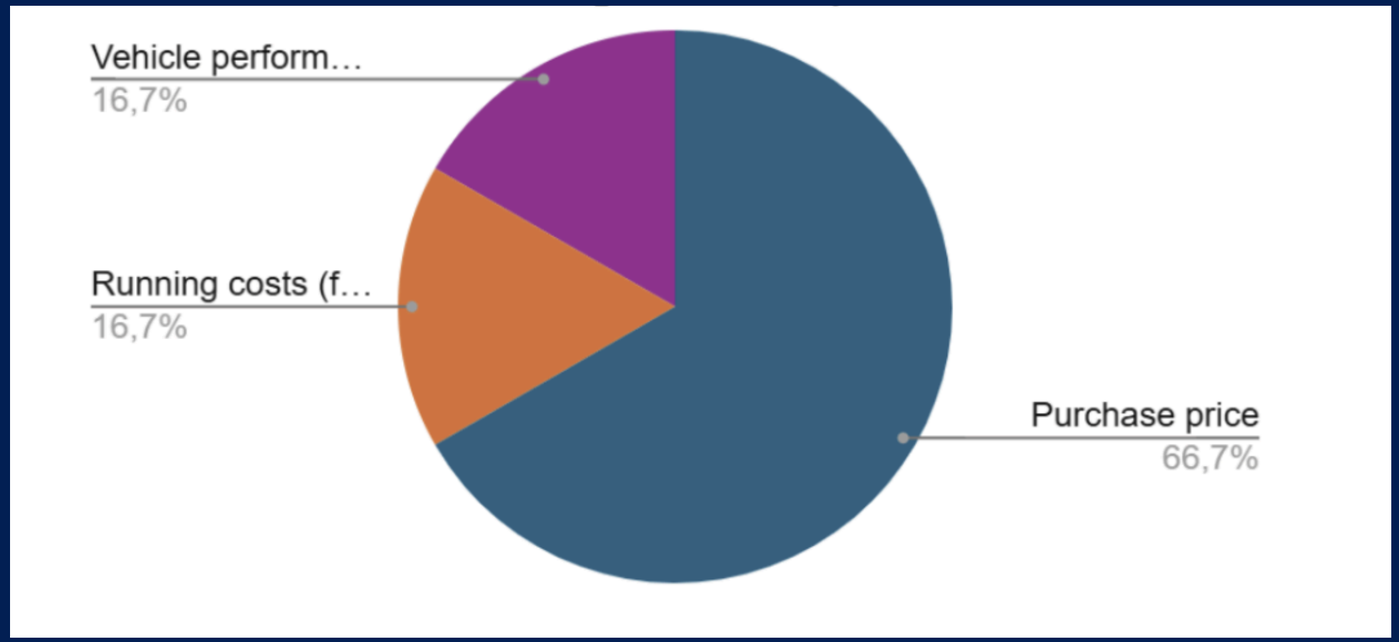
🚙 Škoda only offers two EVs currently, but plans to add three more (including the Epig and a 7-seater) in the next two years to expand the offering.

👨‍💼 In companies, high-mileage reps still drive gasoline cars, while EVs are typically used for short trips or as loaners.

Consumer Preferences (Survey)

“When considering a new vehicle, which factor is most important to you?”

The Czech Republic



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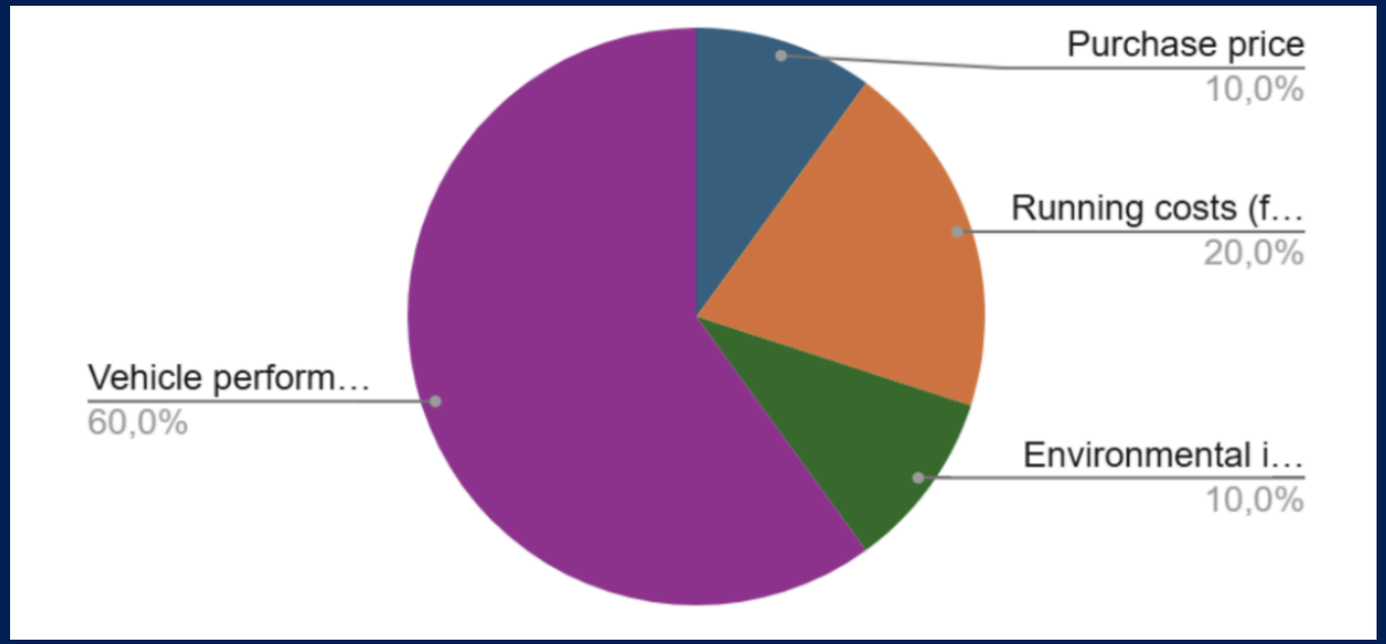
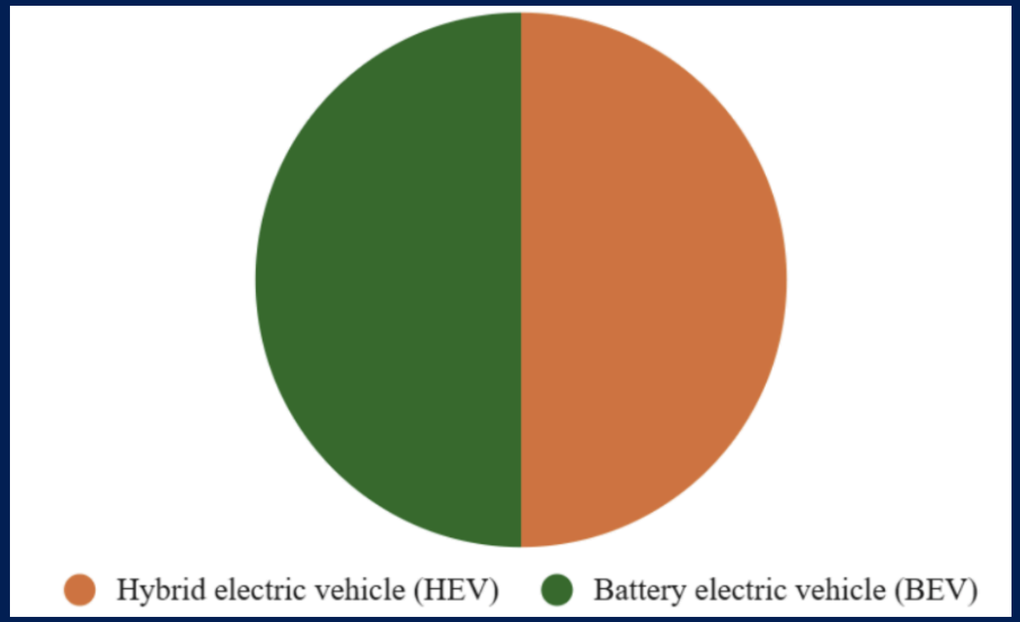


Consumer Preferences (Survey)

“Which type of vehicle would you prefer to buy today, assuming similar prices?”

The Czech Republic



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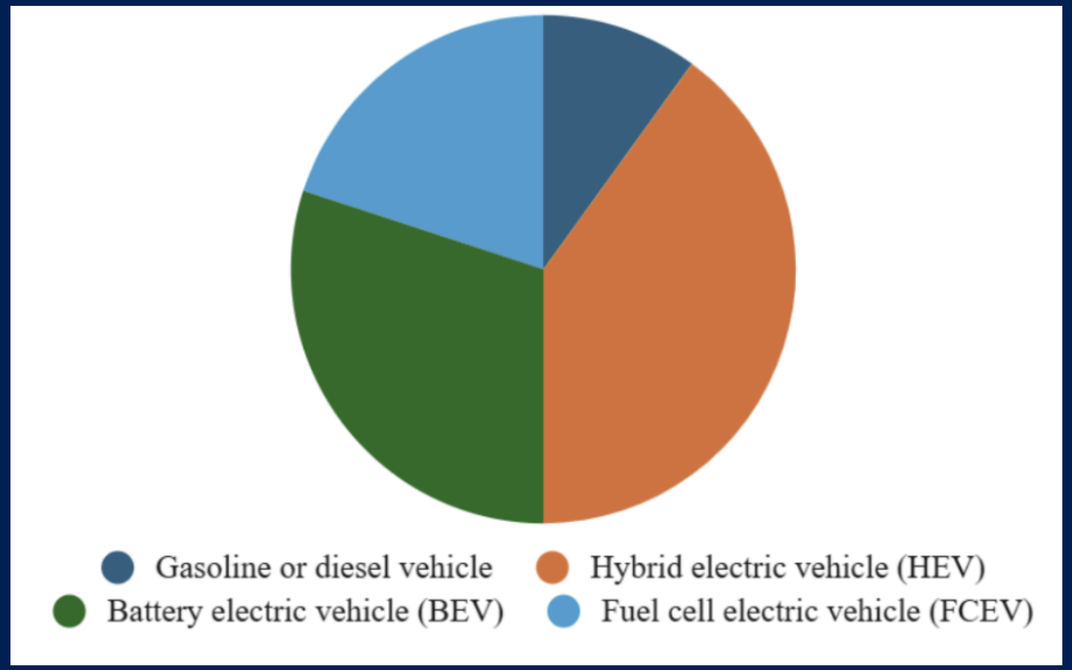
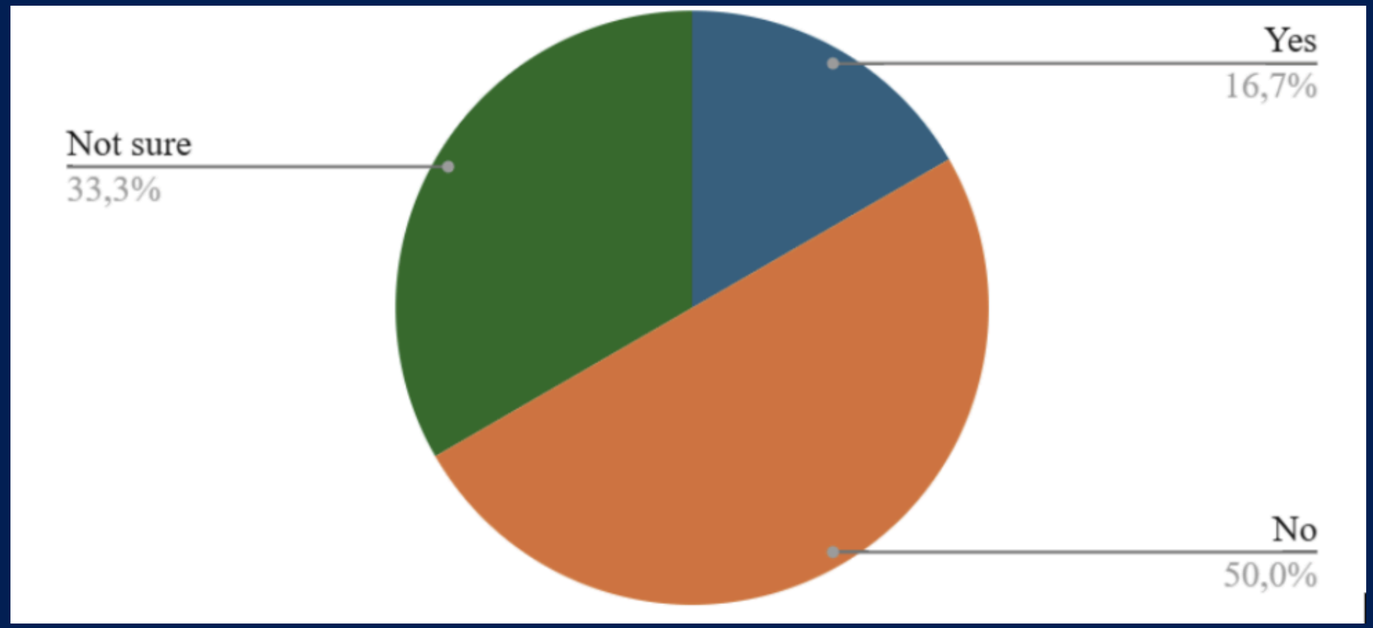


Consumer Preferences (Survey)

“Do you think electric vehicles (EVs) are already more economical over their lifetime than gasoline vehicles in your country?”

The Czech Republic



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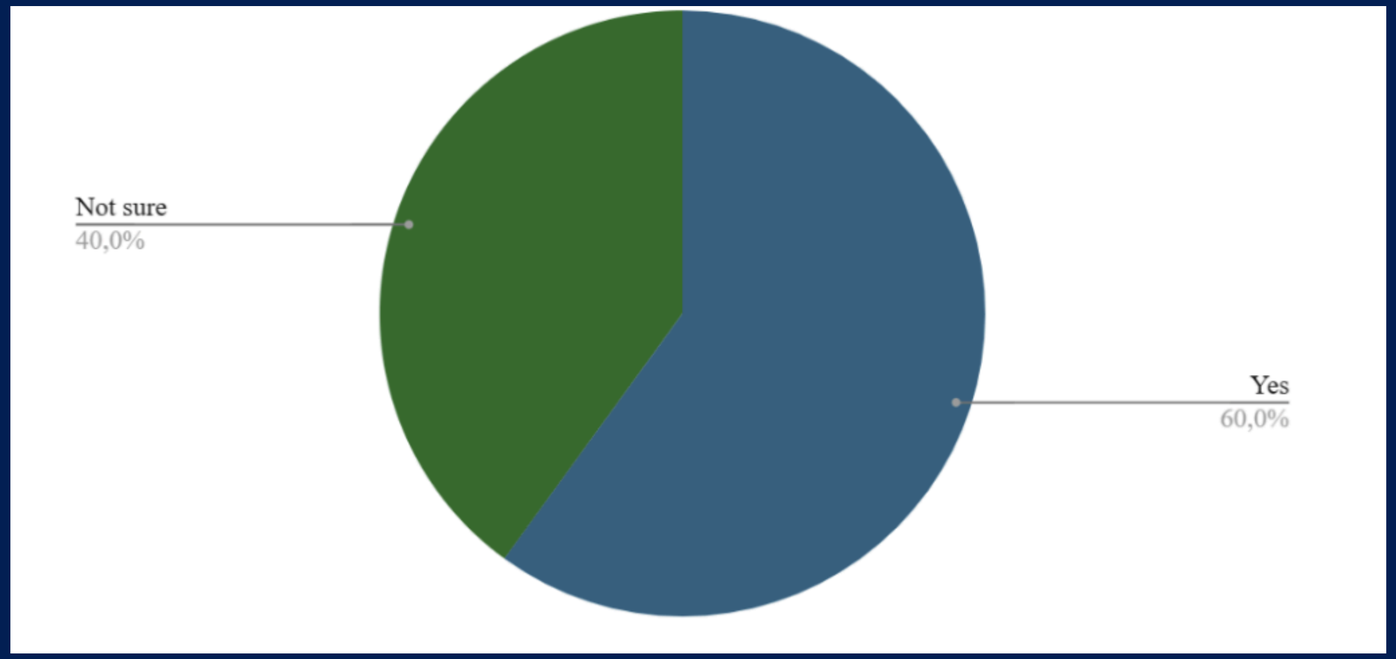
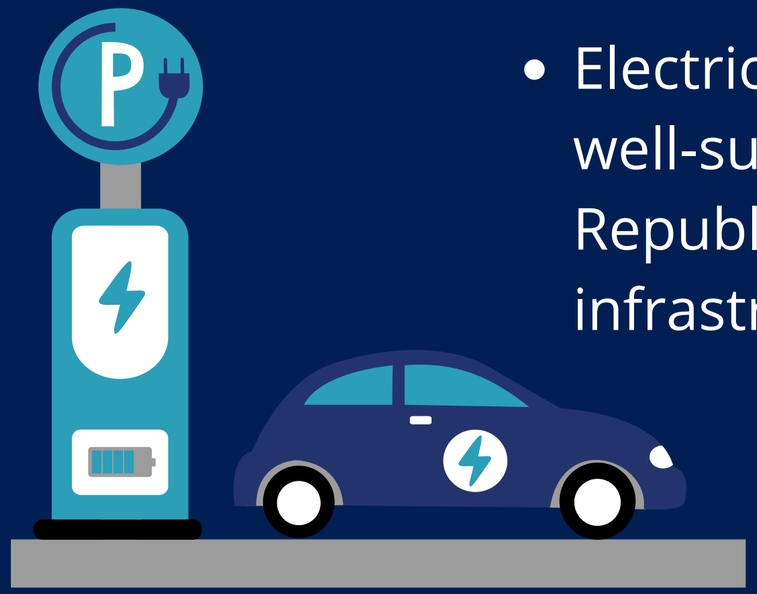


Conclusion



- Electric vehicles offer clear long-term benefits, especially in well-supported markets like Austria. While the Czech Republic shows progress, further improvements in infrastructure and affordability are needed to close the gap.

European Green Deal Speech, 2020

“The future of mobility is digital and electric”

Ursula Von der Leyen

(Presiden of European Comission)