

Potential options and technology pathways for delivering zero-carbon freight in Spain

Launch event

Jon Stenning

Wednesday 11th May 2022



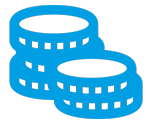
Overview

- The aims of the study
- Exploring different sales mixes and their impact on fleet emissions
- The total cost of ownership of the different technologies
- Conclusions

Objectives of the study



Explore the potential options and technology pathways for delivering **zero-carbon freight** in Spain

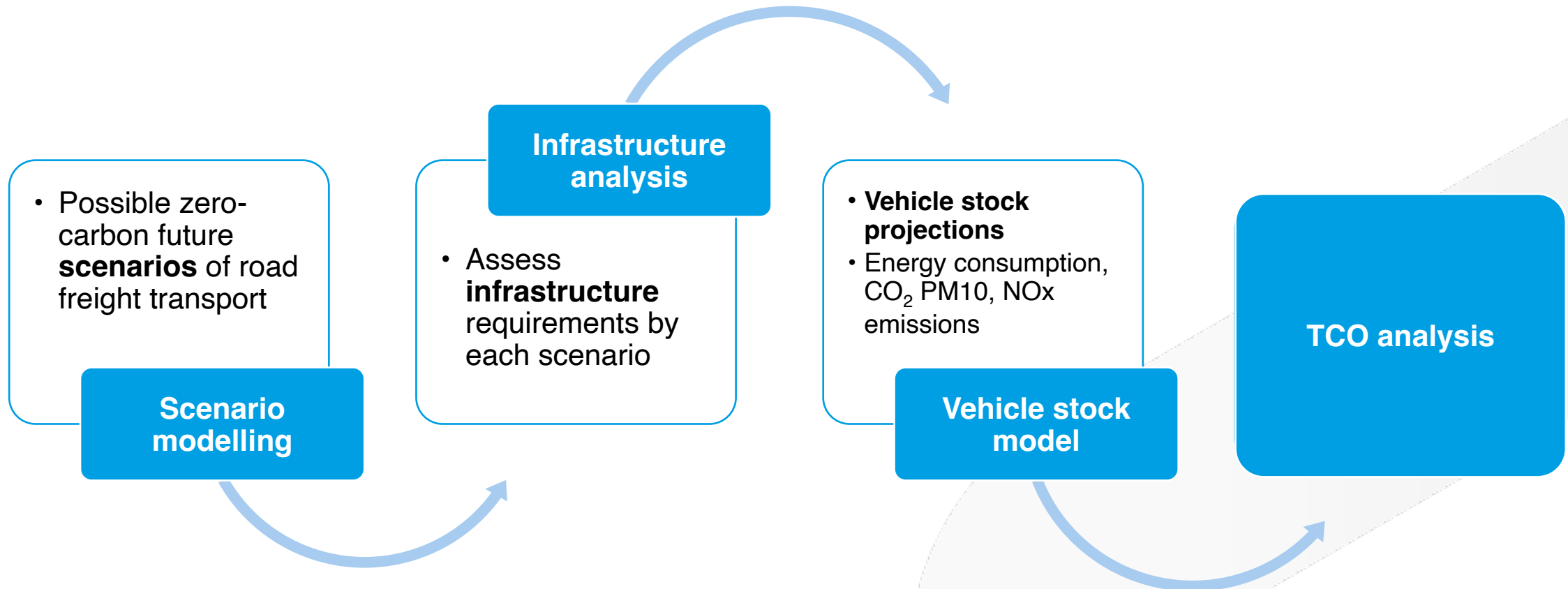


Analyze the **total cost of ownership** for each technological solution



Analyze the **environmental impacts** of each technological solution
(CO₂ emissions)

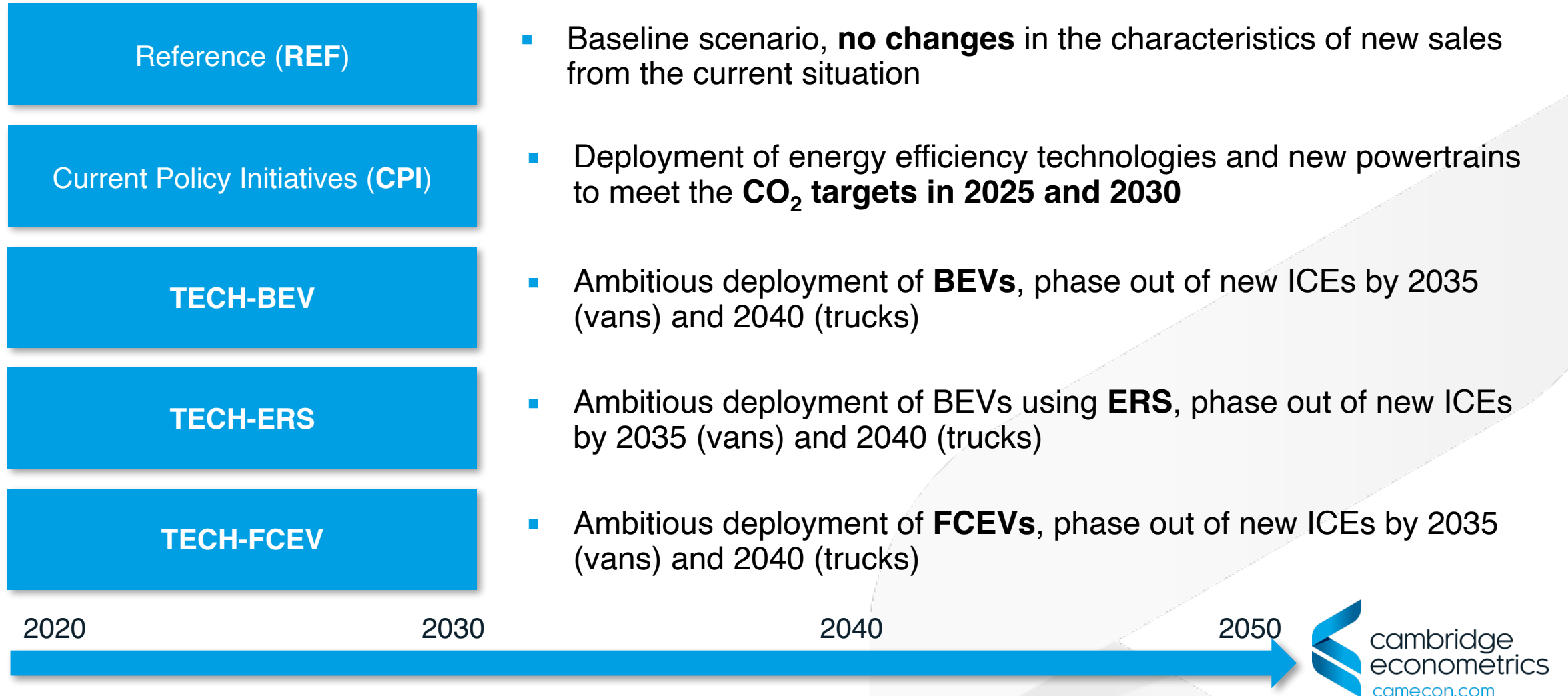
Methodology



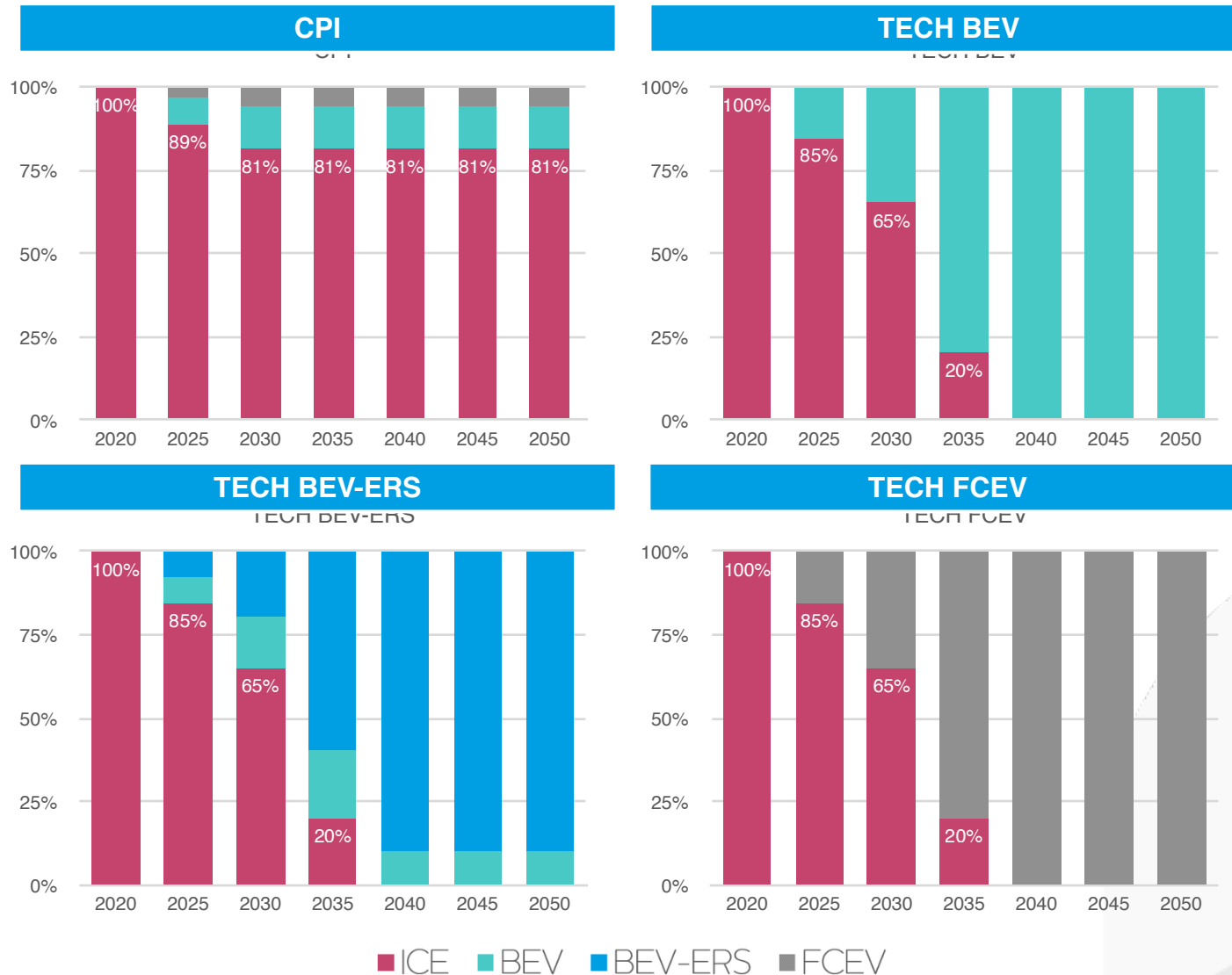
Evolution of the Spanish road freight stock



Overview of core scenarios



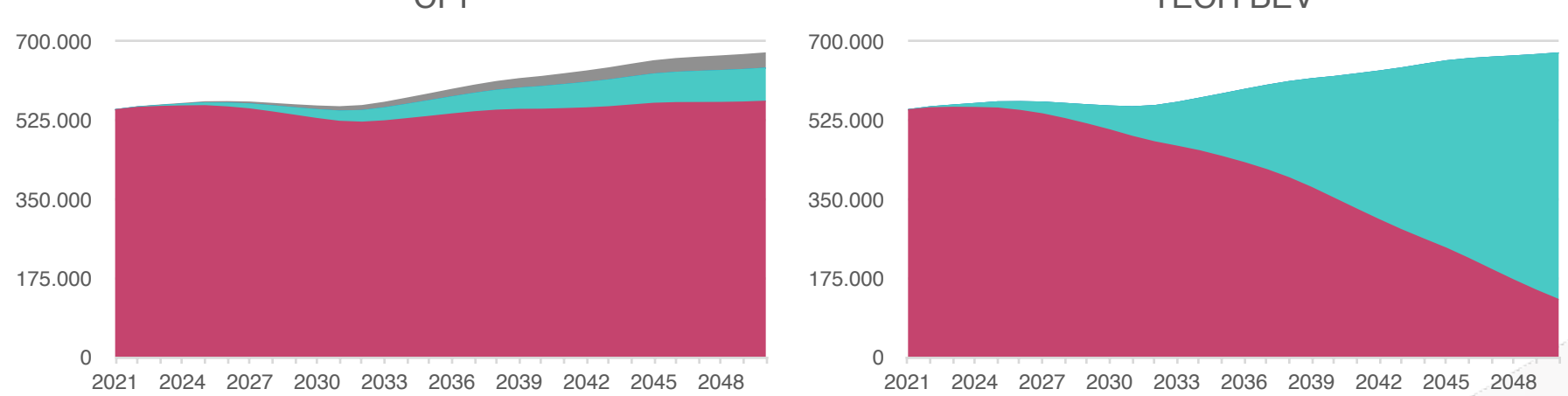
Scenarios – Sales mixes



- ICEs are phased out in 2040 in the TECH scenarios
- Different zero-carbon technologies are assumed to dominate across the scenarios

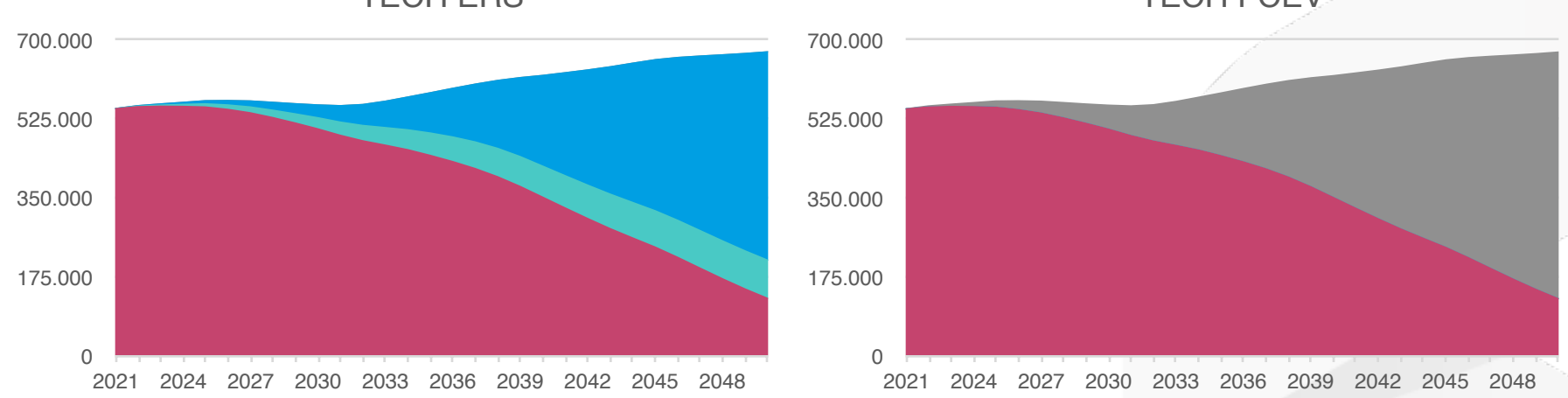
Projected vehicle stock (HGVs) by powertrain

CPI | **TECH BEV**



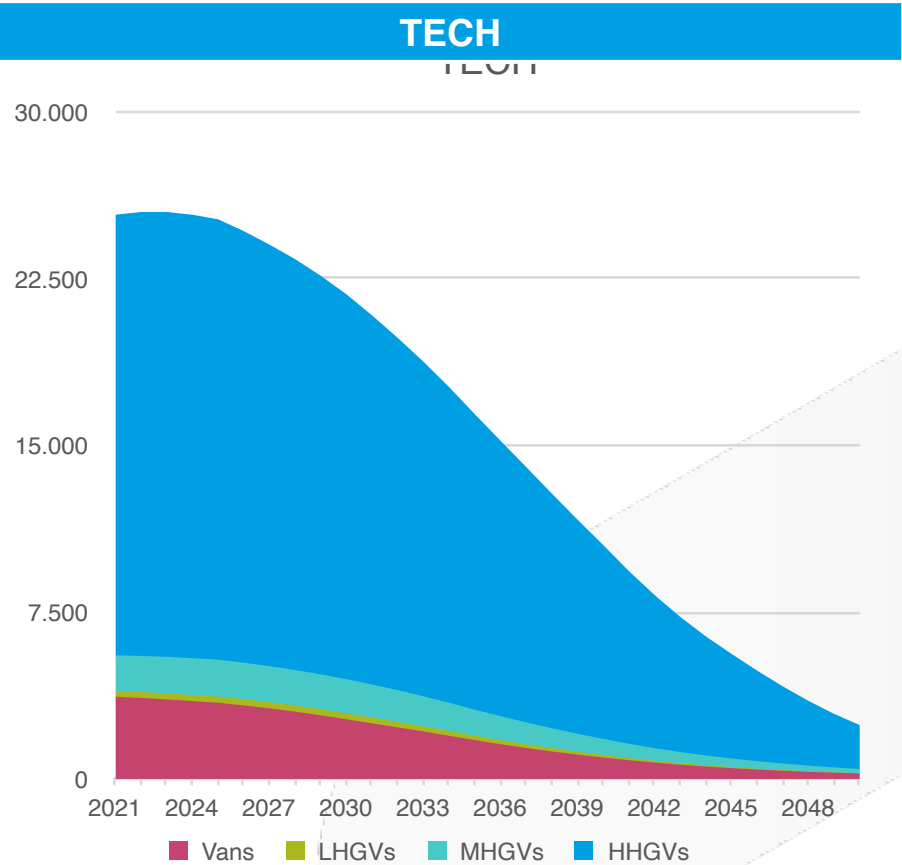
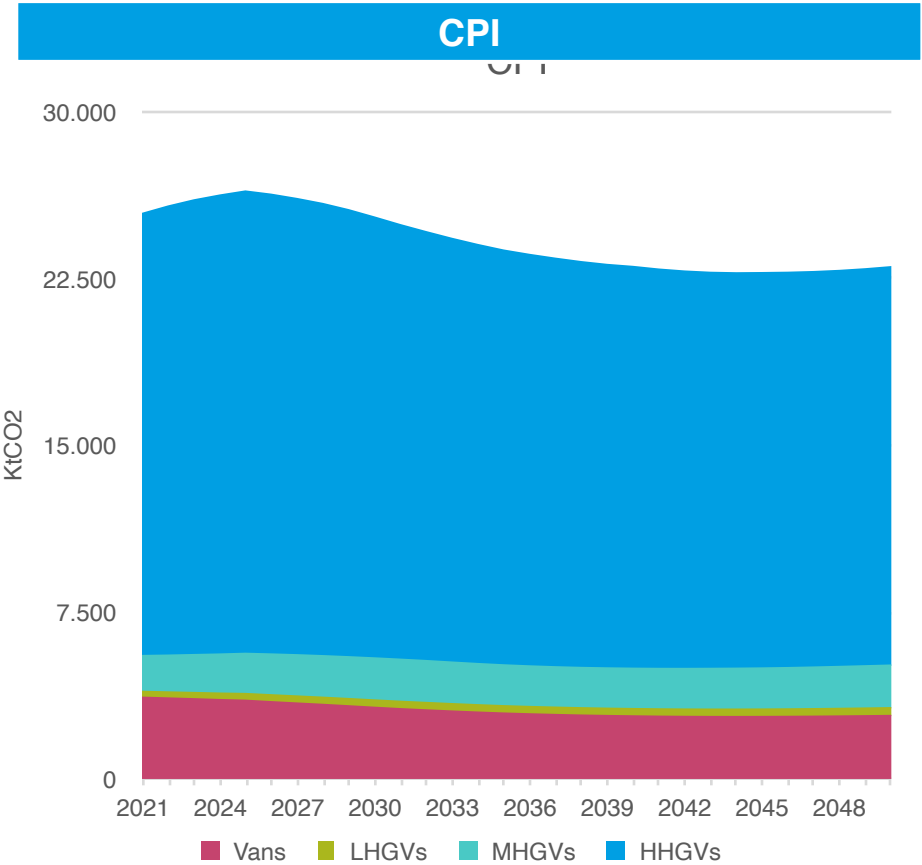
- ZETs reach 16% in CPI and 81% of the fleet in TECH scenarios
- A zero emission fleet is not achieved by 2050

TECH BEV-ERS | **TECH FCEV**



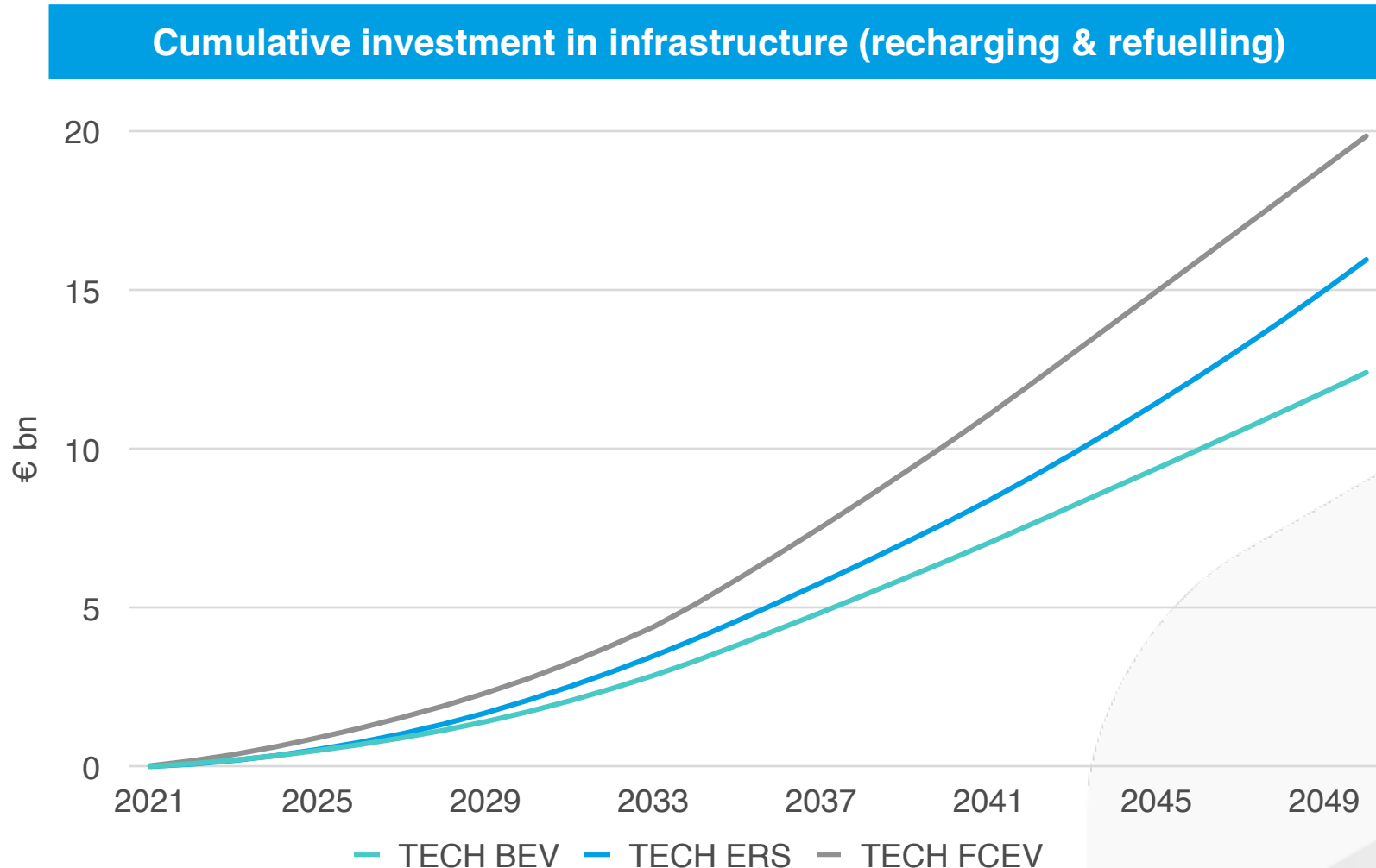
■ ICE ■ BEV ■ BEV-ERS ■ FCEV

Tailpipe CO₂ emissions (Tank-to-Wheel)



- HHGVs are the largest emitters
- Moderate decrease until 2030, accelerating later on due to stock dynamics

Infrastructure investment across scenarios

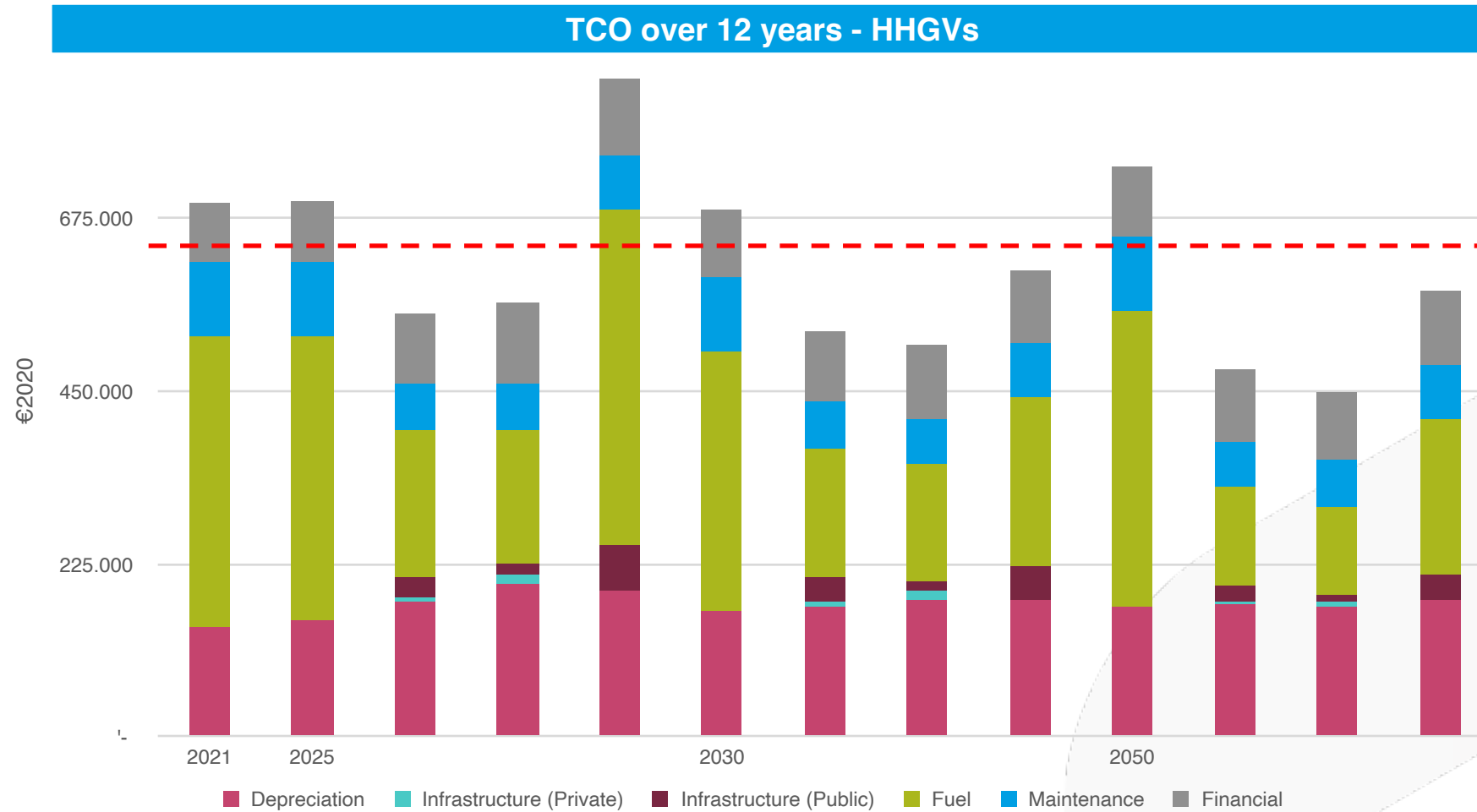


- Investment requirements are the highest in the TECH FCEV scenario
- Implementation of ERS can be challenging

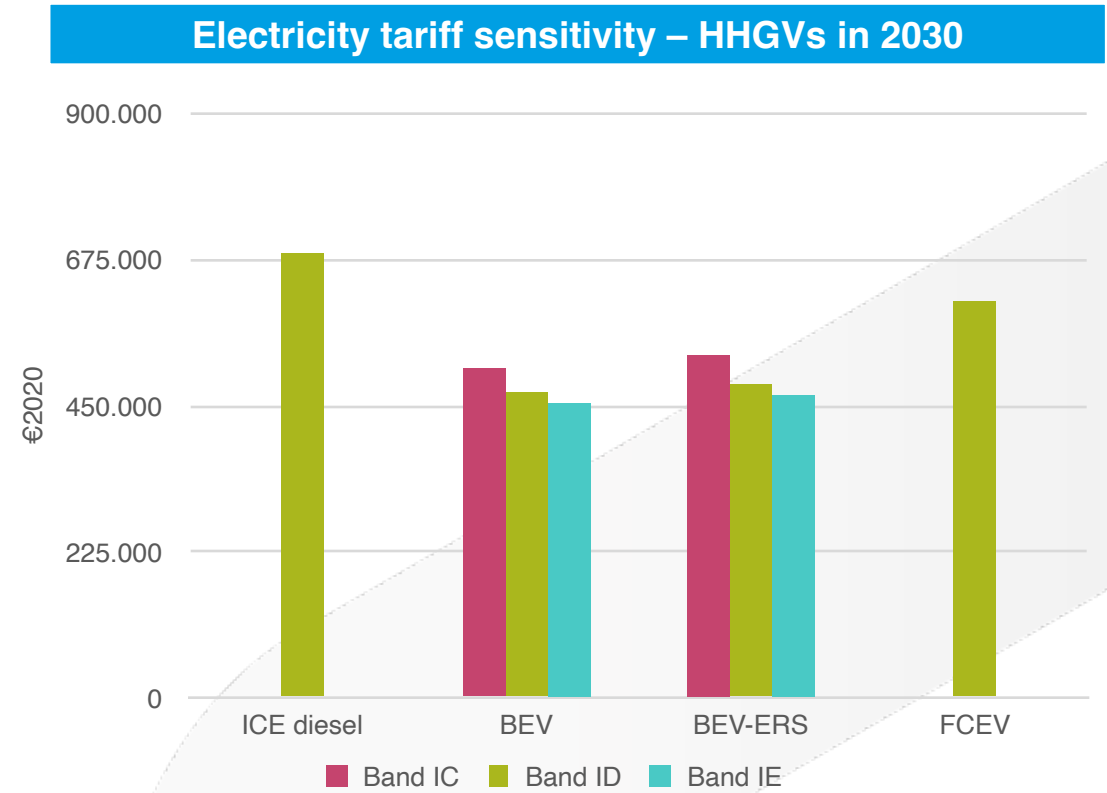
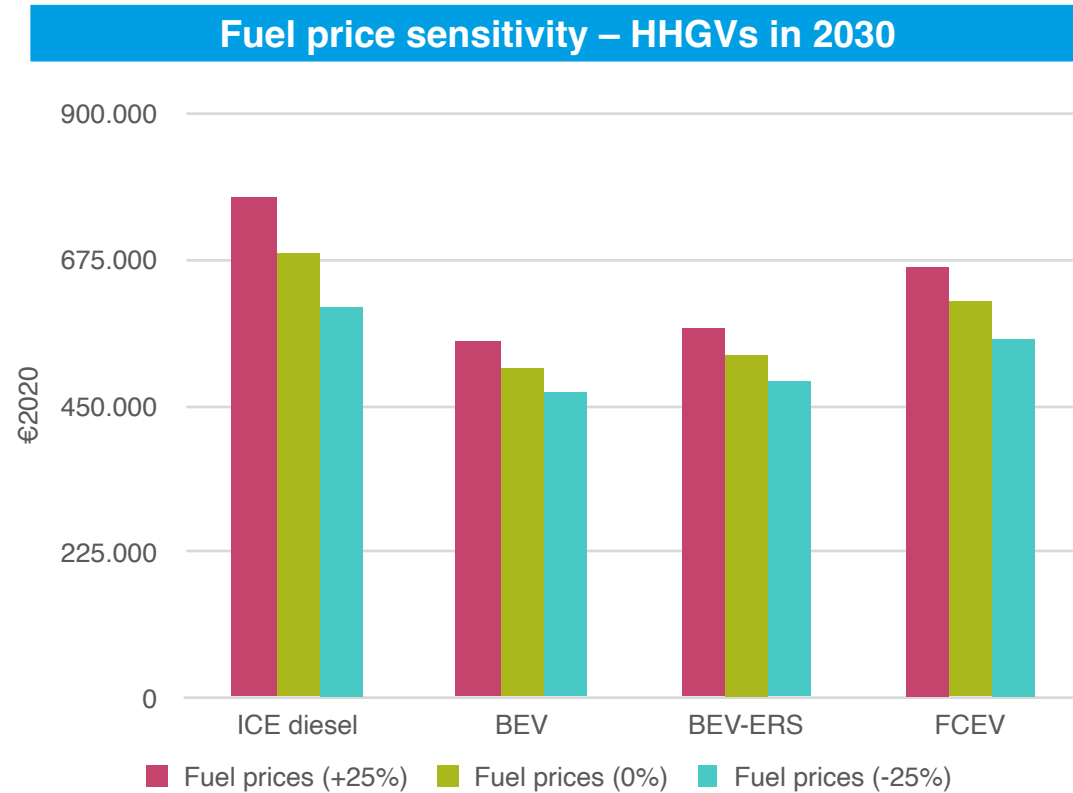
Analysis of the Total Cost of Ownership (TCO)



Lifetime TCO for HHGVs



Sensitivity on different costs of use

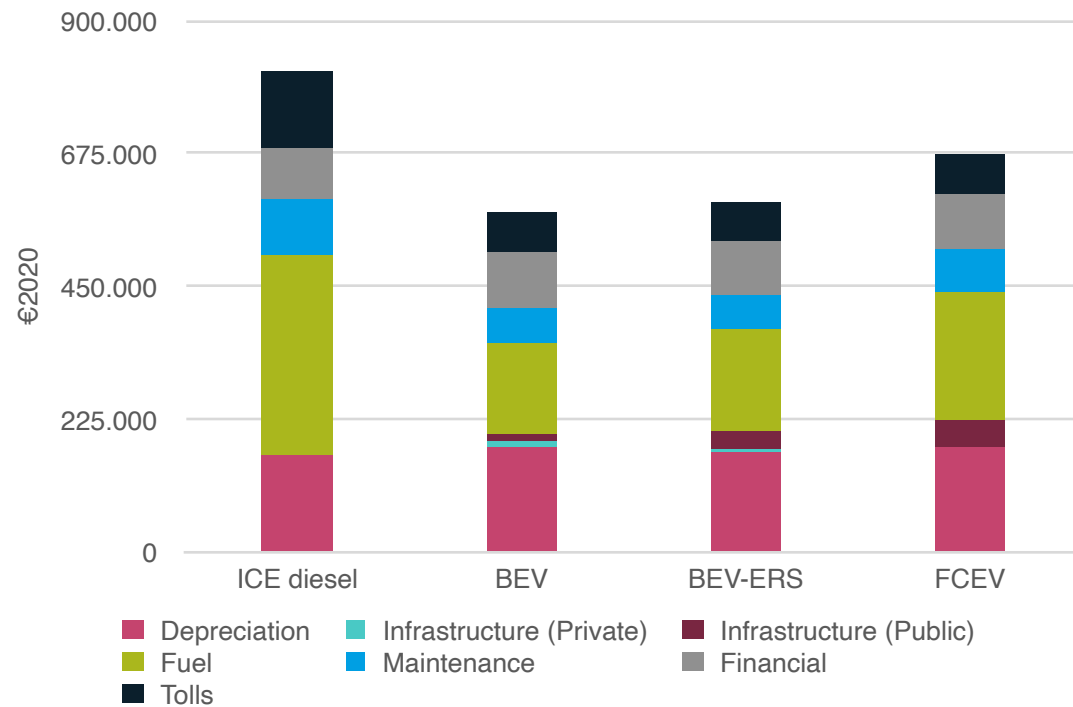


- Large consumers face lower electricity tariffs

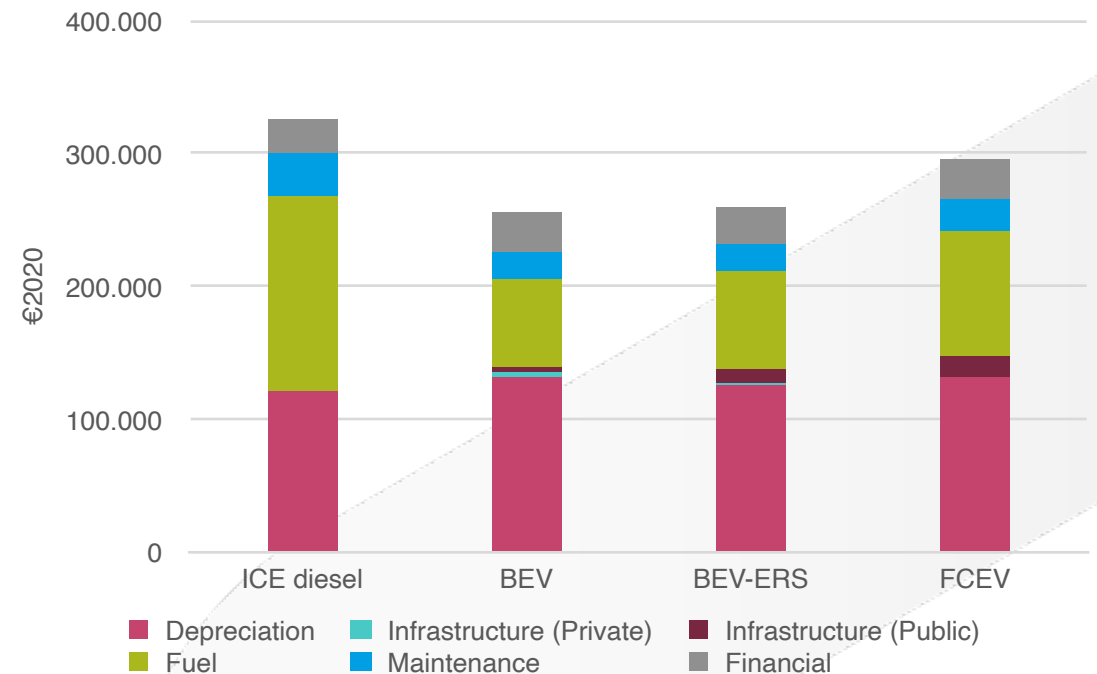
Band IC	500 MWh < Consumption < 2 000 MWh
Band ID	2 000 MWh < Consumption < 20 000 MWh
Band IE	20 000 MWh < Consumption < 70 000 MWh

Sensitivity on Eurovignette and holding period

Eurovignette directive sensitivity – HHGVs in 2030



4-year holding period sensitivity – HHGVs in 2030



- Long-haul trips are taken on highway in 90%
- From 2023, emissions-free trucks will get at least half off road tolls

- Depreciation has greater impact in the short run

Conclusion and key-takeaways



Key messages

1. A rapid transition to zero tailpipe powertrains can substantially reduce emissions from the road freight fleet...
2. ...although measures focussed on reducing the *use* of ICEs, in addition to their sale, will likely be needed to ensure delivery in line with a target of climate neutrality by 2050.
3. In the HGV markets, BEVs and ERS-enabled vehicles are expected to be cost-competitive on a total cost of ownership basis in the near future...
4. ...and these vehicles, along with FCEVs, are likely to be *cheaper* than ICEs on that basis by 2030.
5. There is a need for substantial supporting infrastructure to support all available technologies, with perhaps the largest challenge faced in the delivery of internationally-compatible ERS systems.
6. The key uncertainty is how quickly low-carbon fuels (particularly hydrogen) can come down in cost.

Contact us

@ info@camecon.com

camecon.com

in cambridge-econometrics

CambridgeEcon



Key contacts:

Jon Stenning js@camecon.com
Áron Hartvig adh@camecon.com

Tel: (+44) 1223 533100