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

- Possible zero-carbon future scenarios of road freight transport

**Scenario modelling**

**Infrastructure analysis**

- Assess infrastructure requirements by each scenario

**Vehicle stock model**

- Vehicle stock projections
- Energy consumption, CO$_2$, PM10, NOx emissions

**TCO analysis**
Overview

▪ First thing I’m talking about (capital letter at the start)

▪ Second thing – this is a particularly interesting part of the second thing (no capital letter)

▪ Third thing

Evolution of the Spanish road freight stock
Overview of core scenarios

- **Reference (REF)**
  - Baseline scenario, **no changes** in the characteristics of new sales from the current situation

- **Current Policy Initiatives (CPI)**
  - Deployment of energy efficiency technologies and new powertrains to meet the **CO₂ targets in 2025 and 2030**
  - Ambitious deployment of **BEVs**, phase out of new ICEs by 2035 (vans) and 2040 (trucks)
  - Ambitious deployment of **BEVs using ERS**, phase out of new ICEs by 2035 (vans) and 2040 (trucks)
  - Ambitious deployment of **FCEVs**, phase out of new ICEs by 2035 (vans) and 2040 (trucks)
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

- ZETs reach 16% in CPI and 81% of the fleet in TECH scenarios
- A zero emission fleet is not achieved by 2050
Tailpipe CO\textsubscript{2} 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
Overview

▪ First thing I'm talking about (capital letter at the start)
▪ Second thing – this is a particularly interesting part of the second thing (no capital letter)
▪ Third thing

Analysis of the Total Cost of Ownership (TCO)
Lifetime TCO for HHGVs

TCO over 12 years - HHGVs
Sensitivity on different costs of use

- Large consumers face lower electricity tariffs

<table>
<thead>
<tr>
<th>Band IC</th>
<th>500 MWh &lt; Consumption &lt; 2 000 MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band ID</td>
<td>2 000 MWh &lt; Consumption &lt; 20 000 MWh</td>
</tr>
<tr>
<td>Band IE</td>
<td>20 000 MWh &lt; Consumption &lt; 70 000 MWh</td>
</tr>
</tbody>
</table>
Sensitivity on Eurovignette and holding period

- 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

.cambridge-econometrics

CambridgeEcon

Cambridge

Brussels

Budapest
Key contacts:

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

Tel: (+44) 1223 533100