FREVUE
Freight Electric Vehicles in Urban Europe

GLA Group Fleet Meeting
08 December 2017
Agenda

- FREVUE project overview
- FREVUE vehicles
- Technical suitability
- Economics
- Environmental impacts
- Other findings
Objectives

**Demonstrate** suitability of electric freight vehicles for urban last-mile deliveries

Underpin future uptake of these vehicles

Provide evidence for policy intervention
FREVUE Vehicles
Example of 12t vehicle: Heineken

Supplier: Ginaf (NL)

Payload: 4t; Load volume: 25 m³

Battery capacity: 120 kWh; Range: 125 km
Example of 18t vehicle: Heineken

Supplier: EMOSS

Payload: 7.5t; Load volume: 38 m³

Battery capacity: 160 kWh; Range: 160 km
Example of 19t vehicle: Breytner

Supplier: EMOSS

Payload: 7-8t; Load volume: 47 m³

Battery capacity: 200 kWh; Range: 200 km
Technical suitability - Data

• Dynamic vehicle data with state-of-charge from 10 operators and 83 vehicles

• Covering 757,000 km – 19 times around the Earth at the equator
Technical suitability
Km per kWh, temperature and weight group
Technical suitability
Energy usage taking GVW into account
Technical suitability
Range – Mixed messages

• Operators consistently ask for more range
• FREVUE research shows that range sufficient for most urban freight operations
• Range perception changes over time

Before survey

<table>
<thead>
<tr>
<th>Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100km</td>
<td>6%</td>
</tr>
<tr>
<td>100-199km</td>
<td>28%</td>
</tr>
<tr>
<td>200-299km</td>
<td>17%</td>
</tr>
<tr>
<td>300-499km</td>
<td>39%</td>
</tr>
<tr>
<td>&gt;500km</td>
<td>11%</td>
</tr>
</tbody>
</table>

After survey

<table>
<thead>
<tr>
<th>Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100km</td>
<td>50%</td>
</tr>
<tr>
<td>100-199km</td>
<td>17%</td>
</tr>
<tr>
<td>200-299km</td>
<td>17%</td>
</tr>
<tr>
<td>300-499km</td>
<td>0%</td>
</tr>
<tr>
<td>&gt;500km</td>
<td>11%</td>
</tr>
</tbody>
</table>

I am happy with what we have...
Technical suitability
Charging

• Most operators charge once a day – at night at the depot
• Some, especially the smaller ones, opportunity charge during the day, typically at lunch time
• Grid infrastructure constraints
• Most large vehicles have excess battery capacity
• Inner city fast charging infrastructure and new battery packs with higher capacity will further remove barriers
Environmental impact

• Low penetration level (10%), 2021:
  • NOx reduction of 402Kt
  • PM reduction of 3.8t
  • Local GHG savings of 284Kt CO$_2$e

• Monetisation, 10% penetration level, 2021:
  • Monetary savings from NOx reductions: £881 million
  • Monetary savings from CO2 reductions: £13 million
Direct impacts - Noise

- Many factors contribute to road traffic noises, including vehicle, road, geo-spatial and weather related parameters
- However, EFVs only reduce engine noise
- In the FREVUE project, the impacts are impossible to measure
- Previous studies show that noise reductions from an EFV significant at lower speed
Economics of EVs for City Logistics

- A positive business case is achievable for small and medium EFVs

- For large EFVs this remains difficult
TCO comparison (small EFV)
TCO comparison medium EFV
TCO comparison large EFV
Attitudes towards EFVs

Question to fleet managers: Are EFVs a viable alternative to ICEs?

Before survey
- Yes: 39%
- No: 6%
- I am not sure: 56%

After survey
- Yes: 72%
- No: 11%
- I am not sure: 17%
Thank you

Tanja Dalle-Muenchmeyer
tanjadalle@crossriverpartnership.org