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Electrifying your fleet
How feasible is it?

Post & Parcel Live: Future Logistics
15 May 2018
Tanja Dalle-Muenchmeyer, Cross River Partnership

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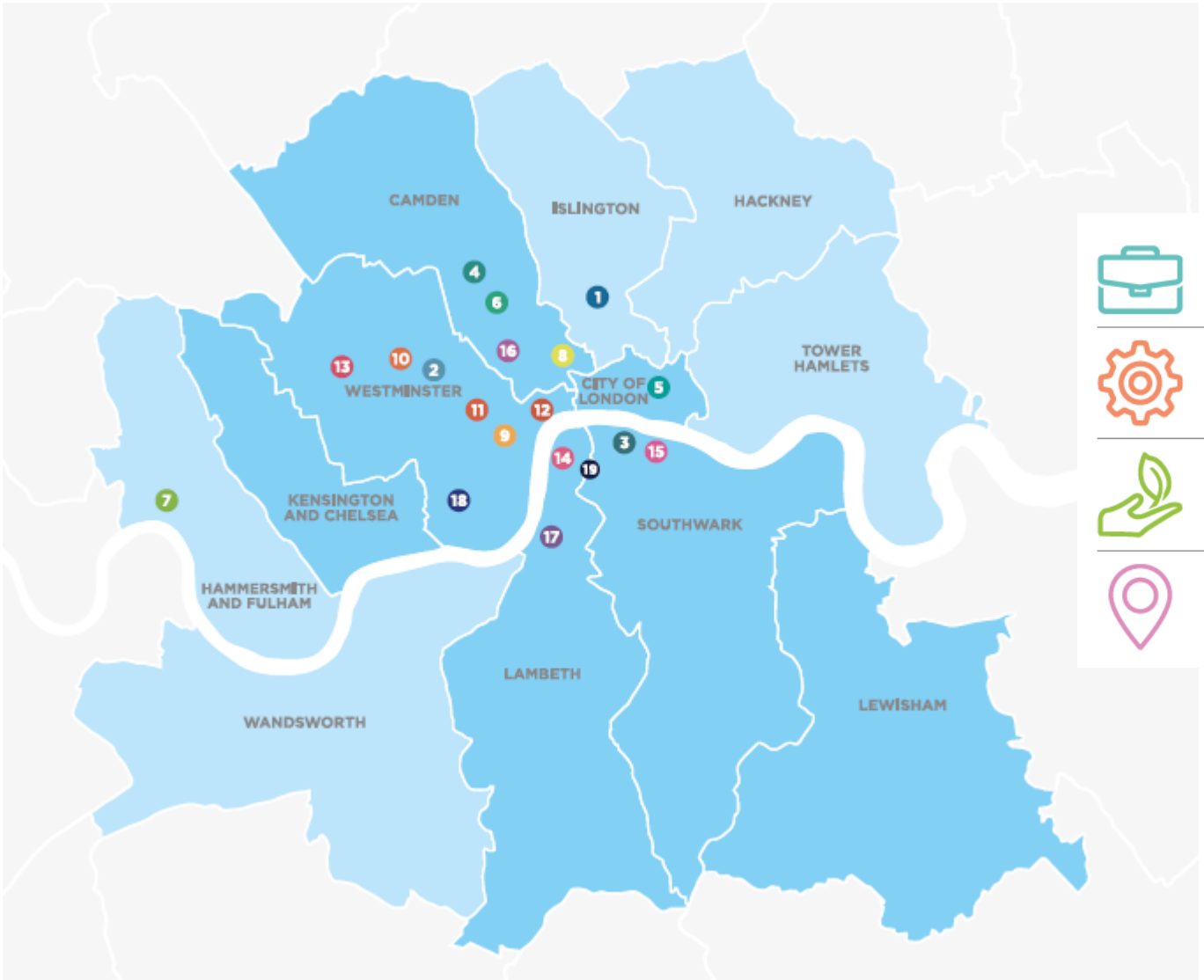

- Good Jobs
- Strong Businesses
- Clean Air
- Great Places

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Contents

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The Case for Electric Freight Vehicles

- Traditionally focus on electrification of passenger cars and buses
- Freight vehicles contribute disproportionately to urban air pollution
- Freight movements remain crucial to well-functioning cities
- Fully electric freight vehicles offer no tailpipe emissions and significant reductions in CO_2 emissions

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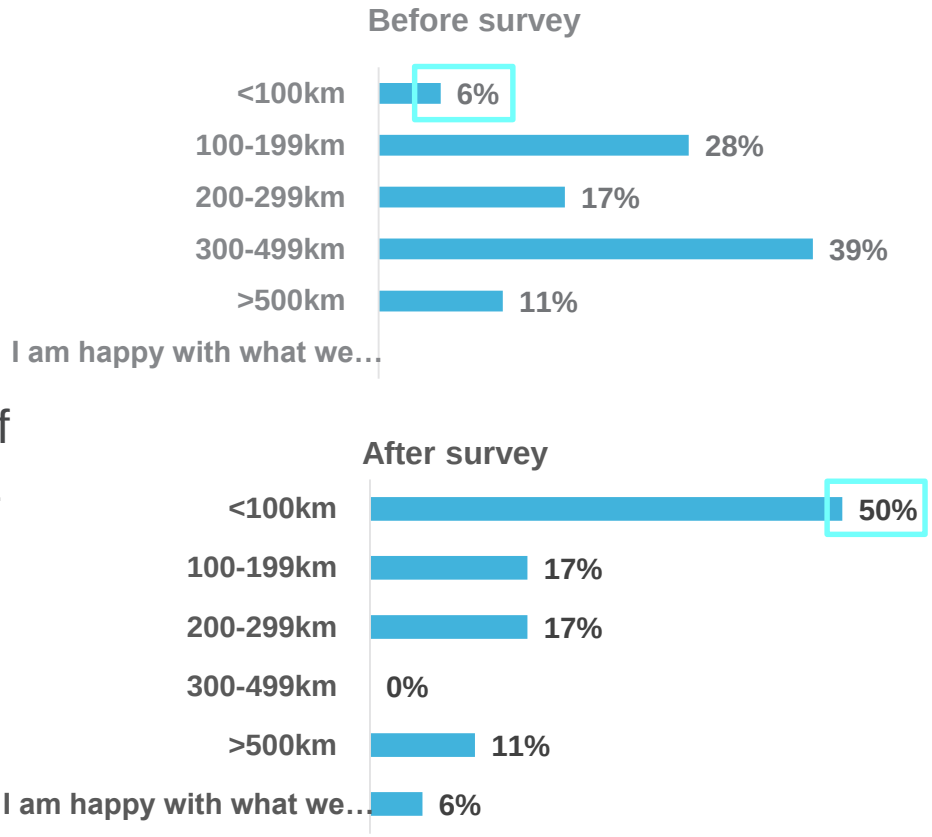
FREVUE
Freight Electric Vehicles in Urban Europe

- 4.5-year EU-funded project, 8 cities
- Objective to demonstrate the suitability of electric freight vehicles for inner city logistics
- Deployed over 80 fully electric vans and trucks <3.5 tonnes to >19 tonnes
- Provides evidence base

FREVUE Findings

- Current generation of electric vans and trucks technically and operationally suitable
- Available range sufficient for most urban operations
- Perception/attitude change over time
- Most operators increased numbers of EFVs in their fleet following FREVUE experience



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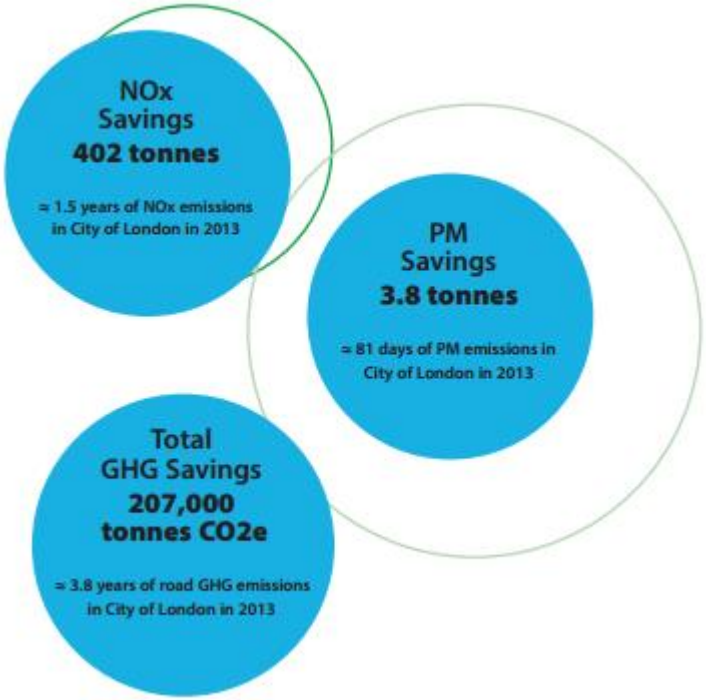
FREVUE Findings (cont'd)

- Clear environmental benefits
- Resulting cost savings significant

> IF, IN LONDON ALONE, WE COULD ELECTRIFY 10% OF THE FREIGHT FLEET BY 2021, WE COULD SAVE OVER € 1BILLION PER ANNUM IN PUBLIC SPENDING ON REDUCED HEALTH IMPACTS AND ABATEMENT COSTS.



FREVUE Findings (cont'd)

- Limited vehicle availability
  - OEMs entering the market
- High procurement prices
  - Falling battery prices
- Fast charging opportunities and impact on price

Vehicle class	Expected purchase price difference					
	Converted EFV			Series EFV		
	Slow charging	1x fast charging	2x fast charging	Slow charging	1x fast charging	2x fast charging
<3.5 tonne	46,000	40,000	37,000	15,000	9000	6000
13 tonne	111,000	97,000	91,000	32,000	18,000	12,000
19 tonne	159,000	142,000	136,000	38,000	21,000	15,000

EFV Uptake

September 2017 McKinsey Report*:

eTruck market share could reach 15% by 2030

Our latest research reveals that eTrucks could account for 15% of global truck sales by 2030, with favorable segments like urban light duty trucks reaching sales as high as 25-35% in China and Europe.

*Source: McKinsey (2017): New reality: electric trucks and their implications on energy demand

EFV power requirements

- EFV power requirements and charging patterns different to passenger cars and buses

> An18t single-shifted truck with a 200kW battery in daily operation requires an average of **163 kWh per day** to charge. In comparison, a medium-sized van requires approximately 30kWh per day

- Little diversity in charging patterns of large EFVs

> Large (over 12 tonnes) and medium (3.5 tonnes to 7.5 tonnes) EFVs within FREVUE tended to be **charged only once a day** in the late afternoon at the operator's depot.

- Providing challenges but also opportunities

Local grid infrastructure capacity

- Overall impact still low but local constraints pose problems
- FREVUE partner UPS encountered grid infrastructure constraints when charging all EFVs at the same time
- Infrastructure upgraded to charge up to 63 vehicles
- Such infrastructure upgrade has proven:
  - Costly, lengthy and disruptive
  - Non-incremental
  - Requiring investment in 3rd party assets

→ **Barrier to the large-scale deployment of EFVs**

Smart Electric Urban Logistics

- An additional 20 EFVs at UPS central London depot
  - Bringing the number above the maximum that can theoretically be charged
- Design and implement an innovative smart charging system at this depot together with an energy storage system
- Design and implement a sophisticated network capacity assessment tool developed to take into account time of day variation in demand
- April 2017 to March 2019, funded by UK Office for Low Emission Vehicles

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Thank you

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