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ELECTROMOBILITY

–BACK TO THE FUTURE

Is there a market for electromobility for urban freight?

Pierre Camilleri, PhD candidate, IFSTTAR-University of Paris-East/Renault

Laetitia Dablanc, Professor, IFSTTAR-University of Paris-East/Visiting Professor at
University of Gothenburg

laetitia.dablanc@ifsttar.fr

The urban freight market today (Paris region)

15% of Paris vehicle-kilometers

25% of Paris transport-related CO₂

33% of Paris transport-related NOx

50% of Paris transport-related PM

Paris chokes on pollution; City of Light becomes City of Haze



Los Angeles Times, 2015

20,000 small freight operators
10 very large freight operators
Many own-account operations

1.5 million deliveries/pick-ups per day

4% 26% 31% 31% 8%



To urban freight operators, electric vehicles present little or no relative advantage

Lower environmental impact and driving comfort do not compensate for higher costs

- Very competitive market with low margins
- Most customers (businesses and households) not willing to pay more for clean deliveries
- One current exception: public tenders

Norway (first hand market):

- electric passenger cars 25% market share
- electric commercial vans 2% market share

Changing to an electric urban freight operation is complex

- Limited range can impose new processes, new route management
- New software, staff training
- Charging requires specific parking spots, mostly on company premises, the vehicle is immobilized during charging

A risk of loss of opportunity is unacceptable

Long freight trips are usually the most profitable

A market potential model (Camilleri, PhD research, 2018)

A model based on market constraints

Range constraint

Most of the trips must be covered (all except one per year)

Economic constraint

Total cost of ownership must be equal or less

Both constraints are very dependent on the daily distance traveled

Large parcel postal operations today are the ideal market for electric vans: regular routes and total long distances, very often urban facilities available to organize night charging

Constraints evolve with technology

In particular the range depends on battery capacity and costs

Reference scenario (small vans):

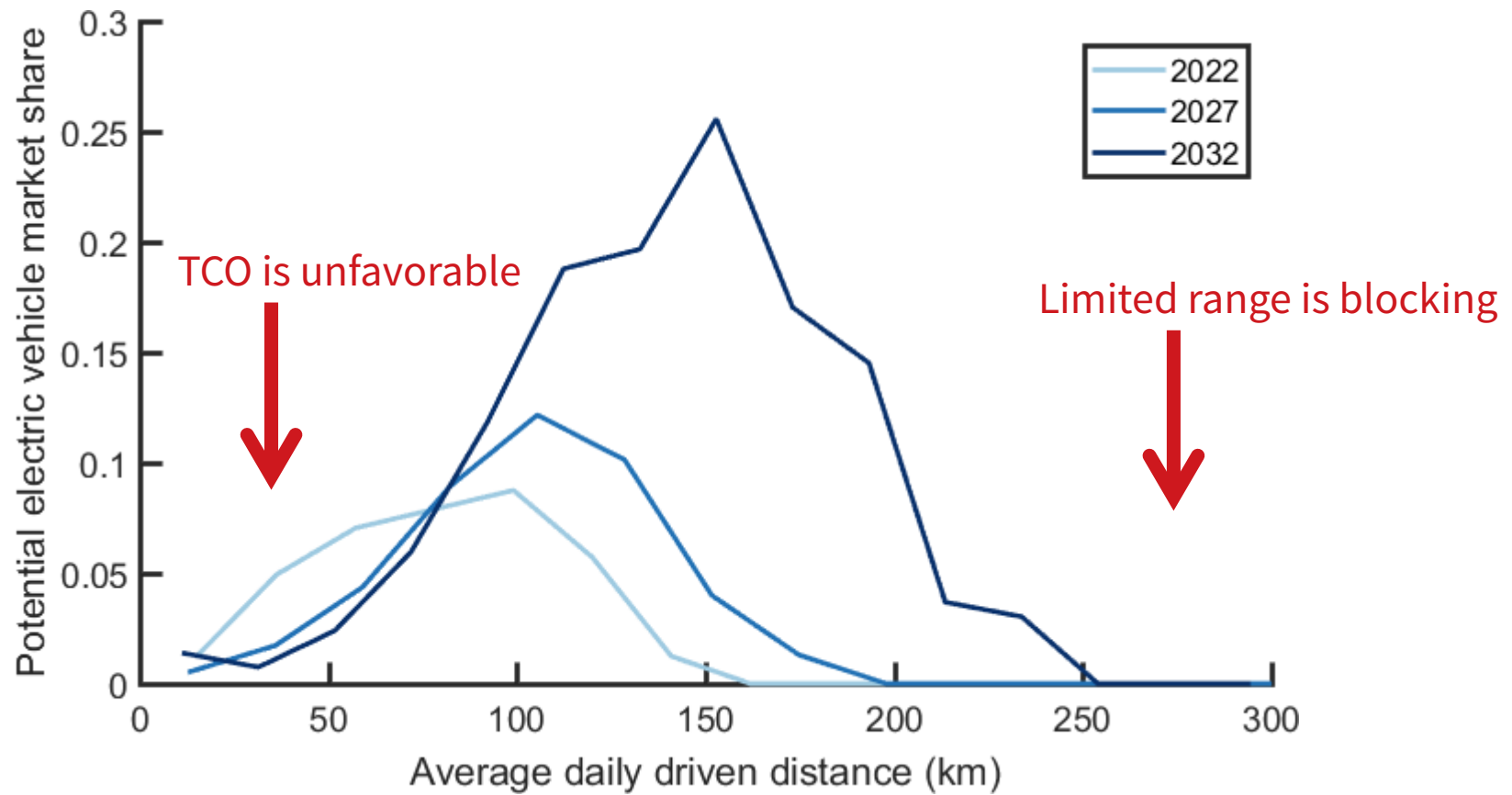


The currently significant subsidies are likely to decrease in the future

Assumption: constant total budget for public subsidies on electric vans

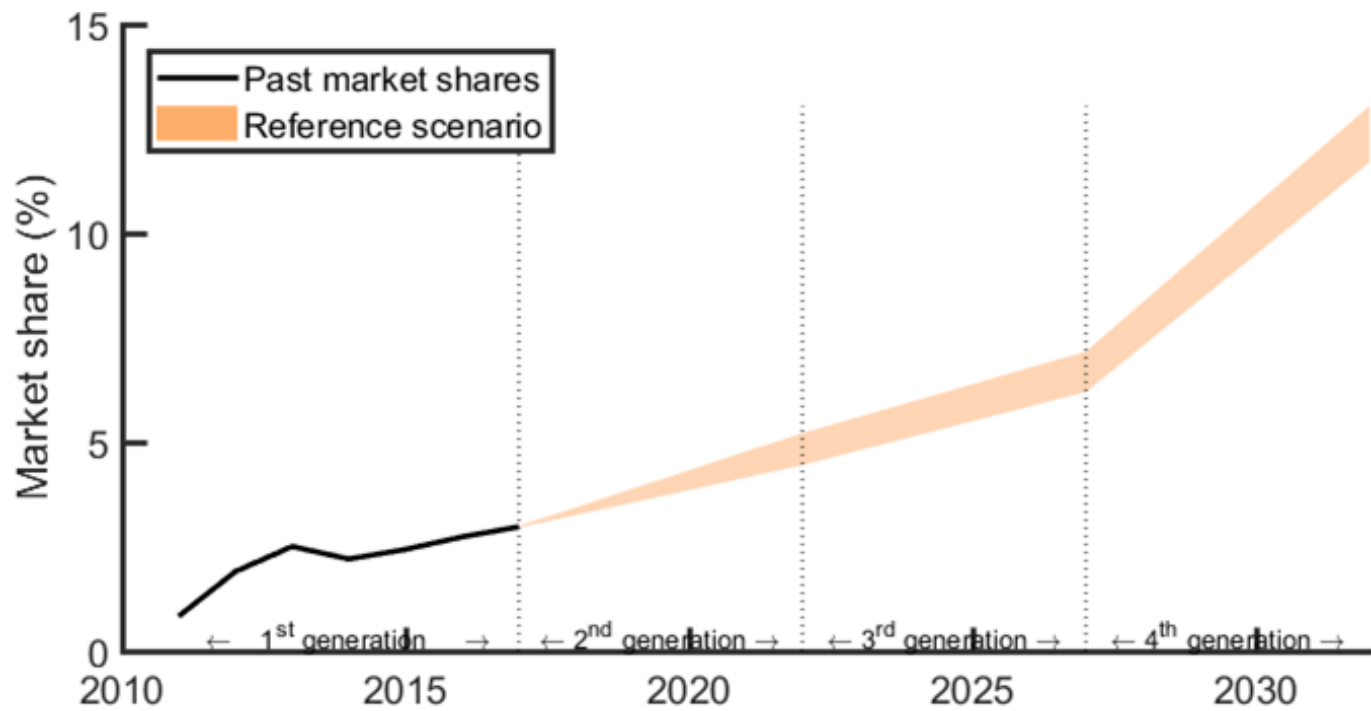
As a result when the market grows, subsidies/veh decrease

Reference scenario for small vans

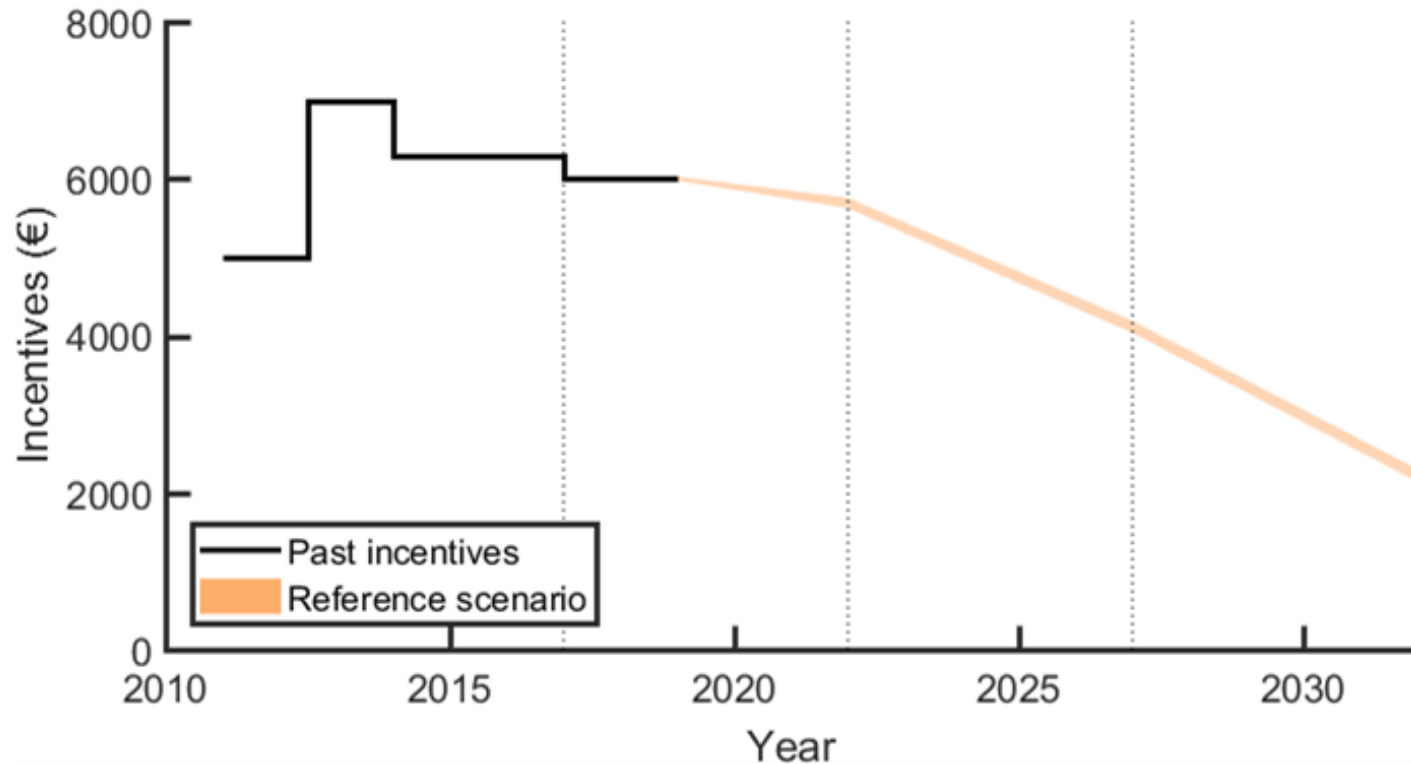


Reference scenario for small vans

Relatively slow increase of the market (13% market share expected in 2032...)



... provided there are subsidies for many more years)



Additional mechanisms may improve the deployment of electric vans

- Public charging adds complexity but prevents from the risk of loss of opportunities
- Diversification of battery capacities
- A technological breakthrough on batteries
- Local regulations (low emission zones or traffic restrictions)



Conclusion from the model

- **Potential to a switch to electric vans depends on the distances traveled and the size of the vehicles used**

Acknowledgement of use patterns is essential for the assessment of electric vehicles potential in the freight market

- **No exponential growth expected, subsidies required many more years**

Slow market progress to be expected despite impressive technological improvements, as it may be balanced out by a decrease in subsidies

Limits of the model

- **Results are sensitive to various other parameters**
 - Fuel price
 - Availability of public charging
- **Does not take into account changes in local policies**
 - Additional local subsidies
 - Low emission zones

Other scenarios possible!

Auto makers' electric vans on the market today: a 'psychological' effect of high price of acquisition?



(pre-tax lowest prices in euros, all from website *Auto-journal*)

Renault Master ZE: 54,000 (43,000 for Diesel version)



Volkswagen eCrafter: 69,000 (41,000 for Diesel version)



Renault Kangoo ZE: 35,000 (21,000 for Diesel version)